SEQUENCE LISTING

<110> Catalyst Biosciences, Inc.
Madison, Edwin
Thanos, Christopher

<120> MODIFIED FACTOR X POLYPEPTIDES AND USES THEREOF

<130> 33328-4941PC

<140> Not yet assigned
<141> Herewith

<150> 61/741,806
<151> 2012-07-25

<160> 557

<170> FastSEQ for Windows Version 4.0

<210> 1
<211> 1467
<212> DNA
<213> Homo sapiens

<220>
<223> Factor X coding sequence

<300>
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<309> 2012-01-23

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gagggctgtg cccgtaaggg gaagtacggg atctacacca aggtcaccgc cttcctcaag 1380
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<210> 2
<211> 488
<212> PRT
<213> Homo sapiens

<220>
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<222> (1)...(31)
<223> signal peptide

<220>
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<220>
<221> CHAIN
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<220>
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<223> Factor X light chain

<220>
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<222> (183)...(488)
<223> Factor X heavy chain

<220>
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<222> (183)...(234)
<223> activation peptide

<220>
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<222> (235)...(488)
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<300>
<308> UniProtKB: P00742
<309> 1989-10-01

<400> 2

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 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
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Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485


<210> 3
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X I195L

<400> 3
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1                5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
```

```
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Leu Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445
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<210> 4
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196I (V236I) Prepropeptide

<400> 4

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Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
```

```
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ile Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
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<210> 5
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S (V236S) Prepropeptide

<400> 5

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 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
```

```
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
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<210> 6
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X T85N/K87S/V196S (T125N/K127S/V236S)
      Prepropeptide

<400> 6

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Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
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```
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Asn Arg Ser Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
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<210> 7
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X Q56N/Q58S/V196S (Q96N/Q98S/V236S)
Prepropeptide

<400> 7

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Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
```

```
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Asn
                85                  90                  95
Asn Ser Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
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<210> 8
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X K62N/G64S/V196S (K102N/G104S/V236S)

Prepropeptide

<400> 8

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Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Asn Asp Ser Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 9

<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X L65N/E67S/V196S (L105N/E107S/V236S)
Prepropeptide

<400> 9
```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Asn Gly Ser Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
```

```
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 10
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X E67N/V196S (E107N/V236S) Prepropeptide

<400> 10

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Asn Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
```

```
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 11
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X L73N/G75S/V196S (L113N/G115S/V236S)
Prepropeptide

<400> 11

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Asn Glu Ser Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
```

```
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 12
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X G75N/E77S/V196S Prepropeptide
(G115N/E117S/V236S)

<400> 12

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Asn Phe Ser Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
```

```
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 13
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X R86N/L88S/V196S (R126N/L128S/V236S)
Prepropeptide

<400> 13

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Asn Lys Ser
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
```

```
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 14
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X G114N/V196S (G154N/V236S) Prepropeptide

<400> 14

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Asn Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
```

```
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 15
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X D95N/D97S/V196S (D135N/D137S/V236S)
Prepropeptide

<400> 15

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1                5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asn Cys Ser Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
```

```
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 16
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X E82S/V196S (E122S/V236S) Prepropeptide

<400> 16

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Ser Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
```

```
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 17
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X E82N/F84S/V196S (E122N/F124S/V236S)
Prepropeptide

<400> 17

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
```

```
Leu Glu Gly Phe Glu Gly Lys Asn Cys Asn Leu Ser Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 18
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X G78N/N80S/V196S (G118N/N120S/v236S)
Prepropeptide

<400> 18

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
```

```
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Asn Lys Ser Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 19
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X E77N/K79S/V196S (E117N/K119S/V236S)
Prepropeptide

<400> 19

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
```

```
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Asn Gly Ser Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 20
<211> 488
<212> PRT
<213> Artificial Sequence

<220>

<223> Factor X D119N/G121S/V196S (D159N/G161S/V236S) Prepropeptide

<400> 20

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asn Asn
145                 150                 155                 160
Ser Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 21
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X L83N/V196S (L123N/V236S) Prepropeptide

<400> 21
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1   5   10   15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20   25   30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35   40   45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50   55   60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65   70   75   80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85   90   95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100   105   110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Asn Phe Thr Arg Lys Leu
        115   120   125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130   135   140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145   150   155   160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165   170   175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180   185   190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195   200   205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210   215   220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225   230   235   240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245   250   255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260   265   270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275   280   285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290   295   300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305   310   315   320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325   330   335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340   345   350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355   360   365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370   375   380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385   390   395   400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405   410   415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420   425   430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435   440   445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450   455   460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu

465 470 475 480
Val Ile Thr Ser Ser Pro Leu Lys
485

<210> 22
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X K122S/V196S (K162S/V236S) Prepropeptide

<400> 22
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
1 5 10 15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
20 25 30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
35 40 45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
50 55 60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65 70 75 80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
85 90 95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
100 105 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
115 120 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
130 135 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145 150 155 160
Gly Ser Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
165 170 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
180 185 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
195 200 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
210 215 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225 230 235 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
245 250 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
260 265 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
275 280 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
290 295 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305 310 315 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
325 330 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
340 345 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
355 360 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
370 375 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385 390 395 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
405 410 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
420 425 430

Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
435 440 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
450 455 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465 470 475 480
Val Ile Thr Ser Ser Pro Leu Lys
485

<210> 23
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X E51N/V196S (E91N/V236S) Prepropeptide

<400> 23
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
1 5 10 15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
20 25 30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
35 40 45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
50 55 60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65 70 75 80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Asn Thr Ser Pro Cys Gln
85 90 95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
100 105 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
115 120 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
130 135 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145 150 155 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
165 170 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
180 185 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
195 200 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
210 215 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225 230 235 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
245 250 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
260 265 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
275 280 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
290 295 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305 310 315 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
325 330 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
340 345 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
355 360 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
370 375 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln

385 390 395 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
405 410 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
420 425 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
435 440 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
450 455 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465 470 475 480
Val Ile Thr Ser Ser Pro Leu Lys
485

<210> 24
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X Q58N/K60S/V196S (Q98N/K100S/V236S)
Prepropeptide

<400> 24
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
1 5 10 15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
20 25 30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
35 40 45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
50 55 60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65 70 75 80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
85 90 95
Asn Asn Gly Ser Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
100 105 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
115 120 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
130 135 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145 150 155 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
165 170 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
180 185 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
195 200 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
210 215 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225 230 235 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
245 250 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
260 265 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
275 280 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
290 295 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305 310 315 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
325 330 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr

340 345 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
355 360 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
370 375 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385 390 395 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
405 410 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
420 425 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
435 440 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
450 455 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465 470 475 480
Val Ile Thr Ser Ser Pro Leu Lys
485

<210> 25
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X G114N/D119N/G121S/V196S
(G154N/D159N/G161S/V236S) Prepropeptide

<400> 25
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
1 5 10 15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
20 25 30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
35 40 45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
50 55 60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65 70 75 80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
85 90 95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
100 105 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
115 120 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
130 135 140
Asn Ser Val Val Cys Ser Cys Ala Arg Asn Tyr Thr Leu Ala Asn Asn
145 150 155 160
Ser Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
165 170 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
180 185 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
195 200 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
210 215 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225 230 235 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
245 250 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
260 265 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
275 280 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu

```
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 26
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X G198A (G238A) Prepropeptide

<400> 26

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Ala Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
```

```
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 27
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X G198V (G238V) Prepropeptide

<400> 27

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
```

```
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Val Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 28
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X G198R (G238R) Prepropeptide

<400> 28

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1                5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
```

```
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Arg Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 29
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X G198K (G238K) Prepropeptide

<400> 29

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1                5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
```

```
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Lys Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 30
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X G198P (G238P) Prepropeptide

<400> 30

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
```

```
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Pro Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 31
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X G198H (G238H) Prepropeptide

<400> 31

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1                5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
```

```
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly His Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 32
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X L211S/G219H (L251S/G259H) Prepropeptide

<400> 32

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
```

```
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Ser Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu His Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 33
<211> 488
<212> PRT
<213> Artificial Sequence

<220>

<223> Factor X G197P (G237P) Prepropeptide

<400> 33

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Pro Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 34

<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X D378N (D418N) Prepropeptide

<400> 34
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1   5   10   15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20   25   30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35   40   45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50   55   60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65   70   75   80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85   90   95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100   105   110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115   120   125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130   135   140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145   150   155   160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165   170   175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180   185   190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195   200   205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210   215   220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225   230   235   240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245   250   255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260   265   270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275   280   285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290   295   300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305   310   315   320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325   330   335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340   345   350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355   360   365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370   375   380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385   390   395   400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405   410   415
Gly Asn Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420   425   430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435   440   445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450   455   460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465   470   475   480

Val Ile Thr Ser Ser Pro Leu Lys
485

<210> 35
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X D378S (D418S) Prepropeptide

<400> 35
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
1 5 10 15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
20 25 30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
35 40 45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
50 55 60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65 70 75 80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
85 90 95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
100 105 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
115 120 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
130 135 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145 150 155 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
165 170 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
180 185 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
195 200 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
210 215 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225 230 235 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
245 250 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
260 265 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
275 280 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
290 295 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305 310 315 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
325 330 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
340 345 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
355 360 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
370 375 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385 390 395 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
405 410 415
Gly Ser Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
420 425 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys

```
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 36
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196L (V236L) Prepropeptide

<400> 36

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Leu Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
```

Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
405 410 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
420 425 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
435 440 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
450 455 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465 470 475 480
Val Ile Thr Ser Ser Pro Leu Lys
485

<210> 37
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196T (V236T) Prepropeptide

<400> 37
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
1 5 10 15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
20 25 30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
35 40 45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
50 55 60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65 70 75 80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
85 90 95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
100 105 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
115 120 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
130 135 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145 150 155 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
165 170 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
180 185 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
195 200 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
210 215 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Thr Gly Gly Gln Glu
225 230 235 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
245 250 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
260 265 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
275 280 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
290 295 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305 310 315 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
325 330 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
340 345 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His

```
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 38
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196P (V236P) Prepropeptide

<400> 38

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Pro Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
```

```
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 39
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X G197V (G237V) Prepropeptide

<400> 39

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Val Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
```

```
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 40
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X G197T (G237T) Prepropeptide

<400> 40

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Thr Gly Gln Glu
225                 230                 235                 240
```

```
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 41
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X G197S (G237S) Prepropeptide

<400> 41

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1                5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
```

```
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Ser Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 42
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X E200A (E240A) Prepropeptide

<400> 42

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
```

```
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Ala
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 43
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X E200S (E240S) Prepropeptide

<400> 43

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
```

```
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Ser
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 44
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X E200V (E240V) Prepropeptide

<400> 44

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
```

```
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Val
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 45
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X K202S (K242S) Prepropeptide

<400> 45

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1                5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
```

```
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225                 230                 235                 240
Cys Ser Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 46
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X R326A (R366A) Prepropeptide

<400> 46

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Ala Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 47
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X R326S (R366S) Prepropeptide

<400> 47
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1   5   10   15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20   25   30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35   40   45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50   55   60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65   70   75   80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85   90   95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100   105   110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115   120   125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130   135   140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145   150   155   160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165   170   175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180   185   190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195   200   205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210   215   220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225   230   235   240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245   250   255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260   265   270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275   280   285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290   295   300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305   310   315   320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325   330   335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340   345   350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Ser Thr His
        355   360   365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370   375   380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385   390   395   400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405   410   415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420   425   430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435   440   445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450   455   460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465   470   475   480
Val Ile Thr Ser Ser Pro Leu Lys
                485

<210> 48
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X R326T (R366T) Prepropeptide

<400> 48
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1   5   10   15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20   25   30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35   40   45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50   55   60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65   70   75   80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85   90   95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100   105   110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115   120   125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130   135   140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145   150   155   160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165   170   175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180   185   190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195   200   205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210   215   220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225   230   235   240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245   250   255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260   265   270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275   280   285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290   295   300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305   310   315   320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325   330   335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340   345   350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Thr Thr His
        355   360   365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370   375   380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385   390   395   400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405   410   415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420   425   430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435   440   445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450   455   460

Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465 470 475 480
Val Ile Thr Ser Ser Pro Leu Lys
485

<210> 49
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X R326V (R366V) Prepropeptide

<400> 49
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
1 5 10 15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
20 25 30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
35 40 45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
50 55 60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65 70 75 80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
85 90 95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
100 105 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
115 120 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
130 135 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145 150 155 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
165 170 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
180 185 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
195 200 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
210 215 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225 230 235 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
245 250 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
260 265 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
275 280 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
290 295 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305 310 315 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
325 330 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
340 345 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Val Thr His
355 360 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
370 375 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385 390 395 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
405 410 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe

```
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 50
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X R326Q (R366Q) Prepropeptide

<400> 50

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Gln Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
```

Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385 390 395 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
405 410 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
420 425 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
435 440 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
450 455 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465 470 475 480
Val Ile Thr Ser Ser Pro Leu Lys
485

<210> 51
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X R326N (R366N) Prepropeptide

<400> 51
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
1 5 10 15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
20 25 30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
35 40 45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
50 55 60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65 70 75 80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
85 90 95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
100 105 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
115 120 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
130 135 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145 150 155 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
165 170 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
180 185 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
195 200 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
210 215 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225 230 235 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
245 250 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
260 265 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
275 280 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
290 295 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305 310 315 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
325 330 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr

```
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Asn Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 52
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X R326M (R366M) Prepropeptide

<400> 52

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
```

```
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Met Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485


<210> 53
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X R326K (R366K) Prepropeptide

<400> 53
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
```

260 265 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
275 280 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
290 295 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305 310 315 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
325 330 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
340 345 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Lys Thr His
355 360 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
370 375 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385 390 395 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
405 410 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
420 425 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
435 440 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
450 455 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465 470 475 480
Val Ile Thr Ser Ser Pro Leu Lys
485

<210> 54
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X R326Y (R366Y) Prepropeptide

<400> 54
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
1 5 10 15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
20 25 30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
35 40 45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
50 55 60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65 70 75 80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
85 90 95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
100 105 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
115 120 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
130 135 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145 150 155 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
165 170 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
180 185 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
195 200 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
210 215 220

```
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Tyr Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485


<210> 55
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X T327A (T367A)Prepropeptide

<400> 55
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1                5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
```

```
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Ala Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Ala His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 56
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X T327L (T367L) Prepropeptide

<400> 56

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
```

```
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Leu His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 57
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X S334A (S374A) Prepropeptide

<400> 57

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
```

100 105 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
115 120 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
130 135 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145 150 155 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
165 170 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
180 185 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
195 200 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
210 215 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225 230 235 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
245 250 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
260 265 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
275 280 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
290 295 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305 310 315 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
325 330 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
340 345 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
355 360 365
Glu Lys Gly Arg Gln Ala Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
370 375 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385 390 395 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
405 410 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
420 425 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
435 440 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
450 455 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465 470 475 480
Val Ile Thr Ser Ser Pro Leu Lys
485

<210> 58
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X S334T (S374T) Prepropeptide

<400> 58
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
1 5 10 15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
20 25 30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
35 40 45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
50 55 60

```
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Thr Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 59
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X S334N (S374N) Prepropeptide

<400> 59

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
```

```
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Asn Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 60
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X R336E (R376E) Prepropeptide

<400> 60
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1   5   10   15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20   25   30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35   40   45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50   55   60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65   70   75   80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85   90   95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100   105   110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115   120   125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130   135   140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145   150   155   160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165   170   175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180   185   190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195   200   205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210   215   220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225   230   235   240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245   250   255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260   265   270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275   280   285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290   295   300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305   310   315   320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325   330   335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340   345   350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355   360   365
Glu Lys Gly Arg Gln Ser Thr Glu Leu Lys Met Leu Glu Val Pro Tyr
    370   375   380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385   390   395   400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405   410   415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420   425   430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435   440   445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450   455   460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465   470   475   480
Val Ile Thr Ser Ser Pro Leu Lys
                485

<210> 61
<211> 488

<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X K338A (K378A) Prepropeptide

<400> 61
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1   5   10   15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20   25   30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35   40   45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50   55   60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65   70   75   80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85   90   95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100   105   110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115   120   125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130   135   140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145   150   155   160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165   170   175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180   185   190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195   200   205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210   215   220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225   230   235   240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245   250   255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260   265   270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275   280   285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290   295   300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305   310   315   320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325   330   335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340   345   350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355   360   365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Ala Met Leu Glu Val Pro Tyr
    370   375   380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385   390   395   400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405   410   415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420   425   430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435   440   445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450   455   460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465   470   475   480
Val Ile Thr Ser Ser Pro Leu Lys

485

<210> 62
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X K338S (K378S) Prepropeptide

<400> 62

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Ser Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
```

```
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 63
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X K338N (K378N) Prepropeptide

<400> 63

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Asn Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
```

405 410 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
420 425 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
435 440 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
450 455 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465 470 475 480
Val Ile Thr Ser Ser Pro Leu Lys
485

<210> 64
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X K338R (K378R) Prepropeptide

<400> 64
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
1 5 10 15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
20 25 30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
35 40 45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
50 55 60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65 70 75 80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
85 90 95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
100 105 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
115 120 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
130 135 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145 150 155 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
165 170 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
180 185 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
195 200 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
210 215 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225 230 235 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
245 250 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
260 265 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
275 280 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
290 295 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305 310 315 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
325 330 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
340 345 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
355 360 365

```
Glu Lys Gly Arg Gln Ser Thr Arg Leu Arg Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 65
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X K338V (K378V) Prepropeptide

<400> 65

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
```

325 330 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
340 345 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
355 360 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Val Met Leu Glu Val Pro Tyr
370 375 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385 390 395 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
405 410 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
420 425 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
435 440 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
450 455 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465 470 475 480
Val Ile Thr Ser Ser Pro Leu Lys
485

<210> 66
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X K338Y (K378Y) Prepropeptide

<400> 66
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
1 5 10 15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
20 25 30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
35 40 45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
50 55 60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65 70 75 80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
85 90 95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
100 105 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
115 120 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
130 135 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145 150 155 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
165 170 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
180 185 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
195 200 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
210 215 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225 230 235 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
245 250 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
260 265 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
275 280 285

```
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Tyr Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 67
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X K338M (K378M) Prepropeptide

<400> 67

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
```

```
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Met Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485


<210> 68
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X T327A/K338A (T367A/K378A) Prepropeptide

<400> 68
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1                  5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
```

```
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Ala His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Ala Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 69
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X T327L/K338M (T367L/K378M) Prepropeptide

<400> 69

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
```

```
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Leu His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Met Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 70
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X E200V/T327L/K338M (E240V/T367L/K378M)
Prepropeptide

<400> 70

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
```

```
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Val
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Leu His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Met Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 71
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X E200V/T327L/S334A/K338M
(E240V/T367L/S374A/K378M) Prepropeptide

<400> 71

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
```

```
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Val
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Leu His
        355                 360                 365
Glu Lys Gly Arg Gln Ala Thr Arg Leu Met Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 72
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/G197A (V236S/G237A) Prepropeptide

<400> 72

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
```

```
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Ala Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 73
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/L211S/G219H (V236S/L251S/G259H)
Prepropeptide

<400> 73
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1   5   10   15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20   25   30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35   40   45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50   55   60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65   70   75   80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85   90   95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100   105   110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115   120   125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130   135   140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145   150   155   160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165   170   175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180   185   190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195   200   205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210   215   220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225   230   235   240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Ser Leu Ile Asn Glu Glu
                245   250   255
Asn Glu His Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260   265   270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275   280   285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290   295   300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305   310   315   320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325   330   335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340   345   350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355   360   365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370   375   380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385   390   395   400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405   410   415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420   425   430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435   440   445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450   455   460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465   470   475   480
Val Ile Thr Ser Ser Pro Leu Lys
                485

<210> 74
<211> 488

<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X D119N/G121S/V196S/L211S/G219H
(D159N/G161S/V236S/L251S/G259H) Prepropeptide

<400> 74
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
1 5 10 15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
20 25 30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
35 40 45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
50 55 60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65 70 75 80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
85 90 95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
100 105 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
115 120 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
130 135 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asn Asn
145 150 155 160
Ser Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
165 170 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
180 185 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
195 200 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
210 215 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225 230 235 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Ser Leu Ile Asn Glu Glu
245 250 255
Asn Glu His Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
260 265 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
275 280 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
290 295 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305 310 315 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
325 330 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
340 345 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
355 360 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
370 375 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385 390 395 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
405 410 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
420 425 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
435 440 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
450 455 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465 470 475 480

Val Ile Thr Ser Ser Pro Leu Lys
485

<210> 75
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X G114N/V196S/L211S/G219H
(G154N/V236S/L251S/G259H) Prepropeptide

<400> 75
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
1 5 10 15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
20 25 30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
35 40 45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
50 55 60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65 70 75 80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
85 90 95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
100 105 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
115 120 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
130 135 140
Asn Ser Val Val Cys Ser Cys Ala Arg Asn Tyr Thr Leu Ala Asp Asn
145 150 155 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
165 170 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
180 185 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
195 200 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
210 215 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225 230 235 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Ser Leu Ile Asn Glu Glu
245 250 255
Asn Glu His Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
260 265 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
275 280 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
290 295 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305 310 315 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
325 330 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
340 345 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
355 360 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
370 375 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385 390 395 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
405 410 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
420 425 430

Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
435 440 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
450 455 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465 470 475 480
Val Ile Thr Ser Ser Pro Leu Lys
485

<210> 76
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X G114N/D119N/G121S/V196S/L211S/G219H
(G154N/D159N/G161S/V236S/L251S/G259H)
Prepropeptide

<400> 76
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
1 5 10 15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
20 25 30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
35 40 45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
50 55 60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65 70 75 80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
85 90 95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
100 105 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
115 120 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
130 135 140
Asn Ser Val Val Cys Ser Cys Ala Arg Asn Tyr Thr Leu Ala Asn Asn
145 150 155 160
Ser Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
165 170 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
180 185 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
195 200 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
210 215 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225 230 235 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Ser Leu Ile Asn Glu Glu
245 250 255
Asn Glu His Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
260 265 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
275 280 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
290 295 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305 310 315 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
325 330 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
340 345 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
355 360 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr

```
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 77
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X G197A/L211S/G219H (G237A/L251S/G259H)
Prepropeptide

<400> 77

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Ala Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Ser Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu His Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
```

325 330 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
340 345 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
355 360 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
370 375 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385 390 395 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
405 410 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
420 425 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
435 440 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
450 455 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465 470 475 480
Val Ile Thr Ser Ser Pro Leu Lys
485

<210> 78
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/G197A/L211S/G219H
(V236S/G237A/L251S/G259H) Prepropeptide

<400> 78
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
1 5 10 15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
20 25 30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
35 40 45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
50 55 60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65 70 75 80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
85 90 95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
100 105 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
115 120 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
130 135 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145 150 155 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
165 170 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
180 185 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
195 200 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
210 215 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Ala Gly Gln Glu
225 230 235 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Ser Leu Ile Asn Glu Glu
245 250 255
Asn Glu His Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
260 265 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val

```
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 79
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X I195L/V196S (I235L/V236S) Prepropeptide

<400> 79

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Leu Ser Gly Gly Gln Glu
225                 230                 235                 240
```

Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
245 250 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
260 265 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
275 280 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
290 295 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305 310 315 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
325 330 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
340 345 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
355 360 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
370 375 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385 390 395 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
405 410 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
420 425 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
435 440 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
450 455 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465 470 475 480
Val Ile Thr Ser Ser Pro Leu Lys
485

<210> 80
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X I195L/G197A (I235L/G237A) Prepropeptide

<400> 80
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
1 5 10 15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
20 25 30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
35 40 45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
50 55 60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65 70 75 80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
85 90 95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
100 105 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
115 120 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
130 135 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145 150 155 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
165 170 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
180 185 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu

```
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Leu Val Ala Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 81
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X I195L/L211S/G219H (I235L/L251S/G259H)
Prepropeptide

<400> 81

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1                5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
```

```
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Leu Val Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Ser Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu His Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 82
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/N214D (V236S/N254D) Prepropeptide

<400> 82

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
```

```
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asp Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 83
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/N214A (V236S/N254A) Prepropeptide

<400> 83

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
```

65 70 75 80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
85 90 95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
100 105 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
115 120 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
130 135 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145 150 155 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
165 170 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
180 185 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
195 200 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
210 215 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225 230 235 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Ala Glu Glu
245 250 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
260 265 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
275 280 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
290 295 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305 310 315 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
325 330 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
340 345 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
355 360 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
370 375 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385 390 395 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
405 410 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
420 425 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
435 440 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
450 455 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465 470 475 480
Val Ile Thr Ser Ser Pro Leu Lys
485

<210> 84
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/N214S (V236S/N254S) Prepropeptide

<400> 84
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
1 5 10 15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
20 25 30

```
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Ser Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 85
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/E216R (V236S/E256R) Prepropeptide

<400> 85
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1   5   10   15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20   25   30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35   40   45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50   55   60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65   70   75   80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85   90   95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100   105   110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115   120   125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130   135   140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145   150   155   160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165   170   175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180   185   190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195   200   205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210   215   220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225   230   235   240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Arg
                245   250   255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260   265   270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275   280   285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290   295   300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305   310   315   320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325   330   335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340   345   350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355   360   365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370   375   380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385   390   395   400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405   410   415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420   425   430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435   440   445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450   455   460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465   470   475   480
Val Ile Thr Ser Ser Pro Leu Lys
                485

<210> 86
<211> 488
<212> PRT

<213> Artificial Sequence

<220>
<223> Factor X V196S/E216K (V236S/E256K) Prepropeptide

<400> 86

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Lys
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 87
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/E216A (V236S/E256A) Prepropeptide

<400> 87
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1   5   10   15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20   25   30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35   40   45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50   55   60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65   70   75   80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85   90   95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100   105   110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115   120   125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130   135   140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145   150   155   160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165   170   175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180   185   190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195   200   205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210   215   220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225   230   235   240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Ala
                245   250   255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260   265   270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275   280   285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290   295   300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305   310   315   320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325   330   335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340   345   350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355   360   365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370   375   380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385   390   395   400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405   410   415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420   425   430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435   440   445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg

```
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 88
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/E216S (V236S/E256S) Prepropeptide

<400> 88

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Ser
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
```

Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
420 425 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
435 440 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
450 455 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465 470 475 480
Val Ile Thr Ser Ser Pro Leu Lys
485

<210> 89
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/E218R (V236S/E258R) Prepropeptide

<400> 89
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
1 5 10 15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
20 25 30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
35 40 45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
50 55 60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65 70 75 80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
85 90 95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
100 105 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
115 120 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
130 135 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145 150 155 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
165 170 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
180 185 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
195 200 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
210 215 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225 230 235 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
245 250 255
Asn Arg Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
260 265 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
275 280 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
290 295 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305 310 315 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
325 330 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
340 345 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
355 360 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr

```
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 90
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/E218K (V236S/E258K) Prepropeptide

<400> 90

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Lys Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
```

```
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 91
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/E218A (V236S/E258A) Prepropeptide

<400> 91

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1                5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Ala Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
```

```
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485


<210> 92
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/R332A (V236S/R372A) Prepropeptide

<400> 92
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
```

```
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Ala Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 93
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/R332D (V236S/R372D) Prepropeptide

<400> 93

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
```

210 215 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225 230 235 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
245 250 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
260 265 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
275 280 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
290 295 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305 310 315 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
325 330 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
340 345 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
355 360 365
Glu Lys Gly Asp Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
370 375 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385 390 395 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
405 410 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
420 425 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
435 440 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
450 455 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465 470 475 480
Val Ile Thr Ser Ser Pro Leu Lys
485

<210> 94
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/R332E (V236S/R372E) Prepropeptide

<400> 94
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
1 5 10 15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
20 25 30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
35 40 45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
50 55 60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65 70 75 80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
85 90 95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
100 105 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
115 120 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
130 135 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145 150 155 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
165 170 175

Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180   185   190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195   200   205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210   215   220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225   230   235   240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245   250   255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260   265   270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275   280   285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290   295   300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305   310   315   320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325   330   335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340   345   350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355   360   365
Glu Lys Gly Glu Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370   375   380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385   390   395   400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405   410   415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420   425   430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435   440   445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450   455   460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465   470   475   480
Val Ile Thr Ser Ser Pro Leu Lys
                485

<210> 95
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/R332S (V236S/R372S) Prepropeptide

<400> 95
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1   5   10   15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20   25   30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35   40   45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50   55   60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65   70   75   80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85   90   95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100   105   110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115   120   125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln

130 135 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145 150 155 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
165 170 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
180 185 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
195 200 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
210 215 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225 230 235 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
245 250 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
260 265 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
275 280 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
290 295 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305 310 315 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
325 330 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
340 345 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
355 360 365
Glu Lys Gly Ser Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
370 375 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385 390 395 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
405 410 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
420 425 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
435 440 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
450 455 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465 470 475 480
Val Ile Thr Ser Ser Pro Leu Lys
485

<210> 96
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/R332G (V236S/R372G) Prepropeptide

<400> 96
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
1 5 10 15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
20 25 30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
35 40 45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
50 55 60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65 70 75 80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
85 90 95

```
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Gly Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 97
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/R326E (V236S/R366E) Prepropeptide

<400> 97

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1                5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
```

```
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Glu Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 98
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/R326D (V236S/R366D) Prepropeptide

<400> 98

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
```

```
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Asp Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 99
<211> 488
<212> PRT
<213> Artificial Sequence

<220>

<223> Factor X V196S/R326M (V236S/R366M) Prepropeptide

<400> 99
```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Met Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 100

<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/R326N (V236S/R366N) Prepropeptide

<400> 100
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1   5   10   15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20   25   30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35   40   45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50   55   60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65   70   75   80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85   90   95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100   105   110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115   120   125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130   135   140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145   150   155   160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165   170   175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180   185   190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195   200   205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210   215   220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225   230   235   240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245   250   255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260   265   270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275   280   285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290   295   300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305   310   315   320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325   330   335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340   345   350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Asn Thr His
        355   360   365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370   375   380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385   390   395   400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405   410   415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420   425   430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435   440   445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450   455   460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465   470   475   480

Val Ile Thr Ser Ser Pro Leu Lys
485

<210> 101
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/R326Q (V236S/R366Q) Prepropeptide

<400> 101
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
1 5 10 15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
20 25 30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
35 40 45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
50 55 60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65 70 75 80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
85 90 95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
100 105 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
115 120 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
130 135 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145 150 155 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
165 170 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
180 185 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
195 200 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
210 215 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225 230 235 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
245 250 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
260 265 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
275 280 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
290 295 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305 310 315 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
325 330 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
340 345 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Gln Thr His
355 360 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
370 375 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385 390 395 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
405 410 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
420 425 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys

```
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 102
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/R273E (V236S/R313E) Prepropeptide

<400> 102

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Glu Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
```

```
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 103
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/R273A (V236S/R313A) Prepropeptide

<400> 103

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Ala Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
```

```
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 104
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/R424A (V236S/R464A) Prepropeptide

<400> 104

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
```

```
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Ala
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 105
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/R424E (V236S/R464E) Prepropeptide

<400> 105

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1                5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
```

275 280 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
290 295 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305 310 315 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
325 330 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
340 345 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
355 360 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
370 375 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385 390 395 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
405 410 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
420 425 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
435 440 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Glu
450 455 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465 470 475 480
Val Ile Thr Ser Ser Pro Leu Lys
485

<210> 106
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/K420A (V236S/K460A) Prepropeptide

<400> 106
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
1 5 10 15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
20 25 30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
35 40 45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
50 55 60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65 70 75 80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
85 90 95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
100 105 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
115 120 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
130 135 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145 150 155 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
165 170 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
180 185 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
195 200 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
210 215 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225 230 235 240

Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
245 250 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
260 265 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
275 280 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
290 295 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305 310 315 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
325 330 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
340 345 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
355 360 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
370 375 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385 390 395 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
405 410 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
420 425 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
435 440 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Ala Trp Ile Asp Arg
450 455 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465 470 475 480
Val Ile Thr Ser Ser Pro Leu Lys
485

<210> 107
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/K420E (V236S/K460E) Prepropeptide

<400> 107
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
1 5 10 15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
20 25 30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
35 40 45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
50 55 60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65 70 75 80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
85 90 95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
100 105 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
115 120 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
130 135 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145 150 155 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
165 170 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
180 185 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu

```
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Glu Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 108
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/R306E (V236S/R346E) Prepropeptide

<400> 108

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
```

```
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Glu Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 109
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/K276A (V236S/K316A) Prepropeptide

<400> 109

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
```

```
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Ala Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 110
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/K276E (V236S/K316E) Prepropeptide

<400> 110

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
```

```
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Glu Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 111
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/K420E/R424E (V236S/K460E/R464E)
Prepropeptide

<400> 111

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
```

```
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Glu Trp Ile Asp Glu
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 112
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/R273E/K420E/R424E
(V236S/R313E/K460E/R464E) Prepropeptide

<400> 112
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1   5   10   15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20   25   30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35   40   45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50   55   60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65   70   75   80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85   90   95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100   105   110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115   120   125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130   135   140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145   150   155   160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165   170   175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180   185   190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195   200   205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210   215   220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225   230   235   240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245   250   255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260   265   270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275   280   285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290   295   300
Val Glu Val Val Ile Lys His Asn Glu Phe Thr Lys Glu Thr Tyr Asp
305   310   315   320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325   330   335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340   345   350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355   360   365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370   375   380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385   390   395   400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405   410   415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420   425   430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435   440   445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Glu Trp Ile Asp Glu
    450   455   460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465   470   475   480
Val Ile Thr Ser Ser Pro Leu Lys
                485

<210> 113
<211> 488

<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/R273E/R306E/K420E/R424E
(V236S/R313E/R346E/K460E/R464E) Prepropeptide

<400> 113

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Glu Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Glu Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Glu Trp Ile Asp Glu
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
```

Val Ile Thr Ser Ser Pro Leu Lys
485

<210> 114
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/K338A (V236S/K378A) Prepropeptide

<400> 114
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
1 5 10 15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
20 25 30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
35 40 45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
50 55 60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65 70 75 80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
85 90 95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
100 105 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
115 120 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
130 135 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145 150 155 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
165 170 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
180 185 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
195 200 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
210 215 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225 230 235 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
245 250 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
260 265 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
275 280 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
290 295 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305 310 315 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
325 330 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
340 345 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
355 360 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Ala Met Leu Glu Val Pro Tyr
370 375 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385 390 395 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
405 410 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
420 425 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys

```
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 115
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/K338S (V236S/K378S) Prepropeptide

<400> 115

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Ser Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
```

```
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 116
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/E215N/N217S (V236S/E255N/N257S)
Prepropeptide

<400> 116

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Asn Glu
                245                 250                 255
Ser Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
```

```
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 117
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/E264N/E266S (V236S/E304N/N306S)
Prepropeptide

<400> 117

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Asn
    290                 295                 300
```

```
Val Ser Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485


<210> 118
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X D119N/G121S/V196S/E264N/E266S
      (D159N/G161S/V236S/E304N/N306S) Prepropeptide

<400> 118
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asn Asn
145                 150                 155                 160
Ser Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
```

```
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Asn
    290                 295                 300
Val Ser Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 119
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X G114N/V196S/E264N/E266S
(G154N/V236S/E304N/N306S) Prepropeptide

<400> 119

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1                5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Asn Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
```

```
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Asn
    290                 295                 300
Val Ser Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 120
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/R429N/L431S (V236S/R469N/L471S)
Prepropeptide

<400> 120

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
```

```
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Asn Gly Ser Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 121
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/R243N/K245S (V236S/R283N/K285S)
Prepropeptide

<400> 121

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
```

```
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Asn Phe Ser Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 122
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/T293N/R295S (V236S/T333N/R335S)
Prepropeptide

<400> 122

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
```

```
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Asn Phe Ser Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 123
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/D389N/Y391S (V236S/D429N/Y431S)
Prepropeptide

<400> 123

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
```

```
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asn Thr Ser Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 124
<211> 488
<212> PRT
<213> Artificial Sequence

<220>

<223> Factor X V196S/K388N (V236S/K428N) Prepropeptide

<400> 124
```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Asn Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 125

<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X D119N/G121S/V196S/K388N
(D159N/G161S/V236S/K428N) Prepropeptide

<400> 125
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1   5   10   15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20   25   30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35   40   45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50   55   60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65   70   75   80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85   90   95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100   105   110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115   120   125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130   135   140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asn Asn
145   150   155   160
Ser Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165   170   175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180   185   190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195   200   205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210   215   220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225   230   235   240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245   250   255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260   265   270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275   280   285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290   295   300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305   310   315   320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325   330   335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340   345   350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355   360   365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370   375   380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385   390   395   400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405   410   415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Asn Asp Thr Tyr Phe
            420   425   430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435   440   445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450   455   460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu

465 470 475 480
Val Ile Thr Ser Ser Pro Leu Lys
485

<210> 126
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/T428N/G430S (V236S/T468N/G470S)
Prepropeptide

<400> 126
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
1 5 10 15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
20 25 30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
35 40 45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
50 55 60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65 70 75 80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
85 90 95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
100 105 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
115 120 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
130 135 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145 150 155 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
165 170 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
180 185 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
195 200 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
210 215 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225 230 235 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
245 250 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
260 265 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
275 280 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
290 295 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305 310 315 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
325 330 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
340 345 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
355 360 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
370 375 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385 390 395 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
405 410 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe

```
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Asn Arg Ser Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 127
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/L211S/G219H/E264N/E266S
(V236S/L251S/G259H/E304NE306S) Prepropeptide

<400> 127

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Ser Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu His Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Asn
    290                 295                 300
Val Ser Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
```

```
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 128
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X D119N/G121S/V196S/L211S/G219H/E264N/E266S
(D159N/G161S/V236S/L251S/G259H/E304N/E306S)
Prepropeptide

<400> 128

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asn Asn
145                 150                 155                 160
Ser Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Ser Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu His Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Asn
    290                 295                 300
Val Ser Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
```

```
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485


<210> 129
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X G114N/V196S/L211S/G219H/E264N/E266S
      (G154N/V236S/L251S/G259H/E304N/E306S)
      Prepropeptide

<400> 129
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Asn Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Ser Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu His Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
```

```
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Asn
    290                 295                 300
Val Ser Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485


<210> 130
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/E264N/E266S/K388N
      (V236S/E304N/E306S/K428N) Prepropeptide

<400> 130
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
```

210 215 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225 230 235 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
245 250 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
260 265 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
275 280 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Asn
290 295 300
Val Ser Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305 310 315 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
325 330 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
340 345 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
355 360 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
370 375 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385 390 395 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
405 410 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Asn Asp Thr Tyr Phe
420 425 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
435 440 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
450 455 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465 470 475 480
Val Ile Thr Ser Ser Pro Leu Lys
485

<210> 131
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X D119N/G121S/V196S/L211S/G219H/K388N
(D159N/G161S/V236S/L251S/G259H/K428N)
Prepropeptide

<400> 131
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
1 5 10 15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
20 25 30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
35 40 45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
50 55 60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65 70 75 80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
85 90 95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
100 105 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
115 120 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
130 135 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asn Asn
145 150 155 160

```
Ser Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Ser Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu His Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Asn Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 132
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X G114N/V196S/L211S/G219H/K388N
(G154N/V236S/L251S/G259H/K428N) Prepropeptide

<400> 132

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
```

```
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Asn Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Ser Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu His Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Asn Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 133
<211> 488
<212> PRT
<213> Artificial Sequence

<220>
<223> Factor X V196S/L211S/G219H/E264N/E266S/K388N
(V236S/L251S/G259H/E304N/E306S/K428N)
Prepropeptide

<400> 133

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
```

```
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Ser Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu His Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Asn
    290                 295                 300
Val Ser Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Asn Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 134
<211> 448
<212> PRT
<213> Homo sapiens

<220>
<223> Mature (single-chain zymogen) human Factor X
wild-type

<400> 134

```
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
```

```
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445
```

<210> 135
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X I195L

<400> 135

```
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
```

```
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Leu Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 136
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196I

<400> 136
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
```

```
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ile Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 137
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S

<400> 137
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
```

```
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 138
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X T85N/K87S/V196S

<400> 138
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
```

```
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Asn Arg Ser Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 139
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X Q56N/Q58S/V196S

<400> 139
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
```

```
Gln Cys Glu Thr Ser Pro Cys Asn Asn Ser Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 140
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X K62N/G64S/V196S

<400> 140
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Asn Asp Ser
```

```
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 141
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X L65N/E67S/V196S

<400> 141
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
```

```
Asn Gly Ser Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 142
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X E67N/V196S

<400> 142
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Asn Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
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65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 143
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X L73N/G75S/V196S

<400> 143
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Asn Glu Ser Phe Glu Gly Lys Asn
65 70 75 80

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Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 144
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X G75N/E77S/V196S

<400> 144
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Asn Phe Ser Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
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                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 145
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X R86N/L88S/V196S

<400> 145
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Asn Lys Ser Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
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Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 146
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X G114N/V196S

<400> 146
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala

100 105 110
Arg Asn Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 147
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X D95N/D97S/V196S

<400> 147
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asn Cys
85 90 95
Ser Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110

Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115   120   125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130   135   140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145   150   155   160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165   170   175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180   185   190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195   200   205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210   215   220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225   230   235   240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245   250   255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260   265   270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275   280   285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290   295   300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305   310   315   320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325   330   335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340   345   350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355   360   365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370   375   380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385   390   395   400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405   410   415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420   425   430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435   440   445

<210> 148
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X E82S/V196S

<400> 148
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1   5   10   15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20   25   30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35   40   45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50   55   60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65   70   75   80
Cys Ser Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85   90   95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100   105   110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly

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        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 149
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X E82N/F84S/V196S

<400> 149
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Asn Leu Ser Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
```

Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130   135   140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145   150   155   160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165   170   175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180   185   190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195   200   205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210   215   220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225   230   235   240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245   250   255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260   265   270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275   280   285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290   295   300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305   310   315   320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325   330   335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340   345   350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355   360   365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370   375   380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385   390   395   400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405   410   415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420   425   430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435   440   445

<210> 150
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X G78N/N80S/V196S

<400> 150
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1   5   10   15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20   25   30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35   40   45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50   55   60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Asn Lys Ser
65   70   75   80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85   90   95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100   105   110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115   120   125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val

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    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 151
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X E77N/K79S/V196S

<400> 151
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1                5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Asn Gly Ser Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
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Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 152
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X D119N/G121S/V196S

<400> 152
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asn Asn Ser Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp

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145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 153
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X L83N/V196S

<400> 153
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1                5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Asn Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
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Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165   170   175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180   185   190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195   200   205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210   215   220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225   230   235   240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245   250   255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260   265   270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275   280   285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290   295   300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305   310   315   320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325   330   335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340   345   350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355   360   365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370   375   380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385   390   395   400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405   410   415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420   425   430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435   440   445

<210> 154
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X K122S/V196S

<400> 154
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1   5   10   15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20   25   30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35   40   45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50   55   60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65   70   75   80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85   90   95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100   105   110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Ser Ala Cys Ile Pro Thr Gly
        115   120   125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130   135   140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145   150   155   160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp

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                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 155
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X E51N/V196S

<400> 155
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Asn Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
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Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 156
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X Q58N/K60S/V196S

<400> 156
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Asn Gly Ser Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
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            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 157
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X G114N/D119N/G121S/V196S

<400> 157
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Asn Tyr Thr Leu Ala Asn Asn Ser Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
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Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 158
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X G198A

<400> 158
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Val Gly Ala Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp

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        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 159
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X G198V

<400> 159
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1                5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Val Gly Val Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
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Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 160
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X G198R

<400> 160
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1                5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Val Gly Arg Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
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    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 161
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X G198K

<400> 161
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1                  5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Val Gly Lys Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
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Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 162
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X G198P

<400> 162
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Val Gly Pro Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln

225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 163
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X G198H

<400> 163
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Val Gly His Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240

Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 164
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X L211S/G219H

<400> 164
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Ser Leu Ile Asn Glu Glu Asn Glu His Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu

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                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 165
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X G197P

<400> 165
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Val Pro Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
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Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260   265   270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275   280   285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290   295   300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305   310   315   320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325   330   335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340   345   350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355   360   365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370   375   380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385   390   395   400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405   410   415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420   425   430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435   440   445

<210> 166
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X D378N

<400> 166
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1   5   10   15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20   25   30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35   40   45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50   55   60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65   70   75   80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85   90   95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100   105   110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115   120   125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130   135   140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145   150   155   160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165   170   175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180   185   190
Thr Arg Ile Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195   200   205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210   215   220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225   230   235   240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245   250   255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn

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            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asn Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 167
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X D378S

<400> 167
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
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Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275   280   285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290   295   300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305   310   315   320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325   330   335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340   345   350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355   360   365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Ser Ser Gly Gly Pro His Val
    370   375   380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385   390   395   400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405   410   415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420   425   430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435   440   445

<210> 168
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196L

<400> 168
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1   5   10   15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20   25   30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35   40   45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50   55   60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65   70   75   80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85   90   95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100   105   110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115   120   125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130   135   140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145   150   155   160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165   170   175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180   185   190
Thr Arg Ile Leu Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195   200   205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210   215   220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225   230   235   240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245   250   255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260   265   270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu

275 280 285

Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300

Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320

Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335

Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350

Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365

Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380

Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400

Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415

Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430

Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 169
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196T

<400> 169

Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15

Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30

Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45

Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60

Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80

Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95

Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110

Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125

Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140

Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160

Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175

Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190

Thr Arg Ile Thr Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205

Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220

Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240

Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255

Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270

Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285

Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 170
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196P

<400> 170
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Pro Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro

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    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 171
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X G197V

<400> 171
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Val Val Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
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Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 172
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X G197T

<400> 172
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Val Thr Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile

305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 173
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X G197S

<400> 173
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Val Ser Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320

Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 174
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X E200A

<400> 174
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Val Gly Gly Gln Ala Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg

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                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 175
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X E200S

<400> 175
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Val Gly Gly Gln Ser Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
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Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 176
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X E200V

<400> 176
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Val Gly Gly Gln Val Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
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            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 177
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X K202S

<400> 177
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Val Gly Gly Gln Glu Cys Ser Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
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Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 178
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X R326A

<400> 178
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1                5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Ala Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
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355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 179
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X R326S

<400> 179
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Ser Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365

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Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 180
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X R326T

<400> 180
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Thr Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
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    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 181
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X R326V

<400> 181
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Val Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
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Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 182
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X R326Q

<400> 182
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Gln Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly

385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 183
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X R326N

<400> 183
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Asn Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400

Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 184
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X R326M

<400> 184
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Met Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr

405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 185
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X R326K

<400> 185
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Lys Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415

Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 186
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X R326Y

<400> 186
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Tyr Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro

420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 187
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X T327A

<400> 187
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Ala Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Ala His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430

Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435   440   445

<210> 188
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X T327L

<400> 188
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1   5   10   15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20   25   30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35   40   45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50   55   60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65   70   75   80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85   90   95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100   105   110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115   120   125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130   135   140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145   150   155   160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165   170   175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180   185   190
Thr Arg Ile Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195   200   205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210   215   220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225   230   235   240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245   250   255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260   265   270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275   280   285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290   295   300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305   310   315   320
Val Ser Gly Phe Gly Arg Leu His Glu Lys Gly Arg Gln Ser Thr Arg
                325   330   335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340   345   350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355   360   365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370   375   380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385   390   395   400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405   410   415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420   425   430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys

435 440 445

<210> 189
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X S334A

<400> 189
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ala Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 190
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X S334T

<400> 190
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1   5   10   15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20   25   30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35   40   45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50   55   60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65   70   75   80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85   90   95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100   105   110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115   120   125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130   135   140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145   150   155   160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165   170   175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180   185   190
Thr Arg Ile Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195   200   205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210   215   220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225   230   235   240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245   250   255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260   265   270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275   280   285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290   295   300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305   310   315   320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Thr Thr Arg
                325   330   335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340   345   350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355   360   365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370   375   380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385   390   395   400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405   410   415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420   425   430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435   440   445

<210> 191
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X S334N

<400> 191
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1   5   10   15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20   25   30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35   40   45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50   55   60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65   70   75   80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85   90   95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100   105   110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115   120   125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130   135   140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145   150   155   160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165   170   175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180   185   190
Thr Arg Ile Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195   200   205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210   215   220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225   230   235   240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245   250   255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260   265   270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275   280   285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290   295   300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305   310   315   320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Asn Thr Arg
                325   330   335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340   345   350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355   360   365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370   375   380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385   390   395   400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405   410   415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420   425   430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435   440   445

<210> 192
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X R336E

<400> 192
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1   5   10   15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20   25   30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35   40   45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50   55   60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65   70   75   80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85   90   95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100   105   110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115   120   125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130   135   140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145   150   155   160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165   170   175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180   185   190
Thr Arg Ile Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195   200   205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210   215   220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225   230   235   240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245   250   255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260   265   270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275   280   285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290   295   300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305   310   315   320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Glu
                325   330   335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340   345   350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355   360   365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370   375   380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385   390   395   400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405   410   415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420   425   430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435   440   445

<210> 193

<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X K338A

<400> 193
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1   5   10   15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20   25   30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35   40   45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50   55   60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65   70   75   80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85   90   95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100   105   110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115   120   125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130   135   140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145   150   155   160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165   170   175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180   185   190
Thr Arg Ile Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195   200   205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210   215   220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225   230   235   240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245   250   255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260   265   270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275   280   285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290   295   300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305   310   315   320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325   330   335
Leu Ala Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340   345   350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355   360   365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370   375   380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385   390   395   400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405   410   415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420   425   430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435   440   445

<210> 194
<211> 448

<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X K338S

<400> 194
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1   5   10   15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20   25   30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35   40   45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50   55   60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65   70   75   80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85   90   95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100   105   110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115   120   125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130   135   140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145   150   155   160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165   170   175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180   185   190
Thr Arg Ile Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195   200   205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210   215   220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225   230   235   240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245   250   255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260   265   270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275   280   285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290   295   300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305   310   315   320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325   330   335
Leu Ser Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340   345   350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355   360   365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370   375   380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385   390   395   400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405   410   415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420   425   430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435   440   445

<210> 195
<211> 448
<212> PRT

<213> Artificial Sequence

<220>
<223> Mature Factor X K338N

<400> 195

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Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Asn Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445
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<210> 196
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X K338R

<400> 196
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1   5   10   15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20   25   30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35   40   45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50   55   60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65   70   75   80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85   90   95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100   105   110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115   120   125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130   135   140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145   150   155   160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165   170   175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180   185   190
Thr Arg Ile Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195   200   205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210   215   220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225   230   235   240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245   250   255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260   265   270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275   280   285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290   295   300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305   310   315   320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325   330   335
Leu Arg Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340   345   350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355   360   365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370   375   380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385   390   395   400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405   410   415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420   425   430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435   440   445

<210> 197
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X K338V

<400> 197
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1   5   10   15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20   25   30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35   40   45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50   55   60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65   70   75   80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85   90   95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100   105   110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115   120   125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130   135   140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145   150   155   160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165   170   175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180   185   190
Thr Arg Ile Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195   200   205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210   215   220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225   230   235   240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245   250   255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260   265   270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275   280   285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290   295   300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305   310   315   320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325   330   335
Leu Val Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340   345   350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355   360   365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370   375   380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385   390   395   400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405   410   415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420   425   430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435   440   445

<210> 198
<211> 448
<212> PRT
<213> Artificial Sequence

<220>

<223> Mature Factor X K338Y

<400> 198

```
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Tyr Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445
```

<210> 199
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X K338M

<400> 199
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1   5   10   15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20   25   30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35   40   45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50   55   60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65   70   75   80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85   90   95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100   105   110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115   120   125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130   135   140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145   150   155   160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165   170   175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180   185   190
Thr Arg Ile Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195   200   205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210   215   220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225   230   235   240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245   250   255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260   265   270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275   280   285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290   295   300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305   310   315   320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325   330   335
Leu Met Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340   345   350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355   360   365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370   375   380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385   390   395   400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405   410   415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420   425   430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435   440   445

<210> 200
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X T327A/K338A

<400> 200
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1   5   10   15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20   25   30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35   40   45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50   55   60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65   70   75   80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85   90   95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100   105   110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115   120   125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130   135   140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145   150   155   160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165   170   175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180   185   190
Thr Arg Ile Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195   200   205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210   215   220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225   230   235   240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245   250   255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260   265   270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275   280   285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290   295   300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305   310   315   320
Val Ser Gly Phe Gly Arg Ala His Glu Lys Gly Arg Gln Ser Thr Arg
                325   330   335
Leu Ala Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340   345   350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355   360   365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370   375   380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385   390   395   400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405   410   415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420   425   430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435   440   445

<210> 201
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X T327L/K338M

<400> 201

```
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Leu His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Met Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 202
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X E200V/T327L/K338M

<400> 202
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
```

```
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Val Gly Gly Gln Val Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Leu His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Met Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445
```

<210> 203
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X E200V/T327L/S334A/K338M

<400> 203

```
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
```

Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20   25   30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35   40   45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50   55   60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65   70   75   80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85   90   95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100   105   110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115   120   125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130   135   140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145   150   155   160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165   170   175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180   185   190
Thr Arg Ile Val Gly Gly Gln Val Cys Lys Asp Gly Glu Cys Pro Trp
        195   200   205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210   215   220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225   230   235   240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245   250   255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260   265   270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275   280   285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290   295   300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305   310   315   320
Val Ser Gly Phe Gly Arg Leu His Glu Lys Gly Arg Gln Ala Thr Arg
                325   330   335
Leu Met Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340   345   350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355   360   365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370   375   380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385   390   395   400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405   410   415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420   425   430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435   440   445

<210> 204
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/G197A

<400> 204
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1   5   10   15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu

```
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ser Ala Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 205
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/L211S/G219H

<400> 205
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
```

```
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Ser Leu Ile Asn Glu Glu Asn Glu His Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 206
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X D119N/G121S/V196S/L211S/G219H

<400> 206
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
```

```
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asn Asn Ser Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Ser Leu Ile Asn Glu Glu Asn Glu His Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 207
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X G114N/V196S/L211S/G219H

<400> 207
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
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Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Asn Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Ser Leu Ile Asn Glu Glu Asn Glu His Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 208
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X
      G114N/D119N/G121S/V196S/L211S/G219H

<400> 208
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
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Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Asn Tyr Thr Leu Ala Asn Asn Ser Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Ser Leu Ile Asn Glu Glu Asn Glu His Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 209
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X G197A/L211S/G219H

<400> 209
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
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    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Val Ala Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Ser Leu Ile Asn Glu Glu Asn Glu His Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 210
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/G197A/L211S/G219H

<400> 210
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1                5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
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Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Ala Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Ser Leu Ile Asn Glu Glu Asn Glu His Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 211
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X I195L/V196S

<400> 211
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn

65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Leu Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 212
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X I195L/G197A

<400> 212
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80

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Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Leu Val Ala Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 213
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X I195L/L211S/G219H

<400> 213
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
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                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Leu Val Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Ser Leu Ile Asn Glu Glu Asn Glu His Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 214
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/N214D

<400> 214
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
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Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asp Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 215
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/N214A

<400> 215
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
```

100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Ala Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 216
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/N214S

<400> 216
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110

Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115   120   125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130   135   140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145   150   155   160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165   170   175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180   185   190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195   200   205
Gln Ala Leu Leu Ile Ser Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210   215   220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225   230   235   240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245   250   255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260   265   270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275   280   285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290   295   300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305   310   315   320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325   330   335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340   345   350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355   360   365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370   375   380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385   390   395   400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405   410   415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420   425   430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435   440   445

<210> 217
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/E216R

<400> 217
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1   5   10   15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20   25   30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35   40   45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50   55   60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65   70   75   80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85   90   95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100   105   110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly

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        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Arg Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 218
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/E216K

<400> 218
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
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Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Lys Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 219
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/E216A

<400> 219
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val

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    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Ala Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 220
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/E216S

<400> 220
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1                5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
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Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Ser Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 221
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/E218R

<400> 221
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp

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145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Arg Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445
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<210> 222
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/E218K

<400> 222

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Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
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Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Lys Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 223
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/E218A

<400> 223
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp

165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Ala Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 224
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/R332A

<400> 224
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175

Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Ala Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 225
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/R332D

<400> 225
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu

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            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Asp Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 226
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/R332E

<400> 226
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
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Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Glu Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 227
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/R332S

<400> 227
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp

195 200 205

Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220

Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240

Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255

Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270

Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285

Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300

Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320

Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Ser Gln Ser Thr Arg
325 330 335

Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350

Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365

Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380

Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400

Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415

Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430

Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 228
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/R332G

<400> 228
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15

Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30

Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45

Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60

Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80

Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95

Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110

Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125

Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140

Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160

Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175

Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190

Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205

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Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Gly Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 229
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/R326E

<400> 229
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1                5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
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    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Glu Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 230
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/R326D

<400> 230
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1                  5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
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Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Asp Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 231
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/R326M

<400> 231
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln

225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Met Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 232
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/R326N

<400> 232
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240

Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Asn Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 233
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/R326Q

<400> 233
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu

245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Gln Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 234
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/R273E

<400> 234
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255

Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260   265   270
Glu Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275   280   285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290   295   300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305   310   315   320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325   330   335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340   345   350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355   360   365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370   375   380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385   390   395   400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405   410   415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420   425   430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435   440   445

<210> 235
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/R273A

<400> 235
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1   5   10   15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20   25   30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35   40   45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50   55   60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65   70   75   80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85   90   95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100   105   110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115   120   125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130   135   140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145   150   155   160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165   170   175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180   185   190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195   200   205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210   215   220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225   230   235   240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245   250   255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn

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            260                 265                 270
Ala Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 236
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/R424A

<400> 236
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
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Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275   280   285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290   295   300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305   310   315   320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325   330   335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340   345   350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355   360   365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370   375   380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385   390   395   400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405   410   415
Ala Phe Leu Lys Trp Ile Asp Ala Ser Met Lys Thr Arg Gly Leu Pro
            420   425   430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435   440   445

<210> 237
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/R424E

<400> 237
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1   5   10   15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20   25   30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35   40   45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50   55   60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65   70   75   80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85   90   95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100   105   110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115   120   125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130   135   140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145   150   155   160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165   170   175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180   185   190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195   200   205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210   215   220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225   230   235   240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245   250   255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260   265   270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu

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        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Glu Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 238
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/K420A

<400> 238
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
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Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Ala Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 239
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/K420E

<400> 239
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro

290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Glu Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Glu Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 240
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/R306E

<400> 240
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300

Glu Glu Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 241
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/K276A

<400> 241
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Ala Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile

305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 242
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/K276E

<400> 242
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Glu Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320

Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 243
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/K420E/R424E

<400> 243
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg

325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Glu Trp Ile Asp Glu Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 244
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/R273E/K420E/R424E

<400> 244
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Glu Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335

Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Glu Trp Ile Asp Glu Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 245
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/R273E/R306E/K420E/R424E

<400> 245
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Glu Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Glu Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu

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            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Glu Trp Ile Asp Glu Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 246
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/K338A

<400> 246
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Ala Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
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Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355   360   365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370   375   380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385   390   395   400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405   410   415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420   425   430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435   440   445

<210> 247
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/K338S

<400> 247
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1   5   10   15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20   25   30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35   40   45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50   55   60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65   70   75   80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85   90   95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100   105   110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115   120   125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130   135   140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145   150   155   160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165   170   175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180   185   190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195   200   205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210   215   220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225   230   235   240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245   250   255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260   265   270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275   280   285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290   295   300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305   310   315   320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325   330   335
Leu Ser Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340   345   350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp

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        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 248
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/E215N/N217S

<400> 248
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Asn Glu Ser Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
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Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 249
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/E264N/E266S

<400> 249
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1                5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Asn Val Ser Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
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    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435                 440                 445


<210> 250
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X D119N/G121S/V196S/E264N/E266S

<400> 250
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asn Asn Ser Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Asn Val Ser Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
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Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 251
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X G114N/V196S/E264N/E266S

<400> 251
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Asn Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Asn Val Ser Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly

385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 252
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/R429N/L431S

<400> 252
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400

Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Asn Gly Ser Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 253
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/R243N/K245S

<400> 253
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Asn Phe Ser Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr

405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 254
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/T293N/R295S

<400> 254
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Asn Phe Ser Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415

Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 255
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/D389N/Y391S

<400> 255
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asn Thr Ser Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro

420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 256
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/K388N

<400> 256
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Asn Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430

Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435   440   445

<210> 257
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X D119N/G121S/V196S/K388N

<400> 257
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1   5   10   15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20   25   30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35   40   45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50   55   60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65   70   75   80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85   90   95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100   105   110
Arg Gly Tyr Thr Leu Ala Asn Asn Ser Lys Ala Cys Ile Pro Thr Gly
        115   120   125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130   135   140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145   150   155   160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165   170   175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180   185   190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195   200   205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210   215   220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225   230   235   240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245   250   255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260   265   270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275   280   285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290   295   300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305   310   315   320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325   330   335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340   345   350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355   360   365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370   375   380
Thr Arg Phe Asn Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385   390   395   400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405   410   415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420   425   430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys

435 440 445

<210> 258
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/T428N/G430S

<400> 258
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Asn Arg Ser Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 259
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/L211S/G219H/E264N/E266S

<400> 259
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1   5   10   15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20   25   30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35   40   45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50   55   60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65   70   75   80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85   90   95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100   105   110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115   120   125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130   135   140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145   150   155   160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165   170   175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180   185   190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195   200   205
Gln Ala Ser Leu Ile Asn Glu Glu Asn Glu His Phe Cys Gly Gly Thr
    210   215   220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225   230   235   240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245   250   255
Glu Gly Gly Glu Ala Val His Asn Val Ser Val Val Ile Lys His Asn
            260   265   270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275   280   285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290   295   300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305   310   315   320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325   330   335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340   345   350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355   360   365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370   375   380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385   390   395   400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405   410   415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420   425   430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435   440   445

<210> 260
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X
D119N/G121S/V196S/L211S/G219H/E264N/E266S

<400> 260
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asn Asn Ser Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Ser Leu Ile Asn Glu Glu Asn Glu His Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Asn Val Ser Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 261
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X
G114N/V196S/L211S/G219H/E264N/E266S

<400> 261
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Asn Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Ser Leu Ile Asn Glu Glu Asn Glu His Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Asn Val Ser Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 262
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X V196S/E264N/E266S/K388N

<400> 262
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
 1   5   10   15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20   25   30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35   40   45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50   55   60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65   70   75   80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85   90   95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100   105   110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115   120   125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130   135   140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145   150   155   160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165   170   175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180   185   190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195   200   205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210   215   220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225   230   235   240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245   250   255
Glu Gly Gly Glu Ala Val His Asn Val Ser Val Val Ile Lys His Asn
            260   265   270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275   280   285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290   295   300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305   310   315   320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325   330   335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340   345   350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355   360   365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370   375   380
Thr Arg Phe Asn Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385   390   395   400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405   410   415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420   425   430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435   440   445

<210> 263
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X
D119N/G121S/V196S/L211S/G219H/K388N

<400> 263
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu
1 5 10 15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
20 25 30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
35 40 45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
50 55 60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65 70 75 80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
85 90 95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
100 105 110
Arg Gly Tyr Thr Leu Ala Asn Asn Ser Lys Ala Cys Ile Pro Thr Gly
115 120 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
130 135 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145 150 155 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
165 170 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
180 185 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
195 200 205
Gln Ala Ser Leu Ile Asn Glu Glu Asn Glu His Phe Cys Gly Gly Thr
210 215 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225 230 235 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
245 250 255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
260 265 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
275 280 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
290 295 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305 310 315 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
325 330 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
340 345 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
355 360 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
370 375 380
Thr Arg Phe Asn Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385 390 395 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
405 410 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
420 425 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
435 440 445

<210> 264
<211> 448
<212> PRT
<213> Artificial Sequence

<220>
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Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20   25   30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35   40   45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50   55   60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65   70   75   80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85   90   95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100   105   110
Arg Asn Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115   120   125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130   135   140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145   150   155   160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165   170   175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180   185   190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195   200   205
Gln Ala Ser Leu Ile Asn Glu Glu Asn Glu His Phe Cys Gly Gly Thr
    210   215   220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225   230   235   240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245   250   255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260   265   270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275   280   285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290   295   300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305   310   315   320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325   330   335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340   345   350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355   360   365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370   375   380
Thr Arg Phe Asn Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385   390   395   400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405   410   415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420   425   430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
        435   440   445

<210> 265

<211> 448
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature Factor X
V196S/L211S/G219H/E264N/E266S/K388N

<400> 265
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Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Gln Ala Thr Ser Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp
145                 150                 155                 160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180                 185                 190
Thr Arg Ile Ser Gly Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Ser Leu Ile Asn Glu Glu Asn Glu His Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245                 250                 255
Glu Gly Gly Glu Ala Val His Asn Val Ser Val Val Ile Lys His Asn
            260                 265                 270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Asn Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405                 410                 415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420                 425                 430
Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
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<210> 266

<211> 4194
<212> DNA
<213> Artificial Sequence

<220>
<223> pFUSE-hIgG1-Fc2 vector

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actgggaaag tgatgtcgtg tactggctcc gccttttttcc cgagggtggg ggagaaccgt 180
atataagtgc agtagtcgcc gtgaacgttc tttttcgcaa cgggtttgcc gccagaacac 240
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cgtccgccgt ctaggtaagt ttaaagctca ggtcgagacc gggcctttgt ccggcgctcc 420
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tcagcctgac ctgcctggtc aaaggcttct atcccagcga catcgccgtg gagtgggaga 1140
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aggtatgtag gcggtgctac agagttcttg aagtggtggc ctaactacgg ctacactaga 3780
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caaaataggc tgtccccagt gcaagtgcag gtgccagaac atttctctat cgaa 4194

<210> 267
<211> 25
<212> DNA
<213> Artificial Sequence

<220>
<223> pFUSE-Acc-F1 forward primer

<400> 267
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<210> 268
<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> pFUSE-Acc-R3 reverse primer

<400> 268
catggtggcc ctccttcgcc ggtgatc 27

<210> 269
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> FX-wtsp-Invivo-F1 forward primer

<400> 269
cgaaggaggg ccaccatggg gcgcccactg cacctc 36

<210> 270
<211> 38
<212> DNA
<213> Artificial Sequence

<220>
<223> FX-Invivo-R1 reverse primer

<400> 270
tgtctggcca gctagcactc actttaatgg agaggacg 38

<210> 271
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<223> F10-Pro-Acc-F1 forward primer

<400> 271
gccaattcct ttcttgaaga gatg 24

<210> 272

<211> 27
<212> DNA
<213> Artificial Sequence

<220>
<223> pFUSE-Acc-R3 reverse primer

<400> 272
catggtggcc ctccttcgcc ggtgatc 27

<210> 273
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<212> PRT
<213> Homo sapiens

<220>
<223> Thrombin

<220>
<221> PROPEP
<222> (1)...(43)

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<309> 2012-02-22

<400> 273
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            20   25   30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Thr Phe Leu
        35   40   45
Glu Glu Val Arg Lys Gly Asn Leu Glu Arg Glu Cys Val Glu Glu Thr
    50   55   60
Cys Ser Tyr Glu Glu Ala Phe Glu Ala Leu Glu Ser Ser Thr Ala Thr
65   70   75   80
Asp Val Phe Trp Ala Lys Tyr Thr Ala Cys Glu Thr Ala Arg Thr Pro
                85   90   95
Arg Asp Lys Leu Ala Ala Cys Leu Glu Gly Asn Cys Ala Glu Gly Leu
            100   105   110
Gly Thr Asn Tyr Arg Gly His Val Asn Ile Thr Arg Ser Gly Ile Glu
        115   120   125
Cys Gln Leu Trp Arg Ser Arg Tyr Pro His Lys Pro Glu Ile Asn Ser
    130   135   140
Thr Thr His Pro Gly Ala Asp Leu Gln Glu Asn Phe Cys Arg Asn Pro
145   150   155   160
Asp Ser Ser Thr Thr Gly Pro Trp Cys Tyr Thr Thr Asp Pro Thr Val
                165   170   175
Arg Arg Gln Glu Cys Ser Ile Pro Val Cys Gly Gln Asp Gln Val Thr
            180   185   190
Val Ala Met Thr Pro Arg Ser Glu Gly Ser Ser Val Asn Leu Ser Pro
        195   200   205
Pro Leu Glu Gln Cys Val Pro Asp Arg Gly Gln Gln Tyr Gln Gly Arg
    210   215   220
Leu Ala Val Thr Thr His Gly Leu Pro Cys Leu Ala Trp Ala Ser Ala
225   230   235   240
Gln Ala Lys Ala Leu Ser Lys His Gln Asp Phe Asn Ser Ala Val Gln
                245   250   255
Leu Val Glu Asn Phe Cys Arg Asn Pro Asp Gly Asp Glu Glu Gly Val
            260   265   270
Trp Cys Tyr Val Ala Gly Lys Pro Gly Asp Phe Gly Tyr Cys Asp Leu
        275   280   285
Asn Tyr Cys Glu Glu Ala Val Glu Glu Glu Thr Gly Asp Gly Leu Asp
    290   295   300
Glu Asp Ser Asp Arg Ala Ile Glu Gly Arg Thr Ala Thr Ser Glu Tyr

305 310 315 320
Gln Thr Phe Phe Asn Pro Arg Thr Phe Gly Ser Gly Glu Ala Asp Cys
325 330 335
Gly Leu Arg Pro Leu Phe Glu Lys Lys Ser Leu Glu Asp Lys Thr Glu
340 345 350
Arg Glu Leu Leu Glu Ser Tyr Ile Asp Gly Arg Ile Val Glu Gly Ser
355 360 365
Asp Ala Glu Ile Gly Met Ser Pro Trp Gln Val Met Leu Phe Arg Lys
370 375 380
Ser Pro Gln Glu Leu Leu Cys Gly Ala Ser Leu Ile Ser Asp Arg Trp
385 390 395 400
Val Leu Thr Ala Ala His Cys Leu Leu Tyr Pro Pro Trp Asp Lys Asn
405 410 415
Phe Thr Glu Asn Asp Leu Leu Val Arg Ile Gly Lys His Ser Arg Thr
420 425 430
Arg Tyr Glu Arg Asn Ile Glu Lys Ile Ser Met Leu Glu Lys Ile Tyr
435 440 445
Ile His Pro Arg Tyr Asn Trp Arg Glu Asn Leu Asp Arg Asp Ile Ala
450 455 460
Leu Met Lys Leu Lys Lys Pro Val Ala Phe Ser Asp Tyr Ile His Pro
465 470 475 480
Val Cys Leu Pro Asp Arg Glu Thr Ala Ala Ser Leu Leu Gln Ala Gly
485 490 495
Tyr Lys Gly Arg Val Thr Gly Trp Gly Asn Leu Lys Glu Thr Trp Thr
500 505 510
Ala Asn Val Gly Lys Gly Gln Pro Ser Val Leu Gln Val Val Asn Leu
515 520 525
Pro Ile Val Glu Arg Pro Val Cys Lys Asp Ser Thr Arg Ile Arg Ile
530 535 540
Thr Asp Asn Met Phe Cys Ala Gly Tyr Lys Pro Asp Glu Gly Lys Arg
545 550 555 560
Gly Asp Ala Cys Glu Gly Asp Ser Gly Gly Pro Phe Val Met Lys Ser
565 570 575
Pro Phe Asn Asn Arg Trp Tyr Gln Met Gly Ile Val Ser Trp Gly Glu
580 585 590
Gly Cys Asp Arg Asp Gly Lys Tyr Gly Phe Tyr Thr His Val Phe Arg
595 600 605
Leu Lys Lys Trp Ile Gln Lys Val Ile Asp Gln Phe Gly Glu
610 615 620

<210> 274
<211> 36
<212> DNA
<213> Artificial Sequence

<220>
<223> FII-SP+Pro-F10Acc-F1 forward primer

<400> 274
cgaaggaggg ccaccatggc gcacgtccga ggcttg 36

<210> 275
<211> 39
<212> DNA
<213> Artificial Sequence

<220>
<223> FII-SP+Pro-F10Acc-R1 reverse primer

<400> 275
ttcaagaaag gaattggctc gccggacccg ctggagcag 39

<210> 276
<211> 39
<212> DNA

<213> Artificial Sequence

<220>
<223> FX-I16L-For primer

<400> 276
gacaacaacc tcaccaggct ggtgggaggc caggaatgc 39

<210> 277
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
<223> FX-V17A-For primer

<400> 277
caacaacctc accaggatcg ccggaggcca ggaatgcaag 40

<210> 278
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> FX-V17I-For primer

<400> 278
caacctcacc aggatcatcg gaggccagga atgc 34

<210> 279
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> FX-V17L-For primer

<400> 279
caacctcacc aggatcctgg gaggccagga atgc 34

<210> 280
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> FX-V17T-For primer

<400> 280
caacctcacc aggatcaccg gaggccagga atgc 34

<210> 281
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> FX-V17S-For primer

<400> 281
caacctcacc aggatcagcg gaggccagga atgc 34

<210> 282
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> FX-V17P-For primer

<400> 282
caacctcacc aggatccccg gaggccagga atgc 34

<210> 283
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> FX-G18A-For primer

<400> 283
accaggatcg tggccggcca ggaatgcaag gac 33

<210> 284
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> FX-G18P-For primer

<400> 284
accaggatcg tgcccggcca ggaatgcaag gac 33

<210> 285
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<212> DNA
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<220>
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<400> 285
accaggatcg tgagcggcca ggaatgcaag gac 33

<210> 286
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> FX-G18V-For primer

<400> 286
accaggatcg tggtgggcca ggaatgcaag gac 33

<210> 287
<211> 33
<212> DNA
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<220>
<223> FX-G18T-For primer

<400> 287
accaggatcg tgaccggcca ggaatgcaag gac 33

<210> 288
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> FX-G19A-For primer

<400> 288
caccaggatc gtgggagccc aggaatgcaa ggac 34

<210> 289
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> FX-G19V-For primer

<400> 289
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<210> 290
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> FX-G19R-For primer

<400> 290
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<210> 291
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> FX-G19K-For primer

<400> 291
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<210> 292
<211> 34
<212> DNA
<213> Artificial Sequence

<220>
<223> FX-G19P-For primer

<400> 292
caccaggatc gtgggacccc aggaatgcaa ggac 34

<210> 293
<211> 34
<212> DNA

<213> Artificial Sequence

<220>
<223> FX-G19H-For primer

<400> 293
caccaggatc gtgggacacc aggaatgcaa ggac 34

<210> 294
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> FX-G19N-For primer

<400> 294
gatgcctgcc aggggaacag cgggggcccg cac 33

<210> 295
<211> 33
<212> DNA
<213> Artificial Sequence

<220>
<223> FX-G19S-For primer

<400> 295
gatgcctgcc aggggagcag cgggggcccg cac 33

<210> 296
<211> 58
<212> DNA
<213> Artificial Sequence

<220>
<223> FX-L32S/G40H-For primer

<400> 296
gtgtccctgg caggccagcc tcatcaatga ggaaaacgag cacttctgtg gtggaacc 58

<210> 297
<211> 34
<212> DNA
<213> Artificial Sequence

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Lys Lys Gly Asn Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
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Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65   70   75   80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
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Asn Glu Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
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Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
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Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
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Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
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Pro Glu Thr Gly Asp Asn Asn Leu Val Arg Ile Val Gly Gly Arg Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
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        275                 280                 285
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Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
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Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
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385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr His Ala Arg Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Glu Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Pro Ser Pro Leu Lys
                485


<210> 394
<211> 488
<212> PRT
<213> Papio anubis

<220>
<223> Factor X

<300>
<308> GenBank: ABY40835.1
<309> 2008-02-05

<400> 394
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Phe Leu Ala Ser
 1               5                  10                  15
Leu Leu Leu Pro Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Val Leu Ala Arg Val Arg Arg Ser Asn Ser Phe Leu Glu Glu Leu
        35                  40                  45
Lys Lys Gly Asn Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ile Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Glu Gly Lys Cys Arg Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
```

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            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Ala Ala Gln Ala Thr Asn Ser Ser Gly
            180                 185                 190
Glu Ala Ser Asp Ser Ile Ile Trp Lys Pro Asp Asp Ala Ala Asp Leu
        195                 200                 205
Asp Ala Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Ile Arg Ile Val Gly Gly Arg Glu
225                 230                 235                 240
Cys Glu Asn Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asp Met Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Ile Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Ser Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr His Ala Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Glu Ser Arg Ala Pro Glu
465                 470                 475                 480
Val Ser Thr Ser Ser Pro Leu Lys
                485


<210> 395
<211> 488
<212> PRT
<213> Macaca mulatta

<220>
<223> Factor X

<300>
<308> GenBank: ABK54294.1
<309> 2006-11-14

<400> 395
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Phe Leu Ala Ser
 1               5                  10                  15
Leu Leu Leu Pro Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
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Asn Val Leu Ala Arg Val Arg Arg Ser Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly Asn Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Leu Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Glu Gly Lys Cys Arg Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Glu Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Ala Ala Gln Ala Thr Asn Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Asn Ile Ile Trp Lys Pro Asp Asp Ala Ala Asp Leu
        195                 200                 205
Asp Ala Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Ile Arg Ile Val Gly Gly Arg Glu
225                 230                 235                 240
Cys Glu Asn Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asp Met Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Ile Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Ser Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr His Ala Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Glu Ser Arg Ala Pro Glu
465                 470                 475                 480
Ala Ser Thr Ser Ser Pro Leu Lys
                485
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<210> 396
<211> 488
<212> PRT
<213> Callicebus moloch

<220>
<223> Factor X

<300>
<308> UniProtKB: B1MTD3
<309> 2008-04-29

<400> 396

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Met Gly His Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Pro Gly Gly Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Val Leu Ala Arg Val Arg Arg Ala Asn Ser Ile Leu Glu Glu Leu
        35                  40                  45
Lys Lys Gly Asn Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Gln Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Ser Asp Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Gln Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Ser Gly Tyr Val Leu Ala Asp Asp
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Leu Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ala Ala Ala Gln Ala Thr His Arg Arg Gly
            180                 185                 190
Glu Thr Pro Gly Thr Ile Thr Arg Pro Gln His Asn Thr Ser Asp Pro
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Gly Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Trp Glu Glu Ser Asp Leu Val Arg Ile Val Gly Gly Arg Asp
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe His Val Leu
            260                 265                 270
Thr Ala Ala His Cys Leu His Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Lys Glu Glu Gly Gly Glu Thr Val His Glu
    290                 295                 300
Val Glu Val Ile Ile Lys His Asn Arg Phe Ser Ile Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Thr Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Ala Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Thr Leu Lys Ile Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Thr Cys Lys Leu Ser Ser Ser Phe Thr Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Glu Ala Arg Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Ser Gly Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Val Pro Lys Ala Glu Ser His Val Pro Gly
465                 470                 475                 480
Val Asn Thr Ser Ser Pro Leu Lys
                485
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<210> 397
<211> 477
<212> PRT
<213> Loxodonta africana

<220>
<223> Factor X

<300>
<308> UniProtKB: G3TXA1
<309> 2011-11-16

<400> 397
Met Ala Ser Trp Pro Cys Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1   5   10   15
Leu Leu Leu Pro Gly Ala Ser Val Phe Ile Asn Arg Glu His Ala Ser
            20   25   30
Asn Val Leu Gln Arg Ala Arg Arg Ala Asn Ser Phe Leu Glu Glu Met
        35   40   45
Lys Gln Gly Asn Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Phe
    50   55   60
Glu Glu Ala Arg Glu Val Phe Glu Asp Asp Val Lys Thr Asn Glu Phe
65   70   75   80
Trp Asn Arg Tyr Lys Asp Gly Asp Gln Cys Glu Ser Asn Pro Cys Gln
                85   90   95
Asn Gln Gly Lys Cys Gln Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100   105   110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Thr Ile Arg Glu Leu
        115   120   125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys Asn Glu Glu Arg
    130   135   140
Asn Ser Val Val Cys Ser Cys Ala Ala Gly Tyr Thr Leu Gly Asp Asn
145   150   155   160
Gly Lys Ser Cys Ile Ser Thr Glu Pro Phe Pro Cys Gly Lys Leu Thr
                165   170   175
Met Gly Arg Asn Lys Arg Ser Leu Ala Gln Ala Asn Asn Val Ser Gly
            180   185   190
Ser Pro Pro Glu Thr Ser Thr Gln Lys Gln Tyr Gly Leu Asp Asp Leu
        195   200   205
Ala Pro Thr Glu Asn Pro Val Asn Leu Leu Asn Leu Asn Gln Glu Phe
    210   215   220
Pro Glu Gln Asp Thr Ser Asp Leu Val Arg Ile Val Gly Gly Arg Asp
225   230   235   240
Cys Lys Glu Gly Glu Cys Pro Trp Gln Ala Leu Leu Val Asn Glu Glu
                245   250   255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Asn Glu Tyr Tyr Ile Leu
            260   265   270
Thr Ala Ala His Cys Leu His Gln Ala Lys Arg Phe Lys Val Arg Val
        275   280   285
Gly Asp Arg Asn Thr Glu Lys Glu Glu Gly Asn Glu Met Ala His Glu
    290   295   300
Val Glu Ile Ile Leu Lys His Asn Lys Phe Val Arg Glu Thr Tyr Asp
305   310   315   320
Phe Asp Ile Ala Val Ile Lys Leu Lys Thr Pro Ile Thr Phe Arg Met
                325   330   335
Asn Val Ala Pro Ala Cys Leu Pro Glu Lys Asp Trp Ala Glu Ser Thr
            340   345   350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355   360   365
Glu Lys Gly Arg Ala Ser Thr Ile Leu Lys Met Leu Glu Val Pro Tyr
    370   375   380
Val Asp Arg Asn Thr Cys Lys Leu Ser Ser Ser Phe Thr Ile Thr Gln
385   390   395   400
Asn Met Phe Cys Ala Gly Tyr Asp Ser Lys Pro Glu Asp Ala Cys Gln
                405   410   415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420   425   430

Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435   440   445
Tyr Gly Val Tyr Thr Lys Val Thr Ser Phe Leu Lys Trp Ile Asp Arg
    450   455   460
Cys Met Lys Thr Lys Ala Gly Val His Ala Gln Ala Pro
465   470   475

<210> 398
<211> 481
<212> PRT
<213> Mus musculus

<220>
<223> Factor X

<300>
<308> UniProtKB: O88947
<309> 1998-11-01

<400> 398
Met Gly Ser Pro Val Gln Leu Ser Leu Leu Cys Val Val Leu Ala Ser
 1   5   10   15
Leu Leu Leu Pro Gly Lys Gly Val Phe Ile Asn Arg Glu Arg Ala Asn
            20   25   30
Asn Val Leu Ala Arg Thr Arg Arg Ala Asn Ser Phe Phe Glu Glu Phe
        35   40   45
Lys Lys Gly Asn Leu Glu Arg Glu Cys Met Glu Glu Ile Cys Ser Tyr
    50   55   60
Glu Glu Val Arg Glu Ile Phe Glu Asp Asp Glu Lys Thr Lys Glu Tyr
65   70   75   80
Trp Thr Lys Tyr Lys Asp Gly Asp Gln Cys Glu Ser Ser Pro Cys Gln
                85   90   95
Asn Gln Gly Ala Cys Arg Asp Gly Ile Gly Gly Tyr Thr Cys Thr Cys
            100   105   110
Ser Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Val Arg Lys Leu
        115   120   125
Cys Arg Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys Arg Glu Glu Gln
    130   135   140
Asn Ser Val Val Cys Ser Cys Ala Ser Gly Tyr Phe Leu Gly Asn Asp
145   150   155   160
Gly Lys Ser Cys Ile Ser Thr Ala Pro Phe Pro Cys Gly Lys Ile Thr
                165   170   175
Thr Gly Arg Arg Lys Arg Ser Val Ala Leu Asn Thr Ser Asp Ser Glu
            180   185   190
Leu Asp Leu Glu Asp Ala Leu Leu Asp Glu Asp Phe Leu Ser Pro Thr
        195   200   205
Glu Asn Pro Ile Glu Leu Leu Asn Leu Asn Glu Thr Gln Pro Glu Arg
    210   215   220
Ser Ser Asp Asp Leu Val Arg Ile Val Gly Gly Arg Glu Cys Lys Asp
225   230   235   240
Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Asp Asn Glu Gly
                245   250   255
Phe Cys Gly Gly Thr Ile Leu Asn Glu Phe Tyr Ile Leu Thr Ala Ala
            260   265   270
His Cys Leu His Gln Ala Arg Arg Phe Lys Val Arg Val Gly Asp Arg
        275   280   285
Asn Thr Glu Lys Glu Glu Gly Asn Glu Met Val His Glu Val Asp Val
    290   295   300
Val Ile Lys His Asn Lys Phe Gln Arg Asp Thr Tyr Asp Tyr Asp Ile
305   310   315   320
Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala
                325   330   335
Pro Ala Cys Leu Pro Gln Lys Asp Trp Ala Glu Ser Thr Leu Met Thr
            340   345   350
Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly
        355   360   365
Arg Gln Ser Asn Ile Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg

370 375 380
Asn Thr Cys Lys Leu Ser Thr Ser Phe Ser Ile Thr Gln Asn Met Phe
385 390 395 400
Cys Ala Gly Tyr Glu Ala Lys Leu Glu Asp Ala Cys Gln Gly Asp Ser
405 410 415
Gly Gly Pro His Val Thr Arg Phe Lys Asn Thr Tyr Tyr Val Thr Gly
420 425 430
Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile
435 440 445
Tyr Thr Lys Val Thr Thr Phe Leu Lys Trp Ile Asp Arg Ser Met Lys
450 455 460
Ala Arg Val Gly Pro Thr Ala Glu Thr Pro Arg Thr Ala Gly Pro Pro
465 470 475 480
Asn

<210> 399
<211> 490
<212> PRT
<213> Oryctolagus cuniculus

<220>
<223> Factor X

<300>
<308> UniProtKB: O19045
<309> 1998-01-01

<400> 399
Met Ala Asn Pro Leu His Leu Val Leu Leu Gly Ala Ala Leu Ala Gly
1 5 10 15
Leu Leu Leu Ser Gly Ser Ser Val Phe Ile Ser Arg Arg Ala Ala Asn
20 25 30
Asp Val Leu Ala Arg Thr Arg Arg Ala Asn Ser Phe Leu Glu Glu Leu
35 40 45
Lys Lys Gly Asn Leu Glu Arg Glu Cys Met Glu Glu Asn Cys Ser Tyr
50 55 60
Glu Glu Ala Leu Glu Val Phe Glu Asp Arg Glu Lys Thr Asn Glu Phe
65 70 75 80
Trp Asn Lys Tyr Val Asp Gly Asp Gln Cys Glu Ser Asn Pro Cys Gln
85 90 95
Asn Gln Gly Thr Cys Lys Asp Gly Leu Gly Met Tyr Thr Cys Ser Cys
100 105 110
Val Glu Gly Tyr Glu Gly Gln Asp Cys Glu Pro Val Thr Arg Lys Leu
115 120 125
Cys Ser Leu Asp Asn Gly Gly Cys Asp Gln Phe Cys Lys Glu Glu Glu
130 135 140
Asn Ser Val Leu Cys Ser Cys Ala Ser Gly Tyr Thr Leu Gly Asp Asn
145 150 155 160
Gly Lys Ser Cys Ile Ser Thr Glu Leu Phe Pro Cys Gly Lys Val Thr
165 170 175
Leu Gly Arg Trp Arg Arg Ser Pro Ala Thr Asn Ser Ser Glu Gly Pro
180 185 190
Pro Glu Ala Pro Gly Pro Glu Gln Gln Asp Asp Gly Asn Leu Thr Ala
195 200 205
Thr Glu Asn Pro Phe Asn Leu Leu Asp Ser Pro Glu Pro Pro Pro Glu
210 215 220
Asp Asp Ser Ser Ser Leu Val Arg Ile Val Gly Gly Gln Asp Cys Arg
225 230 235 240
Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Val Asn Glu Glu Asn Glu
245 250 255
Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Tyr His Val Leu Thr Ala
260 265 270
Ala His Cys Leu His Gln Ala Lys Arg Phe Lys Val Arg Val Gly Asp
275 280 285
Arg Asp Thr Glu His Glu Glu Gly Asn Glu Glu Thr His Glu Val Glu
290 295 300

Val Val Val Lys His Asn Arg Phe Val Lys Glu Thr Tyr Asp Phe Asp
305 310 315 320
Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Arg Asn Val
325 330 335
Ala Pro Ala Cys Leu Pro Gln Lys Asp Trp Ala Glu Ser Thr Leu Met
340 345 350
Ala Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His Glu Met
355 360 365
Gly Arg Leu Ser Thr Thr Leu Lys Met Leu Glu Val Pro Tyr Val Asp
370 375 380
Arg Asn Ser Cys Lys Arg Ser Ser Ser Phe Thr Ile Thr Gln Asn Met
385 390 395 400
Phe Cys Ala Gly Tyr Asp Ala Arg Pro Glu Asp Ala Cys Gln Gly Asp
405 410 415
Ser Gly Gly Pro His Val Thr Arg Phe Arg Asp Thr Tyr Phe Val Thr
420 425 430
Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys Phe Gly
435 440 445
Val Tyr Thr Lys Val Ser Asn Phe Leu Lys Trp Ile Glu Lys Ser Met
450 455 460
Arg Ala Arg Ala Val Pro Val Ala Glu Ala Ala Gly Thr Pro Gly Pro
465 470 475 480
Thr Gln Pro Thr Ile Lys Gly Ser Pro Ser
485 490

<210> 400
<211> 482
<212> PRT
<213> Rattus norvegicus

<220>
<223> Factor X

<300>
<308> UniProtKB: Q63207
<309> 1996-11-01

<400> 400
Met Glu Ser Pro Val Arg Leu Ser Leu Leu Tyr Val Val Leu Ala Ser
1 5 10 15
Leu Leu Leu Pro Gly Arg Ser Val Phe Ile Asn Arg Glu Arg Ala Asn
20 25 30
Asn Val Leu Gln Arg Ile Arg Arg Ala Asn Ser Phe Phe Glu Glu Ile
35 40 45
Lys Lys Gly Asn Leu Glu Arg Glu Cys Val Glu Glu Ile Cys Ser Phe
50 55 60
Glu Glu Ala Arg Glu Val Phe Glu Asp Asn Glu Lys Thr Thr Glu Phe
65 70 75 80
Trp Asn Lys Tyr Glu Asp Gly Asp Gln Cys Glu Ser Ser Pro Cys Gln
85 90 95
Asn Gln Gly Glu Cys Arg Asp Gly Leu Gly Ser Tyr Thr Cys Thr Cys
100 105 110
Thr Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Val Arg Lys Leu
115 120 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys Arg Glu Glu Gln
130 135 140
Asn Ser Val Val Cys Ser Cys Ala Lys Gly Tyr Phe Leu Gly Asn Asp
145 150 155 160
Gly Lys Ser Cys Leu Ser Thr Ala Pro Phe Pro Cys Gly Lys Thr Asn
165 170 175
Lys Gly Arg Ala Lys Arg Ser Val Ala Leu Asn Thr Ser Asn Ser Glu
180 185 190
Pro Asp Pro Glu Asp Leu Met Pro Asp Ala Asp Ile Leu Tyr Pro Thr
195 200 205
Glu Ser Pro Ser Glu Leu Leu Asn Leu Asn Lys Thr Glu Pro Glu Ala
210 215 220
Asn Ser Asp Asp Val Ile Arg Ile Val Gly Gly Gln Glu Cys Lys Arg

225 230 235 240
Gly Glu Cys Pro Trp Gln Ala Leu Leu Phe Ser Asp Glu Glu Thr Asp
245 250 255
Gly Phe Cys Gly Gly Thr Ile Leu Asn Glu Phe Tyr Ile Leu Thr Ala
260 265 270
Ala His Cys Leu His Gln Ala Lys Arg Phe Lys Val Arg Val Gly Asp
275 280 285
Leu Asn Thr Glu Gln Glu Asp Gly Gly Glu Met Val His Glu Val Asp
290 295 300
Met Ile Ile Lys His Asn Lys Phe Gln Arg Asp Thr Tyr Asp Phe Asp
305 310 315 320
Ile Ala Met Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Glu Asn Val
325 330 335
Ala Pro Ala Cys Leu Pro Gln Lys Asp Trp Ala Glu Ala Thr Leu Met
340 345 350
Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His Glu Lys
355 360 365
Gly Arg Gln Ser Lys Val Leu Lys Met Met Glu Val Pro Tyr Val Asp
370 375 380
Arg Asn Thr Cys Arg Leu Ser Thr Ser Phe Ser Ile Thr Gln Asn Met
385 390 395 400
Phe Cys Ala Gly Tyr Asp Ala Lys Gln Glu Asp Ala Cys Gln Gly Asp
405 410 415
Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr
420 425 430
Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly
435 440 445
Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg Ser Met
450 455 460
Lys Ala Arg Val Gly Pro Thr Ser Glu Thr Pro Arg Leu Thr His Pro
465 470 475 480
Pro Tyr

<210> 401
<211> 499
<212> PRT
<213> Canis familiaris

<220>
<223> Factor X

<300>
<308> UniProtKB: F1Q4A3
<309> 2011-05-03

<400> 401
Met Ala Gly Pro Leu Cys Leu Val Leu Leu Ser Ala Ser Leu Ala Cys
1 5 10 15
Leu Pro Leu Pro Gly Gly Ser Val Phe Leu Ser Pro Glu Arg Ala Ser
20 25 30
Ser Val Leu Gly Arg Val Arg Arg Ala Asn Ser Phe Leu Glu Glu Met
35 40 45
Lys Lys Gly Asn Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Phe
50 55 60
Glu Glu Ala Arg Glu Val Phe Glu Asp Thr Ala Lys Thr Met Glu Phe
65 70 75 80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Ser Ser Pro Cys Gln
85 90 95
Asn Gln Gly Gln Cys Lys Asp Gly Leu Leu Glu Tyr Ser Cys Ile Cys
100 105 110
Leu Glu Gly Tyr Glu Gly Lys Asn Cys Glu Leu Ser Thr Arg Lys Leu
115 120 125
Cys Ser Val Asp Asn Gly Asp Cys Asp Gln Phe Cys Arg Glu Glu Gln
130 135 140
Ser Ser Val Val Cys Ser Cys Ala Ser Gly Tyr Ile Leu Gly Asp Asn
145 150 155 160

Gly Lys Ser Cys Ile Ser Thr Glu Pro Phe Pro Cys Gly Lys Thr Thr
165 170 175
Val Gly Arg Arg Lys Arg Ala Thr Glu Thr Ala Pro Ser Ser Glu Ala
180 185 190
Pro Pro Asp Ala Glu Glu Glu Ala Gly Met Leu Glu Gln Tyr Asp Pro
195 200 205
Gly Asp Leu Ser Pro Thr Gln Ser Thr Met Phe Leu Leu Pro Phe Asn
210 215 220
Gln Thr Asn Ser Asp Pro Asp Glu Asp Ala Ser Gly Leu Val Arg Ile
225 230 235 240
Val Gly Gly Gln Asp Cys Arg Asp Gly Glu Cys Pro Trp Gln Ala Leu
245 250 255
Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser
260 265 270
Glu Tyr Tyr Ile Leu Thr Ala Ala His Cys Leu Gln Gln Ala Lys Lys
275 280 285
Phe Thr Val Arg Val Gly Glu Arg Asp Thr Asp Lys Glu Glu Gly Asn
290 295 300
Glu Val Ala His Glu Val Glu Met Ile Ile Lys His Asn Lys Phe Val
305 310 315 320
Arg Glu Thr Tyr Asp Phe Asp Ile Ala Val Ile Lys Leu Lys Thr Pro
325 330 335
Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Gln Lys Asp
340 345 350
Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly
355 360 365
Phe Gly Lys Thr His Glu Lys Gly Arg Pro Ser Thr Thr Leu Lys Met
370 375 380
Met Glu Val Pro Tyr Val Asp Arg Asn Thr Cys Lys Leu Ser Ser Ser
385 390 395 400
Phe Ser Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Ser Lys Pro
405 410 415
Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe
420 425 430
Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys
435 440 445
Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Asn Phe Leu
450 455 460
Lys Trp Ile Asp Arg Ser Met Lys Ala Arg Ala Gly Trp Gly Gly Phe
465 470 475 480
Phe Gly Lys Lys Glu Arg Pro Pro Ser Leu Trp Ala Asp Pro Pro Pro
485 490 495
Gly Pro Cys

<210> 402
<211> 479
<212> PRT
<213> Sus scrofa

<220>
<223> Factor X

<300>
<308> UniProtKB: F1RN41
<309> 2011-05-03

<400> 402
Met Val Gly Leu Pro Ser Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
1 5 10 15
Leu Leu Leu Pro Gly Gly Ser Val Phe Leu Pro Arg Asp Arg Ala His
20 25 30
Ser Val Leu Glu Arg Ala Arg Arg Ala Asn Ser Phe Trp Glu Glu Met
35 40 45
Lys Lys Gly Asn Leu Glu Arg Glu Cys Leu Glu Glu Thr Cys Ser Tyr
50 55 60
Glu Glu Ala Arg Glu Val Phe Glu Asp Gln Gln Lys Thr Asp Glu Phe

65 70 75 80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Ser Ser Pro Cys Gln
85 90 95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Asn Cys Thr Cys
100 105 110
Ala Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Leu Thr Arg Lys Leu
115 120 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys Arg Glu Glu Gln
130 135 140
Ser Ser Val Val Cys Ser Cys Ala Ser Gly Tyr Ile Leu Gly Asp Asn
145 150 155 160
Gly Lys Ser Cys Ile Ser Thr Glu Pro Phe Pro Cys Gly Lys Arg Thr
165 170 175
Leu Gly Arg Ser Arg Arg Ser Ala Asp His Gly Ser Glu Ala Ala Pro
180 185 190
Glu Ala Gly Arg Ser Glu Gln Glu Pro Arg Asp Leu Gly Pro Thr Glu
195 200 205
Gly Pro Leu His Leu Leu Ser Leu Asn Asp Thr Glu Pro Gly Pro Glu
210 215 220
Glu Asp Glu Asp Glu Ser Ser Leu Val Arg Ile Val Gly Gly Arg Asp
225 230 235 240
Cys Arg Glu Gly Glu Cys Pro Trp Gln Ala Leu Leu Val Asn Glu Glu
245 250 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe His Val Leu
260 265 270
Thr Ala Ala His Cys Leu His Gln Ala Lys Lys Phe Lys Val Arg Val
275 280 285
Gly Asp Arg Asn Leu Glu Lys Glu Glu Gly Asp Glu Ala Ala His Glu
290 295 300
Val Glu Val Thr Val Lys His Ser Arg Phe Val Arg Glu Thr Tyr Asp
305 310 315 320
Phe Asp Ile Ala Val Leu Lys Leu Lys Thr Pro Ile Thr Phe Arg Thr
325 330 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Lys Asn Trp Ala Glu Ala Thr
340 345 350
Leu Leu Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
355 360 365
Glu Arg Gly Arg Pro Ser Ser Thr Leu Lys Met Leu Glu Val Pro Tyr
370 375 380
Val Asp Arg Asn Thr Cys Lys Leu Ser Ser Ser Phe Leu Ile Thr Pro
385 390 395 400
Asn Met Phe Cys Ala Gly Tyr Asp Glu Gln Pro Glu Asp Ala Cys Gln
405 410 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Arg Asp Thr Tyr Phe
420 425 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Arg Gly Lys
435 440 445
Tyr Gly Val Tyr Thr Lys Val Thr Asn Phe Leu Lys Trp Ile Glu Arg
450 455 460
Ser Met Arg Ala Arg Ala Glu Ala Gly Ala Glu Pro His Pro Gln
465 470 475

<210> 403
<211> 492
<212> PRT
<213> Bos taurus

<220>
<223> Factor X

<300>
<308> UniProtKB: P00743
<309> 1987-08-13

<400> 403
Met Ala Gly Leu Leu His Leu Val Leu Leu Ser Thr Ala Leu Gly Gly
1 5 10 15

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Leu Leu Arg Pro Ala Gly Ser Val Phe Leu Pro Arg Asp Gln Ala His
            20                  25                  30
Arg Val Leu Gln Arg Ala Arg Arg Ala Asn Ser Phe Leu Glu Glu Val
        35                  40                  45
Lys Gln Gly Asn Leu Glu Arg Glu Cys Leu Glu Glu Ala Cys Ser Leu
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ala Glu Gln Thr Asp Glu Phe
65                  70                  75                  80
Trp Ser Lys Tyr Lys Asp Gly Asp Gln Cys Glu Gly His Pro Cys Leu
                85                  90                  95
Asn Gln Gly His Cys Lys Asp Gly Ile Gly Asp Tyr Thr Cys Thr Cys
            100                 105                 110
Ala Glu Gly Phe Glu Gly Lys Asn Cys Glu Phe Ser Thr Arg Glu Ile
        115                 120                 125
Cys Ser Leu Asp Asn Gly Gly Cys Asp Gln Phe Cys Arg Glu Glu Arg
    130                 135                 140
Ser Glu Val Arg Cys Ser Cys Ala His Gly Tyr Val Leu Gly Asp Asp
145                 150                 155                 160
Ser Lys Ser Cys Val Ser Thr Glu Arg Phe Pro Cys Gly Lys Phe Thr
                165                 170                 175
Gln Gly Arg Ser Arg Arg Trp Ala Ile His Thr Ser Glu Asp Ala Leu
            180                 185                 190
Asp Ala Ser Glu Leu Glu His Tyr Asp Pro Ala Asp Leu Ser Pro Thr
        195                 200                 205
Glu Ser Ser Leu Asp Leu Leu Gly Leu Asn Arg Thr Glu Pro Ser Ala
    210                 215                 220
Gly Glu Asp Gly Ser Gln Val Val Arg Ile Val Gly Gly Arg Asp Cys
225                 230                 235                 240
Ala Glu Gly Glu Cys Pro Trp Gln Ala Leu Leu Val Asn Glu Glu Asn
                245                 250                 255
Glu Gly Phe Cys Gly Gly Thr Ile Leu Asn Glu Phe Tyr Val Leu Thr
            260                 265                 270
Ala Ala His Cys Leu His Gln Ala Lys Arg Phe Thr Val Arg Val Gly
        275                 280                 285
Asp Arg Asn Thr Glu Gln Glu Glu Gly Asn Glu Met Ala His Glu Val
    290                 295                 300
Glu Met Thr Val Lys His Ser Arg Phe Val Lys Glu Thr Tyr Asp Phe
305                 310                 315                 320
Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Arg Phe Arg Arg Asn
                325                 330                 335
Val Ala Pro Ala Cys Leu Pro Glu Lys Asp Trp Ala Glu Ala Thr Leu
            340                 345                 350
Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His Glu
        355                 360                 365
Lys Gly Arg Leu Ser Ser Thr Leu Lys Met Leu Glu Val Pro Tyr Val
    370                 375                 380
Asp Arg Ser Thr Cys Lys Leu Ser Ser Ser Phe Thr Ile Thr Pro Asn
385                 390                 395                 400
Met Phe Cys Ala Gly Tyr Asp Thr Gln Pro Glu Asp Ala Cys Gln Gly
                405                 410                 415
Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe Val
            420                 425                 430
Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys Phe
        435                 440                 445
Gly Val Tyr Thr Lys Val Ser Asn Phe Leu Lys Trp Ile Asp Lys Ile
    450                 455                 460
Met Lys Ala Arg Ala Gly Ala Ala Gly Ser Arg Gly His Ser Glu Ala
465                 470                 475                 480
Pro Ala Thr Trp Thr Val Pro Pro Pro Leu Pro Leu
                485                 490
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<210> 404
<211> 448
<212> PRT
<213> Nomascus leucogenys

<220>

<223> mature Factor X protein

<400> 404
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly Asn Leu Glu Arg Glu
 1   5   10   15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20   25   30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35   40   45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Glu Gly Lys Cys Lys Asp Gly
    50   55   60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65   70   75   80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85   90   95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100   105   110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115   120   125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val
    130   135   140
Ala Gln Ala Thr Asn Ser Ser Gly Glu Gly Pro Asp Ser Ile Thr Trp
145   150   155   160
Lys Pro Tyr Asp Ala Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp
                165   170   175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Thr Gly Asp Asn Asn Leu
            180   185   190
Val Arg Ile Val Gly Gly Arg Glu Cys Lys Asp Gly Glu Cys Pro Trp
        195   200   205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210   215   220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225   230   235   240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu
                245   250   255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Val Ile Lys His Asn
            260   265   270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275   280   285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290   295   300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305   310   315   320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325   330   335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340   345   350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr His
        355   360   365
Ala Arg Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370   375   380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385   390   395   400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405   410   415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420   425   430
Lys Ala Glu Ser His Ala Pro Glu Val Ile Thr Pro Ser Pro Leu Lys
        435   440   445

<210> 405
<211> 448
<212> PRT
<213> Papio anubis

<220>
<223> mature Factor X protein

<400> 405
Ser Asn Ser Phe Leu Glu Glu Leu Lys Lys Gly Asn Leu Glu Arg Glu
 1   5   10   15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20   25   30
Asp Ile Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35   40   45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Glu Gly Lys Cys Arg Asp Gly
    50   55   60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65   70   75   80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85   90   95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100   105   110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115   120   125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Ala
    130   135   140
Ala Gln Ala Thr Asn Ser Ser Gly Glu Ala Ser Asp Ser Ile Ile Trp
145   150   155   160
Lys Pro Asp Asp Ala Ala Asp Leu Asp Ala Thr Glu Asn Pro Phe Asp
                165   170   175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180   185   190
Ile Arg Ile Val Gly Gly Arg Glu Cys Glu Asn Gly Glu Cys Pro Trp
        195   200   205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210   215   220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225   230   235   240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asp Met Glu Gln Glu
                245   250   255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Ile Ile Lys His Asn
            260   265   270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275   280   285
Lys Ser Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290   295   300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305   310   315   320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325   330   335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340   345   350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr His
        355   360   365
Ala Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370   375   380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385   390   395   400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405   410   415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420   425   430
Lys Ala Glu Ser Arg Ala Pro Glu Val Ser Thr Ser Ser Pro Leu Lys
        435   440   445

<210> 406
<211> 448
<212> PRT
<213> Macaca mulatta

<220>
<223> mature Factor X protein

<400> 406
Ser Asn Ser Phe Leu Glu Glu Met Lys Lys Gly Asn Leu Glu Arg Glu
 1   5   10   15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Leu Glu
            20   25   30
Asp Ser Asp Lys Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35   40   45
Gln Cys Glu Thr Ser Pro Cys Gln Asn Glu Gly Lys Cys Arg Asp Gly
    50   55   60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65   70   75   80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Glu Cys
                85   90   95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100   105   110
Arg Gly Tyr Thr Leu Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly
        115   120   125
Pro Tyr Pro Cys Gly Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Ala
    130   135   140
Ala Gln Ala Thr Asn Ser Ser Gly Glu Ala Pro Asp Asn Ile Ile Trp
145   150   155   160
Lys Pro Asp Asp Ala Ala Asp Leu Asp Ala Thr Glu Asn Pro Phe Asp
                165   170   175
Leu Leu Asp Phe Asn Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu
            180   185   190
Ile Arg Ile Val Gly Gly Arg Glu Cys Glu Asn Gly Glu Cys Pro Trp
        195   200   205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210   215   220
Ile Leu Ser Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln
225   230   235   240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asp Met Glu Gln Glu
                245   250   255
Glu Gly Gly Glu Ala Val His Glu Val Glu Val Ile Ile Lys His Asn
            260   265   270
Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu
        275   280   285
Lys Ser Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290   295   300
Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305   310   315   320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg
                325   330   335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu
            340   345   350
Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr His
        355   360   365
Ala Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370   375   380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385   390   395   400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr
                405   410   415
Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro
            420   425   430
Lys Ala Glu Ser Arg Ala Pro Glu Ala Ser Thr Ser Ser Pro Leu Lys
        435   440   445

<210> 407
<211> 448
<212> PRT
<213> Callicebus moloch

<220>
<223> mature Factor X protein

<400> 407

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Ala Asn Ser Ile Leu Glu Glu Leu Lys Lys Gly Asn Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Ser Asp Gln Thr Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Ser Asp Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Gln Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys His Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Ser Gly Tyr Val Leu Ala Asp Asp Gly Lys Ala Cys Ile Pro Thr Gly
        115                 120                 125
Pro Tyr Pro Cys Gly Lys Leu Thr Leu Glu Arg Arg Lys Arg Ala Ala
    130                 135                 140
Ala Gln Ala Thr His Arg Arg Gly Glu Thr Pro Gly Thr Ile Thr Arg
145                 150                 155                 160
Pro Gln His Asn Thr Ser Asp Pro Asp Pro Thr Glu Asn Pro Phe Asp
                165                 170                 175
Leu Leu Gly Phe Asn Gln Thr Gln Pro Glu Trp Glu Glu Ser Asp Leu
            180                 185                 190
Val Arg Ile Val Gly Gly Arg Asp Cys Lys Asp Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe His Val Leu Thr Ala Ala His Cys Leu His Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Lys Glu
                245                 250                 255
Glu Gly Gly Glu Thr Val His Glu Val Glu Val Ile Ile Lys His Asn
            260                 265                 270
Arg Phe Ser Ile Glu Thr Tyr Asp Phe Asp Ile Thr Val Leu Arg Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Ala Arg Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Thr Thr
                325                 330                 335
Leu Lys Ile Leu Glu Val Pro Tyr Val Asp Arg Asn Thr Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Thr Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Glu
        355                 360                 365
Ala Arg Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Ser
                405                 410                 415
Gly Phe Leu Lys Trp Ile Asp Arg Ser Met Lys Thr Arg Gly Val Pro
            420                 425                 430
Lys Ala Glu Ser His Val Pro Gly Val Asn Thr Ser Ser Pro Leu Lys
        435                 440                 445
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<210> 408
<211> 437
<212> PRT
<213> Loxodonta africana

<220>
<223> mature Factor X protein

<400> 408

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Ala Asn Ser Phe Leu Glu Glu Met Lys Gln Gly Asn Leu Glu Arg Glu
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 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Phe Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Asp Val Lys Thr Asn Glu Phe Trp Asn Arg Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Ser Asn Pro Cys Gln Asn Gln Gly Lys Cys Gln Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Thr Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Thr Ile Arg Glu Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys Asn Glu Glu Arg Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Ala Gly Tyr Thr Leu Gly Asp Asn Gly Lys Ser Cys Ile Ser Thr Glu
        115                 120                 125
Pro Phe Pro Cys Gly Lys Leu Thr Met Gly Arg Asn Lys Arg Ser Leu
    130                 135                 140
Ala Gln Ala Asn Asn Val Ser Gly Ser Pro Pro Glu Thr Ser Thr Gln
145                 150                 155                 160
Lys Gln Tyr Gly Leu Asp Asp Leu Ala Pro Thr Glu Asn Pro Val Asn
                165                 170                 175
Leu Leu Asn Leu Asn Gln Glu Phe Pro Glu Gln Asp Thr Ser Asp Leu
            180                 185                 190
Val Arg Ile Val Gly Gly Arg Asp Cys Lys Glu Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Val Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Asn Glu Tyr Tyr Ile Leu Thr Ala Ala His Cys Leu His Gln
225                 230                 235                 240
Ala Lys Arg Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Lys Glu
                245                 250                 255
Glu Gly Asn Glu Met Ala His Glu Val Glu Ile Ile Leu Lys His Asn
            260                 265                 270
Lys Phe Val Arg Glu Thr Tyr Asp Phe Asp Ile Ala Val Ile Lys Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Lys Asp Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Ala Ser Thr Ile
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Thr Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Thr Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Ser Lys Pro Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Val Tyr Thr Lys Val Thr
                405                 410                 415
Ser Phe Leu Lys Trp Ile Asp Arg Cys Met Lys Thr Lys Ala Gly Val
            420                 425                 430
His Ala Gln Ala Pro
        435
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<210> 409
<211> 441
<212> PRT
<213> Mus musculus

<220>
<223> mature Factor X protein

<400> 409

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Ala Asn Ser Phe Phe Glu Glu Phe Lys Lys Gly Asn Leu Glu Arg Glu
 1               5                  10                  15
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Cys Met Glu Glu Ile Cys Ser Tyr Glu Glu Val Arg Glu Ile Phe Glu
            20                  25                  30
Asp Asp Glu Lys Thr Lys Glu Tyr Trp Thr Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Ser Ser Pro Cys Gln Asn Gln Gly Ala Cys Arg Asp Gly
    50                  55                  60
Ile Gly Gly Tyr Thr Cys Thr Cys Ser Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Val Arg Lys Leu Cys Arg Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys Arg Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Ser Gly Tyr Phe Leu Gly Asn Asp Gly Lys Ser Cys Ile Ser Thr Ala
        115                 120                 125
Pro Phe Pro Cys Gly Lys Ile Thr Thr Gly Arg Arg Lys Arg Ser Val
    130                 135                 140
Ala Leu Asn Thr Ser Asp Ser Glu Leu Asp Leu Glu Asp Ala Leu Leu
145                 150                 155                 160
Asp Glu Asp Phe Leu Ser Pro Thr Glu Asn Pro Ile Glu Leu Leu Asn
                165                 170                 175
Leu Asn Glu Thr Gln Pro Glu Arg Ser Ser Asp Asp Leu Val Arg Ile
            180                 185                 190
Val Gly Gly Arg Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu
        195                 200                 205
Leu Ile Asn Glu Asp Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Asn
    210                 215                 220
Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu His Gln Ala Arg Arg
225                 230                 235                 240
Phe Lys Val Arg Val Gly Asp Arg Asn Thr Glu Lys Glu Glu Gly Asn
                245                 250                 255
Glu Met Val His Glu Val Asp Val Val Ile Lys His Asn Lys Phe Gln
            260                 265                 270
Arg Asp Thr Tyr Asp Tyr Asp Ile Ala Val Leu Arg Leu Lys Thr Pro
        275                 280                 285
Ile Thr Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Gln Lys Asp
    290                 295                 300
Trp Ala Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly
305                 310                 315                 320
Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Asn Ile Leu Lys Met
                325                 330                 335
Leu Glu Val Pro Tyr Val Asp Arg Asn Thr Cys Lys Leu Ser Thr Ser
            340                 345                 350
Phe Ser Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Glu Ala Lys Leu
        355                 360                 365
Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe
    370                 375                 380
Lys Asn Thr Tyr Tyr Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys
385                 390                 395                 400
Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Thr Phe Leu
                405                 410                 415
Lys Trp Ile Asp Arg Ser Met Lys Ala Arg Val Gly Pro Thr Ala Glu
            420                 425                 430
Thr Pro Arg Thr Ala Gly Pro Pro Asn
        435                 440


<210> 410
<211> 450
<212> PRT
<213> Oryctolagus cuniculus

<220>
<223> mature Factor X protein

<400> 410
Ala Asn Ser Phe Leu Glu Glu Leu Lys Lys Gly Asn Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Asn Cys Ser Tyr Glu Glu Ala Leu Glu Val Phe Glu
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            20                  25                  30
Asp Arg Glu Lys Thr Asn Glu Phe Trp Asn Lys Tyr Val Asp Gly Asp
        35                  40                  45
Gln Cys Glu Ser Asn Pro Cys Gln Asn Gln Gly Thr Cys Lys Asp Gly
    50                  55                  60
Leu Gly Met Tyr Thr Cys Ser Cys Val Glu Gly Tyr Glu Gly Gln Asp
65                  70                  75                  80
Cys Glu Pro Val Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Gly Cys
                85                  90                  95
Asp Gln Phe Cys Lys Glu Glu Glu Asn Ser Val Leu Cys Ser Cys Ala
            100                 105                 110
Ser Gly Tyr Thr Leu Gly Asp Asn Gly Lys Ser Cys Ile Ser Thr Glu
        115                 120                 125
Leu Phe Pro Cys Gly Lys Val Thr Leu Gly Arg Trp Arg Arg Ser Pro
    130                 135                 140
Ala Thr Asn Ser Ser Glu Gly Pro Pro Glu Ala Pro Gly Pro Glu Gln
145                 150                 155                 160
Gln Asp Asp Gly Asn Leu Thr Ala Thr Glu Asn Pro Phe Asn Leu Leu
                165                 170                 175
Asp Ser Pro Glu Pro Pro Pro Glu Asp Asp Ser Ser Ser Leu Val Arg
            180                 185                 190
Ile Val Gly Gly Gln Asp Cys Arg Asp Gly Glu Cys Pro Trp Gln Ala
        195                 200                 205
Leu Leu Val Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu
    210                 215                 220
Ser Glu Tyr His Val Leu Thr Ala Ala His Cys Leu His Gln Ala Lys
225                 230                 235                 240
Arg Phe Lys Val Arg Val Gly Asp Arg Asp Thr Glu His Glu Glu Gly
                245                 250                 255
Asn Glu Glu Thr His Glu Val Glu Val Val Val Lys His Asn Arg Phe
            260                 265                 270
Val Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr
        275                 280                 285
Pro Ile Thr Phe Arg Arg Asn Val Ala Pro Ala Cys Leu Pro Gln Lys
    290                 295                 300
Asp Trp Ala Glu Ser Thr Leu Met Ala Gln Lys Thr Gly Ile Val Ser
305                 310                 315                 320
Gly Phe Gly Arg Thr His Glu Met Gly Arg Leu Ser Thr Thr Leu Lys
                325                 330                 335
Met Leu Glu Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Arg Ser Ser
            340                 345                 350
Ser Phe Thr Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Ala Arg
        355                 360                 365
Pro Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg
    370                 375                 380
Phe Arg Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly
385                 390                 395                 400
Cys Ala Arg Lys Gly Lys Phe Gly Val Tyr Thr Lys Val Ser Asn Phe
                405                 410                 415
Leu Lys Trp Ile Glu Lys Ser Met Arg Ala Arg Ala Val Pro Val Ala
            420                 425                 430
Glu Ala Ala Gly Thr Pro Gly Pro Thr Gln Pro Thr Ile Lys Gly Ser
        435                 440                 445
Pro Ser
    450


<210> 411
<211> 442
<212> PRT
<213> Rattus norvegicus

<220>
<223> mature Factor X protein

<400> 411
Ala Asn Ser Phe Phe Glu Glu Ile Lys Lys Gly Asn Leu Glu Arg Glu
 1               5                  10                  15
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Cys Val Glu Glu Ile Cys Ser Phe Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Asn Glu Lys Thr Thr Glu Phe Trp Asn Lys Tyr Glu Asp Gly Asp
        35                  40                  45
Gln Cys Glu Ser Ser Pro Cys Gln Asn Gln Gly Glu Cys Arg Asp Gly
    50                  55                  60
Leu Gly Ser Tyr Thr Cys Thr Cys Thr Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Phe Val Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys Arg Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Lys Gly Tyr Phe Leu Gly Asn Asp Gly Lys Ser Cys Leu Ser Thr Ala
        115                 120                 125
Pro Phe Pro Cys Gly Lys Thr Asn Lys Gly Arg Ala Lys Arg Ser Val
    130                 135                 140
Ala Leu Asn Thr Ser Asn Ser Glu Pro Asp Pro Glu Asp Leu Met Pro
145                 150                 155                 160
Asp Ala Asp Ile Leu Tyr Pro Thr Glu Ser Pro Ser Glu Leu Leu Asn
                165                 170                 175
Leu Asn Lys Thr Glu Pro Glu Ala Asn Ser Asp Asp Val Ile Arg Ile
            180                 185                 190
Val Gly Gly Gln Glu Cys Lys Arg Gly Glu Cys Pro Trp Gln Ala Leu
        195                 200                 205
Leu Phe Ser Asp Glu Glu Thr Asp Gly Phe Cys Gly Gly Thr Ile Leu
    210                 215                 220
Asn Glu Phe Tyr Ile Leu Thr Ala Ala His Cys Leu His Gln Ala Lys
225                 230                 235                 240
Arg Phe Lys Val Arg Val Gly Asp Leu Asn Thr Glu Gln Glu Asp Gly
                245                 250                 255
Gly Glu Met Val His Glu Val Asp Met Ile Ile Lys His Asn Lys Phe
            260                 265                 270
Gln Arg Asp Thr Tyr Asp Phe Asp Ile Ala Met Leu Arg Leu Lys Thr
        275                 280                 285
Pro Ile Thr Phe Arg Glu Asn Val Ala Pro Ala Cys Leu Pro Gln Lys
    290                 295                 300
Asp Trp Ala Glu Ala Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser
305                 310                 315                 320
Gly Phe Gly Arg Thr His Glu Lys Gly Arg Gln Ser Lys Val Leu Lys
                325                 330                 335
Met Met Glu Val Pro Tyr Val Asp Arg Asn Thr Cys Arg Leu Ser Thr
            340                 345                 350
Ser Phe Ser Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Ala Lys
        355                 360                 365
Gln Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg
    370                 375                 380
Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly
385                 390                 395                 400
Cys Ala Arg Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe
                405                 410                 415
Leu Lys Trp Ile Asp Arg Ser Met Lys Ala Arg Val Gly Pro Thr Ser
            420                 425                 430
Glu Thr Pro Arg Leu Thr His Pro Pro Tyr
        435                 440


<210> 412
<211> 459
<212> PRT
<213> Canis familiaris

<220>
<223> mature Factor X protein

<400> 412
Ala Asn Ser Phe Leu Glu Glu Met Lys Lys Gly Asn Leu Glu Arg Glu
 1               5                  10                  15
Cys Met Glu Glu Thr Cys Ser Phe Glu Glu Ala Arg Glu Val Phe Glu
```

```
            20                  25                  30
Asp Thr Ala Lys Thr Met Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Ser Ser Pro Cys Gln Asn Gln Gly Gln Cys Lys Asp Gly
    50                  55                  60
Leu Leu Glu Tyr Ser Cys Ile Cys Leu Glu Gly Tyr Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Ser Thr Arg Lys Leu Cys Ser Val Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys Arg Glu Glu Gln Ser Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Ser Gly Tyr Ile Leu Gly Asp Asn Gly Lys Ser Cys Ile Ser Thr Glu
        115                 120                 125
Pro Phe Pro Cys Gly Lys Thr Thr Val Gly Arg Arg Lys Arg Ala Thr
    130                 135                 140
Glu Thr Ala Pro Ser Ser Glu Ala Pro Pro Asp Ala Glu Glu Glu Ala
145                 150                 155                 160
Gly Met Leu Glu Gln Tyr Asp Pro Gly Asp Leu Ser Pro Thr Gln Ser
                165                 170                 175
Thr Met Phe Leu Leu Pro Phe Asn Gln Thr Asn Ser Asp Pro Asp Glu
            180                 185                 190
Asp Ala Ser Gly Leu Val Arg Ile Val Gly Gly Gln Asp Cys Arg Asp
        195                 200                 205
Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu Asn Glu Gly
    210                 215                 220
Phe Cys Gly Gly Thr Ile Leu Ser Glu Tyr Tyr Ile Leu Thr Ala Ala
225                 230                 235                 240
His Cys Leu Gln Gln Ala Lys Lys Phe Thr Val Arg Val Gly Glu Arg
                245                 250                 255
Asp Thr Asp Lys Glu Glu Gly Asn Glu Val Ala His Glu Val Glu Met
            260                 265                 270
Ile Ile Lys His Asn Lys Phe Val Arg Glu Thr Tyr Asp Phe Asp Ile
        275                 280                 285
Ala Val Ile Lys Leu Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala
    290                 295                 300
Pro Ala Cys Leu Pro Gln Lys Asp Trp Ala Glu Ser Thr Leu Met Thr
305                 310                 315                 320
Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Lys Thr His Glu Lys Gly
                325                 330                 335
Arg Pro Ser Thr Thr Leu Lys Met Met Glu Val Pro Tyr Val Asp Arg
            340                 345                 350
Asn Thr Cys Lys Leu Ser Ser Ser Phe Ser Ile Thr Gln Asn Met Phe
        355                 360                 365
Cys Ala Gly Tyr Asp Ser Lys Pro Glu Asp Ala Cys Gln Gly Asp Ser
    370                 375                 380
Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly
385                 390                 395                 400
Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile
                405                 410                 415
Tyr Thr Lys Val Thr Asn Phe Leu Lys Trp Ile Asp Arg Ser Met Lys
            420                 425                 430
Ala Arg Ala Gly Trp Gly Gly Phe Phe Gly Lys Lys Glu Arg Pro Pro
        435                 440                 445
Ser Leu Trp Ala Asp Pro Pro Pro Gly Pro Cys
    450                 455


<210> 413
<211> 439
<212> PRT
<213> Sus scrofa

<220>
<223> mature Factor X protein

<400> 413
Ala Asn Ser Phe Trp Glu Glu Met Lys Lys Gly Asn Leu Glu Arg Glu
 1               5                  10                  15
```

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Cys Leu Glu Glu Thr Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu
            20                  25                  30
Asp Gln Gln Lys Thr Asp Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Ser Ser Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly
    50                  55                  60
Leu Gly Glu Tyr Asn Cys Thr Cys Ala Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Leu Leu Thr Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys
                85                  90                  95
Asp Gln Phe Cys Arg Glu Glu Gln Ser Ser Val Val Cys Ser Cys Ala
            100                 105                 110
Ser Gly Tyr Ile Leu Gly Asp Asn Gly Lys Ser Cys Ile Ser Thr Glu
        115                 120                 125
Pro Phe Pro Cys Gly Lys Arg Thr Leu Gly Arg Ser Arg Arg Ser Ala
    130                 135                 140
Asp His Gly Ser Glu Ala Ala Pro Glu Ala Gly Arg Ser Glu Gln Glu
145                 150                 155                 160
Pro Arg Asp Leu Gly Pro Thr Glu Gly Pro Leu His Leu Leu Ser Leu
                165                 170                 175
Asn Asp Thr Glu Pro Gly Pro Glu Glu Asp Glu Asp Glu Ser Ser Leu
            180                 185                 190
Val Arg Ile Val Gly Gly Arg Asp Cys Arg Glu Gly Glu Cys Pro Trp
        195                 200                 205
Gln Ala Leu Leu Val Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr
    210                 215                 220
Ile Leu Ser Glu Phe His Val Leu Thr Ala Ala His Cys Leu His Gln
225                 230                 235                 240
Ala Lys Lys Phe Lys Val Arg Val Gly Asp Arg Asn Leu Glu Lys Glu
                245                 250                 255
Glu Gly Asp Glu Ala Ala His Glu Val Glu Val Thr Val Lys His Ser
            260                 265                 270
Arg Phe Val Arg Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Lys Leu
        275                 280                 285
Lys Thr Pro Ile Thr Phe Arg Thr Asn Val Ala Pro Ala Cys Leu Pro
    290                 295                 300
Glu Lys Asn Trp Ala Glu Ala Thr Leu Leu Thr Gln Lys Thr Gly Ile
305                 310                 315                 320
Val Ser Gly Phe Gly Arg Thr His Glu Arg Gly Arg Pro Ser Ser Thr
                325                 330                 335
Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg Asn Thr Cys Lys Leu
            340                 345                 350
Ser Ser Ser Phe Leu Ile Thr Pro Asn Met Phe Cys Ala Gly Tyr Asp
        355                 360                 365
Glu Gln Pro Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val
    370                 375                 380
Thr Arg Phe Arg Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly
385                 390                 395                 400
Glu Gly Cys Ala Arg Arg Gly Lys Tyr Gly Val Tyr Thr Lys Val Thr
                405                 410                 415
Asn Phe Leu Lys Trp Ile Glu Arg Ser Met Arg Ala Arg Ala Glu Ala
            420                 425                 430
Gly Ala Glu Pro His Pro Gln
        435


<210> 414
<211> 452
<212> PRT
<213> Bos taurus

<220>
<223> mature Factor X protein

<400> 414
Ala Asn Ser Phe Leu Glu Glu Val Lys Gln Gly Asn Leu Glu Arg Glu
 1               5                  10                  15
Cys Leu Glu Glu Ala Cys Ser Leu Glu Glu Ala Arg Glu Val Phe Glu
```

```
            20                  25                  30
Asp Ala Glu Gln Thr Asp Glu Phe Trp Ser Lys Tyr Lys Asp Gly Asp
        35                  40                  45
Gln Cys Glu Gly His Pro Cys Leu Asn Gln Gly His Cys Lys Asp Gly
    50                  55                  60
Ile Gly Asp Tyr Thr Cys Thr Cys Ala Glu Gly Phe Glu Gly Lys Asn
65                  70                  75                  80
Cys Glu Phe Ser Thr Arg Glu Ile Cys Ser Leu Asp Asn Gly Gly Cys
                85                  90                  95
Asp Gln Phe Cys Arg Glu Glu Arg Ser Glu Val Arg Cys Ser Cys Ala
            100                 105                 110
His Gly Tyr Val Leu Gly Asp Asp Ser Lys Ser Cys Val Ser Thr Glu
        115                 120                 125
Arg Phe Pro Cys Gly Lys Phe Thr Gln Gly Arg Ser Arg Arg Trp Ala
    130                 135                 140
Ile His Thr Ser Glu Asp Ala Leu Asp Ala Ser Glu Leu Glu His Tyr
145                 150                 155                 160
Asp Pro Ala Asp Leu Ser Pro Thr Glu Ser Ser Leu Asp Leu Leu Gly
                165                 170                 175
Leu Asn Arg Thr Glu Pro Ser Ala Gly Glu Asp Gly Ser Gln Val Val
            180                 185                 190
Arg Ile Val Gly Gly Arg Asp Cys Ala Glu Gly Glu Cys Pro Trp Gln
        195                 200                 205
Ala Leu Leu Val Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile
    210                 215                 220
Leu Asn Glu Phe Tyr Val Leu Thr Ala Ala His Cys Leu His Gln Ala
225                 230                 235                 240
Lys Arg Phe Thr Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu
                245                 250                 255
Gly Asn Glu Met Ala His Glu Val Glu Met Thr Val Lys His Ser Arg
            260                 265                 270
Phe Val Lys Glu Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys
        275                 280                 285
Thr Pro Ile Arg Phe Arg Arg Asn Val Ala Pro Ala Cys Leu Pro Glu
    290                 295                 300
Lys Asp Trp Ala Glu Ala Thr Leu Met Thr Gln Lys Thr Gly Ile Val
305                 310                 315                 320
Ser Gly Phe Gly Arg Thr His Glu Lys Gly Arg Leu Ser Ser Thr Leu
                325                 330                 335
Lys Met Leu Glu Val Pro Tyr Val Asp Arg Ser Thr Cys Lys Leu Ser
            340                 345                 350
Ser Ser Phe Thr Ile Thr Pro Asn Met Phe Cys Ala Gly Tyr Asp Thr
        355                 360                 365
Gln Pro Glu Asp Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr
    370                 375                 380
Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu
385                 390                 395                 400
Gly Cys Ala Arg Lys Gly Lys Phe Gly Val Tyr Thr Lys Val Ser Asn
                405                 410                 415
Phe Leu Lys Trp Ile Asp Lys Ile Met Lys Ala Arg Ala Gly Ala Ala
            420                 425                 430
Gly Ser Arg Gly His Ser Glu Ala Pro Ala Thr Trp Thr Val Pro Pro
        435                 440                 445
Pro Leu Pro Leu
    450


<210> 415
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Human Factor X with thrombin signal and propeptide
      sequences (Thrombin-Factor X fusion polypeptide)

<220>
<221> PROPEP
```

<222> (1)...(43)
<223> Thrombin signal peptide and propeptide

<220>
<221> PEPTIDE
<222> (44)...(491)
<223> Mature Factor X peptide

<400> 415
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1   5   10   15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20   25   30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35   40   45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50   55   60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65   70   75   80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85   90   95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100   105   110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115   120   125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130   135   140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145   150   155   160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165   170   175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180   185   190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195   200   205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210   215   220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225   230   235   240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245   250   255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260   265   270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275   280   285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290   295   300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305   310   315   320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325   330   335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340   345   350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355   360   365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370   375   380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385   390   395   400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405   410   415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420   425   430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435   440   445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450   455   460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His

465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 416
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X I195L fusion polypeptide

<400> 416
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Leu Val Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430

Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 417
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196I fusion polypeptide

<400> 417
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ile Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile

385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 418
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S fusion polypeptide

<400> 418
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350

```
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 419
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X T85N/K87S/V196S fusion
      polypeptide

<400> 419
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1                5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Asn
        115                 120                 125
Arg Ser Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
```

```
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 420
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X Q56N/Q58S/V196S fusion
      polypeptide

<400> 420
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Asn Asn Ser Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
```

```
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 421
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X K62N/G64S/V196S fusion
      polypeptide

<400> 421
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1                5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Asn Asp Ser Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
```

```
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490
```

<210> 422
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X L65N/E67S/V196S fusion polypeptide

<400> 422

```
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Asn Gly Ser Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
```

```
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490
```

<210> 423
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X E67N/V196S fusion polypeptide

<400> 423

```
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Asn Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
```

```
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 424
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X L73N/G75S/V196S fusion
      polypeptide

<400> 424
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
```

65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Asn Glu Ser Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 425
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X G75N/E77S/V196S fusion
polypeptide

<400> 425
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln

```
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Asn Phe Ser Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 426
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X R86N/L88S/V196S fusion
```

polypeptide

<400> 426

```
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Asn Lys Ser Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490
```

<210> 427

<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X G114N/V196S fusion polypeptide

<400> 427
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1   5   10   15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20   25   30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35   40   45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50   55   60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65   70   75   80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85   90   95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100   105   110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115   120   125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130   135   140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Asn Tyr Thr Leu
145   150   155   160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165   170   175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180   185   190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195   200   205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210   215   220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225   230   235   240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245   250   255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260   265   270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275   280   285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290   295   300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305   310   315   320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325   330   335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340   345   350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355   360   365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370   375   380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385   390   395   400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405   410   415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420   425   430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435   440   445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450   455   460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465   470   475   480

Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 428
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X D95N/D97S/V196S fusion polypeptide

<400> 428
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asn Cys Ser Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430

Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435   440   445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450   455   460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465   470   475   480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485   490

<210> 429
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X E82S/V196S fusion polypeptide

<400> 429
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1   5   10   15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20   25   30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35   40   45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50   55   60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65   70   75   80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85   90   95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100   105   110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Ser Leu Phe Thr
        115   120   125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130   135   140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145   150   155   160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165   170   175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180   185   190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195   200   205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210   215   220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225   230   235   240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245   250   255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260   265   270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275   280   285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290   295   300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305   310   315   320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325   330   335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340   345   350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355   360   365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370   375   380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile

385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 430
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X E82N/F84S/V196S fusion polypeptide

<400> 430
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Asn Leu Ser Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala

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            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 431
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X G78N/N80S/V196S fusion
      polypeptide

<400> 431
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1                  5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Asn Lys Ser Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
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    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 432
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X E77N/K79S/V196S fusion
      polypeptide

<400> 432
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Asn Gly Ser Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
```

245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 433
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X D119N/G121S/V196S fusion
polypeptide

<400> 433
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asn Asn Ser Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala

```
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 434
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X L83N/V196S fusion polypeptide

<400> 434
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1                5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Asn Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
```

Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 435
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X K122S/V196S fusion polypeptide

<400> 435
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr

```
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Ser Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 436
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X E51N/V196S fusion polypeptide

<400> 436
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
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Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Asn Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 437
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X Q58N/K60S/V196S fusion
      polypeptide

<400> 437
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
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Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Asn Gly Ser Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490
```

<210> 438
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X G114N/D119N/G121S/V196S fusion polypeptide

<400> 438
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1   5   10   15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20   25   30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35   40   45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50   55   60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65   70   75   80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85   90   95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100   105   110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115   120   125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130   135   140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Asn Tyr Thr Leu
145   150   155   160
Ala Asn Asn Ser Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165   170   175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180   185   190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195   200   205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210   215   220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225   230   235   240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245   250   255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260   265   270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275   280   285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290   295   300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305   310   315   320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325   330   335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340   345   350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355   360   365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370   375   380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385   390   395   400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405   410   415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420   425   430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435   440   445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450   455   460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465   470   475   480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485   490

<210> 439
<211> 491

<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X G198A fusion polypeptide

<400> 439
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1   5   10   15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20   25   30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35   40   45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50   55   60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65   70   75   80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85   90   95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100   105   110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115   120   125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130   135   140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145   150   155   160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165   170   175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180   185   190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195   200   205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210   215   220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225   230   235   240
Ala Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245   250   255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260   265   270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275   280   285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290   295   300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305   310   315   320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325   330   335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340   345   350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355   360   365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370   375   380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385   390   395   400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405   410   415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420   425   430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435   440   445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450   455   460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465   470   475   480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys

485 490

<210> 440
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X G198V fusion polypeptide

<400> 440
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225 230 235 240
Val Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445

```
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 441
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X G198R fusion polypeptide

<400> 441
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225                 230                 235                 240
Arg Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
```

405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 442
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X G198K fusion polypeptide

<400> 442
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225 230 235 240
Lys Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365

```
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 443
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X G198P fusion polypeptide

<400> 443
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225                 230                 235                 240
Pro Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
```

325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 444
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X G198H fusion polypeptide

<400> 444
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225 230 235 240
His Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285

```
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 445
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X L211S/G219H fusion polypeptide

<400> 445
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Ser Leu Ile
```

```
                245                 250                 255
Asn Glu Glu Asn Glu His Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 446
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X G197P fusion polypeptide

<400> 446
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1                  5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
```

Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210   215   220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Pro
225   230   235   240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245   250   255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260   265   270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275   280   285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290   295   300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305   310   315   320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325   330   335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340   345   350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355   360   365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370   375   380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385   390   395   400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405   410   415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420   425   430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435   440   445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450   455   460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465   470   475   480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485   490

<210> 447
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X D378N fusion polypeptide

<400> 447
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1   5   10   15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20   25   30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35   40   45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50   55   60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65   70   75   80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85   90   95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100   105   110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115   120   125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130   135   140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145   150   155   160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly

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                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asn Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 448
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X D378S fusion polypeptide

<400> 448
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1                  5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
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Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Ser Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 449
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196L fusion polypeptide

<400> 449
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
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                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Leu Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 450
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196T fusion polypeptide

<400> 450
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
```

Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50   55   60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65   70   75   80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85   90   95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100   105   110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115   120   125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130   135   140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145   150   155   160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165   170   175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180   185   190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195   200   205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210   215   220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Thr Gly
225   230   235   240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245   250   255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260   265   270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275   280   285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290   295   300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305   310   315   320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325   330   335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340   345   350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355   360   365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370   375   380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385   390   395   400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405   410   415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420   425   430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435   440   445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450   455   460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465   470   475   480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485   490

<210> 451
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196P fusion polypeptide

<400> 451
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala

```
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Pro Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490
```

<210> 452
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X G197V fusion polypeptide

<400> 452
```
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Val
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490
```

<210> 453
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X G197T fusion polypeptide

<400> 453
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1   5   10   15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20   25   30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35   40   45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50   55   60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65   70   75   80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85   90   95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100   105   110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115   120   125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130   135   140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145   150   155   160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165   170   175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180   185   190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195   200   205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210   215   220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Thr
225   230   235   240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245   250   255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260   265   270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275   280   285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290   295   300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305   310   315   320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325   330   335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340   345   350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355   360   365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370   375   380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385   390   395   400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405   410   415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420   425   430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435   440   445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450   455   460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His

465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 454
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X G197S fusion polypeptide

<400> 454
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Ser
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430

Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435   440   445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450   455   460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465   470   475   480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485   490

<210> 455
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X E200A fusion polypeptide

<400> 455
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1   5   10   15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20   25   30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35   40   45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50   55   60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65   70   75   80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85   90   95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100   105   110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115   120   125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130   135   140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145   150   155   160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165   170   175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180   185   190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195   200   205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210   215   220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225   230   235   240
Gly Gln Ala Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245   250   255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260   265   270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275   280   285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290   295   300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305   310   315   320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325   330   335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340   345   350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355   360   365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370   375   380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile

385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 456
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X E20OS fusion polypeptide

<400> 456
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225 230 235 240
Gly Gln Ser Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350

```
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 457
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X E200V fusion polypeptide

<400> 457
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225                 230                 235                 240
Gly Gln Val Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
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305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 458
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X K202S fusion polypeptide

<400> 458
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225 230 235 240
Gly Gln Glu Cys Ser Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270

```
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 459
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X R326A fusion polypeptide

<400> 459
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
```

225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Ala Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 460
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X R326S fusion polypeptide

<400> 460
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190

```
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Ser Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 461
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X R326T fusion polypeptide

<400> 461
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
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145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Thr Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 462
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X R326V fusion polypeptide

<400> 462
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
```

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Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Val Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 463
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X R326Q fusion polypeptide

<400> 463
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
```

65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Gln Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 464
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X R326N fusion polypeptide

<400> 464
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30

```
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Asn Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490
```

<210> 465
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X R326M fusion polypeptide

<400> 465
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1   5   10   15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20   25   30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35   40   45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50   55   60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65   70   75   80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85   90   95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100   105   110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115   120   125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130   135   140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145   150   155   160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165   170   175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180   185   190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195   200   205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210   215   220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225   230   235   240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245   250   255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260   265   270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275   280   285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290   295   300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305   310   315   320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325   330   335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340   345   350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355   360   365
Met Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370   375   380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385   390   395   400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405   410   415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420   425   430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435   440   445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450   455   460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465   470   475   480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485   490

<210> 466
<211> 491
<212> PRT

<213> Artificial Sequence

<220>
<223> Thombin-Factor X R326K fusion polypeptide

<400> 466
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1   5   10   15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20   25   30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35   40   45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50   55   60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65   70   75   80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85   90   95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100   105   110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115   120   125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130   135   140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145   150   155   160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165   170   175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180   185   190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195   200   205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210   215   220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225   230   235   240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245   250   255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260   265   270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275   280   285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290   295   300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305   310   315   320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325   330   335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340   345   350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355   360   365
Lys Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370   375   380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385   390   395   400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405   410   415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420   425   430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435   440   445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450   455   460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465   470   475   480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485   490

<210> 467
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X R326Y fusion polypeptide

<400> 467
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Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Tyr Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
```

```
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 468
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X T327A fusion polypeptide

<400> 468
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Ala Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Ala His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
```

```
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 469
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X T327L fusion polypeptide

<400> 469
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Leu His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
```

370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 470
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X S334A fusion polypeptide

<400> 470
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335

```
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ala Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 471
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X S334T fusion polypeptide

<400> 471
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1                  5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
```

290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Thr Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 472
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X S334N fusion polypeptide

<400> 472
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255

```
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Asn Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 473
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X R336E fusion polypeptide

<400> 473
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
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210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Glu Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 474
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X K338A fusion polypeptide

<400> 474
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175

Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Ala Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 475
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X K338S fusion polypeptide

<400> 475
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His

130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Ser Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 476
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X K338N fusion polypeptide

<400> 476
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95

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Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Asn Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 477
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X K338R fusion polypeptide

<400> 477
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
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```
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Arg Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 478
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X K338V fusion polypeptide

<400> 478
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
```

```
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Val Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490
```

<210> 479
<211> 491
<212> PRT
<213> Artificial Sequence

<220>

<223> Thombin-Factor X K338Y fusion polypeptide

<400> 479
```
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Tyr Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490
```

<210> 480

<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X K338M fusion polypeptide

<400> 480
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1   5   10   15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20   25   30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35   40   45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50   55   60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65   70   75   80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85   90   95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100   105   110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115   120   125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130   135   140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145   150   155   160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165   170   175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180   185   190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195   200   205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210   215   220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225   230   235   240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245   250   255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260   265   270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275   280   285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290   295   300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305   310   315   320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325   330   335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340   345   350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355   360   365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Met Met Leu Glu
    370   375   380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385   390   395   400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405   410   415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420   425   430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435   440   445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450   455   460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465   470   475   480

Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 481
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X T327A/K338A fusion polypeptide

<400> 481
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Ala His Glu Lys Gly Arg Gln Ser Thr Arg Leu Ala Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg

```
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 482
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X T327L/K338M fusion polypeptide

<400> 482
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Leu His Glu Lys Gly Arg Gln Ser Thr Arg Leu Met Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
```

```
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 483
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X E200V/T327L/K338M fusion
      polypeptide

<400> 483
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1                5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225                 230                 235                 240
Gly Gln Val Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
```

```
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Leu His Glu Lys Gly Arg Gln Ser Thr Arg Leu Met Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 484
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X E200V/T327L/S334A/K338M fusion
      polypeptide

<400> 484
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1                  5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly
225                 230                 235                 240
Gly Gln Val Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
```

```
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Leu His Glu Lys Gly Arg Gln Ala Thr Arg Leu Met Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 485
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/G197A fusion polypeptide

<400> 485
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Ala
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
```

```
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 486
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/L211S/G219H fusion
      polypeptide

<400> 486
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1                5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
```

210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Ser Leu Ile
245 250 255
Asn Glu Glu Asn Glu His Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 487
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X D119N/G121S/V196S/L211S/G219H
fusion polypeptide

<400> 487
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asn Asn Ser Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly

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                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Ser Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu His Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 488
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X G114N/V196S/L211S/G219H fusion
      polypeptide

<400> 488
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
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        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Asn Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Ser Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu His Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 489
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X
      G114N/D119N/G121S/V196S/L211S/G219H fusion
      polypeptide

<400> 489
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
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Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Asn Tyr Thr Leu
145                 150                 155                 160
Ala Asn Asn Ser Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Ser Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu His Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 490
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X G197A/L211S/G219H fusion
      polypeptide

<400> 490
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
```

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Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Ala
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Ser Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu His Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490
```

<210> 491
<211> 491
<212> PRT
<213> Artificial Sequence

<220>

<223> Thombin-Factor X V196S/G197A/L211S/G219H fusion polypeptide

<400> 491

```
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Ala
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Ser Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu His Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490
```

<210> 492
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X I195L/V196S fusion polypeptide

<400> 492
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1   5   10   15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20   25   30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35   40   45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50   55   60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65   70   75   80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85   90   95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100   105   110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115   120   125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130   135   140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145   150   155   160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165   170   175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180   185   190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195   200   205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210   215   220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Leu Ser Gly
225   230   235   240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245   250   255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260   265   270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275   280   285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290   295   300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305   310   315   320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325   330   335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340   345   350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355   360   365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370   375   380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385   390   395   400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405   410   415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420   425   430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435   440   445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450   455   460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His

465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 493
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X I195L/G197A fusion polypeptide

<400> 493
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Leu Val Ala
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430

Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 494
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X I195L/L211S/G219H fusion polypeptide

<400> 494
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Leu Val Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Ser Leu Ile
245 250 255
Asn Glu Glu Asn Glu His Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380

Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 495
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/N214D fusion polypeptide

<400> 495
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asp Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala

```
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 496
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/N214A fusion polypeptide

<400> 496
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Ala Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
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Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 497
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/N214S fusion polypeptide

<400> 497
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Ser Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe

260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 498
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/E216R fusion polypeptide

<400> 498
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220

Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Arg Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 499
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/E216K fusion polypeptide

<400> 499
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser

180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Lys Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 500
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/E216A fusion polypeptide

<400> 500
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140

Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Ala Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 501
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/E216S fusion polypeptide

<400> 501
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr

```
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Ser Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 502
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/E218R fusion polypeptide

<400> 502
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
```

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Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Arg Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490
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<210> 503
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/E218K fusion polypeptide

<400> 503

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Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
```

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            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Lys Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490
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<210> 504
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/E218A fusion polypeptide

<400> 504
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1   5   10   15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20   25   30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35   40   45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50   55   60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65   70   75   80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85   90   95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100   105   110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115   120   125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130   135   140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145   150   155   160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165   170   175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180   185   190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195   200   205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210   215   220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225   230   235   240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245   250   255
Asn Glu Glu Asn Ala Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260   265   270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275   280   285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290   295   300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305   310   315   320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325   330   335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340   345   350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355   360   365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370   375   380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385   390   395   400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405   410   415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420   425   430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435   440   445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450   455   460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465   470   475   480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485   490

<210> 505
<211> 491

<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/R332A fusion polypeptide

<400> 505
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1   5   10   15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20   25   30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35   40   45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50   55   60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65   70   75   80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85   90   95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100   105   110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115   120   125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130   135   140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145   150   155   160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165   170   175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180   185   190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195   200   205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210   215   220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225   230   235   240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245   250   255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260   265   270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275   280   285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290   295   300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305   310   315   320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325   330   335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340   345   350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355   360   365
Arg Thr His Glu Lys Gly Ala Gln Ser Thr Arg Leu Lys Met Leu Glu
    370   375   380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385   390   395   400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405   410   415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420   425   430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435   440   445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450   455   460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465   470   475   480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys

485 490

<210> 506
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/R332D fusion polypeptide

<400> 506
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Asp Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445

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Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 507
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/R332E fusion polypeptide

<400> 507
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Glu Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
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                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 508
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/R332S fusion polypeptide

<400> 508
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
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Arg Thr His Glu Lys Gly Ser Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 509
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/R332G fusion polypeptide

<400> 509
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
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325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Gly Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 510
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/R326E fusion polypeptide

<400> 510
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285

Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290   295   300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305   310   315   320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325   330   335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340   345   350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355   360   365
Glu Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370   375   380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385   390   395   400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405   410   415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420   425   430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435   440   445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450   455   460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465   470   475   480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485   490

<210> 511
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/R326D fusion polypeptide

<400> 511
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1   5   10   15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20   25   30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35   40   45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50   55   60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65   70   75   80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85   90   95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100   105   110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115   120   125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130   135   140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145   150   155   160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165   170   175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180   185   190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195   200   205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210   215   220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225   230   235   240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile

```
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Asp Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 512
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/R326M fusion polypeptide

<400> 512
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1                  5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
```

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Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Met Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 513
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/R326N fusion polypeptide

<400> 513
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
```

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                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Asn Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490
```

<210> 514
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/R326Q fusion polypeptide

<400> 514

```
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1                5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
```

Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Gln Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 515
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/R273E fusion polypeptide

<400> 515
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser

```
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Glu Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 516
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/R273A fusion polypeptide

<400> 516
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1                5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
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Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Ala Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490
```

<210> 517
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/R424A fusion polypeptide

<400> 517

```
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
```

```
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Ala Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490
```

<210> 518
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/R424E fusion polypeptide

<400> 518
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1   5   10   15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20   25   30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35   40   45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50   55   60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65   70   75   80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85   90   95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100   105   110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115   120   125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130   135   140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145   150   155   160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165   170   175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180   185   190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195   200   205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210   215   220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225   230   235   240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245   250   255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260   265   270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275   280   285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290   295   300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305   310   315   320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325   330   335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340   345   350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355   360   365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370   375   380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385   390   395   400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405   410   415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420   425   430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435   440   445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450   455   460
Ile Asp Glu Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465   470   475   480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485   490

<210> 519
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/K420A fusion polypeptide

<400> 519
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1   5   10   15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20   25   30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35   40   45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50   55   60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65   70   75   80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85   90   95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100   105   110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115   120   125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130   135   140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145   150   155   160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165   170   175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180   185   190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195   200   205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210   215   220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225   230   235   240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245   250   255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260   265   270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275   280   285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290   295   300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305   310   315   320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325   330   335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340   345   350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355   360   365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370   375   380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385   390   395   400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405   410   415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420   425   430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435   440   445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Ala Trp
    450   455   460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His

465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 520
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/K420E fusion polypeptide

<400> 520
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Glu Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430

Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Glu Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 521
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/R306E fusion polypeptide

<400> 521
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Glu Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile

385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 522
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/K276A fusion polypeptide

<400> 522
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Ala Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350

```
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 523
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/K276E fusion polypeptide

<400> 523
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1                  5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Glu Glu
```

305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 524
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/K420E/R424E fusion
polypeptide

<400> 524
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe

```
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Glu Trp
    450                 455                 460
Ile Asp Glu Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 525
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/R273E/K420E/R424E fusion
      polypeptide

<400> 525
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1                  5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
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210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Glu Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Glu Trp
450 455 460
Ile Asp Glu Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 526
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/R273E/R306E/K420E/R424E
fusion polypeptide

<400> 526
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly

```
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Glu Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Glu Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Glu Trp
    450                 455                 460
Ile Asp Glu Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490
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<210> 527
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/K338A fusion polypeptide

<400> 527

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Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1                5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
```

Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Ala Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 528
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/K338S fusion polypeptide

<400> 528
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser

85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Ser Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 529
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/E215N/N217S fusion
polypeptide

<400> 529
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu

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        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Asn Glu Ser Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490
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<210> 530
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/E264N/E266S fusion polypeptide

<400> 530
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1   5   10   15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20   25   30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35   40   45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50   55   60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65   70   75   80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85   90   95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100   105   110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115   120   125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130   135   140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145   150   155   160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165   170   175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180   185   190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195   200   205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210   215   220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225   230   235   240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245   250   255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260   265   270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275   280   285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290   295   300
Val His Asn Val Ser Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305   310   315   320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325   330   335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340   345   350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355   360   365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370   375   380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385   390   395   400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405   410   415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420   425   430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435   440   445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450   455   460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465   470   475   480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485   490

<210> 531
<211> 491
<212> PRT

<213> Artificial Sequence

<220>
<223> Thombin-Factor X D119N/G121S/V196S/E264N/E266S
fusion polypeptide

<400> 531
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asn Asn Ser Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Asn Val Ser Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys

485 490

<210> 532
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X G114N/V196S/E264N/E266S fusion polypeptide

<400> 532
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Asn Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Asn Val Ser Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg

435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 533
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/R429N/L431S fusion polypeptide

<400> 533
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile

385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Asn Gly Ser Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 534
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/R243N/K245S fusion
polypeptide

<400> 534
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Asn Phe Ser
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala

```
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 535
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/T293N/R295S fusion
      polypeptide

<400> 535
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1                5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
```

290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Asn
325 330 335
Phe Ser Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 536
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/D389N/Y391S fusion
polypeptide

<400> 536
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile

```
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asn
            420                 425                 430
Thr Ser Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 537
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/K388N fusion polypeptide

<400> 537
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1                5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
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Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
245 250 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Asn Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 538
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X D119N/G121S/V196S/K388N fusion polypeptide

<400> 538
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160

```
Ala Asn Asn Ser Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Asn Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 539
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/T428N/G430S fusion
      polypeptide

<400> 539
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
```

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Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Asn Arg Ser Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 540
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/L211S/G219H/E264N/E266S
      fusion polypeptide

<400> 540
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
```

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Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Ser Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu His Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Asn Val Ser Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 541
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X
      D119N/G121S/V196S/L211S/G219H/E264N/E266S fusion
      polypeptide

<400> 541
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
```

```
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asn Asn Ser Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Ser Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu His Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Asn Val Ser Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490
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<210> 542
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X
G114N/V196S/L211S/G219H/E264N/E266S fusion
polypeptide

<400> 542

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Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1               5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Asn Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Ser Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu His Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Asn Val Ser Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490
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<210> 543
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X V196S/E264N/E266S/K388N fusion polypeptide

<400> 543
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1   5   10   15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20   25   30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35   40   45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50   55   60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65   70   75   80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85   90   95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100   105   110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115   120   125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130   135   140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145   150   155   160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165   170   175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180   185   190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195   200   205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210   215   220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225   230   235   240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile
                245   250   255
Asn Glu Glu Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260   265   270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275   280   285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290   295   300
Val His Asn Val Ser Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305   310   315   320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325   330   335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340   345   350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355   360   365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370   375   380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385   390   395   400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405   410   415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Asn Asp
            420   425   430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435   440   445

Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 544
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X
D119N/G121S/V196S/L211S/G219H/K388N fusion
polypeptide

<400> 544
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145 150 155 160
Ala Asn Asn Ser Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Ser Leu Ile
245 250 255
Asn Glu Glu Asn Glu His Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
340 345 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
355 360 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
370 375 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile

385 390 395 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
405 410 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Asn Asp
420 425 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
435 440 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
450 455 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465 470 475 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
485 490

<210> 545
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X G114N/V196S/L211S/G219H/K388N
fusion polypeptide

<400> 545
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
1 5 10 15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
20 25 30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
35 40 45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
50 55 60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65 70 75 80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
85 90 95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
100 105 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
115 120 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
130 135 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Asn Tyr Thr Leu
145 150 155 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
165 170 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
180 185 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
195 200 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
210 215 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225 230 235 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Ser Leu Ile
245 250 255
Asn Glu Glu Asn Glu His Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
260 265 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
275 280 285
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
290 295 300
Val His Glu Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305 310 315 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
325 330 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala

```
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Asn Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 546
<211> 491
<212> PRT
<213> Artificial Sequence

<220>
<223> Thombin-Factor X
      V196S/L211S/G219H/E264N/E266S/K388N fusion
      polypeptide

<400> 546
Met Ala His Val Arg Gly Leu Gln Leu Pro Gly Cys Leu Ala Leu Ala
 1                  5                  10                  15
Ala Leu Cys Ser Leu Val His Ser Gln His Val Phe Leu Ala Pro Gln
            20                  25                  30
Gln Ala Arg Ser Leu Leu Gln Arg Val Arg Arg Ala Asn Ser Phe Leu
        35                  40                  45
Glu Glu Met Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr
    50                  55                  60
Cys Ser Tyr Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr
65                  70                  75                  80
Asn Glu Phe Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser
                85                  90                  95
Pro Cys Gln Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr
            100                 105                 110
Cys Thr Cys Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr
        115                 120                 125
Arg Lys Leu Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His
    130                 135                 140
Glu Glu Gln Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu
145                 150                 155                 160
Ala Asp Asn Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly
                165                 170                 175
Lys Gln Thr Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser
            180                 185                 190
Ser Ser Gly Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala
        195                 200                 205
Ala Asp Leu Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn
    210                 215                 220
Gln Thr Gln Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Ser Gly
225                 230                 235                 240
Gly Gln Glu Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Ser Leu Ile
                245                 250                 255
Asn Glu Glu Asn Glu His Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe
            260                 265                 270
Tyr Ile Leu Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys
        275                 280                 285
```

```
Val Arg Val Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala
    290                 295                 300
Val His Asn Val Ser Val Val Ile Lys His Asn Arg Phe Thr Lys Glu
305                 310                 315                 320
Thr Tyr Asp Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr
                325                 330                 335
Phe Arg Met Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala
            340                 345                 350
Glu Ser Thr Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly
        355                 360                 365
Arg Thr His Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu
    370                 375                 380
Val Pro Tyr Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile
385                 390                 395                 400
Ile Thr Gln Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp
                405                 410                 415
Ala Cys Gln Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Asn Asp
            420                 425                 430
Thr Tyr Phe Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg
        435                 440                 445
Lys Gly Lys Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp
    450                 455                 460
Ile Asp Arg Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His
465                 470                 475                 480
Ala Pro Glu Val Ile Thr Ser Ser Pro Leu Lys
                485                 490


<210> 547
<211> 488
<212> PRT
<213> Homo sapiens

<220>
<223> Factor X natural variant (L7I)

<220>
<221> VARIANT
<222> (7)...(7)
<223> L to I

<220>
<221> PROPEP
<222> (1)...(31)
<223> signal peptide

<220>
<221> PROPEP
<222> (32)...(40)
<223> propeptide

<220>
<221> CHAIN
<222> (41)...(488)
<223> mature Factor X


<220>
<221> CHAIN
<222> (41)...(179)
<223> Factor X light chain


<220>
<221> CHAIN
<222> (183)...(488)
<223> Factor X heavy chain
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<220>
<221> PROPEP
<222> (183)...(234)
<223> activation peptide

<220>
<221> CHAIN
<222> (235)...(488)
<223> activated Factor Xa heavy chain

<400> 547
```
Met Gly Arg Pro Leu His Ile Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
```

```
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 548
<211> 488
<212> PRT
<213> Homo sapiens

<220>
<223> Factor X natural variant (G30H)

<220>
<221> VARIANT
<222> (30)...(30)
<223> G to H

<220>
<221> PROPEP
<222> (1)...(31)
<223> signal peptide

<220>
<221> PROPEP
<222> (32)...(40)
<223> propeptide

<220>
<221> CHAIN
<222> (41)...(488)
<223> mature Factor X

<220>
<221> CHAIN
<222> (41)...(179)
<223> Factor X light chain

<220>
<221> CHAIN
<222> (183)...(488)
<223> Factor X heavy chain

<220>
<221> PROPEP
<222> (183)...(234)
<223> activation peptide

<220>
<221> CHAIN
<222> (235)...(488)
<223> activated Factor Xa heavy chain

<400> 548

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu His Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
```

```
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 549
<211> 488
<212> PRT
<213> Homo sapiens

<220>
<223> Factor X natural variant (A152T)

<220>
<221> VARIANT

<222> (152)...(152)
<223> A to T

<220>
<221> PROPEP
<222> (1)...(31)
<223> signal peptide

<220>
<221> PROPEP
<222> (32)...(40)
<223> propeptide

<220>
<221> CHAIN
<222> (41)...(488)
<223> mature Factor X

<220>
<221> CHAIN
<222> (41)...(179)
<223> Factor X light chain

<220>
<221> CHAIN
<222> (183)...(488)
<223> Factor X heavy chain

<220>
<221> PROPEP
<222> (183)...(234)
<223> activation peptide

<220>
<221> CHAIN
<222> (235)...(488)
<223> activated Factor Xa heavy chain

<400> 549
```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Thr Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
```

```
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 550
<211> 488
<212> PRT
<213> Homo sapiens

<220>
<223> Factor X natural variant (G192R)

<220>
<221> VARIANT
<222> (192)...(192)
<223> G to R

<220>
<221> PROPEP
<222> (1)...(31)
<223> signal peptide

<220>
<221> PROPEP
<222> (32)...(40)
<223> propeptide

<220>
<221> CHAIN
<222> (41)...(488)
<223> mature Factor X

<220>
<221> CHAIN
<222> (41)...(179)
<223> Factor X light chain

<220>
<221> CHAIN
<222> (183)...(488)
<223> Factor X heavy chain

<220>
<221> PROPEP
<222> (183)...(234)
<223> activation peptide

<220>
<221> CHAIN
<222> (235)...(488)
<223> activated Factor Xa heavy chain

<400> 550

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Arg
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
```

```
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 551
<211> 485
<212> PRT
<213> Homo sapiens

<220>
<223> Factor X variant (KVRV285-288E)

<220>
<221> VARIANT
<222> (285)...(288)
<223> KVRV285-288 to E

<220>
<221> PROPEP
<222> (1)...(31)
<223> signal peptide

<220>
<221> PROPEP
<222> (32)...(40)
<223> propeptide

<220>
<221> CHAIN
<222> (41)...(485)
<223> mature Factor X

<220>
<221> CHAIN
<222> (41)...(179)
<223> Factor X light chain

<220>
<221> CHAIN
<222> (183)...(485)
<223> Factor X heavy chain

<220>
<221> PROPEP
<222> (183)...(234)
<223> activation peptide

<220>

<221> CHAIN
<222> (235)...(485)
<223> activated Factor Xa heavy chain

<400> 551

```
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1               5                  10                  15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20                  25                  30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35                  40                  45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50                  55                  60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65                  70                  75                  80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85                  90                  95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100                 105                 110
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Glu Gly Asp Arg
        275                 280                 285
Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu Val Glu Val
    290                 295                 300
Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp Phe Asp Ile
305                 310                 315                 320
Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met Asn Val Ala
                325                 330                 335
Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr Leu Met Thr
            340                 345                 350
Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His Glu Lys Gly
        355                 360                 365
Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr Val Asp Arg
    370                 375                 380
Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln Asn Met Phe
385                 390                 395                 400
Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln Gly Asp Ser
                405                 410                 415
Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe Val Thr Gly
            420                 425                 430
Ile Val Ser Trp Gly Glu Gly Cys Ala Arg Lys Gly Lys Tyr Gly Ile
        435                 440                 445
Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg Ser Met Lys
    450                 455                 460
Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu Val Ile Thr
465                 470                 475                 480
Ser Ser Pro Leu Lys
                485
```

<210> 552
<211> 488
<212> PRT
<213> Homo sapiens

<220>
<223> FX variant G192S

<220>
<221> VARIANT
<222> (192)...(192)
<223> G to S

<220>
<221> PROPEP
<222> (1)...(31)
<223> signal peptide

<220>
<221> PROPEP
<222> (32)...(40)
<223> propeptide

<220>
<221> CHAIN
<222> (41)...(488)
<223> mature Factor X

<220>
<221> CHAIN
<222> (41)...(179)
<223> Factor X light chain

<220>
<221> CHAIN
<222> (183)...(488)
<223> Factor X heavy chain

<220>
<221> PROPEP
<222> (183)...(234)
<223> activation peptide

<220>
<221> CHAIN
<222> (235)...(488)
<223> activated Factor Xa heavy chain

<400> 552
Met Gly Arg Pro Leu His Leu Val Leu Leu Ser Ala Ser Leu Ala Gly
 1   5   10   15
Leu Leu Leu Leu Gly Glu Ser Leu Phe Ile Arg Arg Glu Gln Ala Asn
            20   25   30
Asn Ile Leu Ala Arg Val Thr Arg Ala Asn Ser Phe Leu Glu Glu Met
        35   40   45
Lys Lys Gly His Leu Glu Arg Glu Cys Met Glu Glu Thr Cys Ser Tyr
    50   55   60
Glu Glu Ala Arg Glu Val Phe Glu Asp Ser Asp Lys Thr Asn Glu Phe
65   70   75   80
Trp Asn Lys Tyr Lys Asp Gly Asp Gln Cys Glu Thr Ser Pro Cys Gln
                85   90   95
Asn Gln Gly Lys Cys Lys Asp Gly Leu Gly Glu Tyr Thr Cys Thr Cys
            100   105   110

```
Leu Glu Gly Phe Glu Gly Lys Asn Cys Glu Leu Phe Thr Arg Lys Leu
        115                 120                 125
Cys Ser Leu Asp Asn Gly Asp Cys Asp Gln Phe Cys His Glu Glu Gln
    130                 135                 140
Asn Ser Val Val Cys Ser Cys Ala Arg Gly Tyr Thr Leu Ala Asp Asn
145                 150                 155                 160
Gly Lys Ala Cys Ile Pro Thr Gly Pro Tyr Pro Cys Gly Lys Gln Thr
                165                 170                 175
Leu Glu Arg Arg Lys Arg Ser Val Ala Gln Ala Thr Ser Ser Ser Gly
            180                 185                 190
Glu Ala Pro Asp Ser Ile Thr Trp Lys Pro Tyr Asp Ala Ala Asp Leu
        195                 200                 205
Asp Pro Thr Glu Asn Pro Phe Asp Leu Leu Asp Phe Asn Gln Thr Gln
    210                 215                 220
Pro Glu Arg Gly Asp Asn Asn Leu Thr Arg Ile Val Gly Gly Gln Glu
225                 230                 235                 240
Cys Lys Asp Gly Glu Cys Pro Trp Gln Ala Leu Leu Ile Asn Glu Glu
                245                 250                 255
Asn Glu Gly Phe Cys Gly Gly Thr Ile Leu Ser Glu Phe Tyr Ile Leu
            260                 265                 270
Thr Ala Ala His Cys Leu Tyr Gln Ala Lys Arg Phe Lys Val Arg Val
        275                 280                 285
Gly Asp Arg Asn Thr Glu Gln Glu Glu Gly Gly Glu Ala Val His Glu
    290                 295                 300
Val Glu Val Val Ile Lys His Asn Arg Phe Thr Lys Glu Thr Tyr Asp
305                 310                 315                 320
Phe Asp Ile Ala Val Leu Arg Leu Lys Thr Pro Ile Thr Phe Arg Met
                325                 330                 335
Asn Val Ala Pro Ala Cys Leu Pro Glu Arg Asp Trp Ala Glu Ser Thr
            340                 345                 350
Leu Met Thr Gln Lys Thr Gly Ile Val Ser Gly Phe Gly Arg Thr His
        355                 360                 365
Glu Lys Gly Arg Gln Ser Thr Arg Leu Lys Met Leu Glu Val Pro Tyr
    370                 375                 380
Val Asp Arg Asn Ser Cys Lys Leu Ser Ser Ser Phe Ile Ile Thr Gln
385                 390                 395                 400
Asn Met Phe Cys Ala Gly Tyr Asp Thr Lys Gln Glu Asp Ala Cys Gln
                405                 410                 415
Gly Asp Ser Gly Gly Pro His Val Thr Arg Phe Lys Asp Thr Tyr Phe
            420                 425                 430
Val Thr Gly Ile Val Ser Trp Gly Glu Ser Cys Ala Arg Lys Gly Lys
        435                 440                 445
Tyr Gly Ile Tyr Thr Lys Val Thr Ala Phe Leu Lys Trp Ile Asp Arg
    450                 455                 460
Ser Met Lys Thr Arg Gly Leu Pro Lys Ala Lys Ser His Ala Pro Glu
465                 470                 475                 480
Val Ile Thr Ser Ser Pro Leu Lys
                485
```

<210> 553
<211> 464
<212> PRT
<213> Homo sapiens

<220>
<223> Antithrombin III precursor

<400> 553

```
Met Tyr Ser Asn Val Ile Gly Thr Val Thr Ser Gly Lys Arg Lys Val
 1               5                  10                  15
Tyr Leu Leu Ser Leu Leu Leu Ile Gly Phe Trp Asp Cys Val Thr Cys
            20                  25                  30
His Gly Ser Pro Val Asp Ile Cys Thr Ala Lys Pro Arg Asp Ile Pro
        35                  40                  45
Met Asn Pro Met Cys Ile Tyr Arg Ser Pro Glu Lys Lys Ala Thr Glu
    50                  55                  60
Asp Glu Gly Ser Glu Gln Lys Ile Pro Glu Ala Thr Asn Arg Arg Val
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65                  70                  75                  80
Trp Glu Leu Ser Lys Ala Asn Ser Arg Phe Ala Thr Thr Phe Tyr Gln
                85                  90                  95
His Leu Ala Asp Ser Lys Asn Asp Asn Asp Asn Ile Phe Leu Ser Pro
            100                 105                 110
Leu Ser Ile Ser Thr Ala Phe Ala Met Thr Lys Leu Gly Ala Cys Asn
        115                 120                 125
Asp Thr Leu Gln Gln Leu Met Glu Val Phe Lys Phe Asp Thr Ile Ser
    130                 135                 140
Glu Lys Thr Ser Asp Gln Ile His Phe Phe Phe Ala Lys Leu Asn Cys
145                 150                 155                 160
Arg Leu Tyr Arg Lys Ala Asn Lys Ser Ser Lys Leu Val Ser Ala Asn
                165                 170                 175
Arg Leu Phe Gly Asp Lys Ser Leu Thr Phe Asn Glu Thr Tyr Gln Asp
            180                 185                 190
Ile Ser Glu Leu Val Tyr Gly Ala Lys Leu Gln Pro Leu Asp Phe Lys
        195                 200                 205
Glu Asn Ala Glu Gln Ser Arg Ala Ala Ile Asn Lys Trp Val Ser Asn
    210                 215                 220
Lys Thr Glu Gly Arg Ile Thr Asp Val Ile Pro Ser Glu Ala Ile Asn
225                 230                 235                 240
Glu Leu Thr Val Leu Val Leu Val Asn Thr Ile Tyr Phe Lys Gly Leu
                245                 250                 255
Trp Lys Ser Lys Phe Ser Pro Glu Asn Thr Arg Lys Glu Leu Phe Tyr
            260                 265                 270
Lys Ala Asp Gly Glu Ser Cys Ser Ala Ser Met Met Tyr Gln Glu Gly
        275                 280                 285
Lys Phe Arg Tyr Arg Arg Val Ala Glu Gly Thr Gln Val Leu Glu Leu
    290                 295                 300
Pro Phe Lys Gly Asp Asp Ile Thr Met Val Leu Ile Leu Pro Lys Pro
305                 310                 315                 320
Glu Lys Ser Leu Ala Lys Val Glu Lys Glu Leu Thr Pro Glu Val Leu
                325                 330                 335
Gln Glu Trp Leu Asp Glu Leu Glu Glu Met Met Leu Val Val His Met
            340                 345                 350
Pro Arg Phe Arg Ile Glu Asp Gly Phe Ser Leu Lys Glu Gln Leu Gln
        355                 360                 365
Asp Met Gly Leu Val Asp Leu Phe Ser Pro Glu Lys Ser Lys Leu Pro
    370                 375                 380
Gly Ile Val Ala Glu Gly Arg Asp Asp Leu Tyr Val Ser Asp Ala Phe
385                 390                 395                 400
His Lys Ala Phe Leu Glu Val Asn Glu Glu Gly Ser Glu Ala Ala Ala
                405                 410                 415
Ser Thr Ala Val Val Ile Ala Gly Arg Ser Leu Asn Pro Asn Arg Val
            420                 425                 430
Thr Phe Lys Ala Asn Arg Pro Phe Leu Val Phe Ile Arg Glu Val Pro
        435                 440                 445
Leu Asn Thr Ile Ile Phe Met Gly Arg Val Ala Asn Pro Cys Val Lys
    450                 455                 460


<210> 554
<211> 432
<212> PRT
<213> Homo sapiens

<220>
<223> mature Antithrombin III

<400> 554
His Gly Ser Pro Val Asp Ile Cys Thr Ala Lys Pro Arg Asp Ile Pro
 1               5                  10                  15
Met Asn Pro Met Cys Ile Tyr Arg Ser Pro Glu Lys Lys Ala Thr Glu
            20                  25                  30
Asp Glu Gly Ser Glu Gln Lys Ile Pro Glu Ala Thr Asn Arg Arg Val
        35                  40                  45
Trp Glu Leu Ser Lys Ala Asn Ser Arg Phe Ala Thr Thr Phe Tyr Gln
    50                  55                  60
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His Leu Ala Asp Ser Lys Asn Asp Asn Asp Asn Ile Phe Leu Ser Pro
65                  70                  75                  80
Leu Ser Ile Ser Thr Ala Phe Ala Met Thr Lys Leu Gly Ala Cys Asn
                85                  90                  95
Asp Thr Leu Gln Gln Leu Met Glu Val Phe Lys Phe Asp Thr Ile Ser
            100                 105                 110
Glu Lys Thr Ser Asp Gln Ile His Phe Phe Phe Ala Lys Leu Asn Cys
        115                 120                 125
Arg Leu Tyr Arg Lys Ala Asn Lys Ser Ser Lys Leu Val Ser Ala Asn
    130                 135                 140
Arg Leu Phe Gly Asp Lys Ser Leu Thr Phe Asn Glu Thr Tyr Gln Asp
145                 150                 155                 160
Ile Ser Glu Leu Val Tyr Gly Ala Lys Leu Gln Pro Leu Asp Phe Lys
                165                 170                 175
Glu Asn Ala Glu Gln Ser Arg Ala Ala Ile Asn Lys Trp Val Ser Asn
            180                 185                 190
Lys Thr Glu Gly Arg Ile Thr Asp Val Ile Pro Ser Glu Ala Ile Asn
        195                 200                 205
Glu Leu Thr Val Leu Val Leu Val Asn Thr Ile Tyr Phe Lys Gly Leu
    210                 215                 220
Trp Lys Ser Lys Phe Ser Pro Glu Asn Thr Arg Lys Glu Leu Phe Tyr
225                 230                 235                 240
Lys Ala Asp Gly Glu Ser Cys Ser Ala Ser Met Met Tyr Gln Glu Gly
                245                 250                 255
Lys Phe Arg Tyr Arg Arg Val Ala Glu Gly Thr Gln Val Leu Glu Leu
            260                 265                 270
Pro Phe Lys Gly Asp Asp Ile Thr Met Val Leu Ile Leu Pro Lys Pro
        275                 280                 285
Glu Lys Ser Leu Ala Lys Val Glu Lys Glu Leu Thr Pro Glu Val Leu
    290                 295                 300
Gln Glu Trp Leu Asp Glu Leu Glu Glu Met Met Leu Val Val His Met
305                 310                 315                 320
Pro Arg Phe Arg Ile Glu Asp Gly Phe Ser Leu Lys Glu Gln Leu Gln
                325                 330                 335
Asp Met Gly Leu Val Asp Leu Phe Ser Pro Glu Lys Ser Lys Leu Pro
            340                 345                 350
Gly Ile Val Ala Glu Gly Arg Asp Asp Leu Tyr Val Ser Asp Ala Phe
        355                 360                 365
His Lys Ala Phe Leu Glu Val Asn Glu Glu Gly Ser Glu Ala Ala Ala
    370                 375                 380
Ser Thr Ala Val Val Ile Ala Gly Arg Ser Leu Asn Pro Asn Arg Val
385                 390                 395                 400
Thr Phe Lys Ala Asn Arg Pro Phe Leu Val Phe Ile Arg Glu Val Pro
                405                 410                 415
Leu Asn Thr Ile Ile Phe Met Gly Arg Val Ala Asn Pro Cys Val Lys
            420                 425                 430


<210> 555
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> EPR-1 recognition site

<400> 555
Leu Phe Thr Arg Lys Leu
 1               5


<210> 556
<211> 245
<212> PRT
<213> Homo sapiens

<220>
<223> Chymotrypsinogen B mature
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<400> 556
Cys Gly Val Pro Ala Ile His Pro Val Leu Ser Gly Leu Ser Arg Ile
 1   5   10   15
Val Asn Gly Glu Asp Ala Val Pro Gly Ser Trp Pro Trp Gln Val Ser
            20   25   30
Leu Gln Asp Lys Thr Gly Phe His Phe Cys Gly Gly Ser Leu Ile Ser
        35   40   45
Glu Asp Trp Val Val Thr Ala Ala His Cys Gly Val Arg Thr Ser Asp
    50   55   60
Val Val Val Ala Gly Glu Phe Asp Gln Gly Ser Asp Glu Glu Asn Ile
65   70   75   80
Gln Val Leu Lys Ile Ala Lys Val Phe Lys Asn Pro Lys Phe Ser Ile
                85   90   95
Leu Thr Val Asn Asn Asp Ile Thr Leu Leu Lys Leu Ala Thr Pro Ala
            100   105   110
Arg Phe Ser Gln Thr Val Ser Ala Val Cys Leu Pro Ser Ala Asp Asp
        115   120   125
Asp Phe Pro Ala Gly Thr Leu Cys Ala Thr Thr Gly Trp Gly Lys Thr
    130   135   140
Lys Tyr Asn Ala Asn Lys Thr Pro Asp Lys Leu Gln Gln Ala Ala Leu
145   150   155   160
Pro Leu Leu Ser Asn Ala Glu Cys Lys Lys Ser Trp Gly Arg Arg Ile
                165   170   175
Thr Asp Val Met Ile Cys Ala Gly Ala Ser Gly Val Ser Ser Cys Met
            180   185   190
Gly Asp Ser Gly Gly Pro Leu Val Cys Gln Lys Asp Gly Ala Trp Thr
        195   200   205
Leu Val Gly Ile Val Ser Trp Gly Ser Asp Thr Cys Ser Thr Ser Ser
    210   215   220
Pro Gly Val Tyr Ala Arg Val Thr Lys Leu Ile Pro Trp Val Gln Lys
225   230   235   240
Ile Leu Ala Ala Asn
                245

<210> 557
<211> 304
<212> PRT
<213> Homo sapiens

<220>
<223> Tissue factor pathway inhibitor (TFPI)

<300>
<308> UniProtKB: P10646
<309> 2013-03-06

<400> 557
Met Ile Tyr Thr Met Lys Lys Val His Ala Leu Trp Ala Ser Val Cys
 1   5   10   15
Leu Leu Leu Asn Leu Ala Pro Ala Pro Leu Asn Ala Asp Ser Glu Glu
            20   25   30
Asp Glu Glu His Thr Ile Ile Thr Asp Thr Glu Leu Pro Pro Leu Lys
        35   40   45
Leu Met His Ser Phe Cys Ala Phe Lys Ala Asp Asp Gly Pro Cys Lys
    50   55   60
Ala Ile Met Lys Arg Phe Phe Phe Asn Ile Phe Thr Arg Gln Cys Glu
65   70   75   80
Glu Phe Ile Tyr Gly Gly Cys Glu Gly Asn Gln Asn Arg Phe Glu Ser
                85   90   95
Leu Glu Glu Cys Lys Lys Met Cys Thr Arg Asp Asn Ala Asn Arg Ile
            100   105   110
Ile Lys Thr Thr Leu Gln Gln Glu Lys Pro Asp Phe Cys Phe Leu Glu
        115   120   125
Glu Asp Pro Gly Ile Cys Arg Gly Tyr Ile Thr Arg Tyr Phe Tyr Asn
    130   135   140
Asn Gln Thr Lys Gln Cys Glu Arg Phe Lys Tyr Gly Gly Cys Leu Gly

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145                 150                 155                 160
Asn Met Asn Asn Phe Glu Thr Leu Glu Glu Cys Lys Asn Ile Cys Glu
                165                 170                 175
Asp Gly Pro Asn Gly Phe Gln Val Asp Asn Tyr Gly Thr Gln Leu Asn
            180                 185                 190
Ala Val Asn Asn Ser Leu Thr Pro Gln Ser Thr Lys Val Pro Ser Leu
        195                 200                 205
Phe Glu Phe His Gly Pro Ser Trp Cys Leu Thr Pro Ala Asp Arg Gly
    210                 215                 220
Leu Cys Arg Ala Asn Glu Asn Arg Phe Tyr Tyr Asn Ser Val Ile Gly
225                 230                 235                 240
Lys Cys Arg Pro Phe Lys Tyr Ser Gly Cys Gly Gly Asn Glu Asn Asn
                245                 250                 255
Phe Thr Ser Lys Gln Glu Cys Leu Arg Ala Cys Lys Lys Gly Phe Ile
            260                 265                 270
Gln Arg Ile Ser Lys Gly Gly Leu Ile Lys Thr Lys Arg Lys Arg Lys
        275                 280                 285
Lys Gln Arg Val Lys Ile Ala Tyr Glu Glu Ile Phe Val Lys Asn Met
    290                 295                 300
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