

SEQUENCE LISTING

<110> NOVARTIS AG

<120> FACTOR XI ANTIBODIES AND METHODS OF USE

<130> PAT056955-WO-PCT

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<150> 62/341,568

<151> 2016-05-25

<150> 62/184,955

<151> 2015-06-26

<160> 51

<170> PatentIn version 3.5

<210> 1

<211> 625

<212> PRT

<213> Homo sapiens

<400> 1

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Ser Gly Glu Cys Val Thr Gln Leu Leu Lys Asp Thr Cys Phe Glu Gly
20 25 30

Gly Asp Ile Thr Thr Val Phe Thr Pro Ser Ala Lys Tyr Cys Gln Val
35 40 45

Val Cys Thr Tyr His Pro Arg Cys Leu Leu Phe Thr Phe Thr Ala Glu
50 55 60

Ser Pro Ser Glu Asp Pro Thr Arg Trp Phe Thr Cys Val Leu Lys Asp
65 70 75 80

Ser Val Thr Glu Thr Leu Pro Arg Val Asn Arg Thr Ala Ala Ile Ser
85 90 95

Gly Tyr Ser Phe Lys Gln Cys Ser His Gln Ile Ser Ala Cys Asn Lys
100 105 110

Asp Ile Tyr Val Asp Leu Asp Met Lys Gly Ile Asn Tyr Asn Ser Ser
 115 120 125

Val Ala Lys Ser Ala Gln Glu Cys Gln Glu Arg Cys Thr Asp Asp Val
 130 135 140

His Cys His Phe Phe Thr Tyr Ala Thr Arg Gln Phe Pro Ser Leu Glu
 145 150 155 160

His Arg Asn Ile Cys Leu Leu Lys His Thr Gln Thr Gly Thr Pro Thr
 165 170 175

Arg Ile Thr Lys Leu Asp Lys Val Val Ser Gly Phe Ser Leu Lys Ser
 180 185 190

Cys Ala Leu Ser Asn Leu Ala Cys Ile Arg Asp Ile Phe Pro Asn Thr
 195 200 205

Val Phe Ala Asp Ser Asn Ile Asp Ser Val Met Ala Pro Asp Ala Phe
 210 215 220

Val Ser Gly Arg Ile Cys Thr His His Pro Gly Cys Leu Phe Phe Thr
 225 230 235 240

Phe Phe Ser Gln Glu Trp Pro Lys Glu Ser Gln Arg Asn Leu Cys Leu
 245 250 255

Leu Lys Thr Ser Glu Ser Gly Leu Pro Ser Thr Arg Ile Lys Lys Ser
 260 265 270

Lys Ala Leu Ser Gly Phe Ser Leu Gln Ser Cys Arg His Ser Ile Pro
 275 280 285

Val Phe Cys His Ser Ser Phe Tyr His Asp Thr Asp Phe Leu Gly Glu
 290 295 300

Glu Leu Asp Ile Val Ala Ala Lys Ser His Glu Ala Cys Gln Lys Leu
 305 310 315 320

Cys Thr Asn Ala Val Arg Cys Gln Phe Phe Thr Tyr Thr Pro Ala Gln
 325 330 335

Ala Ser Cys Asn Glu Gly Lys Gly Lys Cys Tyr Leu Lys Leu Ser Ser
340 345 350

Asn Gly Ser Pro Thr Lys Ile Leu His Gly Arg Gly Gly Ile Ser Gly
355 360 365

Tyr Thr Leu Arg Leu Cys Lys Met Asp Asn Glu Cys Thr Thr Lys Ile
370 375 380

Lys Pro Arg Ile Val Gly Gly Thr Ala Ser Val Arg Gly Glu Trp Pro
385 390 395 400

Trp Gln Val Thr Leu His Thr Thr Ser Pro Thr Gln Arg His Leu Cys
405 410 415

Gly Gly Ser Ile Ile Gly Asn Gln Trp Ile Leu Thr Ala Ala His Cys
420 425 430

Phe Tyr Gly Val Glu Ser Pro Lys Ile Leu Arg Val Tyr Ser Gly Ile
435 440 445

Leu Asn Gln Ser Glu Ile Lys Glu Asp Thr Ser Phe Phe Gly Val Gln
450 455 460

Glu Ile Ile Ile His Asp Gln Tyr Lys Met Ala Glu Ser Gly Tyr Asp
465 470 475 480

Ile Ala Leu Leu Lys Leu Glu Thr Thr Val Asn Tyr Thr Asp Ser Gln
485 490 495

Arg Pro Ile Cys Leu Pro Ser Lys Gly Asp Arg Asn Val Ile Tyr Thr
500 505 510

Asp Cys Trp Val Thr Gly Trp Gly Tyr Arg Lys Leu Arg Asp Lys Ile
515 520 525

Gln Asn Thr Leu Gln Lys Ala Lys Ile Pro Leu Val Thr Asn Glu Glu
530 535 540

Cys Gln Lys Arg Tyr Arg Gly His Lys Ile Thr His Lys Met Ile Cys
545 550 555 560

Ala Gly Tyr Arg Glu Gly Gly Lys Asp Ala Cys Lys Gly Asp Ser Gly
565 570 575

Gly Pro Leu Ser Cys Lys His Asn Glu Val Trp His Leu Val Gly Ile
580 585 590

Thr Ser Trp Gly Glu Gly Cys Ala Gln Arg Glu Arg Pro Gly Val Tyr
595 600 605

Thr Asn Val Val Glu Tyr Val Asp Trp Ile Leu Glu Lys Thr Gln Ala
610 615 620

Val
625

<210> 2
<211> 3278
<212> DNA
<213> Homo sapiens

<400> 2
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tatttctgac atactaagat ttttaacgact ttcacaaata tgctgtactg agagagaatg 180
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<210> 3
 <211> 5
 <212> PRT
 <213> Artificial Sequence

<220>
 <221> source
 <223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 3
 Thr Ala Ala Met Ser
 1 5

<210> 4
 <211> 17
 <212> PRT
 <213> Artificial Sequence

<220>
 <221> source
 <223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 4

Gly Ile Ser Gly Ser Gly Ser Ser Thr Tyr Tyr Ala Asp Ser Val Lys
1 5 10 15

Gly

<210> 5
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 5
Glu Leu Ser Tyr Leu Tyr Ser Gly Tyr Tyr Phe Asp Tyr
1 5 10

<210> 6
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 6
Gly Phe Thr Phe Ser Thr Ala
1 5

<210> 7
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 7
Ser Gly Ser Gly Ser Ser
1 5

<210> 8
<211> 13

<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 8
Glu Leu Ser Tyr Leu Tyr Ser Gly Tyr Tyr Phe Asp Tyr
1 5 10

<210> 9
<211> 122
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 9
Gln Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Thr Ala
20 25 30

Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45

Ser Gly Ile Ser Gly Ser Gly Ser Ser Thr Tyr Tyr Ala Asp Ser Val
50 55 60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr
65 70 75 80

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
85 90 95

Ala Arg Glu Leu Ser Tyr Leu Tyr Ser Gly Tyr Tyr Phe Asp Tyr Trp
100 105 110

Gly Gln Gly Thr Leu Val Thr Val Ser Ser
115 120

<210> 10
<211> 366
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polynucleotide"

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agctgcgcgg cgtccggatt caccttttct actgctgcta tgtcttgggt gcgccaggcc 120
ccgggcaaag gtctcgagtg ggtttccggt atctctgggt ctggttcttc tacctactat 180
gcggatagcg tgaaaggccg ctttaccatc agccgcgata attcgaaaaa caccctgtat 240
ctgcaaatga acagcctgcg tgcggaagat acggccgtgt attattgcgc gcgtgaactg 300
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agctca 366

<210> 11
<211> 452
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 11
Gln Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15
Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Thr Ala
20 25 30
Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45
Ser Gly Ile Ser Gly Ser Gly Ser Ser Thr Tyr Tyr Ala Asp Ser Val
50 55 60
Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr

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

Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr
290 295 300

Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn
305 310 315 320

Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro
325 330 335

Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln
340 345 350

Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln Val
355 360 365

Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val
370 375 380

Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro
385 390 395 400

Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr
405 410 415

Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val
420 425 430

Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu
435 440 445

Ser Pro Gly Lys
450

<210> 12
<211> 1356
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polynucleotide"

<400> 12

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ccgggcaaag gtctcgagtg ggtttccggt atctctggtt ctggttcttc tacctactat	180
gcggatagcg tgaaaggccg ctttaccatc agccgcgata attcgaaaaa caccctgtat	240
ctgcaaatga acagcctgcg tgcggaagat acggccgtgt attattgcgc gcgtgaactg	300
tcttacctgt actctggta ctacttcgat tactggggcc aaggcacct ggtgactgtt	360
agctcagcct ccaccaaggg tccatcggtc ttccccctgg caccctctc caagagcacc	420
tctgggggca cagcggccct gggctgcctg gtcaaggact acttccccga accggtgacg	480
gtgtcgtgga actcaggcgc cctgaccagc ggcgtgcaca cttcccggc tgtcctacag	540
tcctcaggac tctactccct cagcagcgtg gtgaccgtgc cctccagcag cttgggcacc	600
cagacctaca tctgcaacgt gaatcacaag cccagcaaca ccaaggtgga caagagagtt	660
gagcccaaat cttgtgacaa aactcacaca tgcccaccgt gcccagcacc tgaagcagcg	720
gggggaccgt cagtcttctt cttccccca aaaccaagg acaccctcat gatctcccg	780
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gaggagatga ccaagaacca ggtcagcctg acctgcctgg tcaaaggctt ctatcccagc	1140
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cccgtgctgg actccgacgg ctccttcttc ctctacagca agctcaccgt ggacaagagc	1260
aggtggcagc aggggaacgt cttctcatgc tccgtgatgc atgaggctct gcacaaccac	1320
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<210> 13

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<221> source

<223> /note="Description of Artificial Sequence: Synthetic

peptide"

<400> 13

Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn Asp Val Ser
1 5 10

<210> 14

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<221> source

<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 14

Lys Asn Tyr Asn Arg Pro Ser
1 5

<210> 15

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<221> source

<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 15

Ser Ala Trp Asp Gln Arg Gln Phe Asp Val Val
1 5 10

<210> 16

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<221> source

<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 16

Ser Ser Ser Asn Ile Gly Ser Asn Asp
1 5

<210> 17

<211> 3

<212> PRT

<213> Artificial Sequence

<220>

<221> source

<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 17

Lys Asn Tyr

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<210> 18

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<221> source

<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 18

Trp Asp Gln Arg Gln Phe Asp Val

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5

<210> 19

<211> 110

<212> PRT

<213> Artificial Sequence

<220>

<221> source

<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 19

Asp Ile Val Leu Thr Gln Pro Pro Ser Val Ser Gly Ala Pro Gly Gln

1

5

10

15

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn

20

25

30

Asp Val Ser Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu

35

40

45

Ile Tyr Lys Asn Tyr Asn Arg Pro Ser Gly Val Pro Asp Arg Phe Ser

50

55

60

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Thr Gly Leu Gln

65

70

75

80

Ala Glu Asp Glu Ala Asp Tyr Tyr Cys Ser Ala Trp Asp Gln Arg Gln
 85 90 95

Phe Asp Val Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu
 100 105 110

<210> 20

<211> 330

<212> DNA

<213> Artificial Sequence

<220>

<221> source

<223> /note="Description of Artificial Sequence: Synthetic
 polynucleotide"

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agctgtagcg gcagcagcag caacattggg tctaacgacg tgtcttggtta ccagcagctg 120

ccgggcacgg cgccgaaact gctgatctac aaaaactaca accgcccagag cggcgtgccg 180

gatcgcttta gcggatccaa aagcggcacc agcgccagcc tggcgattac cggcctgcaa 240

gcagaagacg aagcggatta ttactgctct gcttgggacc agcgtcagtt cgacgttggtg 300

tttggcggcg gcacgaagtt aaccgtccta 330

<210> 21

<211> 216

<212> PRT

<213> Artificial Sequence

<220>

<221> source

<223> /note="Description of Artificial Sequence: Synthetic
 polypeptide"

<400> 21

Asp Ile Val Leu Thr Gln Pro Pro Ser Val Ser Gly Ala Pro Gly Gln
 1 5 10 15

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn
 20 25 30

Asp Val Ser Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu

35

40

45

Ile Tyr Lys Asn Tyr Asn Arg Pro Ser Gly Val Pro Asp Arg Phe Ser
 50 55 60

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Thr Gly Leu Gln
 65 70 75 80

Ala Glu Asp Glu Ala Asp Tyr Tyr Cys Ser Ala Trp Asp Gln Arg Gln
 85 90 95

Phe Asp Val Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly Gln
 100 105 110

Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu
 115 120 125

Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr
 130 135 140

Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys
 145 150 155 160

Ala Gly Val Glu Thr Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr
 165 170 175

Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His
 180 185 190

Arg Ser Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val Glu Lys
 195 200 205

Thr Val Ala Pro Thr Glu Cys Ser
 210 215

<210> 22

<211> 648

<212> DNA

<213> Artificial Sequence

<220>

<221> source

<223> /note="Description of Artificial Sequence: Synthetic

polynucleotide"

<400> 22
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gatcgcttta gcggatccaa aagcggcacc agcgccagcc tggcgattac cggcctgcaa 240
gcagaagacg aagcggatta ttactgctct gcttgggacc agcgtcagtt cgacgttgtg 300
tttggcggcg gcacgaagtt aaccgtccta ggtagccca aggctgcccc ctcggtcact 360
ctgttccgc cctcctctga ggagcttcaa gccacaagg ccacactggt gtgtctcata 420
agtgacttct acccgggagc cgtgacagtg gcctggaagg cagatagcag ccccgtaag 480
gcgggagtgg agaccaccac accctccaaa caaagcaaca acaagtacgc ggccagcagc 540
tatctgagcc tgacgcctga gcagtggaag tcccacagaa gctacagctg ccaggtcacg 600
catgaaggga gcaccgtgga gaagacagtg gccctacag aatgttca 648

<210> 23
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 23
Thr Ala Ala Met Ser
1 5

<210> 24
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 24
Gly Ile Ser Gly Ser Gly Ser Ser Thr Tyr Tyr Ala Asp Ser Val Lys
1 5 10 15

Gly

<210> 25
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 25
Glu Leu Ser Tyr Leu Tyr Ser Gly Tyr Tyr Phe Asp Tyr
1 5 10

<210> 26
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 26
Gly Phe Thr Phe Ser Thr Ala
1 5

<210> 27
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 27
Ser Gly Ser Gly Ser Ser
1 5

<210> 28
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 28
Glu Leu Ser Tyr Leu Tyr Ser Gly Tyr Tyr Phe Asp Tyr
1 5 10

<210> 29
<211> 122
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 29
Gln Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Thr Ala
20 25 30

Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45

Ser Gly Ile Ser Gly Ser Gly Ser Ser Thr Tyr Tyr Ala Asp Ser Val
50 55 60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr
65 70 75 80

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
85 90 95

Ala Arg Glu Leu Ser Tyr Leu Tyr Ser Gly Tyr Tyr Phe Asp Tyr Trp
100 105 110

Gly Gln Gly Thr Leu Val Thr Val Ser Ser
115 120

<210> 30
<211> 366

<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polynucleotide"

<400> 30
caggtgcagc tgctggaatc aggcggcgga ctggtgcagc ctggcggtag cctgagactg 60
agctgcgctg ctagtggctt cacctttagc accgccgcta tgagctgggt tcgacaggcc 120
ccagggaaag gcctcgagtg ggtctcaggg attagcggtg gcggtcttag cacctactac 180
gccgatagcg tgaagggccg gttcactatc tctagggata actctaagaa caccctgtac 240
ctgcagatga atagcctgag agccgaggac accgccgtct actactgcgc tagagagctg 300
agctacctgt atagcggcta ctacttcgac tactgggggtc aaggcaccct ggtcaccgtg 360
tctagc 366

<210> 31
<211> 452
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 31
Gln Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Thr Ala
20 25 30

Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45

Ser Gly Ile Ser Gly Ser Gly Ser Ser Thr Tyr Tyr Ala Asp Ser Val
50 55 60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr
65 70 75 80

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
 85 90 95

Ala Arg Glu Leu Ser Tyr Leu Tyr Ser Gly Tyr Tyr Phe Asp Tyr Trp
 100 105 110

Gly Gln Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro
 115 120 125

Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr
 130 135 140

Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr
 145 150 155 160

Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro
 165 170 175

Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr
 180 185 190

Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn
 195 200 205

His Lys Pro Ser Asn Thr Lys Val Asp Lys Arg Val Glu Pro Lys Ser
 210 215 220

Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu
 225 230 235 240

Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu
 245 250 255

Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Ala Val Ser
 260 265 270

His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu
 275 280 285

Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr
 290 295 300

Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn
305 310 315 320

Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Ala Ala Pro
325 330 335

Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln
340 345 350

Val Tyr Thr Leu Pro Pro Ser Arg Glu Glu Met Thr Lys Asn Gln Val
355 360 365

Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val
370 375 380

Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro
385 390 395 400

Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr
405 410 415

Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val
420 425 430

Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu
435 440 445

Ser Pro Gly Lys
450

<210> 32
<211> 1356
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polynucleotide"

<400> 32
caggtgcagc tgctggaatc aggcggcgga ctggtgcagc ctggcggtag cctgagactg 60
agctgcgctg ctagtggtt cacctttagc accgccgcta tgagctgggt tcgacaggcc 120

ccagggaaag gcctcgagtg ggtctcaggg attagcggtg gcggctctag cacctactac	180
gccgatatcg tgaagggccg gttcactatc tctagggata actctaagaa caccctgtac	240
ctgcagatga atagcctgag agccgaggac accgccgtct actactgcgc tagagagctg	300
agctacctgt atagcggcta ctacttcgac tactggggtc aaggcacctt ggtcacctgt	360
tctagcgcta gcactaaggg cccctccgtg ttccctctgg ccccttccag caagtctacc	420
tccggcggca cagctgctct gggctgcctg gtcaaggact acttccctga gcctgtgaca	480
gtgtcctgga actctggcgc cctgacctct ggcgtgcaca ccttccctgc cgtgctgcag	540
tcctccggcc tgtactccct gtcctccgtg gtcacagtgc cttcaagcag cctgggcacc	600
cagacctata tctgcaacgt gaaccacaag cttccaaca ccaaggtgga caagcgggtg	660
gagcctaagt cctgcgacaa gaccacacc tgtcctccct gccctgctcc tgaactgctg	720
ggcggccctt ctgtgttcct gttccctcca aagcccaagg acaccctgat gatctcccgg	780
accctgaag tgacctgcgt ggtggtggcc gtgtcccacg aggatcctga agtgaagttc	840
aattggtacg tggacggcgt ggaggtgcac aacgccaaga ccaagcctcg ggaggaacag	900
tacaactcca cctaccgggt ggtgtccgtg ctgacctgc tgcaccagga ctggctgaac	960
ggcaaagagt acaagtgcaa agtctccaac aaggccctgg ccgcccctat cgaaaagaca	1020
atctccaagg ccaagggcca gcctagggaa cccaggtgt acaccctgcc acccagccgg	1080
gaggaaatga ccaagaacca ggtgtccctg acctgtctgg tcaagggctt ctacccttcc	1140
gatatcgccg tggagtggga gtctaacggc cagcctgaga acaactacaa gaccaccctt	1200
cctgtgctgg actccgacgg ctccctcttc ctgtactcca aactgacctg ggacaagtcc	1260
cggcggcagc agggcaacgt gttctcctgc tccgtgatgc acgaggccct gcacaaccac	1320
tacaccaga agtccctgtc cctgtctccc ggcaag	1356

<210> 33

<211> 13

<212> PRT

<213> Artificial Sequence

<220>

<221> source

<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 33

Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn Asp Val Ser
1 5 10

<210> 34

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<221> source

<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 34

Lys Asn Tyr Asn Arg Pro Ser
1 5

<210> 35

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<221> source

<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 35

Ser Ala Trp Asp Gln Arg Gln Phe Asp Val Val
1 5 10

<210> 36

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<221> source

<223> /note="Description of Artificial Sequence: Synthetic
peptide"

<400> 36

Ser Ser Ser Asn Ile Gly Ser Asn Asp
1 5

<210> 37

<211> 3

<212> PRT

<213> Artificial Sequence

<220>

<221> source
<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 37
Lys Asn Tyr
1

<210> 38
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 38
Trp Asp Gln Arg Gln Phe Asp Val
1 5

<210> 39
<211> 110
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 39
Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
1 5 10 15

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn
20 25 30

Asp Val Ser Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu
35 40 45

Ile Tyr Lys Asn Tyr Asn Arg Pro Ser Gly Val Pro Asp Arg Phe Ser
50 55 60

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Gln
65 70 75 80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Ser Ala Trp Asp Gln Arg Gln
85 90 95

Phe Asp Val Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu
100 105 110

<210> 40
<211> 330
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polynucleotide"

<400> 40
cagtcagtcc tgactcagcc ccctagcgct agtggcaccc ctggtcaaag agtgactatt 60
agctgtagcg gctctagctc taatatcggc tctaacgacg tcagctggta tcagcagctg 120
cccggcaccg cccctaagct gctgatctat aagaactata ataggcctag cggcgtgccc 180
gataggttta gcggatctaa atcagggact tctgctagtc tggctattag cggcctgcag 240
tcagaggacg aggccgacta ctactgtagc gcctgggatc agcgtcagtt cgacgtggtg 300
ttcggcggag gcactaagct gaccgtgctg 330

<210> 41
<211> 216
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic
polypeptide"

<400> 41
Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
1 5 10 15

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn
20 25 30

Asp Val Ser Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu
35 40 45

Ile Tyr Lys Asn Tyr Asn Arg Pro Ser Gly Val Pro Asp Arg Phe Ser
50 55 60

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Gln
65 70 75 80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Ser Ala Trp Asp Gln Arg Gln
85 90 95

Phe Asp Val Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly Gln
100 105 110

Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu
115 120 125

Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr
130 135 140

Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys
145 150 155 160

Ala Gly Val Glu Thr Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr
165 170 175

Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His
180 185 190

Arg Ser Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val Glu Lys
195 200 205

Thr Val Ala Pro Thr Glu Cys Ser
210 215

<210> 42

<211> 648

<212> DNA

<213> Artificial Sequence

<220>

<221> source

<223> /note="Description of Artificial Sequence: Synthetic
polynucleotide"

<400> 42

cagtcagtcc tgactcagcc ccctagcgct agtggcaccc ctggtcaaag agtgactatt	60
agctgtagcg gctctagctc taatatcggc tctaacgacg tcagctggta tcagcagctg	120
cccggcaccg cccctaagct gctgatctat aagaactata ataggcctag cggcgtgccc	180
gataggttta gcggatctaa atcagggact tctgctagtc tggctattag cggcctgcag	240
tcagaggacg aggccgacta ctactgtagc gcctgggatc agcgtcagtt cgacgtggtg	300
ttcggcggag gcactaagct gaccgtgctg ggtcaaccta aggctgcccc cagcgtgacc	360
ctgttcccc ccagcagcga ggagctgcag gccacaagg ccaccctggt gtgcctgata	420
agcgacttct acccaggcgc cgtgaccgtg gcctggaagg ccgacagcag ccccgtaag	480
gccggcgtgg agaccaccac cccagcaag cagagcaaca acaagtacgc cgccagcagc	540
tacctgagcc tgacccccga gcagtggaag agccacaggt cctacagctg ccaggtgacc	600
cacgagggca gcaccgtgga aaagaccgtg gcccacaccg agtcagc	648

<210> 43
 <211> 8
 <212> PRT
 <213> Artificial Sequence

<220>
 <221> source
 <223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 43
 Gly Phe Thr Phe Ser Thr Ala Ala
 1 5

<210> 44
 <211> 8
 <212> PRT
 <213> Artificial Sequence

<220>
 <221> source
 <223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 44
 Ile Ser Gly Ser Gly Ser Ser Thr
 1 5

<210> 45
 <211> 15

<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 45
Ala Arg Glu Leu Ser Tyr Leu Tyr Ser Gly Tyr Tyr Phe Asp Tyr
1 5 10 15

<210> 46
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 46
Gly Phe Thr Phe Ser Thr Ala Ala Met Ser
1 5 10

<210> 47
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 47
Ser Ser Asn Ile Gly Ser Asn Asp
1 5

<210> 48
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<221> source
<223> /note="Description of Artificial Sequence: Synthetic 6xHis tag"

<400> 48
His His His His His His

1

5

<210> 49

<211> 4

<212> PRT

<213> Artificial Sequence

<220>

<221> source

<223> /note="Description of Artificial Sequence: Synthetic peptide"

<400> 49

Met Gly Ser Ser

1

<210> 50

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<221> source

<223> /note="Description of Artificial Sequence: Synthetic 8xHis tag"

<400> 50

His His His His His His His His

1

5

<210> 51

<211> 238

<212> PRT

<213> Artificial Sequence

<220>

<221> source

<223> /note="Description of Artificial Sequence: Synthetic polypeptide"

<400> 51

Ile Val Gly Gly Thr Ala Ser Val Arg Gly Glu Trp Pro Trp Gln Val

1

5

10

15

Thr Leu His Thr Thr Ser Pro Thr Gln Arg His Leu Cys Gly Gly Ser

20

25

30

Ile Ile Gly Asn Gln Trp Ile Leu Thr Ala Ala His Cys Phe Tyr Gly

35

40

45

Val Glu Ser Pro Lys Ile Leu Arg Val Tyr Ser Gly Ile Leu Asn Gln
50 55 60

Ser Glu Ile Lys Glu Asp Thr Ser Phe Phe Gly Val Gln Glu Ile Ile
65 70 75 80

Ile His Asp Gln Tyr Lys Met Ala Glu Ser Gly Tyr Asp Ile Ala Leu
85 90 95

Leu Lys Leu Glu Thr Thr Val Asn Tyr Thr Asp Ser Gln Arg Pro Ile
100 105 110

Cys Leu Pro Ser Lys Gly Asp Arg Asn Val Ile Tyr Thr Asp Cys Trp
115 120 125

Val Thr Gly Trp Gly Tyr Arg Lys Leu Arg Asp Lys Ile Gln Asn Thr
130 135 140

Leu Gln Lys Ala Lys Ile Pro Leu Val Thr Asn Glu Glu Cys Gln Lys
145 150 155 160

Arg Tyr Arg Gly His Lys Ile Thr His Lys Met Ile Cys Ala Gly Tyr
165 170 175

Arg Glu Gly Gly Lys Asp Ala Cys Lys Gly Asp Ser Gly Gly Pro Leu
180 185 190

Ser Cys Lys His Asn Glu Val Trp His Leu Val Gly Ile Thr Ser Trp
195 200 205

Gly Glu Gly Cys Ala Gln Arg Glu Arg Pro Gly Val Tyr Thr Asn Val
210 215 220

Val Glu Tyr Val Asp Trp Ile Leu Glu Lys Thr Gln Ala Val
225 230 235