SEQUENCE LISTING

<110> Syngenta
Li, Jiang
Xu, Jianping

<120> METHODS AND COMPOSITIONS FOR DNA BASE EDITING

<130> Attorney Docket Number 81945

<160> 92

<170> PatentIn version 3.5

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Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val Glu Val
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Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr
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Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys
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Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg

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Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg
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Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys
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Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile
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cacgtcgagg tgaacttcat cgagaagttc accacggaga ggtacttctg cccgaacacg      240

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Val Lys Val Ile Leu Asp Asp Tyr His Arg Asp Phe Ile Ala Asp Met
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Met Gly Glu Val Lys Leu Thr Lys Leu Ala Glu Phe Tyr Asp Val Tyr
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Leu Lys Phe Arg Lys Asn Pro Lys Asp Asp Gly Leu Gln Lys Gln Leu
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Lys Asp Leu Gln Ala Val Leu Arg Lys Glu Ser Val Lys Pro Ile Gly
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Ser Gly Gly Lys Tyr Lys Thr Gly Tyr Asp Arg Leu Phe Gly Ala Lys
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Ala Gln Glu Gly Glu Ser Ser Pro Lys Leu Ala His Leu Ala His Phe
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Glu Lys Phe Ser Thr Tyr Phe Thr Gly Phe His Asp Asn Arg Lys Asn
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Met Tyr Ser Asp Glu Asp Lys His Thr Ala Ile Ala Tyr Arg Leu Ile
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His Glu Asn Leu Pro Arg Phe Ile Asp Asn Leu Gln Ile Leu Thr Thr
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Ile Lys Gln Lys His Ser Ala Leu Tyr Asp Gln Ile Ile Asn Glu Leu
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Thr Ala Ser Gly Leu Asp Val Ser Leu Ala Ser His Leu Asp Gly Tyr
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His Lys Leu Leu Thr Gln Glu Gly Ile Thr Ala Tyr Asn Arg Ile Ile
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Ser Glu Arg Ile Ala Lys Leu Arg Pro Leu His Lys Gln Ile Leu Ser
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Asp Gly Ile Tyr Val Glu His Lys Asn Leu Asn Glu Leu Ser Lys Gln
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Ala Phe Gly Asp Phe Ala Leu Leu Gly Arg Val Leu Asp Gly Tyr Tyr
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Val Asp Val Val Asn Pro Glu Phe Asn Glu Arg Phe Ala Lys Ala Lys
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Thr Asp Asn Ala Lys Ala Lys Leu Thr Lys Glu Lys Asp Lys Phe Ile
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Lys Gly Val His Ser Leu Ala Ser Leu Glu Gln Ala Ile Glu His His
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Thr Ala Arg His Asp Asp Glu Ser Val Gln Ala Gly Lys Leu Gly Gln
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Tyr Phe Lys His Gly Leu Ala Gly Val Asp Asn Pro Ile Gln Lys Ile
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His Asn Asn His Ser Thr Ile Lys Gly Phe Leu Glu Arg Glu Arg Pro
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Ala Gly Glu Arg Ala Leu Pro Lys Ile Lys Ser Gly Lys Asn Pro Glu
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Met Thr Gln Leu Arg Gln Leu Lys Glu Leu Leu Asp Asn Ala Leu Asn
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Val Ala His Phe Ala Lys Leu Leu Thr Thr Lys Thr Thr Leu Asp Asn
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Lys Pro Phe Ser Thr Glu Lys Tyr Lys Leu Asn Phe Gly Asn Pro Thr
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Leu Leu Asn Gly Trp Asp Leu Asn Lys Glu Lys Asp Asn Phe Gly Val
                565                 570                 575

Ile Leu Gln Lys Asp Gly Cys Tyr Tyr Leu Ala Leu Leu Asp Lys Ala
            580                 585                 590

His Lys Lys Val Phe Asp Asn Ala Pro Asn Thr Gly Lys Asn Val Tyr
        595                 600                 605

Gln Lys Met Val Tyr Lys Leu Leu Pro Gly Pro Asn Lys Met Leu Pro
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Lys Val Phe Phe Ala Lys Ser Asn Leu Asp Tyr Tyr Asn Pro Ser Ala
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Glu Leu Leu Asp Lys Tyr Ala Lys Gly Thr His Lys Lys Gly Asp Asn
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Phe Asn Leu Lys Asp Cys His Ala Leu Ile Asp Phe Phe Lys Ala Gly
            660                 665                 670

Ile Asn Lys His Pro Glu Trp Gln His Phe Gly Phe Lys Phe Ser Pro
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Gln Gly Tyr Gln Val Lys Phe Val Asp Ile Asn Ala Asp Tyr Ile Asp
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Asp Phe Ser Pro Lys Ala His Gly Lys Pro Asn Leu His Thr Leu Tyr
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Asn Glu Thr Thr Ile His Arg Ala Gly Glu Val Leu Glu Asn Lys Asn
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Pro Asp Asn Pro Lys Lys Arg Gln Phe Val Tyr Asp Ile Ile Lys Asp
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Lys Arg Tyr Thr Gln Asp Lys Phe Met Leu His Val Pro Ile Thr Met
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Asn Phe Gly Val Gln Gly Met Thr Ile Lys Glu Phe Asn Lys Lys Val
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Asn Gln Ser Ile Gln Gln Tyr Asp Glu Val Asn Val Ile Gly Ile Asp
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Arg Gly Glu Arg His Leu Leu Tyr Leu Thr Val Ile Asn Ser Lys Gly
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Glu Ile Leu Glu Gln Arg Ser Leu Asn Asp Ile Thr Thr Ala Ser Ala
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Asn Gly Thr Gln Val Thr Thr Pro Tyr His Lys Ile Leu Asp Lys Arg
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Asn Gln Leu Met Leu Lys Tyr Asn Ala Ile Val Val Leu Glu Asp Leu
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Asn Phe Gly Phe Lys Arg Gly Arg Phe Lys Val Glu Lys Gln Ile Tyr
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Gln Asn Phe Glu Asn Ala Leu Ile Lys Lys Leu Asn His Leu Val Leu
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Lys Asp Lys Ala Asp Asp Glu Ile  Gly Ser Tyr Lys Asn  Ala Leu Gln
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Leu Thr  Asn Asn Phe Thr Asp  Leu Lys Ser Ile Gly  Lys Gln Thr
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Gly Phe  Leu Phe Tyr Val Pro  Ala Trp Asn Thr Ser  Lys Ile Asp
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Tyr Asn  Thr Asp Lys Gly Tyr  Phe Glu Phe His Ile  Asp Tyr Ala
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Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys His Val Glu Val
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Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe Cys Pro Asn Thr
65                  70                  75                  80

Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro Cys Gly Glu Cys
                85                  90                  95

Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro His Val Thr Leu
            100                 105                 110

Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp Pro Arg Asn Arg
        115                 120                 125

Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr Ile Gln Ile Met
    130                 135                 140

Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe Val Asn Tyr Ser
145                 150                 155                 160

Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His Leu Trp Val Arg
                165                 170                 175

Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly Leu Pro Pro Cys
            180                 185                 190

Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr Phe Phe Thr Ile
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Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro His Ile Leu Trp
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```

```
Ala Thr Gly Leu Lys Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly
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Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly
                245                 250                 255


Gly Gly Ser Met Ser Lys Leu Glu Lys Phe Thr Asn Cys Tyr Ser Leu
            260                 265                 270


Ser Lys Thr Leu Arg Phe Lys Ala Ile Pro Val Gly Lys Thr Gln Glu
        275                 280                 285


Asn Ile Asp Asn Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala Glu
    290                 295                 300


Asp Tyr Lys Gly Val Lys Lys Leu Leu Asp Arg Tyr Tyr Leu Ser Phe
305                 310                 315                 320


Ile Asn Asp Val Leu His Ser Ile Lys Leu Lys Asn Leu Asn Asn Tyr
                325                 330                 335


Ile Ser Leu Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn Lys Glu
            340                 345                 350


Leu Glu Asn Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys Ala Phe
        355                 360                 365


Lys Gly Asn Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile Ile Glu
    370                 375                 380


Thr Ile Leu Pro Glu Phe Leu Asp Asp Lys Asp Glu Ile Ala Leu Val
385                 390                 395                 400


Asn Ser Phe Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe Phe Asp Asn
                405                 410                 415


Arg Glu Asn Met Phe Ser Glu Glu Ala Lys Ser Thr Ser Ile Ala Phe
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Arg Cys Ile Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn Met Asp Ile
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Phe Glu Lys Val Asp Ala Ile Phe Asp Lys His Glu Val Gln Glu Ile
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Lys Glu Lys Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp Phe Phe Glu
465                 470                 475                 480

Gly Glu Phe Phe Asn Phe Val Leu Thr Gln Glu Gly Ile Asp Val Tyr
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Asn Ala Ile Ile Gly Gly Phe Val Thr Glu Ser Gly Glu Lys Ile Lys
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Gly Leu Asn Glu Tyr Ile Asn Leu Tyr Asn Gln Lys Thr Lys Gln Lys
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Leu Pro Lys Phe Lys Pro Leu Tyr Lys Gln Val Leu Ser Asp Arg Glu
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Ser Leu Ser Phe Tyr Gly Glu Gly Tyr Thr Ser Asp Glu Glu Val Leu
545                 550                 555                 560

Glu Val Phe Arg Asn Thr Leu Asn Lys Asn Ser Glu Ile Phe Ser Ser
                565                 570                 575

Ile Lys Lys Leu Glu Lys Leu Phe Lys Asn Phe Asp Glu Tyr Ser Ser
            580                 585                 590

Ala Gly Ile Phe Val Lys Asn Gly Pro Ala Ile Ser Thr Ile Ser Lys
        595                 600                 605

Asp Ile Phe Gly Glu Trp Asn Val Ile Arg Asp Lys Trp Asn Ala Glu
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```
Tyr Asp Asp Ile His Leu Lys Lys Lys Ala Val Val Thr Glu Lys Tyr
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Glu Asp Asp Arg Arg Lys Ser Phe Lys Lys Ile Gly Ser Phe Ser Leu
                645                 650                 655


Glu Gln Leu Gln Glu Tyr Ala Asp Ala Asp Leu Ser Val Val Glu Lys
            660                 665                 670


Leu Lys Glu Ile Ile Ile Gln Lys Val Asp Glu Ile Tyr Lys Val Tyr
        675                 680                 685


Gly Ser Ser Glu Lys Leu Phe Asp Ala Asp Phe Val Leu Glu Lys Ser
    690                 695                 700


Leu Lys Lys Asn Asp Ala Val Val Ala Ile Met Lys Asp Leu Leu Asp
705                 710                 715                 720


Ser Val Lys Ser Phe Glu Asn Tyr Ile Lys Ala Phe Phe Gly Glu Gly
                725                 730                 735


Lys Glu Thr Asn Arg Asp Glu Ser Phe Tyr Gly Asp Phe Val Leu Ala
            740                 745                 750


Tyr Asp Ile Leu Leu Lys Val Asp His Ile Tyr Asp Ala Ile Arg Asn
        755                 760                 765


Tyr Val Thr Gln Lys Pro Tyr Ser Lys Asp Lys Phe Lys Leu Tyr Phe
    770                 775                 780


Gln Asn Pro Gln Phe Met Gly Gly Trp Asp Lys Asp Lys Glu Thr Asp
785                 790                 795                 800


Tyr Arg Ala Thr Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr Leu Ala Ile
                805                 810                 815


Met Asp Lys Lys Tyr Ala Lys Cys Leu Gln Lys Ile Asp Lys Asp Asp
            820                 825                 830
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Val Asn Gly Asn Tyr Glu Lys Ile Asn Tyr Lys Leu Leu Pro Gly Pro
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Asn Lys Met Leu Pro Lys Val Phe Phe Ser Lys Lys Trp Met Ala Tyr
    850                 855                 860

Tyr Asn Pro Ser Glu Asp Ile Gln Lys Ile Tyr Lys Asn Gly Thr Phe
865                 870                 875                 880

Lys Lys Gly Asp Met Phe Asn Leu Asn Asp Cys His Lys Leu Ile Asp
                885                 890                 895

Phe Phe Lys Asp Ser Ile Ser Arg Tyr Pro Lys Trp Ser Asn Ala Tyr
            900                 905                 910

Asp Phe Asn Phe Ser Glu Thr Glu Lys Tyr Lys Asp Ile Ala Gly Phe
        915                 920                 925

Tyr Arg Glu Val Glu Glu Gln Gly Tyr Lys Val Ser Phe Glu Ser Ala
    930                 935                 940

Ser Lys Lys Glu Val Asp Lys Leu Val Glu Glu Gly Lys Leu Tyr Met
945                 950                 955                 960

Phe Gln Ile Tyr Asn Lys Asp Phe Ser Asp Lys Ser His Gly Thr Pro
                965                 970                 975

Asn Leu His Thr Met Tyr Phe Lys Leu Leu Phe Asp Glu Asn Asn His
            980                 985                 990

Gly Gln Ile Arg Leu Ser Gly Gly  Ala Glu Leu Phe Met  Arg Arg Ala
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Ser Leu  Lys Lys Glu Glu Leu  Val Val His Pro Ala  Asn Ser Pro
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Ile Ala  Asn Lys Asn Pro Asp  Asn Pro Lys Lys Thr  Thr Thr Leu
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Ser Tyr  Asp Val Tyr Lys Asp  Lys Arg Phe Ser Glu  Asp Gln Tyr
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Glu Leu  His Ile Pro Ile Ala  Ile Asn Lys Cys Pro  Lys Asn Ile
    1055                1060                1065

Phe Lys  Ile Asn Thr Glu Val  Arg Val Leu Leu Lys  His Asp Asp
    1070                1075                1080

Asn Pro  Tyr Val Ile Gly Ile  Ala Arg Gly Glu Arg  Asn Leu Leu
    1085                1090                1095

Tyr Ile  Val Val Val Asp Gly  Lys Gly Asn Ile Val  Glu Gln Tyr
    1100                1105                1110

Ser Leu  Asn Glu Ile Ile Asn  Asn Phe Asn Gly Ile  Arg Ile Lys
    1115                1120                1125

Thr Asp  Tyr His Ser Leu Leu  Asp Lys Lys Glu Lys  Glu Arg Phe
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Glu Ala  Arg Gln Asn Trp Thr  Ser Ile Glu Asn Ile  Lys Glu Leu
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Lys Ala  Gly Tyr Ile Ser Gln  Val Val His Lys Ile  Cys Glu Leu
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Val Glu  Lys Tyr Asp Ala Val  Ile Ala Leu Ala Asp  Leu Asn Ser
    1175                1180                1185

Gly Phe  Lys Asn Ser Arg Val  Lys Val Glu Lys Gln  Val Tyr Gln
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Lys Phe  Glu Lys Met Leu Ile  Asp Lys Leu Asn Tyr  Met Val Asp
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Lys Lys  Ser Asn Pro Cys Ala  Thr Gly Gly Ala Leu  Lys Gly Tyr
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Gln Ile  Thr Asn Lys Phe Glu  Ser Phe Lys Ser Met  Ser Thr Gln
    1235                1240                1245

Asn Gly  Phe Ile Phe Tyr Ile  Pro Ala Trp Leu Thr  Ser Lys Ile
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Asp Pro  Ser Thr Gly Phe Val  Asn Leu Leu Lys Thr  Lys Tyr Thr
    1265                1270                1275

Ser Ile  Ala Asp Ser Lys Lys  Phe Ile Ser Ser Phe  Asp Arg Ile
    1280                1285                1290

Met Tyr  Val Pro Glu Glu Asp  Leu Phe Glu Phe Ala  Leu Asp Tyr
    1295                1300                1305

Lys Asn  Phe Ser Arg Thr Asp  Ala Asp Tyr Ile Lys  Lys Trp Lys
    1310                1315                1320

Leu Tyr  Ser Tyr Gly Asn Arg  Ile Arg Ile Phe Arg  Asn Pro Lys
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Lys Asn  Asn Val Phe Asp Trp  Glu Glu Val Cys Leu  Thr Ser Ala
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Tyr Lys  Glu Leu Phe Asn Lys  Tyr Gly Ile Asn Tyr  Gln Gln Gly
    1355                1360                1365

Asp Ile  Arg Ala Leu Leu Cys  Glu Gln Ser Asp Lys  Ala Phe Tyr
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Ser Ser  Phe Met Ala Leu Met  Ser Leu Met Leu Gln  Met Arg Asn
    1385                1390                1395
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Ser Ile  Thr Gly Arg Thr Asp  Val Ala Phe Leu Ile  Ser Pro Val
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Lys Asn  Ser Asp Gly Ile Phe  Tyr Asp Ser Arg Asn  Tyr Glu Ala
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Gln Glu  Asn Ala Ile Leu Pro  Lys Asn Ala Asp Ala  Asn Gly Ala
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Tyr Asn  Ile Ala Arg Lys Val  Leu Trp Ala Ile Gly
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Gly Asn Lys Pro Glu Ser Asp Ile Leu Val His Thr Ala Tyr Asp Glu
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Ser Thr Asp Glu Asn Val Met Leu Leu Thr Ser Asp Ala Pro Glu Tyr
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ttaagcatgt aataattaac atgtaatgca tgacgttatt tatgagatgg gtttttatga 6780

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<210> 10
<211> 90
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<220>
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ggcgggggcg gcagcggggg cggcgggtcg 90

<210> 11
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<213> Artificial Sequence

<220>
<223> Synthetic

<400> 11

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly
1 5 10 15

Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
20 25 30

<210> 12
<211> 18
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 12

Gly Gly Ser Thr Gly Gly Gly Ser Gly Gly Gly Ser Gly Gly Gly Ser

1 5 10 15

Ser Gly

<210> 13
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
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<400> 13

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
1 5 10 15

<210> 14
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cgcaaggaga cctgcctcct gtacgagatc aactggggcg gcaggcactc catctggagg 180

cacacgagcc agaacaccaa caagcacgtc gaggtgaact tcatcgagaa gttcaccacg 240

gagaggtact tctgcccgaa cacgcgctgc tccatcacgt ggttcctctc gtggagccca 300

tgcggcgagt gctccagggc gatcacggag ttcctcagcc gctacccgca cgtgaccctg 360

ttcatctaca tcgctaggct ctaccaccac gcggacccca ggaacaggca gggcctcagg 420

gacctgatct ccagcggcgt cacgatccag atcatgaccg agcaggagtc cggctactgc 480

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tgccactacc agaggctccc gccccacatc ctgtgggcga ccgggctcaa gtcgggcagc 720

gagacccccg gcacctccga gtcggctacc ccagagtcca tgagcaagct ggagaagttc 780

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gagaaggaga acaaggagct cgagaacctg gagatcaacc tgaggaagga gatcgccaag 1080

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<210> 15
<211> 1613
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 15

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Ala Val Asp Pro Thr Leu Arg Arg Arg Ile Glu Pro His Glu Phe Glu
            20                  25                  30

Val Phe Phe Asp Pro Arg Glu Leu Arg Lys Glu Thr Cys Leu Leu Tyr
        35                  40                  45

Glu Ile Asn Trp Gly Gly Arg His Ser Ile Trp Arg His Thr Ser Gln
    50                  55                  60

Asn Thr Asn Lys His Val Glu Val Asn Phe Ile Glu Lys Phe Thr Thr
65                  70                  75                  80

Glu Arg Tyr Phe Cys Pro Asn Thr Arg Cys Ser Ile Thr Trp Phe Leu
                85                  90                  95

Ser Trp Ser Pro Cys Gly Glu Cys Ser Arg Ala Ile Thr Glu Phe Leu
            100                 105                 110

Ser Arg Tyr Pro His Val Thr Leu Phe Ile Tyr Ile Ala Arg Leu Tyr
        115                 120                 125

His His Ala Asp Pro Arg Asn Arg Gln Gly Leu Arg Asp Leu Ile Ser
    130                 135                 140

Ser Gly Val Thr Ile Gln Ile Met Thr Glu Gln Glu Ser Gly Tyr Cys
145                 150                 155                 160

Trp Arg Asn Phe Val Asn Tyr Ser Pro Ser Asn Glu Ala His Trp Pro
                165                 170                 175

Arg Tyr Pro His Leu Trp Val Arg Leu Tyr Val Leu Glu Leu Tyr Cys
            180                 185                 190
```

```
Ile Ile Leu Gly Leu Pro Pro Cys Leu Asn Ile Leu Arg Arg Lys Gln
        195                 200                 205

Pro Gln Leu Thr Phe Phe Thr Ile Ala Leu Gln Ser Cys His Tyr Gln
    210                 215                 220

Arg Leu Pro Pro His Ile Leu Trp Ala Thr Gly Leu Lys Ser Gly Ser
225                 230                 235                 240

Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser Met Ser Lys
                245                 250                 255

Leu Glu Lys Phe Thr Asn Cys Tyr Ser Leu Ser Lys Thr Leu Arg Phe
            260                 265                 270

Lys Ala Ile Pro Val Gly Lys Thr Gln Glu Asn Ile Asp Asn Lys Arg
        275                 280                 285

Leu Leu Val Glu Asp Glu Lys Arg Ala Glu Asp Tyr Lys Gly Val Lys
    290                 295                 300

Lys Leu Leu Asp Arg Tyr Tyr Leu Ser Phe Ile Asn Asp Val Leu His
305                 310                 315                 320

Ser Ile Lys Leu Lys Asn Leu Asn Asn Tyr Ile Ser Leu Phe Arg Lys
                325                 330                 335

Lys Thr Arg Thr Glu Lys Glu Asn Lys Glu Leu Glu Asn Leu Glu Ile
            340                 345                 350

Asn Leu Arg Lys Glu Ile Ala Lys Ala Phe Lys Gly Asn Glu Gly Tyr
        355                 360                 365

Lys Ser Leu Phe Lys Lys Asp Ile Ile Glu Thr Ile Leu Pro Glu Phe
    370                 375                 380

Leu Asp Asp Lys Asp Glu Ile Ala Leu Val Asn Ser Phe Asn Gly Phe
```

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385                 390                 395                 400

Thr Thr Ala Phe Thr Gly Phe Phe Asp Asn Arg Glu Asn Met Phe Ser
                405                 410                 415

Glu Glu Ala Lys Ser Thr Ser Ile Ala Phe Arg Cys Ile Asn Glu Asn
            420                 425                 430

Leu Thr Arg Tyr Ile Ser Asn Met Asp Ile Phe Glu Lys Val Asp Ala
        435                 440                 445

Ile Phe Asp Lys His Glu Val Gln Glu Ile Lys Glu Lys Ile Leu Asn
    450                 455                 460

Ser Asp Tyr Asp Val Glu Asp Phe Phe Glu Gly Glu Phe Phe Asn Phe
465                 470                 475                 480

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

Phe Val Thr Glu Ser Gly Glu Lys Ile Lys Gly Leu Asn Glu Tyr Ile
            500                 505                 510

Asn Leu Tyr Asn Gln Lys Thr Lys Gln Lys Leu Pro Lys Phe Lys Pro
        515                 520                 525

Leu Tyr Lys Gln Val Leu Ser Asp Arg Glu Ser Leu Ser Phe Tyr Gly
    530                 535                 540

Glu Gly Tyr Thr Ser Asp Glu Glu Val Leu Glu Val Phe Arg Asn Thr
545                 550                 555                 560

Leu Asn Lys Asn Ser Glu Ile Phe Ser Ser Ile Lys Lys Leu Glu Lys
                565                 570                 575

Leu Phe Lys Asn Phe Asp Glu Tyr Ser Ser Ala Gly Ile Phe Val Lys
            580                 585                 590
```

```
Asn Gly Pro Ala Ile Ser Thr Ile Ser Lys Asp Ile Phe Gly Glu Trp
        595                 600                 605

Asn Val Ile Arg Asp Lys Trp Asn Ala Glu Tyr Asp Asp Ile His Leu
    610                 615                 620

Lys Lys Lys Ala Val Val Thr Glu Lys Tyr Glu Asp Asp Arg Arg Lys
625                 630                 635                 640

Ser Phe Lys Lys Ile Gly Ser Phe Ser Leu Glu Gln Leu Gln Glu Tyr
                645                 650                 655

Ala Asp Ala Asp Leu Ser Val Val Glu Lys Leu Lys Glu Ile Ile Ile
            660                 665                 670

Gln Lys Val Asp Glu Ile Tyr Lys Val Tyr Gly Ser Ser Glu Lys Leu
        675                 680                 685

Phe Asp Ala Asp Phe Val Leu Glu Lys Ser Leu Lys Lys Asn Asp Ala
    690                 695                 700

Val Val Ala Ile Met Lys Asp Leu Leu Asp Ser Val Lys Ser Phe Glu
705                 710                 715                 720

Asn Tyr Ile Lys Ala Phe Phe Gly Glu Gly Lys Glu Thr Asn Arg Asp
                725                 730                 735

Glu Ser Phe Tyr Gly Asp Phe Val Leu Ala Tyr Asp Ile Leu Leu Lys
            740                 745                 750

Val Asp His Ile Tyr Asp Ala Ile Arg Asn Tyr Val Thr Gln Lys Pro
        755                 760                 765

Tyr Ser Lys Asp Lys Phe Lys Leu Tyr Phe Gln Asn Pro Gln Phe Met
    770                 775                 780

Gly Gly Trp Asp Lys Asp Lys Glu Thr Asp Tyr Arg Ala Thr Ile Leu
```

785 790 795 800

Arg Tyr Gly Ser Lys Tyr Tyr Leu Ala Ile Met Asp Lys Lys Tyr Ala
805 810 815

Lys Cys Leu Gln Lys Ile Asp Lys Asp Asp Val Asn Gly Asn Tyr Glu
820 825 830

Lys Ile Asn Tyr Lys Leu Leu Pro Gly Pro Asn Lys Met Leu Pro Lys
835 840 845

Val Phe Phe Ser Lys Lys Trp Met Ala Tyr Tyr Asn Pro Ser Glu Asp
850 855 860

Ile Gln Lys Ile Tyr Lys Asn Gly Thr Phe Lys Lys Gly Asp Met Phe
865 870 875 880

Asn Leu Asn Asp Cys His Lys Leu Ile Asp Phe Phe Lys Asp Ser Ile
885 890 895

Ser Arg Tyr Pro Lys Trp Ser Asn Ala Tyr Asp Phe Asn Phe Ser Glu
900 905 910

Thr Glu Lys Tyr Lys Asp Ile Ala Gly Phe Tyr Arg Glu Val Glu Glu
915 920 925

Gln Gly Tyr Lys Val Ser Phe Glu Ser Ala Ser Lys Lys Glu Val Asp
930 935 940

Lys Leu Val Glu Glu Gly Lys Leu Tyr Met Phe Gln Ile Tyr Asn Lys
945 950 955 960

Asp Phe Ser Asp Lys Ser His Gly Thr Pro Asn Leu His Thr Met Tyr
965 970 975

Phe Lys Leu Leu Phe Asp Glu Asn Asn His Gly Gln Ile Arg Leu Ser
980 985 990

```
Gly Gly Ala Glu Leu Phe Met Arg  Arg Ala Ser Leu Lys  Lys Glu Glu
        995                 1000                1005


Leu Val  Val His Pro Ala Asn  Ser Pro Ile Ala Asn  Lys Asn Pro
    1010                1015                1020


Asp Asn  Pro Lys Lys Thr Thr  Thr Leu Ser Tyr Asp  Val Tyr Lys
    1025                1030                1035


Asp Lys  Arg Phe Ser Glu Asp  Gln Tyr Glu Leu His  Ile Pro Ile
    1040                1045                1050


Ala Ile  Asn Lys Cys Pro Lys  Asn Ile Phe Lys Ile  Asn Thr Glu
    1055                1060                1065


Val Arg  Val Leu Leu Lys His  Asp Asp Asn Pro Tyr  Val Ile Gly
    1070                1075                1080


Ile Ala  Arg Gly Glu Arg Asn  Leu Leu Tyr Ile Val  Val Val Asp
    1085                1090                1095


Gly Lys  Gly Asn Ile Val Glu  Gln Tyr Ser Leu Asn  Glu Ile Ile
    1100                1105                1110


Asn Asn  Phe Asn Gly Ile Arg  Ile Lys Thr Asp Tyr  His Ser Leu
    1115                1120                1125


Leu Asp  Lys Lys Glu Lys Glu  Arg Phe Glu Ala Arg  Gln Asn Trp
    1130                1135                1140


Thr Ser  Ile Glu Asn Ile Lys  Glu Leu Lys Ala Gly  Tyr Ile Ser
    1145                1150                1155


Gln Val  Val His Lys Ile Cys  Glu Leu Val Glu Lys  Tyr Asp Ala
    1160                1165                1170


Val Ile  Ala Leu Ala Asp Leu  Asn Ser Gly Phe Lys  Asn Ser Arg
```

```
    1175                1180                1185

Val Lys  Val Glu Lys Gln Val  Tyr Gln Lys Phe Glu  Lys Met Leu
    1190                1195                1200

Ile Asp  Lys Leu Asn Tyr Met  Val Asp Lys Lys Ser  Asn Pro Cys
    1205                1210                1215

Ala Thr  Gly Gly Ala Leu Lys  Gly Tyr Gln Ile Thr  Asn Lys Phe
    1220                1225                1230

Glu Ser  Phe Lys Ser Met Ser  Thr Gln Asn Gly Phe  Ile Phe Tyr
    1235                1240                1245

Ile Pro  Ala Trp Leu Thr Ser  Lys Ile Asp Pro Ser  Thr Gly Phe
    1250                1255                1260

Val Asn  Leu Leu Lys Thr Lys  Tyr Thr Ser Ile Ala  Asp Ser Lys
    1265                1270                1275

Lys Phe  Ile Ser Ser Phe Asp  Arg Ile Met Tyr Val  Pro Glu Glu
    1280                1285                1290

Asp Leu  Phe Glu Phe Ala Leu  Asp Tyr Lys Asn Phe  Ser Arg Thr
    1295                1300                1305

Asp Ala  Asp Tyr Ile Lys Lys  Trp Lys Leu Tyr Ser  Tyr Gly Asn
    1310                1315                1320

Arg Ile  Arg Ile Phe Arg Asn  Pro Lys Lys Asn Asn  Val Phe Asp
    1325                1330                1335

Trp Glu  Glu Val Cys Leu Thr  Ser Ala Tyr Lys Glu  Leu Phe Asn
    1340                1345                1350

Lys Tyr  Gly Ile Asn Tyr Gln  Gln Gly Asp Ile Arg  Ala Leu Leu
    1355                1360                1365
```

```
Cys Glu  Gln Ser Asp Lys Ala  Phe Tyr Ser Ser Phe  Met Ala Leu
    1370                1375                1380

Met Ser  Leu Met Leu Gln Met  Arg Asn Ser Ile Thr  Gly Arg Thr
    1385                1390                1395

Asp Val  Ala Phe Leu Ile Ser  Pro Val Lys Asn Ser  Asp Gly Ile
    1400                1405                1410

Phe Tyr  Asp Ser Arg Asn Tyr  Glu Ala Gln Glu Asn  Ala Ile Leu
    1415                1420                1425

Pro Lys  Asn Ala Asp Ala Asn  Gly Ala Tyr Asn Ile  Ala Arg Lys
    1430                1435                1440

Val Leu  Trp Ala Ile Gly Gln  Phe Lys Lys Ala Glu  Asp Glu Lys
    1445                1450                1455

Leu Asp  Lys Val Lys Ile Ala  Ile Ser Asn Lys Glu  Trp Leu Glu
    1460                1465                1470

Tyr Ala  Gln Thr Ser Val Lys  His Gly Ser Pro Lys  Lys Lys Arg
    1475                1480                1485

Lys Val  Gly Gly Ser Thr Gly  Gly Gly Ser Gly Gly  Gly Ser Gly
    1490                1495                1500

Gly Gly  Ser Ser Gly Thr Asn  Leu Ser Asp Ile Ile  Glu Lys Glu
    1505                1510                1515

Thr Gly  Lys Gln Leu Val Ile  Gln Glu Ser Ile Leu  Met Leu Pro
    1520                1525                1530

Glu Glu  Val Glu Glu Val Ile  Gly Asn Lys Pro Glu  Ser Asp Ile
    1535                1540                1545

Leu Val  His Thr Ala Tyr Asp  Glu Ser Thr Asp Glu  Asn Val Met
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```
    1550                1555                1560

Leu Leu  Thr Ser Asp Ala Pro  Glu Tyr Lys Pro Trp  Ala Leu Val
    1565                1570                1575

Ile Gln  Asp Ser Asn Gly Glu  Asn Lys Ile Lys Met  Leu Gly Gly
    1580                1585                1590

Gly Gly  Ser Gly Gly Gly Gly  Ser Gly Gly Gly Gly  Ser Pro Lys
    1595                1600                1605

Lys Lys  Arg Lys Val
    1610
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<210> 16
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cgcaaggaga cctgcctcct gtacgagatc aactggggcg gcaggcactc catctggagg      180

cacacgagcc agaacaccaa caagcacgtc gaggtgaact tcatcgagaa gttcaccacg      240

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Val Phe Phe Asp Pro Arg Glu Leu Arg Lys Glu Thr Cys Leu Leu Tyr
        35                  40                  45


Glu Ile Asn Trp Gly Gly Arg His Ser Ile Trp Arg His Thr Ser Gln
    50                  55                  60


Asn Thr Asn Lys His Val Glu Val Asn Phe Ile Glu Lys Phe Thr Thr
65                  70                  75                  80


Glu Arg Tyr Phe Cys Pro Asn Thr Arg Cys Ser Ile Thr Trp Phe Leu
                85                  90                  95


Ser Trp Ser Pro Cys Gly Glu Cys Ser Arg Ala Ile Thr Glu Phe Leu
            100                 105                 110


Ser Arg Tyr Pro His Val Thr Leu Phe Ile Tyr Ile Ala Arg Leu Tyr
        115                 120                 125


His His Ala Asp Pro Arg Asn Arg Gln Gly Leu Arg Asp Leu Ile Ser
    130                 135                 140


Ser Gly Val Thr Ile Gln Ile Met Thr Glu Gln Glu Ser Gly Tyr Cys
145                 150                 155                 160
```

```
Trp Arg Asn Phe Val Asn Tyr Ser Pro Ser Asn Glu Ala His Trp Pro
                165                 170                 175

Arg Tyr Pro His Leu Trp Val Arg Leu Tyr Val Leu Glu Leu Tyr Cys
            180                 185                 190

Ile Ile Leu Gly Leu Pro Pro Cys Leu Asn Ile Leu Arg Arg Lys Gln
        195                 200                 205

Pro Gln Leu Thr Phe Phe Thr Ile Ala Leu Gln Ser Cys His Tyr Gln
    210                 215                 220

Arg Leu Pro Pro His Ile Leu Trp Ala Thr Gly Leu Lys Gly Gly Gly
225                 230                 235                 240

Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
                245                 250                 255

Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Met Ser Lys Leu Glu
            260                 265                 270

Lys Phe Thr Asn Cys Tyr Ser Leu Ser Lys Thr Leu Arg Phe Lys Ala
        275                 280                 285

Ile Pro Val Gly Lys Thr Gln Glu Asn Ile Asp Asn Lys Arg Leu Leu
    290                 295                 300

Val Glu Asp Glu Lys Arg Ala Glu Asp Tyr Lys Gly Val Lys Lys Leu
305                 310                 315                 320

Leu Asp Arg Tyr Tyr Leu Ser Phe Ile Asn Asp Val Leu His Ser Ile
                325                 330                 335

Lys Leu Lys Asn Leu Asn Asn Tyr Ile Ser Leu Phe Arg Lys Lys Thr
            340                 345                 350

Arg Thr Glu Lys Glu Asn Lys Glu Leu Glu Asn Leu Glu Ile Asn Leu
```

```
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Arg Lys Glu Ile Ala Lys Ala Phe Lys Gly Asn Glu Gly Tyr Lys Ser
    370                 375                 380

Leu Phe Lys Lys Asp Ile Ile Glu Thr Ile Leu Pro Glu Phe Leu Asp
385                 390                 395                 400

Asp Lys Asp Glu Ile Ala Leu Val Asn Ser Phe Asn Gly Phe Thr Thr
                405                 410                 415

Ala Phe Thr Gly Phe Phe Asp Asn Arg Glu Asn Met Phe Ser Glu Glu
            420                 425                 430

Ala Lys Ser Thr Ser Ile Ala Phe Arg Cys Ile Asn Glu Asn Leu Thr
        435                 440                 445

Arg Tyr Ile Ser Asn Met Asp Ile Phe Glu Lys Val Asp Ala Ile Phe
    450                 455                 460

Asp Lys His Glu Val Gln Glu Ile Lys Glu Lys Ile Leu Asn Ser Asp
465                 470                 475                 480

Tyr Asp Val Glu Asp Phe Phe Glu Gly Glu Phe Phe Asn Phe Val Leu
                485                 490                 495

Thr Gln Glu Gly Ile Asp Val Tyr Asn Ala Ile Ile Gly Gly Phe Val
            500                 505                 510

Thr Glu Ser Gly Glu Lys Ile Lys Gly Leu Asn Glu Tyr Ile Asn Leu
        515                 520                 525

Tyr Asn Gln Lys Thr Lys Gln Lys Leu Pro Lys Phe Lys Pro Leu Tyr
    530                 535                 540

Lys Gln Val Leu Ser Asp Arg Glu Ser Leu Ser Phe Tyr Gly Glu Gly
545                 550                 555                 560
```

```
Tyr Thr Ser Asp Glu Glu Val Leu Glu Val Phe Arg Asn Thr Leu Asn
                565                 570                 575

Lys Asn Ser Glu Ile Phe Ser Ser Ile Lys Lys Leu Glu Lys Leu Phe
            580                 585                 590

Lys Asn Phe Asp Glu Tyr Ser Ser Ala Gly Ile Phe Val Lys Asn Gly
        595                 600                 605

Pro Ala Ile Ser Thr Ile Ser Lys Asp Ile Phe Gly Glu Trp Asn Val
    610                 615                 620

Ile Arg Asp Lys Trp Asn Ala Glu Tyr Asp Asp Ile His Leu Lys Lys
625                 630                 635                 640

Lys Ala Val Val Thr Glu Lys Tyr Glu Asp Asp Arg Arg Lys Ser Phe
                645                 650                 655

Lys Lys Ile Gly Ser Phe Ser Leu Glu Gln Leu Gln Glu Tyr Ala Asp
            660                 665                 670

Ala Asp Leu Ser Val Val Glu Lys Leu Lys Glu Ile Ile Ile Gln Lys
        675                 680                 685

Val Asp Glu Ile Tyr Lys Val Tyr Gly Ser Ser Glu Lys Leu Phe Asp
    690                 695                 700

Ala Asp Phe Val Leu Glu Lys Ser Leu Lys Lys Asn Asp Ala Val Val
705                 710                 715                 720

Ala Ile Met Lys Asp Leu Leu Asp Ser Val Lys Ser Phe Glu Asn Tyr
                725                 730                 735

Ile Lys Ala Phe Phe Gly Glu Gly Lys Glu Thr Asn Arg Asp Glu Ser
            740                 745                 750

Phe Tyr Gly Asp Phe Val Leu Ala Tyr Asp Ile Leu Leu Lys Val Asp
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```
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His Ile Tyr Asp Ala Ile Arg Asn Tyr Val Thr Gln Lys Pro Tyr Ser
    770                 775                 780

Lys Asp Lys Phe Lys Leu Tyr Phe Gln Asn Pro Gln Phe Met Gly Gly
785                 790                 795                 800

Trp Asp Lys Asp Lys Glu Thr Asp Tyr Arg Ala Thr Ile Leu Arg Tyr
                805                 810                 815

Gly Ser Lys Tyr Tyr Leu Ala Ile Met Asp Lys Lys Tyr Ala Lys Cys
            820                 825                 830

Leu Gln Lys Ile Asp Lys Asp Asp Val Asn Gly Asn Tyr Glu Lys Ile
        835                 840                 845

Asn Tyr Lys Leu Leu Pro Gly Pro Asn Lys Met Leu Pro Lys Val Phe
    850                 855                 860

Phe Ser Lys Lys Trp Met Ala Tyr Tyr Asn Pro Ser Glu Asp Ile Gln
865                 870                 875                 880

Lys Ile Tyr Lys Asn Gly Thr Phe Lys Lys Gly Asp Met Phe Asn Leu
                885                 890                 895

Asn Asp Cys His Lys Leu Ile Asp Phe Phe Lys Asp Ser Ile Ser Arg
            900                 905                 910

Tyr Pro Lys Trp Ser Asn Ala Tyr Asp Phe Asn Phe Ser Glu Thr Glu
        915                 920                 925

Lys Tyr Lys Asp Ile Ala Gly Phe Tyr Arg Glu Val Glu Glu Gln Gly
    930                 935                 940

Tyr Lys Val Ser Phe Glu Ser Ala Ser Lys Lys Glu Val Asp Lys Leu
945                 950                 955                 960
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Val Glu Glu Gly Lys Leu Tyr Met Phe Gln Ile Tyr Asn Lys Asp Phe
               965                 970                 975

Ser Asp Lys Ser His Gly Thr Pro Asn Leu His Thr Met Tyr Phe Lys
            980                 985                 990

Leu Leu Phe Asp Glu Asn Asn His  Gly Gln Ile Arg Leu  Ser Gly Gly
        995                 1000                1005

Ala Glu  Leu Phe Met Arg Arg  Ala Ser Leu Lys Lys  Glu Glu Leu
    1010                1015                1020

Val Val  His Pro Ala Asn Ser  Pro Ile Ala Asn Lys  Asn Pro Asp
    1025                1030                1035

Asn Pro  Lys Lys Thr Thr Thr  Leu Ser Tyr Asp Val  Tyr Lys Asp
    1040                1045                1050

Lys Arg  Phe Ser Glu Asp Gln  Tyr Glu Leu His Ile  Pro Ile Ala
    1055                1060                1065

Ile Asn  Lys Cys Pro Lys Asn  Ile Phe Lys Ile Asn  Thr Glu Val
    1070                1075                1080

Arg Val  Leu Leu Lys His Asp  Asp Asn Pro Tyr Val  Ile Gly Ile
    1085                1090                1095

Ala Arg  Gly Glu Arg Asn Leu  Leu Tyr Ile Val Val  Val Asp Gly
    1100                1105                1110

Lys Gly  Asn Ile Val Glu Gln  Tyr Ser Leu Asn Glu  Ile Ile Asn
    1115                1120                1125

Asn Phe  Asn Gly Ile Arg Ile  Lys Thr Asp Tyr His  Ser Leu Leu
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Asp Lys  Lys Glu Lys Glu Arg  Phe Glu Ala Arg Gln  Asn Trp Thr
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Ser Ile  Glu Asn Ile Lys Glu  Leu Lys Ala Gly Tyr  Ile Ser Gln
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Val Val  His Lys Ile Cys Glu  Leu Val Glu Lys Tyr  Asp Ala Val
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Ile Ala  Leu Ala Asp Leu Asn  Ser Gly Phe Lys Asn  Ser Arg Val
    1190                1195                1200

Lys Val  Glu Lys Gln Val Tyr  Gln Lys Phe Glu Lys  Met Leu Ile
    1205                1210                1215

Asp Lys  Leu Asn Tyr Met Val  Asp Lys Lys Ser Asn  Pro Cys Ala
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Thr Gly  Gly Ala Leu Lys Gly  Tyr Gln Ile Thr Asn  Lys Phe Glu
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Ser Phe  Lys Ser Met Ser Thr  Gln Asn Gly Phe Ile  Phe Tyr Ile
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Pro Ala  Trp Leu Thr Ser Lys  Ile Asp Pro Ser Thr  Gly Phe Val
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Asn Leu  Leu Lys Thr Lys Tyr  Thr Ser Ile Ala Asp  Ser Lys Lys
    1280                1285                1290

Phe Ile  Ser Ser Phe Asp Arg  Ile Met Tyr Val Pro  Glu Glu Asp
    1295                1300                1305

Leu Phe  Glu Phe Ala Leu Asp  Tyr Lys Asn Phe Ser  Arg Thr Asp
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Ala Asp  Tyr Ile Lys Lys Trp  Lys Leu Tyr Ser Tyr  Gly Asn Arg
    1325                1330                1335
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Ile Arg  Ile Phe Arg Asn Pro  Lys Lys Asn Asn Val  Phe Asp Trp
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Glu Glu  Val Cys Leu Thr Ser  Ala Tyr Lys Glu Leu  Phe Asn Lys
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Tyr Gly  Ile Asn Tyr Gln Gln  Gly Asp Ile Arg Ala  Leu Leu Cys
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Glu Gln  Ser Asp Lys Ala Phe  Tyr Ser Ser Phe Met  Ala Leu Met
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Ser Leu  Met Leu Gln Met Arg  Asn Ser Ile Thr Gly  Arg Thr Asp
    1400                1405                1410

Val Ala  Phe Leu Ile Ser Pro  Val Lys Asn Ser Asp  Gly Ile Phe
    1415                1420                1425

Tyr Asp  Ser Arg Asn Tyr Glu  Ala Gln Glu Asn Ala  Ile Leu Pro
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Lys Asn  Ala Asp Ala Asn Gly  Ala Tyr Asn Ile Ala  Arg Lys Val
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Leu Trp  Ala Ile Gly Gln Phe  Lys Lys Ala Glu Asp  Glu Lys Leu
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Asp Lys  Val Lys Ile Ala Ile  Ser Asn Lys Glu Trp  Leu Glu Tyr
    1475                1480                1485

Ala Gln  Thr Ser Val Lys His  Gly Ser Pro Lys Lys  Lys Arg Lys
    1490                1495                1500

Val Gly  Gly Ser Thr Gly Gly  Gly Ser Gly Gly Gly  Ser Gly Gly
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Gly Ser  Ser Gly Thr Asn Leu  Ser Asp Ile Ile Glu  Lys Glu Thr
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Gly Lys  Gln Leu Val Ile Gln  Glu Ser Ile Leu Met  Leu Pro Glu
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Glu Val  Glu Glu Val Ile Gly  Asn Lys Pro Glu Ser  Asp Ile Leu
    1550                1555                1560

Val His  Thr Ala Tyr Asp Glu  Ser Thr Asp Glu Asn  Val Met Leu
    1565                1570                1575

Leu Thr  Ser Asp Ala Pro Glu  Tyr Lys Pro Trp Ala  Leu Val Ile
    1580                1585                1590

Gln Asp  Ser Asn Gly Glu Asn  Lys Ile Lys Met Leu  Gly Gly Gly
    1595                1600                1605

Gly Ser  Gly Gly Gly Gly Ser  Gly Gly Gly Gly Ser  Thr Asn Leu
    1610                1615                1620

Ser Asp  Ile Ile Glu Lys Glu  Thr Gly Lys Gln Leu  Val Ile Gln
    1625                1630                1635

Glu Ser  Ile Leu Met Leu Pro  Glu Glu Val Glu Glu  Val Ile Gly
    1640                1645                1650

Asn Lys  Pro Glu Ser Asp Ile  Leu Val His Thr Ala  Tyr Asp Glu
    1655                1660                1665

Ser Thr  Asp Glu Asn Val Met  Leu Leu Thr Ser Asp  Ala Pro Glu
    1670                1675                1680

Tyr Lys  Pro Trp Ala Leu Val  Ile Gln Asp Ser Asn  Gly Glu Asn
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Lys Ile  Lys Met Leu Ser Gly  Gly Ser Pro Lys Lys  Lys Arg Lys
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Val Phe Phe Asp Pro Arg Glu Leu Arg Lys Glu Thr Cys Leu Leu Tyr
35 40 45

Glu Ile Asn Trp Gly Gly Arg His Ser Ile Trp Arg His Thr Ser Gln
50 55 60

```
Asn Thr Asn Lys His Val Glu Val Asn Phe Ile Glu Lys Phe Thr Thr
65                  70                  75                  80

Glu Arg Tyr Phe Cys Pro Asn Thr Arg Cys Ser Ile Thr Trp Phe Leu
                85                  90                  95

Ser Trp Ser Pro Cys Gly Glu Cys Ser Arg Ala Ile Thr Glu Phe Leu
            100                 105                 110

Ser Arg Tyr Pro His Val Thr Leu Phe Ile Tyr Ile Ala Arg Leu Tyr
        115                 120                 125

His His Ala Asp Pro Arg Asn Arg Gln Gly Leu Arg Asp Leu Ile Ser
    130                 135                 140

Ser Gly Val Thr Ile Gln Ile Met Thr Glu Gln Glu Ser Gly Tyr Cys
145                 150                 155                 160

Trp Arg Asn Phe Val Asn Tyr Ser Pro Ser Asn Glu Ala His Trp Pro
                165                 170                 175

Arg Tyr Pro His Leu Trp Val Arg Leu Tyr Val Leu Glu Leu Tyr Cys
            180                 185                 190

Ile Ile Leu Gly Leu Pro Pro Cys Leu Asn Ile Leu Arg Arg Lys Gln
        195                 200                 205

Pro Gln Leu Thr Phe Phe Thr Ile Ala Leu Gln Ser Cys His Tyr Gln
    210                 215                 220

Arg Leu Pro Pro His Ile Leu Trp Ala Thr Gly Leu Lys Ser Gly Ser
225                 230                 235                 240

Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser Met Ser Lys
                245                 250                 255

Leu Glu Lys Phe Thr Asn Cys Tyr Ser Leu Ser Lys Thr Leu Arg Phe
```

```
            260                 265                 270

Lys Ala Ile Pro Val Gly Lys Thr Gln Glu Asn Ile Asp Asn Lys Arg
        275                 280                 285

Leu Leu Val Glu Asp Glu Lys Arg Ala Glu Asp Tyr Lys Gly Val Lys
    290                 295                 300

Lys Leu Leu Asp Arg Tyr Tyr Leu Ser Phe Ile Asn Asp Val Leu His
305                 310                 315                 320

Ser Ile Lys Leu Lys Asn Leu Asn Asn Tyr Ile Ser Leu Phe Arg Lys
                325                 330                 335

Lys Thr Arg Thr Glu Lys Glu Asn Lys Glu Leu Glu Asn Leu Glu Ile
            340                 345                 350

Asn Leu Arg Lys Glu Ile Ala Lys Ala Phe Lys Gly Asn Glu Gly Tyr
        355                 360                 365

Lys Ser Leu Phe Lys Lys Asp Ile Ile Glu Thr Ile Leu Pro Glu Phe
    370                 375                 380

Leu Asp Asp Lys Asp Glu Ile Ala Leu Val Asn Ser Phe Asn Gly Phe
385                 390                 395                 400

Thr Thr Ala Phe Thr Gly Phe Phe Asp Asn Arg Glu Asn Met Phe Ser
                405                 410                 415

Glu Glu Ala Lys Ser Thr Ser Ile Ala Phe Arg Cys Ile Asn Glu Asn
            420                 425                 430

Leu Thr Arg Tyr Ile Ser Asn Met Asp Ile Phe Glu Lys Val Asp Ala
        435                 440                 445

Ile Phe Asp Lys His Glu Val Gln Glu Ile Lys Glu Lys Ile Leu Asn
    450                 455                 460
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```
Ser Asp Tyr Asp Val Glu Asp Phe Phe Glu Gly Glu Phe Phe Asn Phe
465                 470                 475                 480


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


Phe Val Thr Glu Ser Gly Glu Lys Ile Lys Gly Leu Asn Glu Tyr Ile
            500                 505                 510


Asn Leu Tyr Asn Gln Lys Thr Lys Gln Lys Leu Pro Lys Phe Lys Pro
        515                 520                 525


Leu Tyr Lys Gln Val Leu Ser Asp Arg Glu Ser Leu Ser Phe Tyr Gly
    530                 535                 540


Glu Gly Tyr Thr Ser Asp Glu Glu Val Leu Glu Val Phe Arg Asn Thr
545                 550                 555                 560


Leu Asn Lys Asn Ser Glu Ile Phe Ser Ser Ile Lys Lys Leu Glu Lys
                565                 570                 575


Leu Phe Lys Asn Phe Asp Glu Tyr Ser Ser Ala Gly Ile Phe Val Lys
            580                 585                 590


Asn Gly Pro Ala Ile Ser Thr Ile Ser Lys Asp Ile Phe Gly Glu Trp
        595                 600                 605


Asn Val Ile Arg Asp Lys Trp Asn Ala Glu Tyr Asp Asp Ile His Leu
    610                 615                 620


Lys Lys Lys Ala Val Val Thr Glu Lys Tyr Glu Asp Asp Arg Arg Lys
625                 630                 635                 640


Ser Phe Lys Lys Ile Gly Ser Phe Ser Leu Glu Gln Leu Gln Glu Tyr
                645                 650                 655


Ala Asp Ala Asp Leu Ser Val Val Glu Lys Leu Lys Glu Ile Ile Ile
```

```
            660                 665                 670

Gln Lys Val Asp Glu Ile Tyr Lys Val Tyr Gly Ser Ser Glu Lys Leu
        675                 680                 685

Phe Asp Ala Asp Phe Val Leu Glu Lys Ser Leu Lys Lys Asn Asp Ala
    690                 695                 700

Val Val Ala Ile Met Lys Asp Leu Leu Asp Ser Val Lys Ser Phe Glu
705                 710                 715                 720

Asn Tyr Ile Lys Ala Phe Phe Gly Glu Gly Lys Glu Thr Asn Arg Asp
                725                 730                 735

Glu Ser Phe Tyr Gly Asp Phe Val Leu Ala Tyr Asp Ile Leu Leu Lys
            740                 745                 750

Val Asp His Ile Tyr Asp Ala Ile Arg Asn Tyr Val Thr Gln Lys Pro
        755                 760                 765

Tyr Ser Lys Asp Lys Phe Lys Leu Tyr Phe Gln Asn Pro Gln Phe Met
    770                 775                 780

Gly Gly Trp Asp Lys Asp Lys Glu Thr Asp Tyr Arg Ala Thr Ile Leu
785                 790                 795                 800

Arg Tyr Gly Ser Lys Tyr Tyr Leu Ala Ile Met Asp Lys Lys Tyr Ala
                805                 810                 815

Lys Cys Leu Gln Lys Ile Asp Lys Asp Asp Val Asn Gly Asn Tyr Glu
            820                 825                 830

Lys Ile Asn Tyr Lys Leu Leu Pro Gly Pro Asn Lys Met Leu Pro Lys
        835                 840                 845

Val Phe Phe Ser Lys Lys Trp Met Ala Tyr Tyr Asn Pro Ser Glu Asp
    850                 855                 860
```

```
Ile Gln Lys Ile Tyr Lys Asn Gly Thr Phe Lys Lys Gly Asp Met Phe
865                 870                 875                 880


Asn Leu Asn Asp Cys His Lys Leu Ile Asp Phe Phe Lys Asp Ser Ile
                885                 890                 895


Ser Arg Tyr Pro Lys Trp Ser Asn Ala Tyr Asp Phe Asn Phe Ser Glu
            900                 905                 910


Thr Glu Lys Tyr Lys Asp Ile Ala Gly Phe Tyr Arg Glu Val Glu Glu
        915                 920                 925


Gln Gly Tyr Lys Val Ser Phe Glu Ser Ala Ser Lys Lys Glu Val Asp
    930                 935                 940


Lys Leu Val Glu Glu Gly Lys Leu Tyr Met Phe Gln Ile Tyr Asn Lys
945                 950                 955                 960


Asp Phe Ser Asp Lys Ser His Gly Thr Pro Asn Leu His Thr Met Tyr
                965                 970                 975


Phe Lys Leu Leu Phe Asp Glu Asn Asn His Gly Gln Ile Arg Leu Ser
            980                 985                 990


Gly Gly Ala Glu Leu Phe Met Arg  Arg Ala Ser Leu Lys  Lys Glu Glu
        995                 1000                1005


Leu Val  Val His Pro Ala Asn  Ser Pro Ile Ala Asn  Lys Asn Pro
    1010                1015                1020


Asp Asn  Pro Lys Lys Thr Thr  Thr Leu Ser Tyr Asp  Val Tyr Lys
    1025                1030                1035


Asp Lys  Arg Phe Ser Glu Asp  Gln Tyr Glu Leu His  Ile Pro Ile
    1040                1045                1050


Ala Ile  Asn Lys Cys Pro Lys  Asn Ile Phe Lys Ile  Asn Thr Glu
```

```
    1055                1060                1065

Val Arg  Val Leu Leu Lys His  Asp Asp Asn Pro Tyr  Val Ile Gly
    1070                1075                1080

Ile Ala  Arg Gly Glu Arg Asn  Leu Leu Tyr Ile Val  Val Val Asp
    1085                1090                1095

Gly Lys  Gly Asn Ile Val Glu  Gln Tyr Ser Leu Asn  Glu Ile Ile
    1100                1105                1110

Asn Asn  Phe Asn Gly Ile Arg  Ile Lys Thr Asp Tyr  His Ser Leu
    1115                1120                1125

Leu Asp  Lys Lys Glu Lys Glu  Arg Phe Glu Ala Arg  Gln Asn Trp
    1130                1135                1140

Thr Ser  Ile Glu Asn Ile Lys  Glu Leu Lys Ala Gly  Tyr Ile Ser
    1145                1150                1155

Gln Val  Val His Lys Ile Cys  Glu Leu Val Glu Lys  Tyr Asp Ala
    1160                1165                1170

Val Ile  Ala Leu Ala Asp Leu  Asn Ser Gly Phe Lys  Asn Ser Arg
    1175                1180                1185

Val Lys  Val Glu Lys Gln Val  Tyr Gln Lys Phe Glu  Lys Met Leu
    1190                1195                1200

Ile Asp  Lys Leu Asn Tyr Met  Val Asp Lys Lys Ser  Asn Pro Cys
    1205                1210                1215

Ala Thr  Gly Gly Ala Leu Lys  Gly Tyr Gln Ile Thr  Asn Lys Phe
    1220                1225                1230

Glu Ser  Phe Lys Ser Met Ser  Thr Gln Asn Gly Phe  Ile Phe Tyr
    1235                1240                1245
```

```
Ile Pro  Ala Trp Leu Thr Ser  Lys Ile Asp Pro Ser  Thr Gly Phe
    1250                1255                1260

Val Asn  Leu Leu Lys Thr Lys  Tyr Thr Ser Ile Ala  Asp Ser Lys
    1265                1270                1275

Lys Phe  Ile Ser Ser Phe Asp  Arg Ile Met Tyr Val  Pro Glu Glu
    1280                1285                1290

Asp Leu  Phe Glu Phe Ala Leu  Asp Tyr Lys Asn Phe  Ser Arg Thr
    1295                1300                1305

Asp Ala  Asp Tyr Ile Lys Lys  Trp Lys Leu Tyr Ser  Tyr Gly Asn
    1310                1315                1320

Arg Ile  Arg Ile Phe Arg Asn  Pro Lys Lys Asn Asn  Val Phe Asp
    1325                1330                1335

Trp Glu  Glu Val Cys Leu Thr  Ser Ala Tyr Lys Glu  Leu Phe Asn
    1340                1345                1350

Lys Tyr  Gly Ile Asn Tyr Gln  Gln Gly Asp Ile Arg  Ala Leu Leu
    1355                1360                1365

Cys Glu  Gln Ser Asp Lys Ala  Phe Tyr Ser Ser Phe  Met Ala Leu
    1370                1375                1380

Met Ser  Leu Met Leu Gln Met  Arg Asn Ser Ile Thr  Gly Arg Thr
    1385                1390                1395

Asp Val  Ala Phe Leu Ile Ser  Pro Val Lys Asn Ser  Asp Gly Ile
    1400                1405                1410

Phe Tyr  Asp Ser Arg Asn Tyr  Glu Ala Gln Glu Asn  Ala Ile Leu
    1415                1420                1425

Pro Lys  Asn Ala Asp Ala Asn  Gly Ala Tyr Asn Ile  Ala Arg Lys
```

```
    1430                1435                1440

Val Leu  Trp Ala Ile Gly Gln  Phe Lys Lys Ala Glu  Asp Glu Lys
    1445                1450                1455

Leu Asp  Lys Val Lys Ile Ala  Ile Ser Asn Lys Glu  Trp Leu Glu
    1460                1465                1470

Tyr Ala  Gln Thr Ser Val Lys  His Gly Ser Pro Lys  Lys Lys Arg
    1475                1480                1485

Lys Val  Ser Gly Gly Ser Thr  Asn Leu Ser Asp Ile  Ile Glu Lys
    1490                1495                1500

Glu Thr  Gly Lys Gln Leu Val  Ile Gln Glu Ser Ile  Leu Met Leu
    1505                1510                1515

Pro Glu  Glu Val Glu Glu Val  Ile Gly Asn Lys Pro  Glu Ser Asp
    1520                1525                1530

Ile Leu  Val His Thr Ala Tyr  Asp Glu Ser Thr Asp  Glu Asn Val
    1535                1540                1545

Met Leu  Leu Thr Ser Asp Ala  Pro Glu Tyr Lys Pro  Trp Ala Leu
    1550                1555                1560

Val Ile  Gln Asp Ser Asn Gly  Glu Asn Lys Ile Lys  Met Leu Ser
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Gly Gly  Ser Pro Lys Lys Lys  Arg Lys Val
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20 25 30

Phe Phe Asp Pro Arg Glu Leu Arg Lys Glu Thr Cys Leu Leu Tyr Glu
35 40 45

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Ile Asn Trp Gly Gly Arg His Ser Ile Trp Arg His Thr Ser Gln Asn
    50                  55                  60

Thr Asn Lys His Val Glu Val Asn Phe Ile Glu Lys Phe Thr Thr Glu
65                  70                  75                  80

Arg Tyr Phe Cys Pro Asn Thr Arg Cys Ser Ile Thr Trp Phe Leu Ser
                85                  90                  95

Trp Ser Pro Cys Gly Glu Cys Ser Arg Ala Ile Thr Glu Phe Leu Ser
            100                 105                 110

Arg Tyr Pro His Val Thr Leu Phe Ile Tyr Ile Ala Arg Leu Tyr His
        115                 120                 125

His Ala Asp Pro Arg Asn Arg Gln Gly Leu Arg Asp Leu Ile Ser Ser
    130                 135                 140

Gly Val Thr Ile Gln Ile Met Thr Glu Gln Glu Ser Gly Tyr Cys Trp
145                 150                 155                 160

Arg Asn Phe Val Asn Tyr Ser Pro Ser Asn Glu Ala His Trp Pro Arg
                165                 170                 175

Tyr Pro His Leu Trp Val Arg Leu Tyr Val Leu Glu Leu Tyr Cys Ile
            180                 185                 190

Ile Leu Gly Leu Pro Pro Cys Leu Asn Ile Leu Arg Arg Lys Gln Pro
        195                 200                 205

Gln Leu Thr Phe Phe Thr Ile Ala Leu Gln Ser Cys His Tyr Gln Arg
    210                 215                 220

Leu Pro Pro His Ile Leu Trp Ala Thr Gly Leu Lys Ser Gly Ser Glu
225                 230                 235                 240

Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Leu Lys Asp Lys Lys
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                245                 250                 255

Tyr Ser Ile Gly Leu Ala Ile Gly Thr Asn Ser Val Gly Trp Ala Val
            260                 265                 270

Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys Val Leu Gly
        275                 280                 285

Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly Ala Leu Leu
    290                 295                 300

Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys Arg Thr Ala
305                 310                 315                 320

Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr Leu Gln Glu
                325                 330                 335

Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser Phe Phe His Arg
            340                 345                 350

Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His Glu Arg His
        355                 360                 365

Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His Glu Lys Tyr
    370                 375                 380

Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser Thr Asp Lys
385                 390                 395                 400

Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met Ile Lys Phe
                405                 410                 415

Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp Asn Ser Asp
            420                 425                 430

Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn Gln Leu Phe
        435                 440                 445
```

```
Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys Ala Ile Leu
    450                 455                 460

Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu Ile Ala Gln
465                 470                 475                 480

Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu Ile Ala Leu
                485                 490                 495

Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp Leu Ala Glu
            500                 505                 510

Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp Asp Leu Asp
        515                 520                 525

Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu Phe Leu Ala
    530                 535                 540

Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile Leu Arg Val
545                 550                 555                 560

Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met Ile Lys Arg
                565                 570                 575

Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala Leu Val Arg
            580                 585                 590

Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp Gln Ser Lys
        595                 600                 605

Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln Glu Glu Phe
    610                 615                 620

Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly Thr Glu Glu
625                 630                 635                 640

Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys Gln Arg Thr
```

```
               645                 650                 655

Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly Glu Leu His
            660                 665                 670

Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu Lys Asp Asn
        675                 680                 685

Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro Tyr Tyr Val
    690                 695                 700

Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met Thr Arg Lys
705                 710                 715                 720

Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val Val Asp Lys
               725                 730                 735

Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn Phe Asp Lys
            740                 745                 750

Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu Leu Tyr Glu
        755                 760                 765

Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr Val Thr Glu
    770                 775                 780

Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys Lys Ala Ile
785                 790                 795                 800

Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val Lys Gln Leu
               805                 810                 815

Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser Val Glu Ile
            820                 825                 830

Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr Tyr His Asp
        835                 840                 845
```

```
Leu Leu Lys Ile Ile Lys Asp Lys Asp Phe Leu Asp Asn Glu Glu Asn
    850                 855                 860

Glu Asp Ile Leu Glu Asp Ile Val Leu Thr Leu Thr Leu Phe Glu Asp
865                 870                 875                 880

Arg Glu Met Ile Glu Glu Arg Leu Lys Thr Tyr Ala His Leu Phe Asp
                885                 890                 895

Asp Lys Val Met Lys Gln Leu Lys Arg Arg Arg Tyr Thr Gly Trp Gly
            900                 905                 910

Arg Leu Ser Arg Lys Leu Ile Asn Gly Ile Arg Asp Lys Gln Ser Gly
        915                 920                 925

Lys Thr Ile Leu Asp Phe Leu Lys Ser Asp Gly Phe Ala Asn Arg Asn
    930                 935                 940

Phe Met Gln Leu Ile His Asp Asp Ser Leu Thr Phe Lys Glu Asp Ile
945                 950                 955                 960

Gln Lys Ala Gln Val Ser Gly Gln Gly Asp Ser Leu His Glu His Ile
                965                 970                 975

Ala Asn Leu Ala Gly Ser Pro Ala Ile Lys Lys Gly Ile Leu Gln Thr
            980                 985                 990

Val Lys Val Val Asp Glu Leu Val  Lys Val Met Gly Arg  His Lys Pro
        995                 1000                1005

Glu Asn  Ile Val Ile Glu Met  Ala Arg Glu Asn Gln  Thr Thr Gln
    1010                1015                1020

Lys Gly  Gln Lys Asn Ser Arg  Glu Arg Met Lys Arg  Ile Glu Glu
    1025                1030                1035

Gly Ile  Lys Glu Leu Gly Ser  Gln Ile Leu Lys Glu  His Pro Val
```

```
    1040                1045                1050

Glu Asn  Thr Gln Leu Gln Asn  Glu Lys Leu Tyr Leu  Tyr Tyr Leu
    1055                1060                1065

Gln Asn  Gly Arg Asp Met Tyr  Val Asp Gln Glu Leu  Asp Ile Asn
    1070                1075                1080

Arg Leu  Ser Asp Tyr Asp Val  Asp His Ile Val Pro  Gln Ser Phe
    1085                1090                1095

Leu Lys  Asp Asp Ser Ile Asp  Asn Lys Val Leu Thr  Arg Ser Asp
    1100                1105                1110

Lys Asn  Arg Gly Lys Ser Asp  Asn Val Pro Ser Glu  Glu Val Val
    1115                1120                1125

Lys Lys  Met Lys Asn Tyr Trp  Arg Gln Leu Leu Asn  Ala Lys Leu
    1130                1135                1140

Ile Thr  Gln Arg Lys Phe Asp  Asn Leu Thr Lys Ala  Glu Arg Gly
    1145                1150                1155

Gly Leu  Ser Glu Leu Asp Lys  Ala Gly Phe Ile Lys  Arg Gln Leu
    1160                1165                1170

Val Glu  Thr Arg Gln Ile Thr  Lys His Val Ala Gln  Ile Leu Asp
    1175                1180                1185

Ser Arg  Met Asn Thr Lys Tyr  Asp Glu Asn Asp Lys  Leu Ile Arg
    1190                1195                1200

Glu Val  Lys Val Ile Thr Leu  Lys Ser Lys Leu Val  Ser Asp Phe
    1205                1210                1215

Arg Lys  Asp Phe Gln Phe Tyr  Lys Val Arg Glu Ile  Asn Asn Tyr
    1220                1225                1230
```

```
His His  Ala His Asp Ala Tyr  Leu Asn Ala Val Val  Gly Thr Ala
    1235                1240                1245

Leu Ile  Lys Lys Tyr Pro Lys  Leu Glu Ser Glu Phe  Val Tyr Gly
    1250                1255                1260

Asp Tyr  Lys Val Tyr Asp Val  Arg Lys Met Ile Ala  Lys Ser Glu
    1265                1270                1275

Gln Glu  Ile Gly Lys Ala Thr  Ala Lys Tyr Phe Phe  Tyr Ser Asn
    1280                1285                1290

Ile Met  Asn Phe Phe Lys Thr  Glu Ile Thr Leu Ala  Asn Gly Glu
    1295                1300                1305

Ile Arg  Lys Arg Pro Leu Ile  Glu Thr Asn Gly Glu  Thr Gly Glu
    1310                1315                1320

Ile Val  Trp Asp Lys Gly Arg  Asp Phe Ala Thr Val  Arg Lys Val
    1325                1330                1335

Leu Ser  Met Pro Gln Val Asn  Ile Val Lys Lys Thr  Glu Val Gln
    1340                1345                1350

Thr Gly  Gly Phe Ser Lys Glu  Ser Ile Leu Pro Lys  Arg Asn Ser
    1355                1360                1365

Asp Lys  Leu Ile Ala Arg Lys  Lys Asp Trp Asp Pro  Lys Lys Tyr
    1370                1375                1380

Gly Gly  Phe Asp Ser Pro Thr  Val Ala Tyr Ser Val  Leu Val Val
    1385                1390                1395

Ala Lys  Val Glu Lys Gly Lys  Ser Lys Lys Leu Lys  Ser Val Lys
    1400                1405                1410

Glu Leu  Val Gly Ile Thr Ile  Met Glu Arg Ser Ser  Phe Glu Lys
```

```
    1415                1420                1425

Asn Pro  Val Asp Phe Leu Glu  Ala Lys Gly Tyr Lys  Glu Val Lys
    1430                1435                1440

Lys Asp  Leu Ile Ile Lys Leu  Pro Lys Tyr Ser Leu  Phe Glu Leu
    1445                1450                1455

Glu Asn  Gly Arg Lys Arg Met  Leu Ala Ser Ala Gly  Glu Leu Gln
    1460                1465                1470

Lys Gly  Asn Glu Leu Ala Leu  Pro Ser Lys Tyr Val  Asn Phe Leu
    1475                1480                1485

Tyr Leu  Ala Ser His Tyr Glu  Lys Leu Lys Gly Ser  Pro Glu Asp
    1490                1495                1500

Asn Glu  Gln Lys Gln Leu Phe  Val Glu Gln His Lys  His Tyr Leu
    1505                1510                1515

Asp Glu  Ile Ile Glu Gln Ile  Ser Glu Phe Ser Lys  Arg Val Ile
    1520                1525                1530

Leu Ala  Asp Ala Asn Leu Asp  Lys Val Leu Ser Ala  Tyr Asn Lys
    1535                1540                1545

His Arg  Asp Lys Pro Ile Arg  Glu Gln Ala Glu Asn  Ile Ile His
    1550                1555                1560

Leu Phe  Thr Leu Thr Asn Leu  Gly Ala Pro Ala Ala  Phe Lys Tyr
    1565                1570                1575

Phe Asp  Thr Thr Ile Asp Arg  Lys Arg Tyr Thr Ser  Thr Lys Glu
    1580                1585                1590

Val Leu  Asp Ala Thr Leu Ile  His Gln Ser Ile Thr  Gly Leu Tyr
    1595                1600                1605
```

```
Glu Thr  Arg Ile Asp Leu Ser  Gln Leu Gly Gly Asp  Ser Ser Pro
    1610                1615                1620


Pro Lys  Lys Lys Arg Lys Val  Ser Trp Lys Asp Ala  Ser Gly Trp
    1625                1630                1635


Ser Arg  Met Thr Arg Asp Ser  Gly Gly Ser Thr Asn  Leu Ser Asp
    1640                1645                1650


Ile Ile  Glu Lys Glu Thr Gly  Lys Gln Leu Val Ile  Gln Glu Ser
    1655                1660                1665


Ile Leu  Met Leu Pro Glu Glu  Val Glu Glu Val Ile  Gly Asn Lys
    1670                1675                1680


Pro Glu  Ser Asp Ile Leu Val  His Thr Ala Tyr Asp  Glu Ser Thr
    1685                1690                1695


Asp Glu  Asn Val Met Leu Leu  Thr Ser Asp Ala Pro  Glu Tyr Lys
    1700                1705                1710


Pro Trp  Ala Leu Val Ile Gln  Asp Ser Asn Gly Glu  Asn Lys Ile
    1715                1720                1725


Lys Met  Leu Ser Gly Gly Ser  Pro Lys Lys Lys Arg  Lys Val
    1730                1735                1740


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Leu Arg Phe Glu Leu Ile Pro Gln Gly Lys Thr Leu Lys His Ile Gln
            20                  25                  30
```

```
Glu Gln Gly Phe Ile Glu Glu Asp Lys Ala Arg Asn Asp His Tyr Lys
        35                  40                  45

Glu Leu Lys Pro Ile Ile Asp Arg Ile Tyr Lys Thr Tyr Ala Asp Gln
    50                  55                  60

Cys Leu Gln Leu Val Gln Leu Asp Trp Glu Asn Leu Ser Ala Ala Ile
65                  70                  75                  80

Asp Ser Tyr Arg Lys Glu Lys Thr Glu Glu Thr Arg Asn Ala Leu Ile
                85                  90                  95

Glu Glu Gln Ala Thr Tyr Arg Asn Ala Ile His Asp Tyr Phe Ile Gly
            100                 105                 110

Arg Thr Asp Asn Leu Thr Asp Ala Ile Asn Lys Arg His Ala Glu Ile
        115                 120                 125

Tyr Lys Gly Leu Phe Lys Ala Glu Leu Phe Asn Gly Lys Val Leu Lys
    130                 135                 140

Gln Leu Gly Thr Val Thr Thr Thr Glu His Glu Asn Ala Leu Leu Arg
145                 150                 155                 160

Ser Phe Asp Lys Phe Thr Thr Tyr Phe Ser Gly Phe Tyr Glu Asn Arg
                165                 170                 175

Lys Asn Val Phe Ser Ala Glu Asp Ile Ser Thr Ala Ile Pro His Arg
            180                 185                 190

Ile Val Gln Asp Asn Phe Pro Lys Phe Lys Glu Asn Cys His Ile Phe
        195                 200                 205

Thr Arg Leu Ile Thr Ala Val Pro Ser Leu Arg Glu His Phe Glu Asn
    210                 215                 220
```

```
Val Lys Lys Ala Ile Gly Ile Phe Val Ser Thr Ser Ile Glu Glu Val
225                 230                 235                 240


Phe Ser Phe Pro Phe Tyr Asn Gln Leu Leu Thr Gln Thr Gln Ile Asp
                245                 250                 255


Leu Tyr Asn Gln Leu Leu Gly Gly Ile Ser Arg Glu Ala Gly Thr Glu
            260                 265                 270


Lys Ile Lys Gly Leu Asn Glu Val Leu Asn Leu Ala Ile Gln Lys Asn
        275                 280                 285


Asp Glu Thr Ala His Ile Ile Ala Ser Leu Pro His Arg Phe Ile Pro
    290                 295                 300


Leu Phe Lys Gln Ile Leu Ser Asp Arg Asn Thr Leu Ser Phe Ile Leu
305                 310                 315                 320


Glu Glu Phe Lys Ser Asp Glu Glu Val Ile Gln Ser Phe Cys Lys Tyr
                325                 330                 335


Lys Thr Leu Leu Arg Asn Glu Asn Val Leu Glu Thr Ala Glu Ala Leu
            340                 345                 350


Phe Asn Glu Leu Asn Ser Ile Asp Leu Thr His Ile Phe Ile Ser His
        355                 360                 365


Lys Lys Leu Glu Thr Ile Ser Ser Ala Leu Cys Asp His Trp Asp Thr
    370                 375                 380


Leu Arg Asn Ala Leu Tyr Glu Arg Arg Ile Ser Glu Leu Thr Gly Lys
385                 390                 395                 400


Ile Thr Lys Ser Ala Lys Glu Lys Val Gln Arg Ser Leu Lys His Glu
                405                 410                 415


Asp Ile Asn Leu Gln Glu Ile Ile Ser Ala Ala Gly Lys Glu Leu Ser
            420                 425                 430
```

```
Glu Ala Phe Lys Gln Lys Thr Ser Glu Ile Leu Ser His Ala His Ala
        435                 440                 445

Ala Leu Asp Gln Pro Leu Pro Thr Thr Leu Lys Lys Gln Glu Glu Lys
    450                 455                 460

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

Leu Asp Trp Phe Ala Val Asp Glu Ser Asn Glu Val Asp Pro Glu Phe
                485                 490                 495

Ser Ala Arg Leu Thr Gly Ile Lys Leu Glu Met Glu Pro Ser Leu Ser
            500                 505                 510

Phe Tyr Asn Lys Ala Arg Asn Tyr Ala Thr Lys Lys Pro Tyr Ser Val
        515                 520                 525

Glu Lys Phe Lys Leu Asn Phe Gln Met Pro Thr Leu Ala Ser Gly Trp
    530                 535                 540

Asp Val Asn Lys Glu Lys Asn Asn Gly Ala Ile Leu Phe Val Lys Asn
545                 550                 555                 560

Gly Leu Tyr Tyr Leu Gly Ile Met Pro Lys Gln Lys Gly Arg Tyr Lys
                565                 570                 575

Ala Leu Ser Phe Glu Pro Thr Glu Lys Thr Ser Glu Gly Phe Asp Lys
            580                 585                 590

Met Tyr Tyr Asp Tyr Phe Pro Asp Ala Ala Lys Met Ile Pro Lys Cys
        595                 600                 605

Ser Thr Gln Leu Lys Ala Val Thr Ala His Phe Gln Thr His Thr Thr
    610                 615                 620
```

```
Pro Ile Leu Leu Ser Asn Asn Phe Ile Glu Pro Leu Glu Ile Thr Lys
625                 630                 635                 640

Glu Ile Tyr Asp Leu Asn Asn Pro Glu Lys Glu Pro Lys Lys Phe Gln
                645                 650                 655

Thr Ala Tyr Ala Lys Lys Thr Gly Asp Gln Lys Gly Tyr Arg Glu Ala
            660                 665                 670

Leu Cys Lys Trp Ile Asp Phe Thr Arg Asp Phe Leu Ser Lys Tyr Thr
        675                 680                 685

Lys Thr Thr Ser Ile Asp Leu Ser Ser Leu Arg Pro Ser Ser Gln Tyr
    690                 695                 700

Lys Asp Leu Gly Glu Tyr Tyr Ala Glu Leu Asn Pro Leu Leu Tyr His
705                 710                 715                 720

Ile Ser Phe Gln Arg Ile Ala Glu Lys Glu Ile Met Asp Ala Val Glu
                725                 730                 735

Thr Gly Lys Leu Tyr Leu Phe Gln Ile Tyr Asn Lys Asp Phe Ala Lys
            740                 745                 750

Gly His His Gly Lys Pro Asn Leu His Thr Leu Tyr Trp Thr Gly Leu
        755                 760                 765

Phe Ser Pro Glu Asn Leu Ala Lys Thr Ser Ile Lys Leu Asn Gly Gln
    770                 775                 780

Ala Glu Leu Phe Tyr Arg Pro Lys Ser Arg Met Lys Arg Met Ala His
785                 790                 795                 800

Arg Leu Gly Glu Lys Met Leu Asn Lys Lys Leu Lys Asp Gln Lys Thr
                805                 810                 815

Pro Ile Pro Asp Thr Leu Tyr Gln Glu Leu Tyr Asp Tyr Val Asn His
            820                 825                 830
```

```
Arg Leu Ser His Asp Leu Ser Asp Glu Ala Arg Ala Leu Leu Pro Asn
        835                 840                 845

Val Ile Thr Lys Glu Val Ser His Glu Ile Ile Lys Asp Arg Arg Phe
    850                 855                 860

Thr Ser Asp Lys Phe Phe Phe His Val Pro Ile Thr Leu Asn Tyr Gln
865                 870                 875                 880

Ala Ala Asn Ser Pro Ser Lys Phe Asn Gln Arg Val Asn Ala Tyr Leu
                885                 890                 895

Lys Glu His Pro Glu Thr Pro Ile Ile Gly Ile Ala Arg Gly Glu Arg
            900                 905                 910

Asn Leu Ile Tyr Ile Thr Val Ile Asp Ser Thr Gly Lys Ile Leu Glu
        915                 920                 925

Gln Arg Ser Leu Asn Thr Ile Gln Gln Phe Asp Tyr Gln Lys Lys Leu
    930                 935                 940

Asp Asn Arg Glu Lys Glu Arg Val Ala Ala Arg Gln Ala Trp Ser Val
945                 950                 955                 960

Val Gly Thr Ile Lys Asp Leu Lys Gln Gly Tyr Leu Ser Gln Val Ile
                965                 970                 975

His Glu Ile Val Asp Leu Met Ile His Tyr Gln Ala Val Val Val Leu
            980                 985                 990

Ala Asn Leu Asn Phe Gly Phe Lys  Ser Lys Arg Thr Gly  Ile Ala Glu
        995                 1000                1005

Lys Ala  Val Tyr Gln Gln Phe  Glu Lys Met Leu Ile  Asp Lys Leu
    1010                1015                1020
```

```
Asn Cys  Leu Val Leu Lys Asp  Tyr Pro Ala Glu Lys  Val Gly Gly
    1025                1030                1035

Val Leu  Asn Pro Tyr Gln Leu  Thr Asp Gln Phe Thr  Ser Phe Ala
    1040                1045                1050

Lys Met  Gly Thr Gln Ser Gly  Phe Leu Phe Tyr Val  Pro Ala Pro
    1055                1060                1065

Tyr Thr  Ser Lys Ile Asp Pro  Leu Thr Gly Phe Val  Asp Pro Phe
    1070                1075                1080

Val Trp  Lys Thr Ile Lys Asn  His Glu Ser Arg Lys  His Phe Leu
    1085                1090                1095

Glu Gly  Phe Asp Phe Leu His  Tyr Asp Val Lys Thr  Gly Asp Phe
    1100                1105                1110

Ile Leu  His Phe Lys Met Asn  Arg Asn Leu Ser Phe  Gln Arg Gly
    1115                1120                1125

Leu Pro  Gly Phe Met Pro Ala  Trp Asp Ile Val Phe  Glu Lys Asn
    1130                1135                1140

Glu Thr  Gln Phe Asp Ala Lys  Gly Thr Pro Phe Ile  Ala Gly Lys
    1145                1150                1155

Arg Ile  Val Pro Val Ile Glu  Asn His Arg Phe Thr  Gly Arg Tyr
    1160                1165                1170

Arg Asp  Leu Tyr Pro Ala Asn  Glu Leu Ile Ala Leu  Leu Glu Glu
    1175                1180                1185

Lys Gly  Ile Val Phe Arg Asp  Gly Ser Asn Ile Leu  Pro Lys Leu
    1190                1195                1200

Leu Glu  Asn Asp Asp Ser His  Ala Ile Asp Thr Met  Val Ala Leu
    1205                1210                1215
```

```
Ile Arg  Ser Val Leu Gln Met  Arg Asn Ser Asn Ala  Ala Thr Gly
    1220                1225                1230


Glu Ala  Tyr Ile Asn Ser Pro  Val Arg Asp Leu Asn  Gly Val Cys
    1235                1240                1245


Phe Asp  Ser Arg Phe Gln Asn  Pro Glu Trp Pro Met  Asp Ala Asp
    1250                1255                1260


Ala Asn  Gly Ala Tyr His Ile  Ala Leu Lys Gly Gln  Leu Leu Leu
    1265                1270                1275


Asn His  Leu Lys Glu Ser Lys  Asp Leu Lys Leu Gln  Asn Gly Ile
    1280                1285                1290


Ser Asn  Gln Asp Trp Leu Ala  Tyr Ile Gln Glu Leu  Arg Asn Gly
    1295                1300                1305


Ser Pro  Lys Lys Lys Arg Lys  Val
    1310                1315
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cacacgagcc agaacaccaa caagcacgtc gaggtgaact tcatcgagaa gttcaccacg      240

gagaggtact tctgcccgaa cacgcgctgc tccatcacgt ggttcctctc gtggagccca      300

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            20                  25                  30


Val Phe Phe Asp Pro Arg Glu Leu Arg Lys Glu Thr Cys Leu Leu Tyr
        35                  40                  45


Glu Ile Asn Trp Gly Gly Arg His Ser Ile Trp Arg His Thr Ser Gln
    50                  55                  60


Asn Thr Asn Lys His Val Glu Val Asn Phe Ile Glu Lys Phe Thr Thr
65                  70                  75                  80


Glu Arg Tyr Phe Cys Pro Asn Thr Arg Cys Ser Ile Thr Trp Phe Leu
                85                  90                  95


Ser Trp Ser Pro Cys Gly Glu Cys Ser Arg Ala Ile Thr Glu Phe Leu
            100                 105                 110


Ser Arg Tyr Pro His Val Thr Leu Phe Ile Tyr Ile Ala Arg Leu Tyr
        115                 120                 125


His His Ala Asp Pro Arg Asn Arg Gln Gly Leu Arg Asp Leu Ile Ser
    130                 135                 140


Ser Gly Val Thr Ile Gln Ile Met Thr Glu Gln Glu Ser Gly Tyr Cys
145                 150                 155                 160
```

```
Trp Arg Asn Phe Val Asn Tyr Ser Pro Ser Asn Glu Ala His Trp Pro
                165                 170                 175

Arg Tyr Pro His Leu Trp Val Arg Leu Tyr Val Leu Glu Leu Tyr Cys
            180                 185                 190

Ile Ile Leu Gly Leu Pro Pro Cys Leu Asn Ile Leu Arg Arg Lys Gln
        195                 200                 205

Pro Gln Leu Thr Phe Phe Thr Ile Ala Leu Gln Ser Cys His Tyr Gln
    210                 215                 220

Arg Leu Pro Pro His Ile Leu Trp Ala Thr Gly Leu Lys Gly Gly Gly
225                 230                 235                 240

Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
                245                 250                 255

Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Met Ser Lys Leu Glu
            260                 265                 270

Lys Phe Thr Asn Cys Tyr Ser Leu Ser Lys Thr Leu Arg Phe Lys Ala
        275                 280                 285

Ile Pro Val Gly Lys Thr Gln Glu Asn Ile Asp Asn Lys Arg Leu Leu
    290                 295                 300

Val Glu Asp Glu Lys Arg Ala Glu Asp Tyr Lys Gly Val Lys Lys Leu
305                 310                 315                 320

Leu Asp Arg Tyr Tyr Leu Ser Phe Ile Asn Asp Val Leu His Ser Ile
                325                 330                 335

Lys Leu Lys Asn Leu Asn Asn Tyr Ile Ser Leu Phe Arg Lys Lys Thr
            340                 345                 350
```

```
Arg Thr Glu Lys Glu Asn Lys Glu Leu Glu Asn Leu Glu Ile Asn Leu
        355                 360                 365

Arg Lys Glu Ile Ala Lys Ala Phe Lys Gly Asn Glu Gly Tyr Lys Ser
    370                 375                 380

Leu Phe Lys Lys Asp Ile Ile Glu Thr Ile Leu Pro Glu Phe Leu Asp
385                 390                 395                 400

Asp Lys Asp Glu Ile Ala Leu Val Asn Ser Phe Asn Gly Phe Thr Thr
                405                 410                 415

Ala Phe Thr Gly Phe Phe Asp Asn Arg Glu Asn Met Phe Ser Glu Glu
            420                 425                 430

Ala Lys Ser Thr Ser Ile Ala Phe Arg Cys Ile Asn Glu Asn Leu Thr
        435                 440                 445

Arg Tyr Ile Ser Asn Met Asp Ile Phe Glu Lys Val Asp Ala Ile Phe
    450                 455                 460

Asp Lys His Glu Val Gln Glu Ile Lys Glu Lys Ile Leu Asn Ser Asp
465                 470                 475                 480

Tyr Asp Val Glu Asp Phe Phe Glu Gly Glu Phe Phe Asn Phe Val Leu
                485                 490                 495

Thr Gln Glu Gly Ile Asp Val Tyr Asn Ala Ile Ile Gly Gly Phe Val
            500                 505                 510

Thr Glu Ser Gly Glu Lys Ile Lys Gly Leu Asn Glu Tyr Ile Asn Leu
        515                 520                 525

Tyr Asn Gln Lys Thr Lys Gln Lys Leu Pro Lys Phe Lys Pro Leu Tyr
    530                 535                 540

Lys Gln Val Leu Ser Asp Arg Glu Ser Leu Ser Phe Tyr Gly Glu Gly
545                 550                 555                 560
```

```
Tyr Thr Ser Asp Glu Glu Val Leu Glu Val Phe Arg Asn Thr Leu Asn
                565                 570                 575

Lys Asn Ser Glu Ile Phe Ser Ser Ile Lys Lys Leu Glu Lys Leu Phe
            580                 585                 590

Lys Asn Phe Asp Glu Tyr Ser Ser Ala Gly Ile Phe Val Lys Asn Gly
        595                 600                 605

Pro Ala Ile Ser Thr Ile Ser Lys Asp Ile Phe Gly Glu Trp Asn Val
    610                 615                 620

Ile Arg Asp Lys Trp Asn Ala Glu Tyr Asp Asp Ile His Leu Lys Lys
625                 630                 635                 640

Lys Ala Val Val Thr Glu Lys Tyr Glu Asp Asp Arg Arg Lys Ser Phe
                645                 650                 655

Lys Lys Ile Gly Ser Phe Ser Leu Glu Gln Leu Gln Glu Tyr Ala Asp
            660                 665                 670

Ala Asp Leu Ser Val Val Glu Lys Leu Lys Glu Ile Ile Ile Gln Lys
        675                 680                 685

Val Asp Glu Ile Tyr Lys Val Tyr Gly Ser Ser Glu Lys Leu Phe Asp
    690                 695                 700

Ala Asp Phe Val Leu Glu Lys Ser Leu Lys Lys Asn Asp Ala Val Val
705                 710                 715                 720

Ala Ile Met Lys Asp Leu Leu Asp Ser Val Lys Ser Phe Glu Asn Tyr
                725                 730                 735

Ile Lys Ala Phe Phe Gly Glu Gly Lys Glu Thr Asn Arg Asp Glu Ser
            740                 745                 750
```

```
Phe Tyr Gly Asp Phe Val Leu Ala Tyr Asp Ile Leu Leu Lys Val Asp
        755                 760                 765

His Ile Tyr Asp Ala Ile Arg Asn Tyr Val Thr Gln Lys Pro Tyr Ser
    770                 775                 780

Lys Asp Lys Phe Lys Leu Tyr Phe Gln Asn Pro Gln Phe Met Gly Gly
785                 790                 795                 800

Trp Asp Lys Asp Lys Glu Thr Asp Tyr Arg Ala Thr Ile Leu Arg Tyr
                805                 810                 815

Gly Ser Lys Tyr Tyr Leu Ala Ile Met Asp Lys Lys Tyr Ala Lys Cys
            820                 825                 830

Leu Gln Lys Ile Asp Lys Asp Asp Val Asn Gly Asn Tyr Glu Lys Ile
        835                 840                 845

Asn Tyr Lys Leu Leu Pro Gly Pro Asn Lys Met Leu Pro Lys Val Phe
    850                 855                 860

Phe Ser Lys Lys Trp Met Ala Tyr Tyr Asn Pro Ser Glu Asp Ile Gln
865                 870                 875                 880

Lys Ile Tyr Lys Asn Gly Thr Phe Lys Lys Gly Asp Met Phe Asn Leu
                885                 890                 895

Asn Asp Cys His Lys Leu Ile Asp Phe Phe Lys Asp Ser Ile Ser Arg
            900                 905                 910

Tyr Pro Lys Trp Ser Asn Ala Tyr Asp Phe Asn Phe Ser Glu Thr Glu
        915                 920                 925

Lys Tyr Lys Asp Ile Ala Gly Phe Tyr Arg Glu Val Glu Glu Gln Gly
    930                 935                 940

Tyr Lys Val Ser Phe Glu Ser Ala Ser Lys Lys Glu Val Asp Lys Leu
945                 950                 955                 960
```

```
Val Glu Glu Gly Lys Leu Tyr Met Phe Gln Ile Tyr Asn Lys Asp Phe
               965                 970                 975

Ser Asp Lys Ser His Gly Thr Pro Asn Leu His Thr Met Tyr Phe Lys
            980                 985                 990

Leu Leu Phe Asp Glu Asn Asn His  Gly Gln Ile Arg Leu  Ser Gly Gly
        995                 1000                1005

Ala Glu  Leu Phe Met Arg Arg  Ala Ser Leu Lys Lys  Glu Glu Leu
    1010                1015                1020

Val Val  His Pro Ala Asn Ser  Pro Ile Ala Asn Lys  Asn Pro Asp
    1025                1030                1035

Asn Pro  Lys Lys Thr Thr Thr  Leu Ser Tyr Asp Val  Tyr Lys Asp
    1040                1045                1050

Lys Arg  Phe Ser Glu Asp Gln  Tyr Glu Leu His Ile  Pro Ile Ala
    1055                1060                1065

Ile Asn  Lys Cys Pro Lys Asn  Ile Phe Lys Ile Asn  Thr Glu Val
    1070                1075                1080

Arg Val  Leu Leu Lys His Asp  Asp Asn Pro Tyr Val  Ile Gly Ile
    1085                1090                1095

Ala Arg  Gly Glu Arg Asn Leu  Leu Tyr Ile Val Val  Val Asp Gly
    1100                1105                1110

Lys Gly  Asn Ile Val Glu Gln  Tyr Ser Leu Asn Glu  Ile Ile Asn
    1115                1120                1125

Asn Phe  Asn Gly Ile Arg Ile  Lys Thr Asp Tyr His  Ser Leu Leu
    1130                1135                1140
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```
Asp Lys  Lys Glu Lys Glu Arg  Phe Glu Ala Arg Gln  Asn Trp Thr
    1145                1150                1155

Ser Ile  Glu Asn Ile Lys Glu  Leu Lys Ala Gly Tyr  Ile Ser Gln
    1160                1165                1170

Val Val  His Lys Ile Cys Glu  Leu Val Glu Lys Tyr  Asp Ala Val
    1175                1180                1185

Ile Ala  Leu Ala Asp Leu Asn  Ser Gly Phe Lys Asn  Ser Arg Val
    1190                1195                1200

Lys Val  Glu Lys Gln Val Tyr  Gln Lys Phe Glu Lys  Met Leu Ile
    1205                1210                1215

Asp Lys  Leu Asn Tyr Met Val  Asp Lys Lys Ser Asn  Pro Cys Ala
    1220                1225                1230

Thr Gly  Gly Ala Leu Lys Gly  Tyr Gln Ile Thr Asn  Lys Phe Glu
    1235                1240                1245

Ser Phe  Lys Ser Met Ser Thr  Gln Asn Gly Phe Ile  Phe Tyr Ile
    1250                1255                1260

Pro Ala  Trp Leu Thr Ser Lys  Ile Asp Pro Ser Thr  Gly Phe Val
    1265                1270                1275

Asn Leu  Leu Lys Thr Lys Tyr  Thr Ser Ile Ala Asp  Ser Lys Lys
    1280                1285                1290

Phe Ile  Ser Ser Phe Asp Arg  Ile Met Tyr Val Pro  Glu Glu Asp
    1295                1300                1305

Leu Phe  Glu Phe Ala Leu Asp  Tyr Lys Asn Phe Ser  Arg Thr Asp
    1310                1315                1320

Ala Asp  Tyr Ile Lys Lys Trp  Lys Leu Tyr Ser Tyr  Gly Asn Arg
    1325                1330                1335
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Ile Arg  Ile Phe Arg Asn Pro  Lys Lys Asn Asn Val  Phe Asp Trp
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Glu Glu  Val Cys Leu Thr Ser  Ala Tyr Lys Glu Leu  Phe Asn Lys
    1355                1360                1365

Tyr Gly  Ile Asn Tyr Gln Gln  Gly Asp Ile Arg Ala  Leu Leu Cys
    1370                1375                1380

Glu Gln  Ser Asp Lys Ala Phe  Tyr Ser Ser Phe Met  Ala Leu Met
    1385                1390                1395

Ser Leu  Met Leu Gln Met Arg  Asn Ser Ile Thr Gly  Arg Thr Asp
    1400                1405                1410

Val Ala  Phe Leu Ile Ser Pro  Val Lys Asn Ser Asp  Gly Ile Phe
    1415                1420                1425

Tyr Asp  Ser Arg Asn Tyr Glu  Ala Gln Glu Asn Ala  Ile Leu Pro
    1430                1435                1440

Lys Asn  Ala Asp Ala Asn Gly  Ala Tyr Asn Ile Ala  Arg Lys Val
    1445                1450                1455

Leu Trp  Ala Ile Gly Gln Phe  Lys Lys Ala Glu Asp  Glu Lys Leu
    1460                1465                1470

Asp Lys  Val Lys Ile Ala Ile  Ser Asn Lys Glu Trp  Leu Glu Tyr
    1475                1480                1485

Ala Gln  Thr Ser Val Lys His  Gly Ser Pro Lys Lys  Lys Arg Lys
    1490                1495                1500

Val Ser  Gly Gly Ser Thr Asn  Leu Ser Asp Ile Ile  Glu Lys Glu
    1505                1510                1515
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```
Thr Gly  Lys Gln Leu Val Ile  Gln Glu Ser Ile Leu  Met Leu Pro
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Glu Glu  Val Glu Glu Val Ile  Gly Asn Lys Pro Glu  Ser Asp Ile
    1535                1540                1545

Leu Val  His Thr Ala Tyr Asp  Glu Ser Thr Asp Glu  Asn Val Met
    1550                1555                1560

Leu Leu  Thr Ser Asp Ala Pro  Glu Tyr Lys Pro Trp  Ala Leu Val
    1565                1570                1575

Ile Gln  Asp Ser Asn Gly Glu  Asn Lys Ile Lys Met  Leu Ser Gly
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Gly Ser  Pro Lys Lys Lys Arg  Lys Val
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<400> 31
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        35                  40                  45


Asn Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala Glu Asp Tyr Lys
    50                  55                  60


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


Val Leu His Ser Ile Lys Leu Lys Asn Leu Asn Asn Tyr Ile Ser Leu
                85                  90                  95


Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn Lys Glu Leu Glu Asn
            100                 105                 110


Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys Ala Phe Lys Gly Asn
        115                 120                 125


Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile Ile Glu Thr Ile Leu
    130                 135                 140


Pro Glu Phe Leu Asp Asp Lys Asp Glu Ile Ala Leu Val Asn Ser Phe
145                 150                 155                 160
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Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe Phe Asp Asn Arg Glu Asn
                165                 170                 175

Met Phe Ser Glu Glu Ala Lys Ser Thr Ser Ile Ala Phe Arg Cys Ile
            180                 185                 190

Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn Met Asp Ile Phe Glu Lys
        195                 200                 205

Val Asp Ala Ile Phe Asp Lys His Glu Val Gln Glu Ile Lys Glu Lys
    210                 215                 220

Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp Phe Phe Glu Gly Glu Phe
225                 230                 235                 240

Phe Asn Phe Val Leu Thr Gln Glu Gly Ile Asp Val Tyr Asn Ala Ile
                245                 250                 255

Ile Gly Gly Phe Val Thr Glu Ser Gly Glu Lys Ile Lys Gly Leu Asn
            260                 265                 270

Glu Tyr Ile Asn Leu Tyr Asn Gln Lys Thr Lys Gln Lys Leu Pro Lys
        275                 280                 285

Phe Lys Pro Leu Tyr Lys Gln Val Leu Ser Asp Arg Glu Ser Leu Ser
    290                 295                 300

Phe Tyr Gly Glu Gly Tyr Thr Ser Asp Glu Glu Val Leu Glu Val Phe
305                 310                 315                 320

Arg Asn Thr Leu Asn Lys Asn Ser Glu Ile Phe Ser Ser Ile Lys Lys
                325                 330                 335

Leu Glu Lys Leu Phe Lys Asn Phe Asp Glu Tyr Ser Ser Ala Gly Ile
            340                 345                 350
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Phe Val Lys Asn Gly Pro Ala Ile Ser Thr Ile Ser Lys Asp Ile Phe
        355                 360                 365

Gly Glu Trp Asn Val Ile Arg Asp Lys Trp Asn Ala Glu Tyr Asp Asp
    370                 375                 380

Ile His Leu Lys Lys Lys Ala Val Val Thr Glu Lys Tyr Glu Asp Asp
385                 390                 395                 400

Arg Arg Lys Ser Phe Lys Lys Ile Gly Ser Phe Ser Leu Glu Gln Leu
                405                 410                 415

Gln Glu Tyr Ala Asp Ala Asp Leu Ser Val Val Glu Lys Leu Lys Glu
            420                 425                 430

Ile Ile Ile Gln Lys Val Asp Glu Ile Tyr Lys Val Tyr Gly Ser Ser
        435                 440                 445

Glu Lys Leu Phe Asp Ala Asp Phe Val Leu Glu Lys Ser Leu Lys Lys
    450                 455                 460

Asn Asp Ala Val Val Ala Ile Met Lys Asp Leu Leu Asp Ser Val Lys
465                 470                 475                 480

Ser Phe Glu Asn Tyr Ile Lys Ala Phe Phe Gly Glu Gly Lys Glu Thr
                485                 490                 495

Asn Arg Asp Glu Ser Phe Tyr Gly Asp Phe Val Leu Ala Tyr Asp Ile
            500                 505                 510

Leu Leu Lys Val Asp His Ile Tyr Asp Ala Ile Arg Asn Tyr Val Thr
        515                 520                 525

Gln Lys Pro Tyr Ser Lys Asp Lys Phe Lys Leu Tyr Phe Gln Asn Pro
    530                 535                 540

Gln Phe Met Gly Gly Trp Asp Lys Asp Lys Glu Thr Asp Tyr Arg Ala
545                 550                 555                 560
```

```
Thr Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr Leu Ala Ile Met Asp Lys
                565                 570                 575

Lys Tyr Ala Lys Cys Leu Gln Lys Ile Asp Lys Asp Asp Val Asn Gly
            580                 585                 590

Asn Tyr Glu Lys Ile Asn Tyr Lys Leu Leu Pro Gly Pro Asn Lys Met
        595                 600                 605

Leu Pro Lys Val Phe Phe Ser Lys Lys Trp Met Ala Tyr Tyr Asn Pro
    610                 615                 620

Ser Glu Asp Ile Gln Lys Ile Tyr Lys Asn Gly Thr Phe Lys Lys Gly
625                 630                 635                 640

Asp Met Phe Asn Leu Asn Asp Cys His Lys Leu Ile Asp Phe Phe Lys
                645                 650                 655

Asp Ser Ile Ser Arg Tyr Pro Lys Trp Ser Asn Ala Tyr Asp Phe Asn
            660                 665                 670

Phe Ser Glu Thr Glu Lys Tyr Lys Asp Ile Ala Gly Phe Tyr Arg Glu
        675                 680                 685

Val Glu Glu Gln Gly Tyr Lys Val Ser Phe Glu Ser Ala Ser Lys Lys
    690                 695                 700

Glu Val Asp Lys Leu Val Glu Glu Gly Lys Leu Tyr Met Phe Gln Ile
705                 710                 715                 720

Tyr Asn Lys Asp Phe Ser Asp Lys Ser His Gly Thr Pro Asn Leu His
                725                 730                 735

Thr Met Tyr Phe Lys Leu Leu Phe Asp Glu Asn Asn His Gly Gln Ile
            740                 745                 750
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```
Arg Leu Ser Gly Gly Ala Glu Leu Phe Met Arg Arg Ala Ser Leu Lys
        755                 760                 765

Lys Glu Glu Leu Val Val His Pro Ala Asn Ser Pro Ile Ala Asn Lys
    770                 775                 780

Asn Pro Asp Asn Pro Lys Lys Thr Thr Thr Leu Ser Tyr Asp Val Tyr
785                 790                 795                 800

Lys Asp Lys Arg Phe Ser Glu Asp Gln Tyr Glu Leu His Ile Pro Ile
                805                 810                 815

Ala Ile Asn Lys Cys Pro Lys Asn Ile Phe Lys Ile Asn Thr Glu Val
            820                 825                 830

Arg Val Leu Leu Lys His Asp Asp Asn Pro Tyr Val Ile Gly Ile Asp
        835                 840                 845

Arg Gly Glu Arg Asn Leu Leu Tyr Ile Val Val Val Asp Gly Lys Gly
    850                 855                 860

Asn Ile Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn Asn Phe Asn
865                 870                 875                 880

Gly Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu Asp Lys Lys Glu
                885                 890                 895

Lys Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu Asn Ile
            900                 905                 910

Lys Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys Ile Cys
        915                 920                 925

Glu Leu Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu Asp Leu Asn
    930                 935                 940

Ser Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys Gln Val Tyr Gln
945                 950                 955                 960
```

```
Lys Phe Glu Lys Met Leu Ile Asp Lys Leu Asn Tyr Met Val Asp Lys
               965                 970                 975


Lys Ser Asn Pro Cys Ala Thr Gly Gly Ala Leu Lys Gly Tyr Gln Ile
            980                 985                 990


Thr Asn Lys Phe Glu Ser Phe Lys  Ser Met Ser Thr Gln  Asn Gly Phe
        995                 1000                1005


Ile Phe  Tyr Ile Pro Ala Trp  Leu Thr Ser Lys Ile  Asp Pro Ser
    1010                1015                1020


Thr Gly  Phe Val Asn Leu Leu  Lys Thr Lys Tyr Thr  Ser Ile Ala
    1025                1030                1035


Asp Ser  Lys Lys Phe Ile Ser  Ser Phe Asp Arg Ile  Met Tyr Val
    1040                1045                1050


Pro Glu  Glu Asp Leu Phe Glu  Phe Ala Leu Asp Tyr  Lys Asn Phe
    1055                1060                1065


Ser Arg  Thr Asp Ala Asp Tyr  Ile Lys Lys Trp Lys  Leu Tyr Ser
    1070                1075                1080


Tyr Gly  Asn Arg Ile Arg Ile  Phe Arg Asn Pro Lys  Lys Asn Asn
    1085                1090                1095


Val Phe  Asp Trp Glu Glu Val  Cys Leu Thr Ser Ala  Tyr Lys Glu
    1100                1105                1110


Leu Phe  Asn Lys Tyr Gly Ile  Asn Tyr Gln Gln Gly  Asp Ile Arg
    1115                1120                1125


Ala Leu  Leu Cys Glu Gln Ser  Asp Lys Ala Phe Tyr  Ser Ser Phe
    1130                1135                1140
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Met Ala  Leu Met Ser Leu Met  Leu Gln Met Arg Asn  Ser Ile Thr
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Gly Arg  Thr Asp Val Asp Phe  Leu Ile Ser Pro Val  Lys Asn Ser
    1160                1165                1170


Asp Gly  Ile Phe Tyr Asp Ser  Arg Asn Tyr Glu Ala  Gln Glu Asn
    1175                1180                1185


Ala Ile  Leu Pro Lys Asn Ala  Asp Ala Asn Gly Ala  Tyr Asn Ile
    1190                1195                1200


Ala Arg  Lys Val Leu Trp Ala  Ile Gly Gln Phe Lys  Lys Ala Glu
    1205                1210                1215


Asp Glu  Lys Leu Asp Lys Val  Lys Ile Ala Ile Ser  Asn Lys Glu
    1220                1225                1230


Trp Leu  Glu Tyr Ala Gln Thr  Ser Val Lys His Lys  Arg Pro Ala
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Ala Thr  Lys Lys Ala Gly Gln  Ala Lys Lys Lys Lys
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aagctggaga agttcacgaa ctgctactcc ctcagcaaga ccctgaggtt caaggcgatc      180

ccggtcggca agacccagga gaacatcgac aacaagcggc tgctggtgga ggacgagaag      240

agggctgagg actacaaggg cgtgaagaag ctcctggacc gctactacct gtccttcatc      300
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aaccagaaga ccaagcagaa gctgccgaag ttcaagcccc tgtacaagca ggtgctctcc 960

gacagggagt ccctcagctt ctacggcgag ggctacacga gcgacgagga ggtcctggag 1020

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gtgaagagct tcgagaatta catcaaggcc ttcttcggcg agggcaagga gacgaacagg 1560

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Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
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Ser Gly Gly Gly Gly Ser Met Ser Lys Leu Glu Lys Phe Thr Asn Cys
35 40 45

Tyr Ser Leu Ser Lys Thr Leu Arg Phe Lys Ala Ile Pro Val Gly Lys
50 55 60

Thr Gln Glu Asn Ile Asp Asn Lys Arg Leu Leu Val Glu Asp Glu Lys
65 70 75 80

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Arg Ala Glu Asp Tyr Lys Gly Val Lys Lys Leu Leu Asp Arg Tyr Tyr
                85                  90                  95

Leu Ser Phe Ile Asn Asp Val Leu His Ser Ile Lys Leu Lys Asn Leu
            100                 105                 110

Asn Asn Tyr Ile Ser Leu Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu
        115                 120                 125

Asn Lys Glu Leu Glu Asn Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala
    130                 135                 140

Lys Ala Phe Lys Gly Asn Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp
145                 150                 155                 160

Ile Ile Glu Thr Ile Leu Pro Glu Phe Leu Asp Asp Lys Asp Glu Ile
                165                 170                 175

Ala Leu Val Asn Ser Phe Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe
            180                 185                 190

Phe Asp Asn Arg Glu Asn Met Phe Ser Glu Glu Ala Lys Ser Thr Ser
        195                 200                 205

Ile Ala Phe Arg Cys Ile Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn
    210                 215                 220

Met Asp Ile Phe Glu Lys Val Asp Ala Ile Phe Asp Lys His Glu Val
225                 230                 235                 240

Gln Glu Ile Lys Glu Lys Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp
                245                 250                 255

Phe Phe Glu Gly Glu Phe Phe Asn Phe Val Leu Thr Gln Glu Gly Ile
            260                 265                 270
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Asp Val Tyr Asn Ala Ile Ile Gly Gly Phe Val Thr Glu Ser Gly Glu
        275                 280                 285

Lys Ile Lys Gly Leu Asn Glu Tyr Ile Asn Leu Tyr Asn Gln Lys Thr
    290                 295                 300

Lys Gln Lys Leu Pro Lys Phe Lys Pro Leu Tyr Lys Gln Val Leu Ser
305                 310                 315                 320

Asp Arg Glu Ser Leu Ser Phe Tyr Gly Glu Gly Tyr Thr Ser Asp Glu
                325                 330                 335

Glu Val Leu Glu Val Phe Arg Asn Thr Leu Asn Lys Asn Ser Glu Ile
            340                 345                 350

Phe Ser Ser Ile Lys Lys Leu Glu Lys Leu Phe Lys Asn Phe Asp Glu
        355                 360                 365

Tyr Ser Ser Ala Gly Ile Phe Val Lys Asn Gly Pro Ala Ile Ser Thr
    370                 375                 380

Ile Ser Lys Asp Ile Phe Gly Glu Trp Asn Val Ile Arg Asp Lys Trp
385                 390                 395                 400

Asn Ala Glu Tyr Asp Asp Ile His Leu Lys Lys Lys Ala Val Val Thr
                405                 410                 415

Glu Lys Tyr Glu Asp Asp Arg Arg Lys Ser Phe Lys Lys Ile Gly Ser
            420                 425                 430

Phe Ser Leu Glu Gln Leu Gln Glu Tyr Ala Asp Ala Asp Leu Ser Val
        435                 440                 445

Val Glu Lys Leu Lys Glu Ile Ile Ile Gln Lys Val Asp Glu Ile Tyr
    450                 455                 460

Lys Val Tyr Gly Ser Ser Glu Lys Leu Phe Asp Ala Asp Phe Val Leu
465                 470                 475                 480
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Glu Lys Ser Leu Lys Lys Asn Asp Ala Val Val Ala Ile Met Lys Asp
                485                 490                 495

Leu Leu Asp Ser Val Lys Ser Phe Glu Asn Tyr Ile Lys Ala Phe Phe
            500                 505                 510

Gly Glu Gly Lys Glu Thr Asn Arg Asp Glu Ser Phe Tyr Gly Asp Phe
        515                 520                 525

Val Leu Ala Tyr Asp Ile Leu Leu Lys Val Asp His Ile Tyr Asp Ala
    530                 535                 540

Ile Arg Asn Tyr Val Thr Gln Lys Pro Tyr Ser Lys Asp Lys Phe Lys
545                 550                 555                 560

Leu Tyr Phe Gln Asn Pro Gln Phe Met Gly Gly Trp Asp Lys Asp Lys
                565                 570                 575

Glu Thr Asp Tyr Arg Ala Thr Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr
            580                 585                 590

Leu Ala Ile Met Asp Lys Lys Tyr Ala Lys Cys Leu Gln Lys Ile Asp
        595                 600                 605

Lys Asp Asp Val Asn Gly Asn Tyr Glu Lys Ile Asn Tyr Lys Leu Leu
    610                 615                 620

Pro Gly Pro Asn Lys Met Leu Pro Lys Val Phe Phe Ser Lys Lys Trp
625                 630                 635                 640

Met Ala Tyr Tyr Asn Pro Ser Glu Asp Ile Gln Lys Ile Tyr Lys Asn
                645                 650                 655

Gly Thr Phe Lys Lys Gly Asp Met Phe Asn Leu Asn Asp Cys His Lys
            660                 665                 670
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Leu Ile Asp Phe Phe Lys Asp Ser Ile Ser Arg Tyr Pro Lys Trp Ser
        675                 680                 685

Asn Ala Tyr Asp Phe Asn Phe Ser Glu Thr Glu Lys Tyr Lys Asp Ile
    690                 695                 700

Ala Gly Phe Tyr Arg Glu Val Glu Glu Gln Gly Tyr Lys Val Ser Phe
705                 710                 715                 720

Glu Ser Ala Ser Lys Lys Glu Val Asp Lys Leu Val Glu Glu Gly Lys
                725                 730                 735

Leu Tyr Met Phe Gln Ile Tyr Asn Lys Asp Phe Ser Asp Lys Ser His
            740                 745                 750

Gly Thr Pro Asn Leu His Thr Met Tyr Phe Lys Leu Leu Phe Asp Glu
        755                 760                 765

Asn Asn His Gly Gln Ile Arg Leu Ser Gly Gly Ala Glu Leu Phe Met
    770                 775                 780

Arg Arg Ala Ser Leu Lys Lys Glu Glu Leu Val Val His Pro Ala Asn
785                 790                 795                 800

Ser Pro Ile Ala Asn Lys Asn Pro Asp Asn Pro Lys Lys Thr Thr Thr
                805                 810                 815

Leu Ser Tyr Asp Val Tyr Lys Asp Lys Arg Phe Ser Glu Asp Gln Tyr
            820                 825                 830

Glu Leu His Ile Pro Ile Ala Ile Asn Lys Cys Pro Lys Asn Ile Phe
        835                 840                 845

Lys Ile Asn Thr Glu Val Arg Val Leu Leu Lys His Asp Asp Asn Pro
    850                 855                 860

Tyr Val Ile Gly Ile Asp Arg Gly Glu Arg Asn Leu Leu Tyr Ile Val
865                 870                 875                 880
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Val Val Asp Gly Lys Gly Asn Ile Val Glu Gln Tyr Ser Leu Asn Glu
               885                 890                 895


Ile Ile Asn Asn Phe Asn Gly Ile Arg Ile Lys Thr Asp Tyr His Ser
            900                 905                 910


Leu Leu Asp Lys Lys Glu Lys Glu Arg Phe Glu Ala Arg Gln Asn Trp
        915                 920                 925


Thr Ser Ile Glu Asn Ile Lys Glu Leu Lys Ala Gly Tyr Ile Ser Gln
    930                 935                 940


Val Val His Lys Ile Cys Glu Leu Val Glu Lys Tyr Asp Ala Val Ile
945                 950                 955                 960


Ala Leu Glu Asp Leu Asn Ser Gly Phe Lys Asn Ser Arg Val Lys Val
               965                 970                 975


Glu Lys Gln Val Tyr Gln Lys Phe Glu Lys Met Leu Ile Asp Lys Leu
            980                 985                 990


Asn Tyr Met Val Asp Lys Lys Ser  Asn Pro Cys Ala Thr  Gly Gly Ala
        995                 1000                1005


Leu Lys  Gly Tyr Gln Ile Thr  Asn Lys Phe Glu Ser  Phe Lys Ser
    1010                1015                1020


Met Ser  Thr Gln Asn Gly Phe  Ile Phe Tyr Ile Pro  Ala Trp Leu
    1025                1030                1035


Thr Ser  Lys Ile Asp Pro Ser  Thr Gly Phe Val Asn  Leu Leu Lys
    1040                1045                1050


Thr Lys  Tyr Thr Ser Ile Ala  Asp Ser Lys Lys Phe  Ile Ser Ser
    1055                1060                1065
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Phe Asp  Arg Ile Met Tyr Val  Pro Glu Glu Asp Leu  Phe Glu Phe
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Ala Leu  Asp Tyr Lys Asn Phe  Ser Arg Thr Asp Ala  Asp Tyr Ile
    1085                1090                1095

Lys Lys  Trp Lys Leu Tyr Ser  Tyr Gly Asn Arg Ile  Arg Ile Phe
    1100                1105                1110

Arg Asn  Pro Lys Lys Asn Asn  Val Phe Asp Trp Glu  Glu Val Cys
    1115                1120                1125

Leu Thr  Ser Ala Tyr Lys Glu  Leu Phe Asn Lys Tyr  Gly Ile Asn
    1130                1135                1140

Tyr Gln  Gln Gly Asp Ile Arg  Ala Leu Leu Cys Glu  Gln Ser Asp
    1145                1150                1155

Lys Ala  Phe Tyr Ser Ser Phe  Met Ala Leu Met Ser  Leu Met Leu
    1160                1165                1170

Gln Met  Arg Asn Ser Ile Thr  Gly Arg Thr Asp Val  Asp Phe Leu
    1175                1180                1185

Ile Ser  Pro Val Lys Asn Ser  Asp Gly Ile Phe Tyr  Asp Ser Arg
    1190                1195                1200

Asn Tyr  Glu Ala Gln Glu Asn  Ala Ile Leu Pro Lys  Asn Ala Asp
    1205                1210                1215

Ala Asn  Gly Ala Tyr Asn Ile  Ala Arg Lys Val Leu  Trp Ala Ile
    1220                1225                1230

Gly Gln  Phe Lys Lys Ala Glu  Asp Glu Lys Leu Asp  Lys Val Lys
    1235                1240                1245

Ile Ala  Ile Ser Asn Lys Glu  Trp Leu Glu Tyr Ala  Gln Thr Ser
    1250                1255                1260
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Val Lys His Gly Ser Pro Lys Lys Lys Arg Lys Val Ser Gly Gly
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Ser Ser Gly Gly Ser Pro Lys Lys Lys Arg Lys Val
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gaagactaca aaggggtgaa gaagttgttg gacagatact acctctcttt tatcaatgat 240

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acaaggacag aaaaggagaa taaggaactt gaaaatttgg agatcaatct gaggaaagag 360

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tccaacatgg atatctttga gaaggttgac gcaatttttg acaagcacga agttcaggag 660

attaaggaga agatcctcaa ttccgattat gacgttgagg acttcttcga gggtgagttt 720

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35 40 45

Asn Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala Glu Asp Tyr Lys
50 55 60

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

Val Leu His Ser Ile Lys Leu Lys Asn Leu Asn Asn Tyr Ile Ser Leu
85 90 95

Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn Lys Glu Leu Glu Asn
100 105 110

Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys Ala Phe Lys Gly Asn
115 120 125

Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile Ile Glu Thr Ile Leu
130 135 140

Pro Glu Phe Leu Asp Asp Lys Asp Glu Ile Ala Leu Val Asn Ser Phe
145 150 155 160

Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe Phe Asp Asn Arg Glu Asn
165 170 175

```
Met Phe Ser Glu Glu Ala Lys Ser Thr Ser Ile Ala Phe Arg Cys Ile
            180                 185                 190

Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn Met Asp Ile Phe Glu Lys
        195                 200                 205

Val Asp Ala Ile Phe Asp Lys His Glu Val Gln Glu Ile Lys Glu Lys
    210                 215                 220

Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp Phe Phe Glu Gly Glu Phe
225                 230                 235                 240

Phe Asn Phe Val Leu Thr Gln Glu Gly Ile Asp Val Tyr Asn Ala Ile
                245                 250                 255

Ile Gly Gly Phe Val Thr Glu Ser Gly Glu Lys Ile Lys Gly Leu Asn
            260                 265                 270

Glu Tyr Ile Asn Leu Tyr Asn Gln Lys Thr Lys Gln Lys Leu Pro Lys
        275                 280                 285

Phe Lys Pro Leu Tyr Lys Gln Val Leu Ser Asp Arg Glu Ser Leu Ser
    290                 295                 300

Phe Tyr Gly Glu Gly Tyr Thr Ser Asp Glu Glu Val Leu Glu Val Phe
305                 310                 315                 320

Arg Asn Thr Leu Asn Lys Asn Ser Glu Ile Phe Ser Ser Ile Lys Lys
                325                 330                 335

Leu Glu Lys Leu Phe Lys Asn Phe Asp Glu Tyr Ser Ser Ala Gly Ile
            340                 345                 350

Phe Val Lys Asn Gly Pro Ala Ile Ser Thr Ile Ser Lys Asp Ile Phe
        355                 360                 365
```

```
Gly Glu Trp Asn Val Ile Arg Asp Lys Trp Asn Ala Glu Tyr Asp Asp
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Ile His Leu Lys Lys Lys Ala Val Val Thr Glu Lys Tyr Glu Asp Asp
385                 390                 395                 400

Arg Arg Lys Ser Phe Lys Lys Ile Gly Ser Phe Ser Leu Glu Gln Leu
                405                 410                 415

Gln Glu Tyr Ala Asp Ala Asp Leu Ser Val Val Glu Lys Leu Lys Glu
            420                 425                 430

Ile Ile Ile Gln Lys Val Asp Glu Ile Tyr Lys Val Tyr Gly Ser Ser
        435                 440                 445

Glu Lys Leu Phe Asp Ala Asp Phe Val Leu Glu Lys Ser Leu Lys Lys
    450                 455                 460

Asn Asp Ala Val Val Ala Ile Met Lys Asp Leu Leu Asp Ser Val Lys
465                 470                 475                 480

Ser Phe Glu Asn Tyr Ile Lys Ala Phe Phe Gly Glu Gly Lys Glu Thr
                485                 490                 495

Asn Arg Asp Glu Ser Phe Tyr Gly Asp Phe Val Leu Ala Tyr Asp Ile
            500                 505                 510

Leu Leu Lys Val Asp His Ile Tyr Asp Ala Ile Arg Asn Tyr Val Thr
        515                 520                 525

Gln Lys Pro Tyr Ser Lys Asp Lys Phe Lys Leu Tyr Phe Gln Asn Pro
    530                 535                 540

Gln Phe Met Gly Gly Trp Asp Lys Asp Lys Glu Thr Asp Tyr Arg Ala
545                 550                 555                 560

Thr Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr Leu Ala Ile Met Asp Lys
                565                 570                 575
```

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Lys Tyr Ala Lys Cys Leu Gln Lys Ile Asp Lys Asp Asp Val Asn Gly
            580                 585                 590

Asn Tyr Glu Lys Ile Asn Tyr Lys Leu Leu Pro Gly Pro Asn Lys Met
        595                 600                 605

Leu Pro Lys Val Phe Phe Ser Lys Lys Trp Met Ala Tyr Tyr Asn Pro
    610                 615                 620

Ser Glu Asp Ile Gln Lys Ile Tyr Lys Asn Gly Thr Phe Lys Lys Gly
625                 630                 635                 640

Asp Met Phe Asn Leu Asn Asp Cys His Lys Leu Ile Asp Phe Phe Lys
                645                 650                 655

Asp Ser Ile Ser Arg Tyr Pro Lys Trp Ser Asn Ala Tyr Asp Phe Asn
            660                 665                 670

Phe Ser Glu Thr Glu Lys Tyr Lys Asp Ile Ala Gly Phe Tyr Arg Glu
        675                 680                 685

Val Glu Glu Gln Gly Tyr Lys Val Ser Phe Glu Ser Ala Ser Lys Lys
    690                 695                 700

Glu Val Asp Lys Leu Val Glu Glu Gly Lys Leu Tyr Met Phe Gln Ile
705                 710                 715                 720

Tyr Asn Lys Asp Phe Ser Asp Lys Ser His Gly Thr Pro Asn Leu His
                725                 730                 735

Thr Met Tyr Phe Lys Leu Leu Phe Asp Glu Asn Asn His Gly Gln Ile
            740                 745                 750

Arg Leu Ser Gly Gly Ala Glu Leu Phe Met Arg Arg Ala Ser Leu Lys
        755                 760                 765
```

```
Lys Glu Glu Leu Val Val His Pro Ala Asn Ser Pro Ile Ala Asn Lys
    770                 775                 780

Asn Pro Asp Asn Pro Lys Lys Thr Thr Thr Leu Ser Tyr Asp Val Tyr
785                 790                 795                 800

Lys Asp Lys Arg Phe Ser Glu Asp Gln Tyr Glu Leu His Ile Pro Ile
                805                 810                 815

Ala Ile Asn Lys Cys Pro Lys Asn Ile Phe Lys Ile Asn Thr Glu Val
            820                 825                 830

Arg Val Leu Leu Lys His Asp Asp Asn Pro Tyr Val Ile Gly Ile Asp
        835                 840                 845

Arg Gly Glu Arg Asn Leu Leu Tyr Ile Val Val Val Asp Gly Lys Gly
    850                 855                 860

Asn Ile Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn Asn Phe Asn
865                 870                 875                 880

Gly Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu Asp Lys Lys Glu
                885                 890                 895

Lys Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu Asn Ile
            900                 905                 910

Lys Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys Ile Cys
        915                 920                 925

Glu Leu Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu Asp Leu Asn
    930                 935                 940

Ser Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys Gln Val Tyr Gln
945                 950                 955                 960

Lys Phe Glu Lys Met Leu Ile Asp Lys Leu Asn Tyr Met Val Asp Lys
                965                 970                 975
```

```
Lys Ser Asn Pro Cys Ala Thr Gly Gly Ala Leu Lys Gly Tyr Gln Ile
            980                 985                 990

Thr Asn Lys Phe Glu Ser Phe Lys  Ser Met Ser Thr Gln  Asn Gly Phe
        995                 1000                1005

Ile Phe  Tyr Ile Pro Ala Trp  Leu Thr Ser Lys Ile  Asp Pro Ser
    1010                1015                1020

Thr Gly  Phe Val Asn Leu Leu  Lys Thr Lys Tyr Thr  Ser Ile Ala
    1025                1030                1035

Asp Ser  Lys Lys Phe Ile Ser  Ser Phe Asp Arg Ile  Met Tyr Val
    1040                1045                1050

Pro Glu  Glu Asp Leu Phe Glu  Phe Ala Leu Asp Tyr  Lys Asn Phe
    1055                1060                1065

Ser Arg  Thr Asp Ala Asp Tyr  Ile Lys Lys Trp Lys  Leu Tyr Ser
    1070                1075                1080

Tyr Gly  Asn Arg Ile Arg Ile  Phe Arg Asn Pro Lys  Lys Asn Asn
    1085                1090                1095

Val Phe  Asp Trp Glu Glu Val  Cys Leu Thr Ser Ala  Tyr Lys Glu
    1100                1105                1110

Leu Phe  Asn Lys Tyr Gly Ile  Asn Tyr Gln Gln Gly  Asp Ile Arg
    1115                1120                1125

Ala Leu  Leu Cys Glu Gln Ser  Asp Lys Ala Phe Tyr  Ser Ser Phe
    1130                1135                1140

Met Ala  Leu Met Ser Leu Met  Leu Gln Met Arg Asn  Ser Ile Thr
    1145                1150                1155
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Gly Arg Thr Asp Val Asp Phe Leu Ile Ser Pro Val Lys Asn Ser
1160 1165 1170

Asp Gly Ile Phe Tyr Asp Ser Arg Asn Tyr Glu Ala Gln Glu Asn
1175 1180 1185

Ala Ile Leu Pro Lys Asn Ala Asp Ala Asn Gly Ala Tyr Asn Ile
1190 1195 1200

Ala Arg Lys Val Leu Trp Ala Ile Gly Gln Phe Lys Lys Ala Glu
1205 1210 1215

Asp Glu Lys Leu Asp Lys Val Lys Ile Ala Ile Ser Asn Lys Glu
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Trp Leu Glu Tyr Ala Gln Thr Ser Val Lys His Lys Arg Pro Ala
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35 40 45

Tyr Ser Leu Ser Lys Thr Leu Arg Phe Lys Ala Ile Pro Val Gly Lys
50 55 60

Thr Gln Glu Asn Ile Asp Asn Lys Arg Leu Leu Val Glu Asp Glu Lys
65 70 75 80

Arg Ala Glu Asp Tyr Lys Gly Val Lys Lys Leu Leu Asp Arg Tyr Tyr
85 90 95

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Leu Ser Phe Ile Asn Asp Val Leu His Ser Ile Lys Leu Lys Asn Leu
            100                 105                 110

Asn Asn Tyr Ile Ser Leu Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu
        115                 120                 125

Asn Lys Glu Leu Glu Asn Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala
    130                 135                 140

Lys Ala Phe Lys Gly Asn Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp
145                 150                 155                 160

Ile Ile Glu Thr Ile Leu Pro Glu Phe Leu Asp Asp Lys Asp Glu Ile
                165                 170                 175

Ala Leu Val Asn Ser Phe Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe
            180                 185                 190

Phe Asp Asn Arg Glu Asn Met Phe Ser Glu Glu Ala Lys Ser Thr Ser
        195                 200                 205

Ile Ala Phe Arg Cys Ile Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn
    210                 215                 220

Met Asp Ile Phe Glu Lys Val Asp Ala Ile Phe Asp Lys His Glu Val
225                 230                 235                 240

Gln Glu Ile Lys Glu Lys Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp
                245                 250                 255

Phe Phe Glu Gly Glu Phe Phe Asn Phe Val Leu Thr Gln Glu Gly Ile
            260                 265                 270

Asp Val Tyr Asn Ala Ile Ile Gly Gly Phe Val Thr Glu Ser Gly Glu
        275                 280                 285
```

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Lys Ile Lys Gly Leu Asn Glu Tyr Ile Asn Leu Tyr Asn Gln Lys Thr
    290                 295                 300

Lys Gln Lys Leu Pro Lys Phe Lys Pro Leu Tyr Lys Gln Val Leu Ser
305                 310                 315                 320

Asp Arg Glu Ser Leu Ser Phe Tyr Gly Glu Gly Tyr Thr Ser Asp Glu
                325                 330                 335

Glu Val Leu Glu Val Phe Arg Asn Thr Leu Asn Lys Asn Ser Glu Ile
            340                 345                 350

Phe Ser Ser Ile Lys Lys Leu Glu Lys Leu Phe Lys Asn Phe Asp Glu
        355                 360                 365

Tyr Ser Ser Ala Gly Ile Phe Val Lys Asn Gly Pro Ala Ile Ser Thr
    370                 375                 380

Ile Ser Lys Asp Ile Phe Gly Glu Trp Asn Val Ile Arg Asp Lys Trp
385                 390                 395                 400

Asn Ala Glu Tyr Asp Asp Ile His Leu Lys Lys Lys Ala Val Val Thr
                405                 410                 415

Glu Lys Tyr Glu Asp Asp Arg Arg Lys Ser Phe Lys Lys Ile Gly Ser
            420                 425                 430

Phe Ser Leu Glu Gln Leu Gln Glu Tyr Ala Asp Ala Asp Leu Ser Val
        435                 440                 445

Val Glu Lys Leu Lys Glu Ile Ile Ile Gln Lys Val Asp Glu Ile Tyr
    450                 455                 460

Lys Val Tyr Gly Ser Ser Glu Lys Leu Phe Asp Ala Asp Phe Val Leu
465                 470                 475                 480

Glu Lys Ser Leu Lys Lys Asn Asp Ala Val Val Ala Ile Met Lys Asp
                485                 490                 495
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Leu Leu Asp Ser Val Lys Ser Phe Glu Asn Tyr Ile Lys Ala Phe Phe
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Gly Glu Gly Lys Glu Thr Asn Arg Asp Glu Ser Phe Tyr Gly Asp Phe
        515                 520                 525

Val Leu Ala Tyr Asp Ile Leu Leu Lys Val Asp His Ile Tyr Asp Ala
    530                 535                 540

Ile Arg Asn Tyr Val Thr Gln Lys Pro Tyr Ser Lys Asp Lys Phe Lys
545                 550                 555                 560

Leu Tyr Phe Gln Asn Pro Gln Phe Met Gly Gly Trp Asp Lys Asp Lys
                565                 570                 575

Glu Thr Asp Tyr Arg Ala Thr Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr
            580                 585                 590

Leu Ala Ile Met Asp Lys Lys Tyr Ala Lys Cys Leu Gln Lys Ile Asp
        595                 600                 605

Lys Asp Asp Val Asn Gly Asn Tyr Glu Lys Ile Asn Tyr Lys Leu Leu
    610                 615                 620

Pro Gly Pro Asn Lys Met Leu Pro Lys Val Phe Phe Ser Lys Lys Trp
625                 630                 635                 640

Met Ala Tyr Tyr Asn Pro Ser Glu Asp Ile Gln Lys Ile Tyr Lys Asn
                645                 650                 655

Gly Thr Phe Lys Lys Gly Asp Met Phe Asn Leu Asn Asp Cys His Lys
            660                 665                 670

Leu Ile Asp Phe Phe Lys Asp Ser Ile Ser Arg Tyr Pro Lys Trp Ser
        675                 680                 685
```

```
Asn Ala Tyr Asp Phe Asn Phe Ser Glu Thr Glu Lys Tyr Lys Asp Ile
    690                 695                 700

Ala Gly Phe Tyr Arg Glu Val Glu Glu Gln Gly Tyr Lys Val Ser Phe
705                 710                 715                 720

Glu Ser Ala Ser Lys Lys Glu Val Asp Lys Leu Val Glu Glu Gly Lys
                725                 730                 735

Leu Tyr Met Phe Gln Ile Tyr Asn Lys Asp Phe Ser Asp Lys Ser His
            740                 745                 750

Gly Thr Pro Asn Leu His Thr Met Tyr Phe Lys Leu Leu Phe Asp Glu
        755                 760                 765

Asn Asn His Gly Gln Ile Arg Leu Ser Gly Gly Ala Glu Leu Phe Met
    770                 775                 780

Arg Arg Ala Ser Leu Lys Lys Glu Glu Leu Val Val His Pro Ala Asn
785                 790                 795                 800

Ser Pro Ile Ala Asn Lys Asn Pro Asp Asn Pro Lys Lys Thr Thr Thr
                805                 810                 815

Leu Ser Tyr Asp Val Tyr Lys Asp Lys Arg Phe Ser Glu Asp Gln Tyr
            820                 825                 830

Glu Leu His Ile Pro Ile Ala Ile Asn Lys Cys Pro Lys Asn Ile Phe
        835                 840                 845

Lys Ile Asn Thr Glu Val Arg Val Leu Leu Lys His Asp Asp Asn Pro
    850                 855                 860

Tyr Val Ile Gly Ile Asp Arg Gly Glu Arg Asn Leu Leu Tyr Ile Val
865                 870                 875                 880

Val Val Asp Gly Lys Gly Asn Ile Val Glu Gln Tyr Ser Leu Asn Glu
                885                 890                 895
```

```
Ile Ile Asn Asn Phe Asn Gly Ile Arg Ile Lys Thr Asp Tyr His Ser
            900                 905                 910

Leu Leu Asp Lys Lys Glu Lys Glu Arg Phe Glu Ala Arg Gln Asn Trp
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Thr Ser Ile Glu Asn Ile Lys Glu Leu Lys Ala Gly Tyr Ile Ser Gln
    930                 935                 940

Val Val His Lys Ile Cys Glu Leu Val Glu Lys Tyr Asp Ala Val Ile
945                 950                 955                 960

Ala Leu Glu Asp Leu Asn Ser Gly Phe Lys Asn Ser Arg Val Lys Val
                965                 970                 975

Glu Lys Gln Val Tyr Gln Lys Phe Glu Lys Met Leu Ile Asp Lys Leu
            980                 985                 990

Asn Tyr Met Val Asp Lys Lys Ser  Asn Pro Cys Ala Thr  Gly Gly Ala
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Leu Lys  Gly Tyr Gln Ile Thr  Asn Lys Phe Glu Ser  Phe Lys Ser
    1010                1015                1020

Met Ser  Thr Gln Asn Gly Phe  Ile Phe Tyr Ile Pro  Ala Trp Leu
    1025                1030                1035

Thr Ser  Lys Ile Asp Pro Ser  Thr Gly Phe Val Asn  Leu Leu Lys
    1040                1045                1050

Thr Lys  Tyr Thr Ser Ile Ala  Asp Ser Lys Lys Phe  Ile Ser Ser
    1055                1060                1065

Phe Asp  Arg Ile Met Tyr Val  Pro Glu Glu Asp Leu  Phe Glu Phe
    1070                1075                1080
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```
Ala Leu  Asp Tyr Lys Asn Phe  Ser Arg Thr Asp Ala  Asp Tyr Ile
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Lys Lys  Trp Lys Leu Tyr Ser  Tyr Gly Asn Arg Ile  Arg Ile Phe
    1100                1105                1110

Arg Asn  Pro Lys Lys Asn Asn  Val Phe Asp Trp Glu  Glu Val Cys
    1115                1120                1125

Leu Thr  Ser Ala Tyr Lys Glu  Leu Phe Asn Lys Tyr  Gly Ile Asn
    1130                1135                1140

Tyr Gln  Gln Gly Asp Ile Arg  Ala Leu Leu Cys Glu  Gln Ser Asp
    1145                1150                1155

Lys Ala  Phe Tyr Ser Ser Phe  Met Ala Leu Met Ser  Leu Met Leu
    1160                1165                1170

Gln Met  Arg Asn Ser Ile Thr  Gly Arg Thr Asp Val  Asp Phe Leu
    1175                1180                1185

Ile Ser  Pro Val Lys Asn Ser  Asp Gly Ile Phe Tyr  Asp Ser Arg
    1190                1195                1200

Asn Tyr  Glu Ala Gln Glu Asn  Ala Ile Leu Pro Lys  Asn Ala Asp
    1205                1210                1215

Ala Asn  Gly Ala Tyr Asn Ile  Ala Arg Lys Val Leu  Trp Ala Ile
    1220                1225                1230

Gly Gln  Phe Lys Lys Ala Glu  Asp Glu Lys Leu Asp  Lys Val Lys
    1235                1240                1245

Ile Ala  Ile Ser Asn Lys Glu  Trp Leu Glu Tyr Ala  Gln Thr Ser
    1250                1255                1260

Val Lys  His Gly Ser Pro Lys  Lys Lys Arg Lys Val  Ser Gly Gly
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Arg Phe Glu Leu Lys Pro Ile Gly Arg Thr Leu Glu His Ile His Ala
        35   40   45

Lys Asn Phe Leu Ser Gln Asp Glu Thr Met Ala Asp Met Tyr Gln Lys
    50   55   60

Val Lys Val Ile Leu Asp Asp Tyr His Arg Asp Phe Ile Ala Asp Met
65   70   75   80

Met Gly Glu Val Lys Leu Thr Lys Leu Ala Glu Phe Tyr Asp Val Tyr
                85   90   95

Leu Lys Phe Arg Lys Asn Pro Lys Asp Asp Gly Leu Gln Lys Gln Leu
            100   105   110

Lys Asp Leu Gln Ala Val Leu Arg Lys Glu Ser Val Lys Pro Ile Gly
        115   120   125

Ser Gly Gly Lys Tyr Lys Thr Gly Tyr Asp Arg Leu Phe Gly Ala Lys
    130   135   140

Leu Phe Lys Asp Gly Lys Glu Leu Gly Asp Leu Ala Lys Phe Val Ile
145   150   155   160

Ala Gln Glu Gly Glu Ser Ser Pro Lys Leu Ala His Leu Ala His Phe
                165   170   175

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Glu Lys Phe Ser Thr Tyr Phe Thr Gly Phe His Asp Asn Arg Lys Asn
            180                 185                 190

Met Tyr Ser Asp Glu Asp Lys His Thr Ala Ile Ala Tyr Arg Leu Ile
        195                 200                 205

His Glu Asn Leu Pro Arg Phe Ile Asp Asn Leu Gln Ile Leu Thr Thr
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Ile Lys Gln Lys His Ser Ala Leu Tyr Asp Gln Ile Ile Asn Glu Leu
225                 230                 235                 240

Thr Ala Ser Gly Leu Asp Val Ser Leu Ala Ser His Leu Asp Gly Tyr
                245                 250                 255

His Lys Leu Leu Thr Gln Glu Gly Ile Thr Ala Tyr Asn Arg Ile Ile
            260                 265                 270

Gly Glu Val Asn Gly Tyr Thr Asn Lys His Asn Gln Ile Cys His Lys
        275                 280                 285

Ser Glu Arg Ile Ala Lys Leu Arg Pro Leu His Lys Gln Ile Leu Ser
    290                 295                 300

Asp Gly Met Gly Val Ser Phe Leu Pro Ser Lys Phe Ala Asp Asp Ser
305                 310                 315                 320

Glu Met Cys Gln Ala Val Asn Glu Phe Tyr Arg His Tyr Thr Asp Val
                325                 330                 335

Phe Ala Lys Val Gln Ser Leu Phe Asp Gly Phe Asp Asp His Gln Lys
            340                 345                 350

Asp Gly Ile Tyr Val Glu His Lys Asn Leu Asn Glu Leu Ser Lys Gln
        355                 360                 365

Ala Phe Gly Asp Phe Ala Leu Leu Gly Arg Val Leu Asp Gly Tyr Tyr
    370                 375                 380
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Val Asp Val Val Asn Pro Glu Phe Asn Glu Arg Phe Ala Lys Ala Lys
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Thr Asp Asn Ala Lys Ala Lys Leu Thr Lys Glu Lys Asp Lys Phe Ile
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Lys Gly Val His Ser Leu Ala Ser Leu Glu Gln Ala Ile Glu His His
            420                 425                 430

Thr Ala Arg His Asp Asp Glu Ser Val Gln Ala Gly Lys Leu Gly Gln
        435                 440                 445

Tyr Phe Lys His Gly Leu Ala Gly Val Asp Asn Pro Ile Gln Lys Ile
    450                 455                 460

His Asn Asn His Ser Thr Ile Lys Gly Phe Leu Glu Arg Glu Arg Pro
465                 470                 475                 480

Ala Gly Glu Arg Ala Leu Pro Lys Ile Lys Ser Gly Lys Asn Pro Glu
                485                 490                 495

Met Thr Gln Leu Arg Gln Leu Lys Glu Leu Leu Asp Asn Ala Leu Asn
            500                 505                 510

Val Ala His Phe Ala Lys Leu Leu Thr Thr Lys Thr Thr Leu Asp Asn
        515                 520                 525

Gln Asp Gly Asn Phe Tyr Gly Glu Phe Gly Val Leu Tyr Asp Glu Leu
    530                 535                 540

Ala Lys Ile Pro Thr Leu Tyr Asn Lys Val Arg Asp Tyr Leu Ser Gln
545                 550                 555                 560

Lys Pro Phe Ser Thr Glu Lys Tyr Lys Leu Asn Phe Gly Asn Pro Thr
                565                 570                 575
```

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Leu Leu Asn Gly Trp Asp Leu Asn Lys Glu Lys Asp Asn Phe Gly Val
            580                 585                 590

Ile Leu Gln Lys Asp Gly Cys Tyr Tyr Leu Ala Leu Leu Asp Lys Ala
        595                 600                 605

His Lys Lys Val Phe Asp Asn Ala Pro Asn Thr Gly Lys Asn Val Tyr
    610                 615                 620

Gln Lys Met Val Tyr Lys Leu Leu Pro Gly Pro Asn Lys Met Leu Pro
625                 630                 635                 640

Lys Val Phe Phe Ala Lys Ser Asn Leu Asp Tyr Tyr Asn Pro Ser Ala
                645                 650                 655

Glu Leu Leu Asp Lys Tyr Ala Lys Gly Thr His Lys Lys Gly Asp Asn
            660                 665                 670

Phe Asn Leu Lys Asp Cys His Ala Leu Ile Asp Phe Phe Lys Ala Gly
        675                 680                 685

Ile Asn Lys His Pro Glu Trp Gln His Phe Gly Phe Lys Phe Ser Pro
    690                 695                 700

Thr Ser Ser Tyr Arg Asp Leu Ser Asp Phe Tyr Arg Glu Val Glu Pro
705                 710                 715                 720

Gln Gly Tyr Gln Val Lys Phe Val Asp Ile Asn Ala Asp Tyr Ile Asp
                725                 730                 735

Glu Leu Val Glu Gln Gly Lys Leu Tyr Leu Phe Gln Ile Tyr Asn Lys
            740                 745                 750

Asp Phe Ser Pro Lys Ala His Gly Lys Pro Asn Leu His Thr Leu Tyr
        755                 760                 765

Phe Lys Ala Leu Phe Ser Glu Asp Asn Leu Ala Asp Pro Ile Tyr Lys
    770                 775                 780
```

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Leu Asn Gly Glu Ala Gln Ile Phe Tyr Arg Lys Ala Ser Leu Asp Met
785                 790                 795                 800


Asn Glu Thr Thr Ile His Arg Ala Gly Glu Val Leu Glu Asn Lys Asn
                805                 810                 815


Pro Asp Asn Pro Lys Lys Arg Gln Phe Val Tyr Asp Ile Ile Lys Asp
            820                 825                 830


Lys Arg Tyr Thr Gln Asp Lys Phe Met Leu His Val Pro Ile Thr Met
        835                 840                 845


Asn Phe Gly Val Gln Gly Met Thr Ile Lys Glu Phe Asn Lys Lys Val
    850                 855                 860


Asn Gln Ser Ile Gln Gln Tyr Asp Glu Val Asn Val Ile Gly Ile Asp
865                 870                 875                 880


Arg Gly Glu Arg His Leu Leu Tyr Leu Thr Val Ile Asn Ser Lys Gly
                885                 890                 895


Glu Ile Leu Glu Gln Arg Ser Leu Asn Asp Ile Thr Thr Ala Ser Ala
            900                 905                 910


Asn Gly Thr Gln Val Thr Thr Pro Tyr His Lys Ile Leu Asp Lys Arg
        915                 920                 925


Glu Ile Glu Arg Leu Asn Ala Arg Val Gly Trp Gly Glu Ile Glu Thr
    930                 935                 940


Ile Lys Glu Leu Lys Ser Gly Tyr Leu Ser His Val Val His Gln Ile
945                 950                 955                 960


Asn Gln Leu Met Leu Lys Tyr Asn Ala Ile Val Val Leu Glu Asp Leu
                965                 970                 975
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Asn Phe Gly Phe Lys Arg Gly Arg Phe Lys Val Glu Lys Gln Ile Tyr
            980                 985                 990


Gln Asn Phe Glu Asn Ala Leu Ile  Lys Lys Leu Asn His  Leu Val Leu
        995                1000                1005


Lys Asp  Lys Ala Asp Asp Glu  Ile Gly Ser Tyr Lys  Asn Ala Leu
    1010                1015                1020


Gln Leu  Thr Asn Asn Phe Thr  Asp Leu Lys Ser Ile  Gly Lys Gln
    1025                1030                1035


Thr Gly  Phe Leu Phe Tyr Val  Pro Ala Trp Asn Thr  Ser Lys Ile
    1040                1045                1050


Asp Pro  Glu Thr Gly Phe Val  Asp Leu Leu Lys Pro  Arg Tyr Glu
    1055                1060                1065


Asn Ile  Ala Gln Ser Gln Ala  Phe Phe Gly Lys Phe  Asp Lys Ile
    1070                1075                1080


Cys Tyr  Asn Thr Asp Lys Gly  Tyr Phe Glu Phe His  Ile Asp Tyr
    1085                1090                1095


Ala Lys  Phe Thr Asp Lys Ala  Lys Asn Ser Arg Gln  Lys Trp Ala
    1100                1105                1110


Ile Cys  Ser His Gly Asp Lys  Arg Tyr Val Tyr Asp  Lys Thr Ala
    1115                1120                1125


Asn Gln  Asn Lys Gly Ala Ala  Lys Gly Ile Asn Val  Asn Asp Glu
    1130                1135                1140


Leu Lys  Ser Leu Phe Ala Arg  Tyr His Ile Asn Asp  Lys Gln Pro
    1145                1150                1155


Asn Leu  Val Met Asp Ile Cys  Gln Asn Asn Asp Lys  Glu Phe His
    1160                1165                1170
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Lys Ser Leu Met Cys Leu Leu Lys Thr Leu Leu Ala Leu Arg Tyr
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Ser Asn Ala Ser Ser Asp Glu Asp Phe Ile Leu Ser Pro Val Ala
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Asn Asp Glu Gly Val Phe Phe Asn Ser Ala Leu Ala Asp Asp Thr
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Gln Pro Gln Asn Ala Asp Ala Asn Gly Ala Tyr His Ile Ala Leu
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Lys Gly Leu Trp Leu Leu Asn Glu Leu Lys Asn Ser Asp Asp Leu
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Asn Lys Val Lys Leu Ala Ile Asp Asn Gln Thr Trp Leu Asn Phe
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cagatcaacc agctcatgct gaagtacaac gcgatcgtgg tcctcgagga cctgaacttc 3000

ggcttcaaga ggggccgctt caaggtggag aagcagatct accagaactt cgagaacgcc 3060

ctgatcaaga agctcaacca cctggtcctc aaggacaagg cggacgacga gatcggcagc 3120

tacaagaacg cgctccagct gaccaacaac ttcacggacc tcaagtccat cggcaagcag 3180

acgggcttcc tgttctacgt gccggcgtgg aacacctcca agatcgaccc ggaaaccggc 3240

ttcgtcgacc tgctcaagcc gcgctacgag aacatcgcgc agtcccaggc gttcttcggc 3300

aagttcgaca agatctgcta caacaccgac aagggctact tcgagttcca catcgactac 3360

gcgaagttca ccgacaaggc caagaactcc aggcagaagt gggccatctg cagccacggc 3420

gacaagcgct acgtgtacga caagacggcg aaccagaaca agggcgcggc caagggcatc 3480

aacgtgaacg acgagctgaa gtccctcttc gcgcgctacc acatcaacga caagcagccg 3540

aacctcgtca tggacatctg ccagaacaac gacaaggagt tccacaagag cctgatgtgc 3600

ctgctcaaga ccctgctcgc cctccgctac tccaacgcga gctccgacga ggacttcatc 3660

ctcagccccg tcgcgaacga cgagggcgtg ttcttcaact ccgccctcgc ggacgacacg 3720

cagccgcaga acgccgacgc gaacggcgcc taccacatcg ccctcaaggg cctgtggctg 3780

ctcaacgagc tcaagaactc cgacgacctg aacaaggtga agctcgccat tgacaaccag 3840

acgtggctga atttcgctca gaataggccg aagaagaagc gcaaggtgtc cggcggcagc 3900

tccggcggca gcccgaagaa gaagcgcaaa gtgtga 3936

<210> 43
<211> 1311
<212> PRT
<213> Artificial Sequence

<220>
<223> Fusion protein

<400> 43

Met Pro Lys Lys Lys Arg Lys Val Gly Gly Gly Gly Ser Gly Gly Gly
1 5 10 15

Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
20 25 30

Ser Gly Gly Gly Gly Ser Met Leu Phe Gln Asp Phe Thr His Leu Tyr
35 40 45

Pro Leu Ser Lys Thr Val Arg Phe Glu Leu Lys Pro Ile Gly Arg Thr
50 55 60

```
Leu Glu His Ile His Ala Lys Asn Phe Leu Ser Gln Asp Glu Thr Met
65                  70                  75                  80

Ala Asp Met Tyr Gln Lys Val Lys Val Ile Leu Asp Asp Tyr His Arg
                85                  90                  95

Asp Phe Ile Ala Asp Met Met Gly Glu Val Lys Leu Thr Lys Leu Ala
            100                 105                 110

Glu Phe Tyr Asp Val Tyr Leu Lys Phe Arg Lys Asn Pro Lys Asp Asp
        115                 120                 125

Gly Leu Gln Lys Gln Leu Lys Asp Leu Gln Ala Val Leu Arg Lys Glu
    130                 135                 140

Ser Val Lys Pro Ile Gly Ser Gly Gly Lys Tyr Lys Thr Gly Tyr Asp
145                 150                 155                 160

Arg Leu Phe Gly Ala Lys Leu Phe Lys Asp Gly Lys Glu Leu Gly Asp
                165                 170                 175

Leu Ala Lys Phe Val Ile Ala Gln Glu Gly Glu Ser Ser Pro Lys Leu
            180                 185                 190

Ala His Leu Ala His Phe Glu Lys Phe Ser Thr Tyr Phe Thr Gly Phe
        195                 200                 205

His Asp Asn Arg Lys Asn Met Tyr Ser Asp Glu Asp Lys His Thr Ala
    210                 215                 220

Ile Ala Tyr Arg Leu Ile His Glu Asn Leu Pro Arg Phe Ile Asp Asn
225                 230                 235                 240

Leu Gln Ile Leu Thr Thr Ile Lys Gln Lys His Ser Ala Leu Tyr Asp
                245                 250                 255
```

```
Gln Ile Ile Asn Glu Leu Thr Ala Ser Gly Leu Asp Val Ser Leu Ala
            260                 265                 270

Ser His Leu Asp Gly Tyr His Lys Leu Leu Thr Gln Glu Gly Ile Thr
        275                 280                 285

Ala Tyr Asn Arg Ile Ile Gly Glu Val Asn Gly Tyr Thr Asn Lys His
    290                 295                 300

Asn Gln Ile Cys His Lys Ser Glu Arg Ile Ala Lys Leu Arg Pro Leu
305                 310                 315                 320

His Lys Gln Ile Leu Ser Asp Gly Met Gly Val Ser Phe Leu Pro Ser
                325                 330                 335

Lys Phe Ala Asp Asp Ser Glu Met Cys Gln Ala Val Asn Glu Phe Tyr
            340                 345                 350

Arg His Tyr Thr Asp Val Phe Ala Lys Val Gln Ser Leu Phe Asp Gly
        355                 360                 365

Phe Asp Asp His Gln Lys Asp Gly Ile Tyr Val Glu His Lys Asn Leu
    370                 375                 380

Asn Glu Leu Ser Lys Gln Ala Phe Gly Asp Phe Ala Leu Leu Gly Arg
385                 390                 395                 400

Val Leu Asp Gly Tyr Tyr Val Asp Val Val Asn Pro Glu Phe Asn Glu
                405                 410                 415

Arg Phe Ala Lys Ala Lys Thr Asp Asn Ala Lys Ala Lys Leu Thr Lys
            420                 425                 430

Glu Lys Asp Lys Phe Ile Lys Gly Val His Ser Leu Ala Ser Leu Glu
        435                 440                 445

Gln Ala Ile Glu His His Thr Ala Arg His Asp Asp Glu Ser Val Gln
    450                 455                 460
```

```
Ala Gly Lys Leu Gly Gln Tyr Phe Lys His Gly Leu Ala Gly Val Asp
465                 470                 475                 480

Asn Pro Ile Gln Lys Ile His Asn Asn His Ser Thr Ile Lys Gly Phe
                485                 490                 495

Leu Glu Arg Glu Arg Pro Ala Gly Glu Arg Ala Leu Pro Lys Ile Lys
            500                 505                 510

Ser Gly Lys Asn Pro Glu Met Thr Gln Leu Arg Gln Leu Lys Glu Leu
        515                 520                 525

Leu Asp Asn Ala Leu Asn Val Ala His Phe Ala Lys Leu Leu Thr Thr
    530                 535                 540

Lys Thr Thr Leu Asp Asn Gln Asp Gly Asn Phe Tyr Gly Glu Phe Gly
545                 550                 555                 560

Val Leu Tyr Asp Glu Leu Ala Lys Ile Pro Thr Leu Tyr Asn Lys Val
                565                 570                 575

Arg Asp Tyr Leu Ser Gln Lys Pro Phe Ser Thr Glu Lys Tyr Lys Leu
            580                 585                 590

Asn Phe Gly Asn Pro Thr Leu Leu Asn Gly Trp Asp Leu Asn Lys Glu
        595                 600                 605

Lys Asp Asn Phe Gly Val Ile Leu Gln Lys Asp Gly Cys Tyr Tyr Leu
    610                 615                 620

Ala Leu Leu Asp Lys Ala His Lys Lys Val Phe Asp Asn Ala Pro Asn
625                 630                 635                 640

Thr Gly Lys Asn Val Tyr Gln Lys Met Val Tyr Lys Leu Leu Pro Gly
                645                 650                 655
```

```
Pro Asn Lys Met Leu Pro Lys Val Phe Phe Ala Lys Ser Asn Leu Asp
            660                 665                 670

Tyr Tyr Asn Pro Ser Ala Glu Leu Leu Asp Lys Tyr Ala Lys Gly Thr
        675                 680                 685

His Lys Lys Gly Asp Asn Phe Asn Leu Lys Asp Cys His Ala Leu Ile
    690                 695                 700

Asp Phe Phe Lys Ala Gly Ile Asn Lys His Pro Glu Trp Gln His Phe
705                 710                 715                 720

Gly Phe Lys Phe Ser Pro Thr Ser Ser Tyr Arg Asp Leu Ser Asp Phe
                725                 730                 735

Tyr Arg Glu Val Glu Pro Gln Gly Tyr Gln Val Lys Phe Val Asp Ile
            740                 745                 750

Asn Ala Asp Tyr Ile Asp Glu Leu Val Glu Gln Gly Lys Leu Tyr Leu
        755                 760                 765

Phe Gln Ile Tyr Asn Lys Asp Phe Ser Pro Lys Ala His Gly Lys Pro
    770                 775                 780

Asn Leu His Thr Leu Tyr Phe Lys Ala Leu Phe Ser Glu Asp Asn Leu
785                 790                 795                 800

Ala Asp Pro Ile Tyr Lys Leu Asn Gly Glu Ala Gln Ile Phe Tyr Arg
                805                 810                 815

Lys Ala Ser Leu Asp Met Asn Glu Thr Thr Ile His Arg Ala Gly Glu
            820                 825                 830

Val Leu Glu Asn Lys Asn Pro Asp Asn Pro Lys Lys Arg Gln Phe Val
        835                 840                 845

Tyr Asp Ile Ile Lys Asp Lys Arg Tyr Thr Gln Asp Lys Phe Met Leu
    850                 855                 860
```

```
His Val Pro Ile Thr Met Asn Phe Gly Val Gln Gly Met Thr Ile Lys
865                 870                 875                 880


Glu Phe Asn Lys Lys Val Asn Gln Ser Ile Gln Gln Tyr Asp Glu Val
                885                 890                 895


Asn Val Ile Gly Ile Asp Arg Gly Glu Arg His Leu Leu Tyr Leu Thr
            900                 905                 910


Val Ile Asn Ser Lys Gly Glu Ile Leu Glu Gln Arg Ser Leu Asn Asp
        915                 920                 925


Ile Thr Thr Ala Ser Ala Asn Gly Thr Gln Val Thr Thr Pro Tyr His
    930                 935                 940


Lys Ile Leu Asp Lys Arg Glu Ile Glu Arg Leu Asn Ala Arg Val Gly
945                 950                 955                 960


Trp Gly Glu Ile Glu Thr Ile Lys Glu Leu Lys Ser Gly Tyr Leu Ser
                965                 970                 975


His Val Val His Gln Ile Asn Gln Leu Met Leu Lys Tyr Asn Ala Ile
            980                 985                 990


Val Val Leu Glu Asp Leu Asn Phe  Gly Phe Lys Arg Gly  Arg Phe Lys
        995                 1000                1005


Val Glu  Lys Gln Ile Tyr Gln  Asn Phe Glu Asn Ala  Leu Ile Lys
    1010                1015                1020


Lys Leu  Asn His Leu Val Leu  Lys Asp Lys Ala Asp  Asp Glu Ile
    1025                1030                1035


Gly Ser  Tyr Lys Asn Ala Leu  Gln Leu Thr Asn Asn  Phe Thr Asp
    1040                1045                1050
```

```
Leu Lys  Ser Ile Gly Lys Gln  Thr Gly Phe Leu Phe  Tyr Val Pro
    1055                1060                1065

Ala Trp  Asn Thr Ser Lys Ile  Asp Pro Glu Thr Gly  Phe Val Asp
    1070                1075                1080

Leu Leu  Lys Pro Arg Tyr Glu  Asn Ile Ala Gln Ser  Gln Ala Phe
    1085                1090                1095

Phe Gly  Lys Phe Asp Lys Ile  Cys Tyr Asn Thr Asp  Lys Gly Tyr
    1100                1105                1110

Phe Glu  Phe His Ile Asp Tyr  Ala Lys Phe Thr Asp  Lys Ala Lys
    1115                1120                1125

Asn Ser  Arg Gln Lys Trp Ala  Ile Cys Ser His Gly  Asp Lys Arg
    1130                1135                1140

Tyr Val  Tyr Asp Lys Thr Ala  Asn Gln Asn Lys Gly  Ala Ala Lys
    1145                1150                1155

Gly Ile  Asn Val Asn Asp Glu  Leu Lys Ser Leu Phe  Ala Arg Tyr
    1160                1165                1170

His Ile  Asn Asp Lys Gln Pro  Asn Leu Val Met Asp  Ile Cys Gln
    1175                1180                1185

Asn Asn  Asp Lys Glu Phe His  Lys Ser Leu Met Cys  Leu Leu Lys
    1190                1195                1200

Thr Leu  Leu Ala Leu Arg Tyr  Ser Asn Ala Ser Ser  Asp Glu Asp
    1205                1210                1215

Phe Ile  Leu Ser Pro Val Ala  Asn Asp Glu Gly Val  Phe Phe Asn
    1220                1225                1230

Ser Ala  Leu Ala Asp Asp Thr  Gln Pro Gln Asn Ala  Asp Ala Asn
    1235                1240                1245
```

Gly Ala Tyr His Ile Ala Leu Lys Gly Leu Trp Leu Leu Asn Glu
    1250   1255   1260

Leu Lys Asn Ser Asp Asp Leu Asn Lys Val Lys Leu Ala Ile Asp
    1265   1270   1275

Asn Gln Thr Trp Leu Asn Phe Ala Gln Asn Arg Pro Lys Lys Lys
    1280   1285   1290

Arg Lys Val Ser Gly Gly Ser Ser Gly Gly Ser Pro Lys Lys Lys
    1295   1300   1305

Arg Lys Val
    1310

<210> 44
<211> 36
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 44

Gly Gly Gly Gly Ser Gly Gly Gly Gly Gly Ser Gly Gly Gly Gly Gly
1   5   10   15

Ser Gly Gly Gly Gly Gly Ser Gly Gly Gly Gly Gly Ser Gly Gly Gly
            20   25   30

Gly Gly Ser Gly
        35

<210> 45
<211> 1260
<212> PRT
<213> Artificial Sequence

<220>

<223> Synthetic

<220>
<221> xNLS-03
<222> (1)..(9)

<220>
<221> xEpitope-03
<222> (10)..(17)

<220>
<221> xNLS-04
<222> (1245)..(1260)

<400> 45

Met Ala Pro Lys Lys Lys Arg Lys Val Gly Ile His Gly Val Pro Ala
1 5 10 15

Ala Ser Lys Leu Glu Lys Phe Thr Asn Cys Tyr Ser Leu Ser Lys Thr
20 25 30

Leu Arg Phe Lys Ala Ile Pro Val Gly Lys Thr Gln Glu Asn Ile Asp
35 40 45

Asn Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala Glu Asp Tyr Lys
50 55 60

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

Val Leu His Ser Ile Lys Leu Lys Asn Leu Asn Asn Tyr Ile Ser Leu
85 90 95

Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn Lys Glu Leu Glu Asn
100 105 110

Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys Ala Phe Lys Gly Asn
115 120 125

Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile Ile Glu Thr Ile Leu

```
    130                 135                 140

Pro Glu Phe Leu Asp Asp Lys Asp Glu Ile Ala Leu Val Asn Ser Phe
145                 150                 155                 160

Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe Phe Asp Asn Arg Glu Asn
                165                 170                 175

Met Phe Ser Glu Glu Ala Lys Ser Thr Ser Ile Ala Phe Arg Cys Ile
            180                 185                 190

Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn Met Asp Ile Phe Glu Lys
        195                 200                 205

Val Asp Ala Ile Phe Asp Lys His Glu Val Gln Glu Ile Lys Glu Lys
    210                 215                 220

Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp Phe Phe Glu Gly Glu Phe
225                 230                 235                 240

Phe Asn Phe Val Leu Thr Gln Glu Gly Ile Asp Val Tyr Asn Ala Ile
                245                 250                 255

Ile Gly Gly Phe Val Thr Glu Ser Gly Glu Lys Ile Lys Gly Leu Asn
            260                 265                 270

Glu Tyr Ile Asn Leu Tyr Asn Gln Lys Thr Lys Gln Lys Leu Pro Lys
        275                 280                 285

Phe Lys Pro Leu Tyr Lys Gln Val Leu Ser Asp Arg Glu Ser Leu Ser
    290                 295                 300

Phe Tyr Gly Glu Gly Tyr Thr Ser Asp Glu Glu Val Leu Glu Val Phe
305                 310                 315                 320

Arg Asn Thr Leu Asn Lys Asn Ser Glu Ile Phe Ser Ser Ile Lys Lys
                325                 330                 335
```

```
Leu Glu Lys Leu Phe Lys Asn Phe Asp Glu Tyr Ser Ser Ala Gly Ile
            340                 345                 350

Phe Val Lys Asn Gly Pro Ala Ile Ser Thr Ile Ser Lys Asp Ile Phe
        355                 360                 365

Gly Glu Trp Asn Val Ile Arg Asp Lys Trp Asn Ala Glu Tyr Asp Asp
    370                 375                 380

Ile His Leu Lys Lys Lys Ala Val Val Thr Glu Lys Tyr Glu Asp Asp
385                 390                 395                 400

Arg Arg Lys Ser Phe Lys Lys Ile Gly Ser Phe Ser Leu Glu Gln Leu
                405                 410                 415

Gln Glu Tyr Ala Asp Ala Asp Leu Ser Val Val Glu Lys Leu Lys Glu
            420                 425                 430

Ile Ile Ile Gln Lys Val Asp Glu Ile Tyr Lys Val Tyr Gly Ser Ser
        435                 440                 445

Glu Lys Leu Phe Asp Ala Asp Phe Val Leu Glu Lys Ser Leu Lys Lys
    450                 455                 460

Asn Asp Ala Val Val Ala Ile Met Lys Asp Leu Leu Asp Ser Val Lys
465                 470                 475                 480

Ser Phe Glu Asn Tyr Ile Lys Ala Phe Phe Gly Glu Gly Lys Glu Thr
                485                 490                 495

Asn Arg Asp Glu Ser Phe Tyr Gly Asp Phe Val Leu Ala Tyr Asp Ile
            500                 505                 510

Leu Leu Lys Val Asp His Ile Tyr Asp Ala Ile Arg Asn Tyr Val Thr
        515                 520                 525

Gln Lys Pro Tyr Ser Lys Asp Lys Phe Lys Leu Tyr Phe Gln Asn Pro
```

```
    530                 535                 540

Gln Phe Met Gly Gly Trp Asp Lys Asp Lys Glu Thr Asp Tyr Arg Ala
545                 550                 555                 560

Thr Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr Leu Ala Ile Met Asp Lys
                565                 570                 575

Lys Tyr Ala Lys Cys Leu Gln Lys Ile Asp Lys Asp Asp Val Asn Gly
            580                 585                 590

Asn Tyr Glu Lys Ile Asn Tyr Lys Leu Leu Pro Gly Pro Asn Lys Met
        595                 600                 605

Leu Pro Lys Val Phe Phe Ser Lys Lys Trp Met Ala Tyr Tyr Asn Pro
    610                 615                 620

Ser Glu Asp Ile Gln Lys Ile Tyr Lys Asn Gly Thr Phe Lys Lys Gly
625                 630                 635                 640

Asp Met Phe Asn Leu Asn Asp Cys His Lys Leu Ile Asp Phe Phe Lys
                645                 650                 655

Asp Ser Ile Ser Arg Tyr Pro Lys Trp Ser Asn Ala Tyr Asp Phe Asn
            660                 665                 670

Phe Ser Glu Thr Glu Lys Tyr Lys Asp Ile Ala Gly Phe Tyr Arg Glu
        675                 680                 685

Val Glu Glu Gln Gly Tyr Lys Val Ser Phe Glu Ser Ala Ser Lys Lys
    690                 695                 700

Glu Val Asp Lys Leu Val Glu Glu Gly Lys Leu Tyr Met Phe Gln Ile
705                 710                 715                 720

Tyr Asn Lys Asp Phe Ser Asp Lys Ser His Gly Thr Pro Asn Leu His
                725                 730                 735
```

```
Thr Met Tyr Phe Lys Leu Leu Phe Asp Glu Asn Asn His Gly Gln Ile
            740                 745                 750

Arg Leu Ser Gly Gly Ala Glu Leu Phe Met Arg Arg Ala Ser Leu Lys
        755                 760                 765

Lys Glu Glu Leu Val Val His Pro Ala Asn Ser Pro Ile Ala Asn Lys
    770                 775                 780

Asn Pro Asp Asn Pro Lys Lys Thr Thr Thr Leu Ser Tyr Asp Val Tyr
785                 790                 795                 800

Lys Asp Lys Arg Phe Ser Glu Asp Gln Tyr Glu Leu His Ile Pro Ile
                805                 810                 815

Ala Ile Asn Lys Cys Pro Lys Asn Ile Phe Lys Ile Asn Thr Glu Val
            820                 825                 830

Arg Val Leu Leu Lys His Asp Asp Asn Pro Tyr Val Ile Gly Ile Asp
        835                 840                 845

Arg Gly Glu Arg Asn Leu Leu Tyr Ile Val Val Val Asp Gly Lys Gly
    850                 855                 860

Asn Ile Val Glu Gln Tyr Ser Leu Asn Glu Ile Ile Asn Asn Phe Asn
865                 870                 875                 880

Gly Ile Arg Ile Lys Thr Asp Tyr His Ser Leu Leu Asp Lys Lys Glu
                885                 890                 895

Lys Glu Arg Phe Glu Ala Arg Gln Asn Trp Thr Ser Ile Glu Asn Ile
            900                 905                 910

Lys Glu Leu Lys Ala Gly Tyr Ile Ser Gln Val Val His Lys Ile Cys
        915                 920                 925

Glu Leu Val Glu Lys Tyr Asp Ala Val Ile Ala Leu Glu Asp Leu Asn
```

```
    930                 935                 940

Ser Gly Phe Lys Asn Ser Arg Val Lys Val Glu Lys Gln Val Tyr Gln
945                 950                 955                 960

Lys Phe Glu Lys Met Leu Ile Asp Lys Leu Asn Tyr Met Val Asp Lys
                965                 970                 975

Lys Ser Asn Pro Cys Ala Thr Gly Gly Ala Leu Lys Gly Tyr Gln Ile
            980                 985                 990

Thr Asn Lys Phe Glu Ser Phe Lys  Ser Met Ser Thr Gln  Asn Gly Phe
        995                 1000                1005

Ile Phe  Tyr Ile Pro Ala Trp  Leu Thr Ser Lys Ile  Asp Pro Ser
    1010                1015                1020

Thr Gly  Phe Val Asn Leu Leu  Lys Thr Lys Tyr Thr  Ser Ile Ala
    1025                1030                1035

Asp Ser  Lys Lys Phe Ile Ser  Ser Phe Asp Arg Ile  Met Tyr Val
    1040                1045                1050

Pro Glu  Glu Asp Leu Phe Glu  Phe Ala Leu Asp Tyr  Lys Asn Phe
    1055                1060                1065

Ser Arg  Thr Asp Ala Asp Tyr  Ile Lys Lys Trp Lys  Leu Tyr Ser
    1070                1075                1080

Tyr Gly  Asn Arg Ile Arg Ile  Phe Arg Asn Pro Lys  Lys Asn Asn
    1085                1090                1095

Val Phe  Asp Trp Glu Glu Val  Cys Leu Thr Ser Ala  Tyr Lys Glu
    1100                1105                1110

Leu Phe  Asn Lys Tyr Gly Ile  Asn Tyr Gln Gln Gly  Asp Ile Arg
    1115                1120                1125
```

```
Ala Leu  Leu Cys Glu Gln Ser  Asp Lys Ala Phe Tyr  Ser Ser Phe
    1130                1135                1140


Met Ala  Leu Met Ser Leu Met  Leu Gln Met Arg Asn  Ser Ile Thr
    1145                1150                1155


Gly Arg  Thr Asp Val Asp Phe  Leu Ile Ser Pro Val  Lys Asn Ser
    1160                1165                1170


Asp Gly  Ile Phe Tyr Asp Ser  Arg Asn Tyr Glu Ala  Gln Glu Asn
    1175                1180                1185


Ala Ile  Leu Pro Lys Asn Ala  Asp Ala Asn Gly Ala  Tyr Asn Ile
    1190                1195                1200


Ala Arg  Lys Val Leu Trp Ala  Ile Gly Gln Phe Lys  Lys Ala Glu
    1205                1210                1215


Asp Glu  Lys Leu Asp Lys Val  Lys Ile Ala Ile Ser  Asn Lys Glu
    1220                1225                1230


Trp Leu  Glu Tyr Ala Gln Thr  Ser Val Lys His Lys  Arg Pro Ala
    1235                1240                1245


Ala Thr  Lys Lys Ala Gly Gln  Ala Lys Lys Lys Lys
    1250                1255                1260


<210>  46
<211>  1283
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic


<220>
<221>  xNLS-03
<222>  (1)..(9)
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<220>
<221> xEpitope-03
<222> (10)..(17)

<220>
<221> xNLS-04
<222> (1268)..(1283)

<400> 46

Met Ala Pro Lys Lys Lys Arg Lys Val Gly Ile His Gly Val Pro Ala
1   5   10   15

Ala Leu Phe Gln Asp Phe Thr His Leu Tyr Pro Leu Ser Lys Thr Val
            20   25   30

Arg Phe Glu Leu Lys Pro Ile Gly Arg Thr Leu Glu His Ile His Ala
        35   40   45

Lys Asn Phe Leu Ser Gln Asp Glu Thr Met Ala Asp Met Tyr Gln Lys
    50   55   60

Val Lys Val Ile Leu Asp Asp Tyr His Arg Asp Phe Ile Ala Asp Met
65   70   75   80

Met Gly Glu Val Lys Leu Thr Lys Leu Ala Glu Phe Tyr Asp Val Tyr
                85   90   95

Leu Lys Phe Arg Lys Asn Pro Lys Asp Asp Gly Leu Gln Lys Gln Leu
            100   105   110

Lys Asp Leu Gln Ala Val Leu Arg Lys Glu Ser Val Lys Pro Ile Gly
        115   120   125

Ser Gly Gly Lys Tyr Lys Thr Gly Tyr Asp Arg Leu Phe Gly Ala Lys
    130   135   140

Leu Phe Lys Asp Gly Lys Glu Leu Gly Asp Leu Ala Lys Phe Val Ile
145   150   155   160

```
Ala Gln Glu Gly Glu Ser Ser Pro Lys Leu Ala His Leu Ala His Phe
                165                 170                 175

Glu Lys Phe Ser Thr Tyr Phe Thr Gly Phe His Asp Asn Arg Lys Asn
            180                 185                 190

Met Tyr Ser Asp Glu Asp Lys His Thr Ala Ile Ala Tyr Arg Leu Ile
        195                 200                 205

His Glu Asn Leu Pro Arg Phe Ile Asp Asn Leu Gln Ile Leu Thr Thr
    210                 215                 220

Ile Lys Gln Lys His Ser Ala Leu Tyr Asp Gln Ile Ile Asn Glu Leu
225                 230                 235                 240

Thr Ala Ser Gly Leu Asp Val Ser Leu Ala Ser His Leu Asp Gly Tyr
                245                 250                 255

His Lys Leu Leu Thr Gln Glu Gly Ile Thr Ala Tyr Asn Arg Ile Ile
            260                 265                 270

Gly Glu Val Asn Gly Tyr Thr Asn Lys His Asn Gln Ile Cys His Lys
        275                 280                 285

Ser Glu Arg Ile Ala Lys Leu Arg Pro Leu His Lys Gln Ile Leu Ser
    290                 295                 300

Asp Gly Met Gly Val Ser Phe Leu Pro Ser Lys Phe Ala Asp Asp Ser
305                 310                 315                 320

Glu Met Cys Gln Ala Val Asn Glu Phe Tyr Arg His Tyr Thr Asp Val
                325                 330                 335

Phe Ala Lys Val Gln Ser Leu Phe Asp Gly Phe Asp Asp His Gln Lys
            340                 345                 350

Asp Gly Ile Tyr Val Glu His Lys Asn Leu Asn Glu Leu Ser Lys Gln
        355                 360                 365
```

```
Ala Phe Gly Asp Phe Ala Leu Leu Gly Arg Val Leu Asp Gly Tyr Tyr
    370                 375                 380

Val Asp Val Val Asn Pro Glu Phe Asn Glu Arg Phe Ala Lys Ala Lys
385                 390                 395                 400

Thr Asp Asn Ala Lys Ala Lys Leu Thr Lys Glu Lys Asp Lys Phe Ile
                405                 410                 415

Lys Gly Val His Ser Leu Ala Ser Leu Glu Gln Ala Ile Glu His His
            420                 425                 430

Thr Ala Arg His Asp Asp Glu Ser Val Gln Ala Gly Lys Leu Gly Gln
        435                 440                 445

Tyr Phe Lys His Gly Leu Ala Gly Val Asp Asn Pro Ile Gln Lys Ile
    450                 455                 460

His Asn Asn His Ser Thr Ile Lys Gly Phe Leu Glu Arg Glu Arg Pro
465                 470                 475                 480

Ala Gly Glu Arg Ala Leu Pro Lys Ile Lys Ser Gly Lys Asn Pro Glu
                485                 490                 495

Met Thr Gln Leu Arg Gln Leu Lys Glu Leu Leu Asp Asn Ala Leu Asn
            500                 505                 510

Val Ala His Phe Ala Lys Leu Leu Thr Thr Lys Thr Thr Leu Asp Asn
        515                 520                 525

Gln Asp Gly Asn Phe Tyr Gly Glu Phe Gly Val Leu Tyr Asp Glu Leu
    530                 535                 540

Ala Lys Ile Pro Thr Leu Tyr Asn Lys Val Arg Asp Tyr Leu Ser Gln
545                 550                 555                 560
```

```
Lys Pro Phe Ser Thr Glu Lys Tyr Lys Leu Asn Phe Gly Asn Pro Thr
                565                 570                 575

Leu Leu Asn Gly Trp Asp Leu Asn Lys Glu Lys Asp Asn Phe Gly Val
            580                 585                 590

Ile Leu Gln Lys Asp Gly Cys Tyr Tyr Leu Ala Leu Leu Asp Lys Ala
        595                 600                 605

His Lys Lys Val Phe Asp Asn Ala Pro Asn Thr Gly Lys Asn Val Tyr
    610                 615                 620

Gln Lys Met Val Tyr Lys Leu Leu Pro Gly Pro Asn Lys Met Leu Pro
625                 630                 635                 640

Lys Val Phe Phe Ala Lys Ser Asn Leu Asp Tyr Tyr Asn Pro Ser Ala
                645                 650                 655

Glu Leu Leu Asp Lys Tyr Ala Lys Gly Thr His Lys Lys Gly Asp Asn
            660                 665                 670

Phe Asn Leu Lys Asp Cys His Ala Leu Ile Asp Phe Phe Lys Ala Gly
        675                 680                 685

Ile Asn Lys His Pro Glu Trp Gln His Phe Gly Phe Lys Phe Ser Pro
    690                 695                 700

Thr Ser Ser Tyr Arg Asp Leu Ser Asp Phe Tyr Arg Glu Val Glu Pro
705                 710                 715                 720

Gln Gly Tyr Gln Val Lys Phe Val Asp Ile Asn Ala Asp Tyr Ile Asp
                725                 730                 735

Glu Leu Val Glu Gln Gly Lys Leu Tyr Leu Phe Gln Ile Tyr Asn Lys
            740                 745                 750

Asp Phe Ser Pro Lys Ala His Gly Lys Pro Asn Leu His Thr Leu Tyr
        755                 760                 765
```

```
Phe Lys Ala Leu Phe Ser Glu Asp Asn Leu Ala Asp Pro Ile Tyr Lys
    770                 775                 780

Leu Asn Gly Glu Ala Gln Ile Phe Tyr Arg Lys Ala Ser Leu Asp Met
785                 790                 795                 800

Asn Glu Thr Thr Ile His Arg Ala Gly Glu Val Leu Glu Asn Lys Asn
                805                 810                 815

Pro Asp Asn Pro Lys Lys Arg Gln Phe Val Tyr Asp Ile Ile Lys Asp
            820                 825                 830

Lys Arg Tyr Thr Gln Asp Lys Phe Met Leu His Val Pro Ile Thr Met
        835                 840                 845

Asn Phe Gly Val Gln Gly Met Thr Ile Lys Glu Phe Asn Lys Lys Val
    850                 855                 860

Asn Gln Ser Ile Gln Gln Tyr Asp Glu Val Asn Val Ile Gly Ile Asp
865                 870                 875                 880

Arg Gly Glu Arg His Leu Leu Tyr Leu Thr Val Ile Asn Ser Lys Gly
                885                 890                 895

Glu Ile Leu Glu Gln Arg Ser Leu Asn Asp Ile Thr Thr Ala Ser Ala
            900                 905                 910

Asn Gly Thr Gln Val Thr Thr Pro Tyr His Lys Ile Leu Asp Lys Arg
        915                 920                 925

Glu Ile Glu Arg Leu Asn Ala Arg Val Gly Trp Gly Glu Ile Glu Thr
    930                 935                 940

Ile Lys Glu Leu Lys Ser Gly Tyr Leu Ser His Val Val His Gln Ile
945                 950                 955                 960
```

```
Asn Gln Leu Met Leu Lys Tyr Asn Ala Ile Val Val Leu Glu Asp Leu
               965                 970                 975

Asn Phe Gly Phe Lys Arg Gly Arg Phe Lys Val Glu Lys Gln Ile Tyr
           980                 985                 990

Gln Asn Phe Glu Asn Ala Leu Ile  Lys Lys Leu Asn His  Leu Val Leu
        995                1000                1005

Lys Asp  Lys Ala Asp Asp Glu  Ile Gly Ser Tyr Lys  Asn Ala Leu
    1010                1015                1020

Gln Leu  Thr Asn Asn Phe Thr  Asp Leu Lys Ser Ile  Gly Lys Gln
    1025                1030                1035

Thr Gly  Phe Leu Phe Tyr Val  Pro Ala Trp Asn Thr  Ser Lys Ile
    1040                1045                1050

Asp Pro  Glu Thr Gly Phe Val  Asp Leu Leu Lys Pro  Arg Tyr Glu
    1055                1060                1065

Asn Ile  Ala Gln Ser Gln Ala  Phe Phe Gly Lys Phe  Asp Lys Ile
    1070                1075                1080

Cys Tyr  Asn Thr Asp Lys Gly  Tyr Phe Glu Phe His  Ile Asp Tyr
    1085                1090                1095

Ala Lys  Phe Thr Asp Lys Ala  Lys Asn Ser Arg Gln  Lys Trp Ala
    1100                1105                1110

Ile Cys  Ser His Gly Asp Lys  Arg Tyr Val Tyr Asp  Lys Thr Ala
    1115                1120                1125

Asn Gln  Asn Lys Gly Ala Ala  Lys Gly Ile Asn Val  Asn Asp Glu
    1130                1135                1140

Leu Lys  Ser Leu Phe Ala Arg  Tyr His Ile Asn Asp  Lys Gln Pro
    1145                1150                1155
```

```
Asn Leu  Val Met Asp Ile Cys  Gln Asn Asn Asp Lys  Glu Phe His
    1160                1165                1170


Lys Ser  Leu Met Cys Leu Leu  Lys Thr Leu Leu Ala  Leu Arg Tyr
    1175                1180                1185


Ser Asn  Ala Ser Ser Asp Glu  Asp Phe Ile Leu Ser  Pro Val Ala
    1190                1195                1200


Asn Asp  Glu Gly Val Phe Phe  Asn Ser Ala Leu Ala  Asp Asp Thr
    1205                1210                1215


Gln Pro  Gln Asn Ala Asp Ala  Asn Gly Ala Tyr His  Ile Ala Leu
    1220                1225                1230


Lys Gly  Leu Trp Leu Leu Asn  Glu Leu Lys Asn Ser  Asp Asp Leu
    1235                1240                1245


Asn Lys  Val Lys Leu Ala Ile  Asp Asn Gln Thr Trp  Leu Asn Phe
    1250                1255                1260


Ala Gln  Asn Arg Lys Arg Pro  Ala Ala Thr Lys Lys  Ala Gly Gln
    1265                1270                1275


Ala Lys  Lys Lys Lys
    1280
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<220>
<223> Synthetic

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Met Thr Gln Phe Glu Gly Phe Thr Asn Leu Tyr Gln Val Ser Lys Thr
1               5                  10                  15
```

```
Leu Arg Phe Glu Leu Ile Pro Gln Gly Lys Thr Leu Lys His Ile Gln
            20                  25                  30

Glu Gln Gly Phe Ile Glu Glu Asp Lys Ala Arg Asn Asp His Tyr Lys
        35                  40                  45

Glu Leu Lys Pro Ile Ile Asp Arg Ile Tyr Lys Thr Tyr Ala Asp Gln
    50                  55                  60

Cys Leu Gln Leu Val Gln Leu Asp Trp Glu Asn Leu Ser Ala Ala Ile
65                  70                  75                  80

Asp Ser Tyr Arg Lys Glu Lys Thr Glu Glu Thr Arg Asn Ala Leu Ile
                85                  90                  95

Glu Glu Gln Ala Thr Tyr Arg Asn Ala Ile His Asp Tyr Phe Ile Gly
            100                 105                 110

Arg Thr Asp Asn Leu Thr Asp Ala Ile Asn Lys Arg His Ala Glu Ile
        115                 120                 125

Tyr Lys Gly Leu Phe Lys Ala Glu Leu Phe Asn Gly Lys Val Leu Lys
    130                 135                 140

Gln Leu Gly Thr Val Thr Thr Thr Glu His Glu Asn Ala Leu Leu Arg
145                 150                 155                 160

Ser Phe Asp Lys Phe Thr Thr Tyr Phe Ser Gly Phe Tyr Glu Asn Arg
                165                 170                 175

Lys Asn Val Phe Ser Ala Glu Asp Ile Ser Thr Ala Ile Pro His Arg
            180                 185                 190

Ile Val Gln Asp Asn Phe Pro Lys Phe Lys Glu Asn Cys His Ile Phe
        195                 200                 205
```

```
Thr Arg Leu Ile Thr Ala Val Pro Ser Leu Arg Glu His Phe Glu Asn
    210                 215                 220

Val Lys Lys Ala Ile Gly Ile Phe Val Ser Thr Ser Ile Glu Glu Val
225                 230                 235                 240

Phe Ser Phe Pro Phe Tyr Asn Gln Leu Leu Thr Gln Thr Gln Ile Asp
                245                 250                 255

Leu Tyr Asn Gln Leu Leu Gly Gly Ile Ser Arg Glu Ala Gly Thr Glu
            260                 265                 270

Lys Ile Lys Gly Leu Asn Glu Val Leu Asn Leu Ala Ile Gln Lys Asn
        275                 280                 285

Asp Glu Thr Ala His Ile Ile Ala Ser Leu Pro His Arg Phe Ile Pro
    290                 295                 300

Leu Phe Lys Gln Ile Leu Ser Asp Arg Asn Thr Leu Ser Phe Ile Leu
305                 310                 315                 320

Glu Glu Phe Lys Ser Asp Glu Glu Val Ile Gln Ser Phe Cys Lys Tyr
                325                 330                 335

Lys Thr Leu Leu Arg Asn Glu Asn Val Leu Glu Thr Ala Glu Ala Leu
            340                 345                 350

Phe Asn Glu Leu Asn Ser Ile Asp Leu Thr His Ile Phe Ile Ser His
        355                 360                 365

Lys Lys Leu Glu Thr Ile Ser Ser Ala Leu Cys Asp His Trp Asp Thr
    370                 375                 380

Leu Arg Asn Ala Leu Tyr Glu Arg Arg Ile Ser Glu Leu Thr Gly Lys
385                 390                 395                 400

Ile Thr Lys Ser Ala Lys Glu Lys Val Gln Arg Ser Leu Lys His Glu
                405                 410                 415
```

```
Asp Ile Asn Leu Gln Glu Ile Ile Ser Ala Ala Gly Lys Glu Leu Ser
            420                 425                 430

Glu Ala Phe Lys Gln Lys Thr Ser Glu Ile Leu Ser His Ala His Ala
        435                 440                 445

Ala Leu Asp Gln Pro Leu Pro Thr Thr Leu Lys Lys Gln Glu Glu Lys
    450                 455                 460

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

Leu Asp Trp Phe Ala Val Asp Glu Ser Asn Glu Val Asp Pro Glu Phe
                485                 490                 495

Ser Ala Arg Leu Thr Gly Ile Lys Leu Glu Met Glu Pro Ser Leu Ser
            500                 505                 510

Phe Tyr Asn Lys Ala Arg Asn Tyr Ala Thr Lys Lys Pro Tyr Ser Val
        515                 520                 525

Glu Lys Phe Lys Leu Asn Phe Gln Met Pro Thr Leu Ala Ser Gly Trp
    530                 535                 540

Asp Val Asn Lys Glu Lys Asn Asn Gly Ala Ile Leu Phe Val Lys Asn
545                 550                 555                 560

Gly Leu Tyr Tyr Leu Gly Ile Met Pro Lys Gln Lys Gly Arg Tyr Lys
                565                 570                 575

Ala Leu Ser Phe Glu Pro Thr Glu Lys Thr Ser Glu Gly Phe Asp Lys
            580                 585                 590

Met Tyr Tyr Asp Tyr Phe Pro Asp Ala Ala Lys Met Ile Pro Lys Cys
        595                 600                 605
```

```
Ser Thr Gln Leu Lys Ala Val Thr Ala His Phe Gln Thr His Thr Thr
    610                 615                 620

Pro Ile Leu Leu Ser Asn Asn Phe Ile Glu Pro Leu Glu Ile Thr Lys
625                 630                 635                 640

Glu Ile Tyr Asp Leu Asn Asn Pro Glu Lys Glu Pro Lys Lys Phe Gln
                645                 650                 655

Thr Ala Tyr Ala Lys Lys Thr Gly Asp Gln Lys Gly Tyr Arg Glu Ala
            660                 665                 670

Leu Cys Lys Trp Ile Asp Phe Thr Arg Asp Phe Leu Ser Lys Tyr Thr
        675                 680                 685

Lys Thr Thr Ser Ile Asp Leu Ser Ser Leu Arg Pro Ser Ser Gln Tyr
    690                 695                 700

Lys Asp Leu Gly Glu Tyr Tyr Ala Glu Leu Asn Pro Leu Leu Tyr His
705                 710                 715                 720

Ile Ser Phe Gln Arg Ile Ala Glu Lys Glu Ile Met Asp Ala Val Glu
                725                 730                 735

Thr Gly Lys Leu Tyr Leu Phe Gln Ile Tyr Asn Lys Asp Phe Ala Lys
            740                 745                 750

Gly His His Gly Lys Pro Asn Leu His Thr Leu Tyr Trp Thr Gly Leu
        755                 760                 765

Phe Ser Pro Glu Asn Leu Ala Lys Thr Ser Ile Lys Leu Asn Gly Gln
    770                 775                 780

Ala Glu Leu Phe Tyr Arg Pro Lys Ser Arg Met Lys Arg Met Ala His
785                 790                 795                 800

Arg Leu Gly Glu Lys Met Leu Asn Lys Lys Leu Lys Asp Gln Lys Thr
                805                 810                 815
```

```
Pro Ile Pro Asp Thr Leu Tyr Gln Glu Leu Tyr Asp Tyr Val Asn His
            820                 825                 830

Arg Leu Ser His Asp Leu Ser Asp Glu Ala Arg Ala Leu Leu Pro Asn
        835                 840                 845

Val Ile Thr Lys Glu Val Ser His Glu Ile Ile Lys Asp Arg Arg Phe
    850                 855                 860

Thr Ser Asp Lys Phe Phe Phe His Val Pro Ile Thr Leu Asn Tyr Gln
865                 870                 875                 880

Ala Ala Asn Ser Pro Ser Lys Phe Asn Gln Arg Val Asn Ala Tyr Leu
                885                 890                 895

Lys Glu His Pro Glu Thr Pro Ile Ile Gly Ile Asp Arg Gly Glu Arg
            900                 905                 910

Asn Leu Ile Tyr Ile Thr Val Ile Asp Ser Thr Gly Lys Ile Leu Glu
        915                 920                 925

Gln Arg Ser Leu Asn Thr Ile Gln Gln Phe Asp Tyr Gln Lys Lys Leu
    930                 935                 940

Asp Asn Arg Glu Lys Glu Arg Val Ala Ala Arg Gln Ala Trp Ser Val
945                 950                 955                 960

Val Gly Thr Ile Lys Asp Leu Lys Gln Gly Tyr Leu Ser Gln Val Ile
                965                 970                 975

His Glu Ile Val Asp Leu Met Ile His Tyr Gln Ala Val Val Val Leu
            980                 985                 990

Glu Asn Leu Asn Phe Gly Phe Lys  Ser Lys Arg Thr Gly  Ile Ala Glu
        995                 1000                1005
```

```
Lys Ala  Val Tyr Gln Gln Phe  Glu Lys Met Leu Ile  Asp Lys Leu
    1010                1015                1020

Asn Cys  Leu Val Leu Lys Asp  Tyr Pro Ala Glu Lys  Val Gly Gly
    1025                1030                1035

Val Leu  Asn Pro Tyr Gln Leu  Thr Asp Gln Phe Thr  Ser Phe Ala
    1040                1045                1050

Lys Met  Gly Thr Gln Ser Gly  Phe Leu Phe Tyr Val  Pro Ala Pro
    1055                1060                1065

Tyr Thr  Ser Lys Ile Asp Pro  Leu Thr Gly Phe Val  Asp Pro Phe
    1070                1075                1080

Val Trp  Lys Thr Ile Lys Asn  His Glu Ser Arg Lys  His Phe Leu
    1085                1090                1095

Glu Gly  Phe Asp Phe Leu His  Tyr Asp Val Lys Thr  Gly Asp Phe
    1100                1105                1110

Ile Leu  His Phe Lys Met Asn  Arg Asn Leu Ser Phe  Gln Arg Gly
    1115                1120                1125

Leu Pro  Gly Phe Met Pro Ala  Trp Asp Ile Val Phe  Glu Lys Asn
    1130                1135                1140

Glu Thr  Gln Phe Asp Ala Lys  Gly Thr Pro Phe Ile  Ala Gly Lys
    1145                1150                1155

Arg Ile  Val Pro Val Ile Glu  Asn His Arg Phe Thr  Gly Arg Tyr
    1160                1165                1170

Arg Asp  Leu Tyr Pro Ala Asn  Glu Leu Ile Ala Leu  Leu Glu Glu
    1175                1180                1185

Lys Gly  Ile Val Phe Arg Asp  Gly Ser Asn Ile Leu  Pro Lys Leu
    1190                1195                1200
```

```
Leu Glu  Asn Asp Asp Ser His  Ala Ile Asp Thr Met  Val Ala Leu
    1205                 1210                 1215


Ile Arg  Ser Val Leu Gln Met  Arg Asn Ser Asn Ala  Ala Thr Gly
    1220                 1225                 1230


Glu Asp  Tyr Ile Asn Ser Pro  Val Arg Asp Leu Asn  Gly Val Cys
    1235                 1240                 1245


Phe Asp  Ser Arg Phe Gln Asn  Pro Glu Trp Pro Met  Asp Ala Asp
    1250                 1255                 1260


Ala Asn  Gly Ala Tyr His Ile  Ala Leu Lys Gly Gln  Leu Leu Leu
    1265                 1270                 1275


Asn His  Leu Lys Glu Ser Lys  Asp Leu Lys Leu Gln  Asn Gly Ile
    1280                 1285                 1290


Ser Asn  Gln Asp Trp Leu Ala  Tyr Ile Gln Glu Leu  Arg Asn Lys
    1295                 1300                 1305


Arg Pro  Ala Ala Thr Lys Lys  Ala Gly Gln Ala Lys  Lys Lys Lys
    1310                 1315                 1320


Gly Ser  Tyr Pro Tyr Asp Val  Pro Asp Tyr Ala Tyr  Pro Tyr Asp
    1325                 1330                 1335


Val Pro  Asp Tyr Ala Tyr Pro  Tyr Asp Val Pro Asp  Tyr Ala
    1340                 1345                 1350


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<213>  Artificial Sequence

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<223>  Synethtic
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<222> (1339)..(1345)

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<222> (1354)..(1360)

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Met Pro Lys Lys Lys Arg Lys Val Gly Gly Gly Gly Ser Gly Gly Gly
1   5   10   15

Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
            20   25   30

Ser Gly Gly Gly Gly Ser Met Ser Ile Tyr Gln Glu Phe Val Asn Lys
        35   40   45

Tyr Ser Leu Ser Lys Thr Leu Arg Phe Glu Leu Ile Pro Gln Gly Lys
    50   55   60

Thr Leu Glu Asn Ile Lys Ala Arg Gly Leu Ile Leu Asp Asp Glu Lys
65   70   75   80

```
Arg Ala Lys Asp Tyr Lys Lys Ala Lys Gln Ile Ile Asp Lys Tyr His
                85                  90                  95

Gln Phe Phe Ile Glu Glu Ile Leu Ser Ser Val Cys Ile Ser Glu Asp
            100                 105                 110

Leu Leu Gln Asn Tyr Ser Asp Val Tyr Phe Lys Leu Lys Lys Ser Asp
        115                 120                 125

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

Lys Gln Ile Ser Glu Tyr Ile Lys Asp Ser Glu Lys Phe Lys Asn Leu
145                 150                 155                 160

Phe Asn Gln Asn Leu Ile Asp Ala Lys Lys Gly Gln Glu Ser Asp Leu
                165                 170                 175

Ile Leu Trp Leu Lys Gln Ser Lys Asp Asn Gly Ile Glu Leu Phe Lys
            180                 185                 190

Ala Asn Ser Asp Ile Thr Asp Ile Asp Glu Ala Leu Glu Ile Ile Lys
        195                 200                 205

Ser Phe Lys Gly Trp Thr Thr Tyr Phe Lys Gly Phe His Glu Asn Arg
    210                 215                 220

Lys Asn Val Tyr Ser Ser Asn Asp Ile Pro Thr Ser Ile Ile Tyr Arg
225                 230                 235                 240

Ile Val Asp Asp Asn Leu Pro Lys Phe Leu Glu Asn Lys Ala Lys Tyr
                245                 250                 255

Glu Ser Leu Lys Asp Lys Ala Pro Glu Ala Ile Asn Tyr Glu Gln Ile
            260                 265                 270

Lys Lys Asp Leu Ala Glu Glu Leu Thr Phe Asp Ile Asp Tyr Lys Thr
```

```
        275                 280                 285

Ser Glu Val Asn Gln Arg Val Phe Ser Leu Asp Glu Val Phe Glu Ile
    290                 295                 300

Ala Asn Phe Asn Asn Tyr Leu Asn Gln Ser Gly Ile Thr Lys Phe Asn
305                 310                 315                 320

Thr Ile Ile Gly Gly Lys Phe Val Asn Gly Glu Asn Thr Lys Arg Lys
                325                 330                 335

Gly Ile Asn Glu Tyr Ile Asn Leu Tyr Ser Gln Gln Ile Asn Asp Lys
            340                 345                 350

Thr Leu Lys Lys Tyr Lys Met Ser Val Leu Phe Lys Gln Ile Leu Ser
        355                 360                 365

Asp Thr Glu Ser Lys Ser Phe Val Ile Asp Lys Leu Glu Asp Asp Ser
    370                 375                 380

Asp Val Val Thr Thr Met Gln Ser Phe Tyr Glu Gln Ile Ala Ala Phe
385                 390                 395                 400

Lys Thr Val Glu Glu Lys Ser Ile Lys Glu Thr Leu Ser Leu Leu Phe
                405                 410                 415

Asp Asp Leu Lys Ala Gln Lys Leu Asp Leu Ser Lys Ile Tyr Phe Lys
            420                 425                 430

Asn Asp Lys Ser Leu Thr Asp Leu Ser Gln Gln Val Phe Asp Asp Tyr
        435                 440                 445

Ser Val Ile Gly Thr Ala Val Leu Glu Tyr Ile Thr Gln Gln Ile Ala
    450                 455                 460

Pro Lys Asn Leu Asp Asn Pro Ser Lys Lys Glu Gln Glu Leu Ile Ala
465                 470                 475                 480
```

```
Lys Lys Thr Glu Lys Ala Lys Tyr Leu Ser Leu Glu Thr Ile Lys Leu
                485                 490                 495

Ala Leu Glu Glu Phe Asn Lys His Arg Asp Ile Asp Lys Gln Cys Arg
            500                 505                 510

Phe Glu Glu Ile Leu Ala Asn Phe Ala Ala Ile Pro Met Ile Phe Asp
        515                 520                 525

Glu Ile Ala Gln Asn Lys Asp Asn Leu Ala Gln Ile Ser Ile Lys Tyr
    530                 535                 540

Gln Asn Gln Gly Lys Lys Asp Leu Leu Gln Ala Ser Ala Glu Asp Asp
545                 550                 555                 560

Val Lys Ala Ile Lys Asp Leu Leu Asp Gln Thr Asn Asn Leu Leu His
                565                 570                 575

Lys Leu Lys Ile Phe His Ile Ser Gln Ser Glu Asp Lys Ala Asn Ile
            580                 585                 590

Leu Asp Lys Asp Glu His Phe Tyr Leu Val Phe Glu Glu Cys Tyr Phe
        595                 600                 605

Glu Leu Ala Asn Ile Val Pro Leu Tyr Asn Lys Ile Arg Asn Tyr Ile
    610                 615                 620

Thr Gln Lys Pro Tyr Ser Asp Glu Lys Phe Lys Leu Asn Phe Glu Asn
625                 630                 635                 640

Ser Thr Leu Ala Asn Gly Trp Asp Lys Asn Lys Glu Pro Asp Asn Thr
                645                 650                 655

Ala Ile Leu Phe Ile Lys Asp Asp Lys Tyr Tyr Leu Gly Val Met Asn
            660                 665                 670

Lys Lys Asn Asn Lys Ile Phe Asp Asp Lys Ala Ile Lys Glu Asn Lys
```

```
        675                 680                 685

Gly Glu Gly Tyr Lys Lys Ile Val Tyr Lys Leu Leu Pro Gly Ala Asn
    690                 695                 700

Lys Met Leu Pro Lys Val Phe Phe Ser Ala Lys Ser Ile Lys Phe Tyr
705                 710                 715                 720

Asn Pro Ser Glu Asp Ile Leu Arg Ile Arg Asn His Ser Thr His Thr
                725                 730                 735

Lys Asn Gly Ser Pro Gln Lys Gly Tyr Glu Lys Phe Glu Phe Asn Ile
            740                 745                 750

Glu Asp Cys Arg Lys Phe Ile Asp Phe Tyr Lys Gln Ser Ile Ser Lys
        755                 760                 765

His Pro Glu Trp Lys Asp Phe Gly Phe Arg Phe Ser Asp Thr Gln Arg
    770                 775                 780

Tyr Asn Ser Ile Asp Glu Phe Tyr Arg Glu Val Glu Asn Gln Gly Tyr
785                 790                 795                 800

Lys Leu Thr Phe Glu Asn Ile Ser Glu Ser Tyr Ile Asp Ser Val Val
                805                 810                 815

Asn Gln Gly Lys Leu Tyr Leu Phe Gln Ile Tyr Asn Lys Asp Phe Ser
            820                 825                 830

Ala Tyr Ser Lys Gly Arg Pro Asn Leu His Thr Leu Tyr Trp Lys Ala
        835                 840                 845

Leu Phe Asp Glu Arg Asn Leu Gln Asp Val Val Tyr Lys Leu Asn Gly
    850                 855                 860

Glu Ala Glu Leu Phe Tyr Arg Lys Gln Ser Ile Pro Lys Lys Ile Thr
865                 870                 875                 880
```

```
His Pro Ala Lys Glu Ala Ile Ala Asn Lys Asn Lys Asp Asn Pro Lys
               885                 890                 895


Lys Glu Ser Val Phe Glu Tyr Asp Leu Ile Lys Asp Lys Arg Phe Thr
            900                 905                 910


Glu Asp Lys Phe Phe Phe His Cys Pro Ile Thr Ile Asn Phe Lys Ser
        915                 920                 925


Ser Gly Ala Asn Lys Phe Asn Asp Glu Ile Asn Leu Leu Leu Lys Glu
    930                 935                 940


Lys Ala Asn Asp Val His Ile Leu Ser Ile Asp Arg Gly Glu Arg His
945                 950                 955                 960


Leu Ala Tyr Tyr Thr Leu Val Asp Gly Lys Gly Asn Ile Ile Lys Gln
               965                 970                 975


Asp Thr Phe Asn Ile Ile Gly Asn Asp Arg Met Lys Thr Asn Tyr His
            980                 985                 990


Asp Lys Leu Ala Ala Ile Glu Lys  Asp Arg Asp Ser Ala  Arg Lys Asp
        995                 1000                1005


Trp Lys  Lys Ile Asn Asn Ile  Lys Glu Met Lys Glu  Gly Tyr Leu
    1010                1015                1020


Ser Gln  Val Val His Glu Ile  Ala Lys Leu Val Ile  Glu Tyr Asn
    1025                1030                1035


Ala Ile  Val Val Phe Glu Asp  Leu Asn Phe Gly Phe  Lys Arg Gly
    1040                1045                1050


Arg Phe  Lys Val Glu Lys Gln  Val Tyr Gln Lys Leu  Glu Lys Met
    1055                1060                1065


Leu Ile  Glu Lys Leu Asn Tyr  Leu Val Phe Lys Asp  Asn Glu Phe
```

```
    1070                1075                1080

Asp Lys  Thr Gly Gly Val Leu  Arg Ala Tyr Gln Leu  Thr Ala Pro
    1085                1090                1095

Phe Glu  Thr Phe Lys Lys Met  Gly Lys Gln Thr Gly  Ile Ile Tyr
    1100                1105                1110

Tyr Val  Pro Ala Gly Phe Thr  Ser Lys Ile Cys Pro  Val Thr Gly
    1115                1120                1125

Phe Val  Asn Gln Leu Tyr Pro  Lys Tyr Glu Ser Val  Ser Lys Ser
    1130                1135                1140

Gln Glu  Phe Phe Ser Lys Phe  Asp Lys Ile Cys Tyr  Asn Leu Asp
    1145                1150                1155

Lys Gly  Tyr Phe Glu Phe Ser  Phe Asp Tyr Lys Asn  Phe Gly Asp
    1160                1165                1170

Lys Ala  Ala Lys Gly Lys Trp  Thr Ile Ala Ser Phe  Gly Ser Arg
    1175                1180                1185

Leu Ile  Asn Phe Arg Asn Ser  Asp Lys Asn His Asn  Trp Asp Thr
    1190                1195                1200

Arg Glu  Val Tyr Pro Thr Lys  Glu Leu Glu Lys Leu  Leu Lys Asp
    1205                1210                1215

Tyr Ser  Ile Glu Tyr Gly His  Gly Glu Cys Ile Lys  Ala Ala Ile
    1220                1225                1230

Cys Gly  Glu Ser Asp Lys Lys  Phe Phe Ala Lys Leu  Thr Ser Val
    1235                1240                1245

Leu Asn  Thr Ile Leu Gln Met  Arg Asn Ser Lys Thr  Gly Thr Glu
    1250                1255                1260
```

```
Leu Asp  Tyr Leu Ile Ser Pro  Val Ala Asp Val Asn  Gly Asn Phe
    1265                1270                1275


Phe Asp  Ser Arg Gln Ala Pro  Lys Asn Met Pro Gln  Asp Ala Asp
    1280                1285                1290


Ala Asn  Gly Ala Tyr His Ile  Gly Leu Lys Gly Leu  Met Leu Leu
    1295                1300                1305


Gly Arg  Ile Lys Asn Asn Gln  Glu Gly Lys Lys Leu  Asn Leu Val
    1310                1315                1320


Ile Lys  Asn Glu Glu Tyr Phe  Glu Phe Val Gln Asn  Arg Asn Asn
    1325                1330                1335


Pro Lys  Lys Lys Arg Lys Val  Ser Gly Gly Ser Ser  Gly Gly Ser
    1340                1345                1350


Pro Lys  Lys Lys Arg Lys Val  Tyr Pro Tyr Asp Val  Pro Asp Tyr
    1355                1360                1365


Ala Tyr  Pro Tyr Asp Val Pro  Asp Tyr Ala Tyr Pro  Tyr Asp Val
    1370                1375                1380


Pro Asp  Tyr Ala
    1385


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<212>  DNA
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<220>
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cgcaaggaga cctgcctcct gtacgagatc aactggggcg gcaggcactc catctggagg 180

cacacgagcc agaacaccaa caagcacgtc gaggtgaact tcatcgagaa gttcaccacg 240

gagaggtact tctgcccgaa cacgcgctgc tccatcacgt ggttcctctc gtggagccca 300

tgcggcgagt gctccagggc gatcacggag ttcctcagcc gctacccgca cgtgaccctg 360

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gacctgatct ccagcggcgt cacgatccag atcatgaccg agcaggagtc cggctactgc 480

tggaggaact tcgtgaacta ctccccgagc aacgaggccc actggccccg ctacccgcac 540

ctctgggtcc gcctctacgt gctcgagctg tactgcatca tcctcggcct gccgccctgc 600

ctcaacatcc tgaggcgcaa gcagccccag ctgacgttct tcaccatcgc cctgcagagc 660

tgccactacc agaggctccc gccccacatc ctgtgggcga ccgggctcaa ggggggcggg 720

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aacttcctca gccaggacga gacgatggcg gacatgtacc agaaggtgaa ggtcatcctg 960

gacgactacc acagggactt catcgccgac atgatgggcg aggtgaagct caccaagctg 1020

gcggagttct acgacgtcta cctgaagttc cgcaagaacc cgaaggacga cggcctccag 1080

aagcagctca aggacctgca ggccgtgctg aggaaggagt cggtcaagcc aatcggcagc 1140

ggcggcaagt acaagaccgg ctacgacagg ctgttcggcg ccaagctctt caaggacggc 1200

aaggagctcg gcgacctggc caagttcgtg atcgcccagg agggcgagtc ctcgcccaag 1260

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cgcaagaaca tgtacagcga cgaggacaag cacaccgcca tcgcgtacag gctgatccac 1380

gagaacctcc cccgcttcat cgacaacctc cagatcctga ccacgatcaa gcagaagcac 1440

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Glu Ile Asn Trp Gly Gly Arg His Ser Ile Trp Arg His Thr Ser Gln
50 55 60

Asn Thr Asn Lys His Val Glu Val Asn Phe Ile Glu Lys Phe Thr Thr
65 70 75 80

Glu Arg Tyr Phe Cys Pro Asn Thr Arg Cys Ser Ile Thr Trp Phe Leu
85 90 95

Ser Trp Ser Pro Cys Gly Glu Cys Ser Arg Ala Ile Thr Glu Phe Leu
100 105 110

Ser Arg Tyr Pro His Val Thr Leu Phe Ile Tyr Ile Ala Arg Leu Tyr

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His His Ala Asp Pro Arg Asn Arg Gln Gly Leu Arg Asp Leu Ile Ser
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Ser Gly Val Thr Ile Gln Ile Met Thr Glu Gln Glu Ser Gly Tyr Cys
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Trp Arg Asn Phe Val Asn Tyr Ser Pro Ser Asn Glu Ala His Trp Pro
                165                 170                 175

Arg Tyr Pro His Leu Trp Val Arg Leu Tyr Val Leu Glu Leu Tyr Cys
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Ile Ile Leu Gly Leu Pro Pro Cys Leu Asn Ile Leu Arg Arg Lys Gln
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Pro Gln Leu Thr Phe Phe Thr Ile Ala Leu Gln Ser Cys His Tyr Gln
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Arg Leu Pro Pro His Ile Leu Trp Ala Thr Gly Leu Lys Gly Gly Gly
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Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
                245                 250                 255

Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Met Leu Phe Gln Asp
            260                 265                 270

Phe Thr His Leu Tyr Pro Leu Ser Lys Thr Val Arg Phe Glu Leu Lys
        275                 280                 285

Pro Ile Gly Arg Thr Leu Glu His Ile His Ala Lys Asn Phe Leu Ser
    290                 295                 300

Gln Asp Glu Thr Met Ala Asp Met Tyr Gln Lys Val Lys Val Ile Leu
305                 310                 315                 320
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Asp Asp Tyr His Arg Asp Phe Ile Ala Asp Met Met Gly Glu Val Lys
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Leu Thr Lys Leu Ala Glu Phe Tyr Asp Val Tyr Leu Lys Phe Arg Lys
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Asn Pro Lys Asp Asp Gly Leu Gln Lys Gln Leu Lys Asp Leu Gln Ala
        355                 360                 365

Val Leu Arg Lys Glu Ser Val Lys Pro Ile Gly Ser Gly Gly Lys Tyr
    370                 375                 380

Lys Thr Gly Tyr Asp Arg Leu Phe Gly Ala Lys Leu Phe Lys Asp Gly
385                 390                 395                 400

Lys Glu Leu Gly Asp Leu Ala Lys Phe Val Ile Ala Gln Glu Gly Glu
                405                 410                 415

Ser Ser Pro Lys Leu Ala His Leu Ala His Phe Glu Lys Phe Ser Thr
            420                 425                 430

Tyr Phe Thr Gly Phe His Asp Asn Arg Lys Asn Met Tyr Ser Asp Glu
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Asp Lys His Thr Ala Ile Ala Tyr Arg Leu Ile His Glu Asn Leu Pro
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Arg Phe Ile Asp Asn Leu Gln Ile Leu Thr Thr Ile Lys Gln Lys His
465                 470                 475                 480

Ser Ala Leu Tyr Asp Gln Ile Ile Asn Glu Leu Thr Ala Ser Gly Leu
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Asp Val Ser Leu Ala Ser His Leu Asp Gly Tyr His Lys Leu Leu Thr
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Gln Glu Gly Ile Thr Ala Tyr Asn Arg Ile Ile Gly Glu Val Asn Gly
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Tyr Thr Asn Lys His Asn Gln Ile Cys His Lys Ser Glu Arg Ile Ala
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Lys Leu Arg Pro Leu His Lys Gln Ile Leu Ser Asp Gly Met Gly Val
545                 550                 555                 560

Ser Phe Leu Pro Ser Lys Phe Ala Asp Asp Ser Glu Met Cys Gln Ala
                565                 570                 575

Val Asn Glu Phe Tyr Arg His Tyr Thr Asp Val Phe Ala Lys Val Gln
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Ser Leu Phe Asp Gly Phe Asp Asp His Gln Lys Asp Gly Ile Tyr Val
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Glu His Lys Asn Leu Asn Glu Leu Ser Lys Gln Ala Phe Gly Asp Phe
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Ala Leu Leu Gly Arg Val Leu Asp Gly Tyr Tyr Val Asp Val Val Asn
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Pro Glu Phe Asn Glu Arg Phe Ala Lys Ala Lys Thr Asp Asn Ala Lys
                645                 650                 655

Ala Lys Leu Thr Lys Glu Lys Asp Lys Phe Ile Lys Gly Val His Ser
            660                 665                 670

Leu Ala Ser Leu Glu Gln Ala Ile Glu His His Thr Ala Arg His Asp
        675                 680                 685

Asp Glu Ser Val Gln Ala Gly Lys Leu Gly Gln Tyr Phe Lys His Gly
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Leu Ala Gly Val Asp Asn Pro Ile Gln Lys Ile His Asn Asn His Ser
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Thr Ile Lys Gly Phe Leu Glu Arg Glu Arg Pro Ala Gly Glu Arg Ala
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Leu Pro Lys Ile Lys Ser Gly Lys Asn Pro Glu Met Thr Gln Leu Arg
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Gln Leu Lys Glu Leu Leu Asp Asn Ala Leu Asn Val Ala His Phe Ala
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Lys Leu Leu Thr Thr Lys Thr Thr Leu Asp Asn Gln Asp Gly Asn Phe
    770                 775                 780

Tyr Gly Glu Phe Gly Val Leu Tyr Asp Glu Leu Ala Lys Ile Pro Thr
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Leu Tyr Asn Lys Val Arg Asp Tyr Leu Ser Gln Lys Pro Phe Ser Thr
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Glu Lys Tyr Lys Leu Asn Phe Gly Asn Pro Thr Leu Leu Asn Gly Trp
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Asp Leu Asn Lys Glu Lys Asp Asn Phe Gly Val Ile Leu Gln Lys Asp
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Gly Cys Tyr Tyr Leu Ala Leu Leu Asp Lys Ala His Lys Lys Val Phe
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Asp Asn Ala Pro Asn Thr Gly Lys Asn Val Tyr Gln Lys Met Val Tyr
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Lys Leu Leu Pro Gly Pro Asn Lys Met Leu Pro Lys Val Phe Phe Ala
                885                 890                 895

Lys Ser Asn Leu Asp Tyr Tyr Asn Pro Ser Ala Glu Leu Leu Asp Lys
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Tyr Ala Lys Gly Thr His Lys Lys Gly Asp Asn Phe Asn Leu Lys Asp
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Cys His Ala Leu Ile Asp Phe Phe Lys Ala Gly Ile Asn Lys His Pro
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Glu Trp Gln His Phe Gly Phe Lys Phe Ser Pro Thr Ser Ser Tyr Arg
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Asp Leu Ser Asp Phe Tyr Arg Glu Val Glu Pro Gln Gly Tyr Gln Val
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Lys Phe Val Asp Ile Asn Ala Asp Tyr Ile Asp Glu Leu Val Glu Gln
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Gly Lys Leu Tyr Leu Phe Gln Ile  Tyr Asn Lys Asp Phe  Ser Pro Lys
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Ala His  Gly Lys Pro Asn Leu  His Thr Leu Tyr Phe  Lys Ala Leu
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Phe Ser  Glu Asp Asn Leu Ala  Asp Pro Ile Tyr Lys  Leu Asn Gly
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Glu Ala  Gln Ile Phe Tyr Arg  Lys Ala Ser Leu Asp  Met Asn Glu
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Thr Thr  Ile His Arg Ala Gly  Glu Val Leu Glu Asn  Lys Asn Pro
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Asp Asn  Pro Lys Lys Arg Gln  Phe Val Tyr Asp Ile  Ile Lys Asp
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Lys Arg  Tyr Thr Gln Asp Lys  Phe Met Leu His Val  Pro Ile Thr
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Met Asn  Phe Gly Val Gln Gly  Met Thr Ile Lys Glu  Phe Asn Lys
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Asn Ser  Lys Gly Glu Ile Leu  Glu Gln Arg Ser Leu  Asn Asp Ile
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Thr Thr  Ala Ser Ala Asn Gly  Thr Gln Val Thr Thr  Pro Tyr His
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Lys Ile  Leu Asp Lys Arg Glu  Ile Glu Arg Leu Asn  Ala Arg Val
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Gly Trp  Gly Glu Ile Glu Thr  Ile Lys Glu Leu Lys  Ser Gly Tyr
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Leu Ser  His Val Val His Gln  Ile Asn Gln Leu Met  Leu Lys Tyr
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Asn Ala  Ile Val Val Leu Ala  Asp Leu Asn Phe Gly  Phe Lys Arg
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Gly Arg  Phe Lys Val Glu Lys  Gln Ile Tyr Gln Asn  Phe Glu Asn
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Ala Leu  Ile Lys Lys Leu Asn  His Leu Val Leu Lys  Asp Lys Ala
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Asp Asp  Glu Ile Gly Ser Tyr  Lys Asn Ala Leu Gln  Leu Thr Asn
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Asn Phe  Thr Asp Leu Lys Ser  Ile Gly Lys Gln Thr  Gly Phe Leu
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Phe Tyr  Val Pro Ala Trp Asn  Thr Ser Lys Ile Asp  Pro Glu Thr
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Asp Lys  Gly Tyr Phe Glu Phe  His Ile Asp Tyr Ala  Lys Phe Thr
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Asp Lys  Ala Lys Asn Ser Arg  Gln Lys Trp Ala Ile  Cys Ser His
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Gly Asp  Lys Arg Tyr Val Tyr  Asp Lys Thr Ala Asn  Gln Asn Lys
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Gly Ala  Ala Lys Gly Ile Asn  Val Asn Asp Glu Leu  Lys Ser Leu
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Phe Ala  Arg Tyr His Ile Asn  Asp Lys Gln Pro Asn  Leu Val Met
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Cys Leu  Leu Lys Thr Leu Leu  Ala Leu Arg Tyr Ser  Asn Ala Ser
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Ser Asp  Glu Ala Phe Ile Leu  Ser Pro Val Ala Asn  Asp Glu Gly
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Val Phe  Phe Asn Ser Ala Leu  Ala Asp Asp Thr Gln  Pro Gln Asn
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Ala Asp  Ala Asn Gly Ala Tyr  His Ile Ala Leu Lys  Gly Leu Trp
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Lys Arg  Pro Ala Ala Thr Lys  Lys Ala Gly Gln Ala  Lys Lys Lys
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Lys Ser  Gly Gly Ser Thr Asn  Leu Ser Asp Ile Ile  Glu Lys Glu
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Thr Gly  Lys Gln Leu Val Ile  Gln Glu Ser Ile Leu  Met Leu Pro
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Glu Glu  Val Glu Glu Val Ile  Gly Asn Lys Pro Glu  Ser Asp Ile
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Leu Val  His Thr Ala Tyr Asp  Glu Ser Thr Asp Glu  Asn Val Met
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Leu Leu  Thr Ser Asp Ala Pro  Glu Tyr Lys Pro Trp  Ala Leu Val
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gcgtacaagg agctcttcaa caagtacggc atcaactacc agcagggcga catcagggct 4140

ctcctgtgcg agcagagcga caaggccttc tactccagct tcatggcgct gatgtccctc 4200

atgctgcaga tgaggaactc gatcaccggc aggacggacg tggacttcct catctccccg 4260

gtgaagaaca gcgacggcat cttctacgac tccaggaact acgaggccca ggagaacgcg 4320

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gctatcggcc agttcaagaa ggcggaggac gagaagctgg acaaggtgaa gatcgccatc 4440

agcaacaagg agtggctcga gtacgcccag acctcggtca agcacggcag cccgaagaag 4500

aagcgcaagg tgtccggcgg cagcacgaac ctgtccgaca tcatcgagaa ggagaccggc 4560

aagcagctcg tgatccagga gagcatcctc atgctgccgg aggaggtcga ggaggtcatc 4620

ggcaacaagc ccgagtccga catcctcgtc cacacggcct acgacgagtc caccgacgag 4680

aacgtgatgc tcctgacctc ggacgctccc gagtacaagc catgggccct ggtcatccag 4740

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aaagtgtga 4809

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<223> Fusion protein

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Ala Val Asp Pro Thr Leu Arg Arg Arg Ile Glu Pro His Glu Phe Glu
20 25 30

Val Phe Phe Asp Pro Arg Glu Leu Arg Lys Glu Thr Cys Leu Leu Tyr
35 40 45

Glu Ile Asn Trp Gly Gly Arg His Ser Ile Trp Arg His Thr Ser Gln
50 55 60

Asn Thr Asn Lys His Val Glu Val Asn Phe Ile Glu Lys Phe Thr Thr
65 70 75 80

Glu Arg Tyr Phe Cys Pro Asn Thr Arg Cys Ser Ile Thr Trp Phe Leu
85 90 95

Ser Trp Ser Pro Cys Gly Glu Cys Ser Arg Ala Ile Thr Glu Phe Leu
100 105 110

```
Ser Arg Tyr Pro His Val Thr Leu Phe Ile Tyr Ile Ala Arg Leu Tyr
        115                 120                 125

His His Ala Asp Pro Arg Asn Arg Gln Gly Leu Arg Asp Leu Ile Ser
    130                 135                 140

Ser Gly Val Thr Ile Gln Ile Met Thr Glu Gln Glu Ser Gly Tyr Cys
145                 150                 155                 160

Trp Arg Asn Phe Val Asn Tyr Ser Pro Ser Asn Glu Ala His Trp Pro
                165                 170                 175

Arg Tyr Pro His Leu Trp Val Arg Leu Tyr Val Leu Glu Leu Tyr Cys
            180                 185                 190

Ile Ile Leu Gly Leu Pro Pro Cys Leu Asn Ile Leu Arg Arg Lys Gln
        195                 200                 205

Pro Gln Leu Thr Phe Phe Thr Ile Ala Leu Gln Ser Cys His Tyr Gln
    210                 215                 220

Arg Leu Pro Pro His Ile Leu Trp Ala Thr Gly Leu Lys Gly Gly Gly
225                 230                 235                 240

Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
                245                 250                 255

Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Met Ser Lys Leu Glu
            260                 265                 270

Lys Phe Thr Asn Cys Tyr Ser Leu Ser Lys Thr Leu Arg Phe Lys Ala
        275                 280                 285

Ile Pro Val Gly Lys Thr Gln Glu Asn Ile Asp Asn Lys Arg Leu Leu
    290                 295                 300

Val Glu Asp Glu Lys Arg Ala Glu Asp Tyr Lys Gly Val Lys Lys Leu
```

```
305                 310                 315                 320

Leu Asp Arg Tyr Tyr Leu Ser Phe Ile Asn Asp Val Leu His Ser Ile
                325                 330                 335

Lys Leu Lys Asn Leu Asn Asn Tyr Ile Ser Leu Phe Arg Lys Lys Thr
            340                 345                 350

Arg Thr Glu Lys Glu Asn Lys Glu Leu Glu Asn Leu Glu Ile Asn Leu
        355                 360                 365

Arg Lys Glu Ile Ala Lys Ala Phe Lys Gly Asn Glu Gly Tyr Lys Ser
    370                 375                 380

Leu Phe Lys Lys Asp Ile Ile Glu Thr Ile Leu Pro Glu Phe Leu Asp
385                 390                 395                 400

Asp Lys Asp Glu Ile Ala Leu Val Asn Ser Phe Asn Gly Phe Thr Thr
                405                 410                 415

Ala Phe Thr Gly Phe Phe Asp Asn Arg Glu Asn Met Phe Ser Glu Glu
            420                 425                 430

Ala Lys Ser Thr Ser Ile Ala Phe Arg Cys Ile Asn Glu Asn Leu Thr
        435                 440                 445

Arg Tyr Ile Ser Asn Met Asp Ile Phe Glu Lys Val Asp Ala Ile Phe
    450                 455                 460

Asp Lys His Glu Val Gln Glu Ile Lys Glu Lys Ile Leu Asn Ser Asp
465                 470                 475                 480

Tyr Asp Val Glu Asp Phe Phe Glu Gly Glu Phe Phe Asn Phe Val Leu
                485                 490                 495

Thr Gln Glu Gly Ile Asp Val Tyr Asn Ala Ile Ile Gly Gly Phe Val
            500                 505                 510
```

```
Thr Glu Ser Gly Glu Lys Ile Lys Gly Leu Asn Glu Tyr Ile Asn Leu
        515                 520                 525

Tyr Asn Gln Lys Thr Lys Gln Lys Leu Pro Lys Phe Lys Pro Leu Tyr
    530                 535                 540

Lys Gln Val Leu Ser Asp Arg Glu Ser Leu Ser Phe Tyr Gly Glu Gly
545                 550                 555                 560

Tyr Thr Ser Asp Glu Glu Val Leu Glu Val Phe Arg Asn Thr Leu Asn
                565                 570                 575

Lys Asn Ser Glu Ile Phe Ser Ser Ile Lys Lys Leu Glu Lys Leu Phe
            580                 585                 590

Lys Asn Phe Asp Glu Tyr Ser Ser Ala Gly Ile Phe Val Lys Asn Gly
        595                 600                 605

Pro Ala Ile Ser Thr Ile Ser Lys Asp Ile Phe Gly Glu Trp Asn Val
    610                 615                 620

Ile Arg Asp Lys Trp Asn Ala Glu Tyr Asp Asp Ile His Leu Lys Lys
625                 630                 635                 640

Lys Ala Val Val Thr Glu Lys Tyr Glu Asp Asp Arg Arg Lys Ser Phe
                645                 650                 655

Lys Lys Ile Gly Ser Phe Ser Leu Glu Gln Leu Gln Glu Tyr Ala Asp
            660                 665                 670

Ala Asp Leu Ser Val Val Glu Lys Leu Lys Glu Ile Ile Ile Gln Lys
        675                 680                 685

Val Asp Glu Ile Tyr Lys Val Tyr Gly Ser Ser Glu Lys Leu Phe Asp
    690                 695                 700

Ala Asp Phe Val Leu Glu Lys Ser Leu Lys Lys Asn Asp Ala Val Val
```

```
705                 710                 715                 720

Ala Ile Met Lys Asp Leu Leu Asp Ser Val Lys Ser Phe Glu Asn Tyr
                725                 730                 735

Ile Lys Ala Phe Phe Gly Glu Gly Lys Glu Thr Asn Arg Asp Glu Ser
            740                 745                 750

Phe Tyr Gly Asp Phe Val Leu Ala Tyr Asp Ile Leu Leu Lys Val Asp
        755                 760                 765

His Ile Tyr Asp Ala Ile Arg Asn Tyr Val Thr Gln Lys Pro Tyr Ser
    770                 775                 780

Lys Asp Lys Phe Lys Leu Tyr Phe Gln Asn Pro Gln Phe Met Gly Gly
785                 790                 795                 800

Trp Asp Lys Asp Lys Glu Thr Asp Tyr Arg Ala Thr Ile Leu Arg Tyr
                805                 810                 815

Gly Ser Lys Tyr Tyr Leu Ala Ile Met Asp Lys Lys Tyr Ala Lys Cys
            820                 825                 830

Leu Gln Lys Ile Asp Lys Asp Asp Val Asn Gly Asn Tyr Glu Lys Ile
        835                 840                 845

Asn Tyr Lys Leu Leu Pro Gly Pro Asn Lys Met Leu Pro Lys Val Phe
    850                 855                 860

Phe Ser Lys Lys Trp Met Ala Tyr Tyr Asn Pro Ser Glu Asp Ile Gln
865                 870                 875                 880

Lys Ile Tyr Lys Asn Gly Thr Phe Lys Lys Gly Asp Met Phe Asn Leu
                885                 890                 895

Asn Asp Cys His Lys Leu Ile Asp Phe Phe Lys Asp Ser Ile Ser Arg
            900                 905                 910
```

```
Tyr Pro Lys Trp Ser Asn Ala Tyr Asp Phe Asn Phe Ser Glu Thr Glu
        915                 920                 925

Lys Tyr Lys Asp Ile Ala Gly Phe Tyr Arg Glu Val Glu Glu Gln Gly
    930                 935                 940

Tyr Lys Val Ser Phe Glu Ser Ala Ser Lys Lys Glu Val Asp Lys Leu
945                 950                 955                 960

Val Glu Glu Gly Lys Leu Tyr Met Phe Gln Ile Tyr Asn Lys Asp Phe
                965                 970                 975

Ser Asp Lys Ser His Gly Thr Pro Asn Leu His Thr Met Tyr Phe Lys
            980                 985                 990

Leu Leu Phe Asp Glu Asn Asn His  Gly Gln Ile Arg Leu  Ser Gly Gly
        995                 1000                1005

Ala Glu  Leu Phe Met Arg Arg  Ala Ser Leu Lys Lys  Glu Glu Leu
    1010                1015                1020

Val Val  His Pro Ala Asn Ser  Pro Ile Ala Asn Lys  Asn Pro Asp
    1025                1030                1035

Asn Pro  Lys Lys Thr Thr Thr  Leu Ser Tyr Asp Val  Tyr Lys Asp
    1040                1045                1050

Lys Arg  Phe Ser Glu Asp Gln  Tyr Glu Leu His Ile  Pro Ile Ala
    1055                1060                1065

Ile Asn  Lys Cys Pro Lys Asn  Ile Phe Lys Ile Asn  Thr Glu Val
    1070                1075                1080

Arg Val  Leu Leu Lys His Asp  Asp Asn Pro Tyr Val  Ile Gly Ile
    1085                1090                1095

Asp Arg  Gly Glu Arg Asn Leu  Leu Tyr Ile Val Val  Val Asp Gly
```

```
    1100                1105                1110

Lys Gly  Asn Ile Val Glu Gln  Tyr Ser Leu Asn Glu  Ile Ile Asn
    1115                1120                1125

Asn Phe  Asn Gly Ile Arg Ile  Lys Thr Asp Tyr His  Ser Leu Leu
    1130                1135                1140

Asp Lys  Lys Glu Lys Glu Arg  Phe Glu Ala Arg Gln  Asn Trp Thr
    1145                1150                1155

Ser Ile  Glu Asn Ile Lys Glu  Leu Lys Ala Gly Tyr  Ile Ser Gln
    1160                1165                1170

Val Val  His Lys Ile Cys Glu  Leu Val Glu Lys Tyr  Asp Ala Val
    1175                1180                1185

Ile Ala  Leu Glu Asp Leu Asn  Ser Gly Phe Lys Asn  Ser Arg Val
    1190                1195                1200

Lys Val  Glu Lys Gln Val Tyr  Gln Lys Phe Glu Lys  Met Leu Ile
    1205                1210                1215

Asp Lys  Leu Asn Tyr Met Val  Asp Lys Lys Ser Asn  Pro Cys Ala
    1220                1225                1230

Thr Gly  Gly Ala Leu Lys Gly  Tyr Gln Ile Thr Asn  Lys Phe Glu
    1235                1240                1245

Ser Phe  Lys Ser Met Ser Thr  Gln Asn Gly Phe Ile  Phe Tyr Ile
    1250                1255                1260

Pro Ala  Trp Leu Thr Ser Lys  Ile Asp Pro Ser Thr  Gly Phe Val
    1265                1270                1275

Asn Leu  Leu Lys Thr Lys Tyr  Thr Ser Ile Ala Asp  Ser Lys Lys
    1280                1285                1290
```

```
Phe Ile  Ser Ser Phe Asp Arg  Ile Met Tyr Val Pro  Glu Glu Asp
    1295                1300                1305

Leu Phe  Glu Phe Ala Leu Asp  Tyr Lys Asn Phe Ser  Arg Thr Asp
    1310                1315                1320

Ala Asp  Tyr Ile Lys Lys Trp  Lys Leu Tyr Ser Tyr  Gly Asn Arg
    1325                1330                1335

Ile Arg  Ile Phe Arg Asn Pro  Lys Lys Asn Asn Val  Phe Asp Trp
    1340                1345                1350

Glu Glu  Val Cys Leu Thr Ser  Ala Tyr Lys Glu Leu  Phe Asn Lys
    1355                1360                1365

Tyr Gly  Ile Asn Tyr Gln Gln  Gly Asp Ile Arg Ala  Leu Leu Cys
    1370                1375                1380

Glu Gln  Ser Asp Lys Ala Phe  Tyr Ser Ser Phe Met  Ala Leu Met
    1385                1390                1395

Ser Leu  Met Leu Gln Met Arg  Asn Ser Ile Thr Gly  Arg Thr Asp
    1400                1405                1410

Val Asp  Phe Leu Ile Ser Pro  Val Lys Asn Ser Asp  Gly Ile Phe
    1415                1420                1425

Tyr Asp  Ser Arg Asn Tyr Glu  Ala Gln Glu Asn Ala  Ile Leu Pro
    1430                1435                1440

Lys Asn  Ala Asp Ala Asn Gly  Ala Tyr Asn Ile Ala  Arg Lys Val
    1445                1450                1455

Leu Trp  Ala Ile Gly Gln Phe  Lys Lys Ala Glu Asp  Glu Lys Leu
    1460                1465                1470

Asp Lys  Val Lys Ile Ala Ile  Ser Asn Lys Glu Trp  Leu Glu Tyr
```

```
    1475                1480                1485

Ala Gln  Thr Ser Val Lys His  Gly Ser Pro Lys Lys  Lys Arg Lys
    1490                1495                1500

Val Ser  Gly Gly Ser Thr Asn  Leu Ser Asp Ile Ile  Glu Lys Glu
    1505                1510                1515

Thr Gly  Lys Gln Leu Val Ile  Gln Glu Ser Ile Leu  Met Leu Pro
    1520                1525                1530

Glu Glu  Val Glu Glu Val Ile  Gly Asn Lys Pro Glu  Ser Asp Ile
    1535                1540                1545

Leu Val  His Thr Ala Tyr Asp  Glu Ser Thr Asp Glu  Asn Val Met
    1550                1555                1560

Leu Leu  Thr Ser Asp Ala Pro  Glu Tyr Lys Pro Trp  Ala Leu Val
    1565                1570                1575

Ile Gln  Asp Ser Asn Gly Glu  Asn Lys Ile Lys Met  Leu Ser Gly
    1580                1585                1590

Gly Ser  Pro Lys Lys Lys Arg  Lys Val
    1595                1600
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aagctggaga agttcacgaa ctgctactcc ctcagcaaga ccctgaggtt caaggcgatc 180

ccggtcggca agacccagga gaacatcgac aacaagcggc tgctggtgga ggacgagaag 240

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aacgacgtgc tccacagcat caagctcaag aacctgaaca actacatcag cctcttcagg 360

aagaagacgc gcaccgagaa ggagaacaag gagctcgaga acctggagat caacctgagg 420

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tccttcaacg gcttcaccac ggcgttcacc ggcttcttcg acaaccgcga gaacatgttc 600

agcgaggagg ccaagtccac gagcatcgcg ttcaggtgca tcaacgagaa cctcacccgc 660

tacatctcca acatggacat cttcgagaag gtcgacgcga tcttcgacaa gcacgaggtg 720

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aaccagaaga ccaagcagaa gctgccgaag ttcaagcccc tgtacaagca ggtgctctcc 960

gacagggagt ccctcagctt ctacggcgag ggctacacga gcgacgagga ggtcctggag 1020

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gacgagaagc tggacaaggt gaagatcgcc atcagcaaca aggagtggct cgagtacgcc 3780

cagacctcgg tcaagcacgg cagcccgaag aagaagcgca aggtgtccgg cggcagctcc 3840

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<210> 54
<211> 1290
<212> PRT
<213> Artificial Sequence

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Met Pro Lys Lys Lys Arg Lys Val Gly Gly Gly Gly Ser Gly Gly Gly
1 5 10 15

Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
20 25 30

Ser Gly Gly Gly Gly Ser Met Ser Lys Leu Glu Lys Phe Thr Asn Cys
35 40 45

Tyr Ser Leu Ser Lys Thr Leu Arg Phe Lys Ala Ile Pro Val Gly Lys
50 55 60

```
Thr Gln Glu Asn Ile Asp Asn Lys Arg Leu Leu Val Glu Asp Glu Lys
65                  70                  75                  80

Arg Ala Glu Asp Tyr Lys Gly Val Lys Lys Leu Leu Asp Arg Tyr Tyr
                85                  90                  95

Leu Ser Phe Ile Asn Asp Val Leu His Ser Ile Lys Leu Lys Asn Leu
            100                 105                 110

Asn Asn Tyr Ile Ser Leu Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu
        115                 120                 125

Asn Lys Glu Leu Glu Asn Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala
    130                 135                 140

Lys Ala Phe Lys Gly Asn Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp
145                 150                 155                 160

Ile Ile Glu Thr Ile Leu Pro Glu Phe Leu Asp Asp Lys Asp Glu Ile
                165                 170                 175

Ala Leu Val Asn Ser Phe Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe
            180                 185                 190

Phe Asp Asn Arg Glu Asn Met Phe Ser Glu Glu Ala Lys Ser Thr Ser
        195                 200                 205

Ile Ala Phe Arg Cys Ile Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn
    210                 215                 220

Met Asp Ile Phe Glu Lys Val Asp Ala Ile Phe Asp Lys His Glu Val
225                 230                 235                 240

Gln Glu Ile Lys Glu Lys Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp
                245                 250                 255

Phe Phe Glu Gly Glu Phe Phe Asn Phe Val Leu Thr Gln Glu Gly Ile
```

```
            260                 265                 270

Asp Val Tyr Asn Ala Ile Ile Gly Gly Phe Val Thr Glu Ser Gly Glu
        275                 280                 285

Lys Ile Lys Gly Leu Asn Glu Tyr Ile Asn Leu Tyr Asn Gln Lys Thr
    290                 295                 300

Lys Gln Lys Leu Pro Lys Phe Lys Pro Leu Tyr Lys Gln Val Leu Ser
305                 310                 315                 320

Asp Arg Glu Ser Leu Ser Phe Tyr Gly Glu Gly Tyr Thr Ser Asp Glu
                325                 330                 335

Glu Val Leu Glu Val Phe Arg Asn Thr Leu Asn Lys Asn Ser Glu Ile
            340                 345                 350

Phe Ser Ser Ile Lys Lys Leu Glu Lys Leu Phe Lys Asn Phe Asp Glu
        355                 360                 365

Tyr Ser Ser Ala Gly Ile Phe Val Lys Asn Gly Pro Ala Ile Ser Thr
    370                 375                 380

Ile Ser Lys Asp Ile Phe Gly Glu Trp Asn Val Ile Arg Asp Lys Trp
385                 390                 395                 400

Asn Ala Glu Tyr Asp Asp Ile His Leu Lys Lys Lys Ala Val Val Thr
                405                 410                 415

Glu Lys Tyr Glu Asp Asp Arg Arg Lys Ser Phe Lys Lys Ile Gly Ser
            420                 425                 430

Phe Ser Leu Glu Gln Leu Gln Glu Tyr Ala Asp Ala Asp Leu Ser Val
        435                 440                 445

Val Glu Lys Leu Lys Glu Ile Ile Ile Gln Lys Val Asp Glu Ile Tyr
    450                 455                 460
```

```
Lys Val Tyr Gly Ser Ser Glu Lys Leu Phe Asp Ala Asp Phe Val Leu
465                 470                 475                 480

Glu Lys Ser Leu Lys Lys Asn Asp Ala Val Val Ala Ile Met Lys Asp
                485                 490                 495

Leu Leu Asp Ser Val Lys Ser Phe Glu Asn Tyr Ile Lys Ala Phe Phe
            500                 505                 510

Gly Glu Gly Lys Glu Thr Asn Arg Asp Glu Ser Phe Tyr Gly Asp Phe
        515                 520                 525

Val Leu Ala Tyr Asp Ile Leu Leu Lys Val Asp His Ile Tyr Asp Ala
    530                 535                 540

Ile Arg Asn Tyr Val Thr Gln Lys Pro Tyr Ser Lys Asp Lys Phe Lys
545                 550                 555                 560

Leu Tyr Phe Gln Asn Pro Gln Phe Met Gly Gly Trp Asp Lys Asp Lys
                565                 570                 575

Glu Thr Asp Tyr Arg Ala Thr Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr
            580                 585                 590

Leu Ala Ile Met Asp Lys Lys Tyr Ala Lys Cys Leu Gln Lys Ile Asp
        595                 600                 605

Lys Asp Asp Val Asn Gly Asn Tyr Glu Lys Ile Asn Tyr Lys Leu Leu
    610                 615                 620

Pro Gly Pro Asn Lys Met Leu Pro Lys Val Phe Phe Ser Lys Lys Trp
625                 630                 635                 640

Met Ala Tyr Tyr Asn Pro Ser Glu Asp Ile Gln Lys Ile Tyr Lys Asn
                645                 650                 655

Gly Thr Phe Lys Lys Gly Asp Met Phe Asn Leu Asn Asp Cys His Lys
```

```
            660                 665                 670

Leu Ile Asp Phe Phe Lys Asp Ser Ile Ser Arg Tyr Pro Lys Trp Ser
        675                 680                 685

Asn Ala Tyr Asp Phe Asn Phe Ser Glu Thr Glu Lys Tyr Lys Asp Ile
    690                 695                 700

Ala Gly Phe Tyr Arg Glu Val Glu Glu Gln Gly Tyr Lys Val Ser Phe
705                 710                 715                 720

Glu Ser Ala Ser Lys Lys Glu Val Asp Lys Leu Val Glu Glu Gly Lys
                725                 730                 735

Leu Tyr Met Phe Gln Ile Tyr Asn Lys Asp Phe Ser Asp Lys Ser His
            740                 745                 750

Gly Thr Pro Asn Leu His Thr Met Tyr Phe Lys Leu Leu Phe Asp Glu
        755                 760                 765

Asn Asn His Gly Gln Ile Arg Leu Ser Gly Gly Ala Glu Leu Phe Met
    770                 775                 780

Arg Arg Ala Ser Leu Lys Lys Glu Glu Leu Val Val His Pro Ala Asn
785                 790                 795                 800

Ser Pro Ile Ala Asn Lys Asn Pro Asp Asn Pro Lys Lys Thr Thr Thr
                805                 810                 815

Leu Ser Tyr Asp Val Tyr Lys Asp Lys Arg Phe Ser Glu Asp Gln Tyr
            820                 825                 830

Glu Leu His Ile Pro Ile Ala Ile Asn Lys Cys Pro Lys Asn Ile Phe
        835                 840                 845

Lys Ile Asn Thr Glu Val Arg Val Leu Leu Lys His Asp Asp Asn Pro
    850                 855                 860
```

```
Tyr Val Ile Gly Ile Asp Arg Gly Glu Arg Asn Leu Leu Tyr Ile Val
865                 870                 875                 880


Val Val Asp Gly Lys Gly Asn Ile Val Glu Gln Tyr Ser Leu Asn Glu
                885                 890                 895


Ile Ile Asn Asn Phe Asn Gly Ile Arg Ile Lys Thr Asp Tyr His Ser
            900                 905                 910


Leu Leu Asp Lys Lys Glu Lys Glu Arg Phe Glu Ala Arg Gln Asn Trp
        915                 920                 925


Thr Ser Ile Glu Asn Ile Lys Glu Leu Lys Ala Gly Tyr Ile Ser Gln
    930                 935                 940


Val Val His Lys Ile Cys Glu Leu Val Glu Lys Tyr Asp Ala Val Ile
945                 950                 955                 960


Ala Leu Glu Asp Leu Asn Ser Gly Phe Lys Asn Ser Arg Val Lys Val
                965                 970                 975


Glu Lys Gln Val Tyr Gln Lys Phe Glu Lys Met Leu Ile Asp Lys Leu
            980                 985                 990


Asn Tyr Met Val Asp Lys Lys Ser  Asn Pro Cys Ala Thr  Gly Gly Ala
        995                 1000                1005


Leu Lys  Gly Tyr Gln Ile Thr  Asn Lys Phe Glu Ser  Phe Lys Ser
    1010                1015                1020


Met Ser  Thr Gln Asn Gly Phe  Ile Phe Tyr Ile Pro  Ala Trp Leu
    1025                1030                1035


Thr Ser  Lys Ile Asp Pro Ser  Thr Gly Phe Val Asn  Leu Leu Lys
    1040                1045                1050


Thr Lys  Tyr Thr Ser Ile Ala  Asp Ser Lys Lys Phe  Ile Ser Ser
```

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    1055                1060                1065

Phe Asp  Arg Ile Met Tyr Val  Pro Glu Glu Asp Leu  Phe Glu Phe
    1070                1075                1080

Ala Leu  Asp Tyr Lys Asn Phe  Ser Arg Thr Asp Ala  Asp Tyr Ile
    1085                1090                1095

Lys Lys  Trp Lys Leu Tyr Ser  Tyr Gly Asn Arg Ile  Arg Ile Phe
    1100                1105                1110

Arg Asn  Pro Lys Lys Asn Asn  Val Phe Asp Trp Glu  Glu Val Cys
    1115                1120                1125

Leu Thr  Ser Ala Tyr Lys Glu  Leu Phe Asn Lys Tyr  Gly Ile Asn
    1130                1135                1140

Tyr Gln  Gln Gly Asp Ile Arg  Ala Leu Leu Cys Glu  Gln Ser Asp
    1145                1150                1155

Lys Ala  Phe Tyr Ser Ser Phe  Met Ala Leu Met Ser  Leu Met Leu
    1160                1165                1170

Gln Met  Arg Asn Ser Ile Thr  Gly Arg Thr Asp Val  Asp Phe Leu
    1175                1180                1185

Ile Ser  Pro Val Lys Asn Ser  Asp Gly Ile Phe Tyr  Asp Ser Arg
    1190                1195                1200

Asn Tyr  Glu Ala Gln Glu Asn  Ala Ile Leu Pro Lys  Asn Ala Asp
    1205                1210                1215

Ala Asn  Gly Ala Tyr Asn Ile  Ala Arg Lys Val Leu  Trp Ala Ile
    1220                1225                1230

Gly Gln  Phe Lys Lys Ala Glu  Asp Glu Lys Leu Asp  Lys Val Lys
    1235                1240                1245
```

Ile Ala Ile Ser Asn Lys Glu Trp Leu Glu Tyr Ala Gln Thr Ser
    1250   1255   1260

Val Lys His Gly Ser Pro Lys Lys Lys Arg Lys Val Ser Gly Gly
    1265   1270   1275

Ser Ser Gly Gly Ser Pro Lys Lys Lys Arg Lys Val
    1280   1285   1290

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<211> 3873
<212> DNA
<213> Artificial Sequence

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aagctggaga agttcacgaa ctgctactcc ctcagcaaga ccctgaggtt caaggcgatc 180

ccggtcggca agacccagga gaacatcgac aacaagcggc tgctggtgga ggacgagaag 240

agggctgagg actacaaggg cgtgaagaag ctcctggacc gctactacct gtccttcatc 300

aacgacgtgc tccacagcat caagctcaag aacctgaaca actacatcag cctcttcagg 360

aagaagacgc gcaccgagaa ggagaacaag gagctcgaga acctggagat caacctgagg 420

aaggagatcg ccaaggcgtt caagggcaac gagggctaca agtccctctt caagaaggac 480

atcatcgaga cgatcctccc ggagttcctg gacgacaagg acgagatcgc cctggtcaac 540

tccttcaacg gcttcaccac ggcgttcacc ggcttcttcg acaaccgcga gaacatgttc 600

agcgaggagg ccaagtccac gagcatcgcg ttcaggtgca tcaacgagaa cctcacccgc 660

tacatctcca acatggacat cttcgagaag gtcgacgcga tcttcgacaa gcacgaggtg 720

caggagatca aggagaagat cctgaacagc gactacgacg tcgaggactt cttcgagggc 780

gagttcttca acttcgtcct cacgcaggag ggcatcgacg tgtacaacgc catcatcggt 840

ggcttcgtga ccgagtccgg cgagaagatc aagggcctga acgagtacat caacctctac 900

aaccagaaga ccaagcagaa gctgccgaag ttcaagcccc tgtacaagca ggtgctctcc 960

gacagggagt ccctcagctt ctacggcgag ggctacacga gcgacgagga ggtcctggag 1020

gtgttccgca acaccctcaa caagaacagc gagatcttct ccagcatcaa gaagctcgag 1080

aagctgttca agaacttcga cgagtactcc agcgccggca tcttcgtcaa gaacggcccg 1140

gcgatctcca cgatcagcaa ggacatcttc ggcgagtgga acgtgatccg cgacaagtgg 1200

aacgccgagt acgacgacat ccacctcaag aagaaggcgg tggtcaccga gaagtacgag 1260

gacgacaggc gcaagtcctt caagaagatc ggctccttca gcctcgagca gctgcaggag 1320

tacgccgacg cggacctgag cgtggtcgag aagctcaagg agatcatcat ccagaaggtc 1380

gacgagatct acaaggtgta cggctccagc gagaagctct tcgacgcgga cttcgtcctc 1440

gagaagtccc tgaagaagaa cgacgccgtg gtcgcgatca tgaaggacct cctggactcc 1500

gtgaagagct tcgagaatta catcaaggcc ttcttcggcg agggcaagga gacgaacagg 1560

gacgagtcct tctacggcga cttcgtcctg gcctacgaca tcctcctgaa ggtggaccac 1620

atctacgacg cgatccgcaa ctacgtgacc cagaagccgt acagcaagga caagttcaag 1680

ctctacttcc agaaccccca gttcatgggc ggctgggaca aggacaagga gacggactac 1740

agggcgacca tcctgcgcta cggcagcaag tactacctcg ccatcatgga caagaagtac 1800

gcgaagtgcc tgcagaagat cgacaaggac gacgtcaacg gcaactacga gaagatcaac 1860

tacaagctcc tgccgggccc caacaagatg ctcccgaagg tgttcttctc caagaagtgg 1920

atggcctact acaaccccag cgaggacatc cagaagatct acaagaacgg cacgttcaag 1980

aagggcgaca tgttcaacct gaacgactgc cacaagctca tcgacttctt caaggactcc 2040

atcagccgct acccgaagtg gtccaacgcc tacgacttca acttcagcga gaccgagaag 2100

tacaaggaca tcgcgggctt ctaccgcgag gtcgaggagc agggctacaa ggtgtccttc 2160

gagtccgcca gcaagaagga ggtcgacaag ctggtggagg agggcaagct ctacatgttc 2220

cagatctaca acaaggactt ctccgacaag agccacggca cgcccaacct gcacaccatg 2280

tacttcaagc tcctgttcga cgagaacaac cacggccaga tcaggctgtc cggcggcgcc 2340

gagctcttca tgaggagggc gagcctgaag aaggaggagc tggtggtcca ccccgctaac 2400

agcccaatcg cgaacaagaa cccggacaac cccaagaaga ccacgaccct gtcctacgac 2460

gtgtacaagg acaagaggtt cagcgaggac cagtacgagc tccacatccc gatcgcgatc 2520

aacaagtgcc ccaagaacat cttcaagatc aacaccgagg tccgcgtgct cctgaagcac 2580

gacgacaacc cctacgtgat cggcatcgac aggggcgaga ggaacctcct gtacatcgtg 2640

gtcgtggacg gcaagggcaa catcgtggag cagtactccc tcaacgagat catcaacaac 2700

ttcaacggca tcaggatcaa gacggactac cacagcctcc tggacaagaa ggagaaggag 2760

aggttcgagg cccgccagaa ctggacctcc atcgagaaca tcaaggagct gaaggcgggc 2820

tacatcagcc aggtcgtgca caagatctgc gagctcgtcg agaagtacga cgccgtgatc 2880

gccctcgagg acctgaactc cggcttcaag aacagccgcg tcaaggtgga gaagcaggtc 2940

taccagaagt tcgagaagat gctcatcgac aagctgaact acatggtgga caagaagtcc 3000

aacccctgcg ctacgggcgg cgcgctgaag ggctaccaga tcaccaacaa gttcgagagc 3060

ttcaagtcca tgagcactca gaacggcttc atcttctaca tcccggcgtg gctcacgtcc 3120

aagatcgacc ccagcaccgg cttcgtcaac ctcctgaaga cgaagtacac ctccatcgcc 3180

gacagcaaga agttcatctc cagcttcgac cgcatcatgt atgtgccgga ggaggacctg 3240

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tggaagctgt acagctacgg caaccgcatc cgcatcttca ggaaccccaa gaagaacaac 3360

gtcttcgact gggaggaggt gtgcctgacc tccgcgtaca aggagctctt caacaagtac 3420

ggcatcaact accagcaggg cgacatcagg gctctcctgt gcgagcagag cgacaaggcc 3480

ttctactcca gcttcatggc gctgatgtcc ctcatgctgc agatgaggaa ctcgatcacc 3540

ggcaggacgg acgtggactt cctcatctcc ccggtgaaga acagcgacgg catcttctac 3600

gactccagga actacgaggc ccaggagaac gcgatcctcc caaagaacgc ggacgccaac 3660

ggcgcctaca acatcgccag gaaggtcctc tgggctatcg gccagttcaa gaaggcggag 3720

gacgagaagc tggacaaggt gaagatcgcc atcagcaaca aggagtggct cgagtacgcc 3780

cagacctcgg tcaagcacgg cagcccgaag aagaagcgca aggtgtccgg cggcagctcc 3840

ggcggcagcc cgaagaagaa gcgcaaagtg tga 3873

<210> 56
<211> 1290
<212> PRT
<213> Artificial Sequence

<220>
<223> Fusion protein

<400> 56

Met Pro Lys Lys Lys Arg Lys Val Gly Gly Gly Gly Ser Gly Gly Gly
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Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
20 25 30

Ser Gly Gly Gly Gly Ser Met Ser Lys Leu Glu Lys Phe Thr Asn Cys
35 40 45

Tyr Ser Leu Ser Lys Thr Leu Arg Phe Lys Ala Ile Pro Val Gly Lys
50 55 60

Thr Gln Glu Asn Ile Asp Asn Lys Arg Leu Leu Val Glu Asp Glu Lys
65 70 75 80

Arg Ala Glu Asp Tyr Lys Gly Val Lys Lys Leu Leu Asp Arg Tyr Tyr
85 90 95

Leu Ser Phe Ile Asn Asp Val Leu His Ser Ile Lys Leu Lys Asn Leu
100 105 110

Asn Asn Tyr Ile Ser Leu Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu
115 120 125

Asn Lys Glu Leu Glu Asn Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala
130 135 140

Lys Ala Phe Lys Gly Asn Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp

```
145                 150                 155                 160

Ile Ile Glu Thr Ile Leu Pro Glu Phe Leu Asp Asp Lys Asp Glu Ile
                165                 170                 175

Ala Leu Val Asn Ser Phe Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe
            180                 185                 190

Phe Asp Asn Arg Glu Asn Met Phe Ser Glu Glu Ala Lys Ser Thr Ser
        195                 200                 205

Ile Ala Phe Arg Cys Ile Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn
    210                 215                 220

Met Asp Ile Phe Glu Lys Val Asp Ala Ile Phe Asp Lys His Glu Val
225                 230                 235                 240

Gln Glu Ile Lys Glu Lys Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp
                245                 250                 255

Phe Phe Glu Gly Glu Phe Phe Asn Phe Val Leu Thr Gln Glu Gly Ile
            260                 265                 270

Asp Val Tyr Asn Ala Ile Ile Gly Gly Phe Val Thr Glu Ser Gly Glu
        275                 280                 285

Lys Ile Lys Gly Leu Asn Glu Tyr Ile Asn Leu Tyr Asn Gln Lys Thr
    290                 295                 300

Lys Gln Lys Leu Pro Lys Phe Lys Pro Leu Tyr Lys Gln Val Leu Ser
305                 310                 315                 320

Asp Arg Glu Ser Leu Ser Phe Tyr Gly Glu Gly Tyr Thr Ser Asp Glu
                325                 330                 335

Glu Val Leu Glu Val Phe Arg Asn Thr Leu Asn Lys Asn Ser Glu Ile
            340                 345                 350
```

```
Phe Ser Ser Ile Lys Lys Leu Glu Lys Leu Phe Lys Asn Phe Asp Glu
        355                 360                 365

Tyr Ser Ser Ala Gly Ile Phe Val Lys Asn Gly Pro Ala Ile Ser Thr
    370                 375                 380

Ile Ser Lys Asp Ile Phe Gly Glu Trp Asn Val Ile Arg Asp Lys Trp
385                 390                 395                 400

Asn Ala Glu Tyr Asp Asp Ile His Leu Lys Lys Lys Ala Val Val Thr
                405                 410                 415

Glu Lys Tyr Glu Asp Asp Arg Arg Lys Ser Phe Lys Lys Ile Gly Ser
            420                 425                 430

Phe Ser Leu Glu Gln Leu Gln Glu Tyr Ala Asp Ala Asp Leu Ser Val
        435                 440                 445

Val Glu Lys Leu Lys Glu Ile Ile Ile Gln Lys Val Asp Glu Ile Tyr
    450                 455                 460

Lys Val Tyr Gly Ser Ser Glu Lys Leu Phe Asp Ala Asp Phe Val Leu
465                 470                 475                 480

Glu Lys Ser Leu Lys Lys Asn Asp Ala Val Val Ala Ile Met Lys Asp
                485                 490                 495

Leu Leu Asp Ser Val Lys Ser Phe Glu Asn Tyr Ile Lys Ala Phe Phe
            500                 505                 510

Gly Glu Gly Lys Glu Thr Asn Arg Asp Glu Ser Phe Tyr Gly Asp Phe
        515                 520                 525

Val Leu Ala Tyr Asp Ile Leu Leu Lys Val Asp His Ile Tyr Asp Ala
    530                 535                 540

Ile Arg Asn Tyr Val Thr Gln Lys Pro Tyr Ser Lys Asp Lys Phe Lys
```

```
545                 550                 555                 560

Leu Tyr Phe Gln Asn Pro Gln Phe Met Gly Gly Trp Asp Lys Asp Lys
                565                 570                 575

Glu Thr Asp Tyr Arg Ala Thr Ile Leu Arg Tyr Gly Ser Lys Tyr Tyr
            580                 585                 590

Leu Ala Ile Met Asp Lys Lys Tyr Ala Lys Cys Leu Gln Lys Ile Asp
        595                 600                 605

Lys Asp Asp Val Asn Gly Asn Tyr Glu Lys Ile Asn Tyr Lys Leu Leu
    610                 615                 620

Pro Gly Pro Asn Lys Met Leu Pro Lys Val Phe Phe Ser Lys Lys Trp
625                 630                 635                 640

Met Ala Tyr Tyr Asn Pro Ser Glu Asp Ile Gln Lys Ile Tyr Lys Asn
                645                 650                 655

Gly Thr Phe Lys Lys Gly Asp Met Phe Asn Leu Asn Asp Cys His Lys
            660                 665                 670

Leu Ile Asp Phe Phe Lys Asp Ser Ile Ser Arg Tyr Pro Lys Trp Ser
        675                 680                 685

Asn Ala Tyr Asp Phe Asn Phe Ser Glu Thr Glu Lys Tyr Lys Asp Ile
    690                 695                 700

Ala Gly Phe Tyr Arg Glu Val Glu Glu Gln Gly Tyr Lys Val Ser Phe
705                 710                 715                 720

Glu Ser Ala Ser Lys Lys Glu Val Asp Lys Leu Val Glu Glu Gly Lys
                725                 730                 735

Leu Tyr Met Phe Gln Ile Tyr Asn Lys Asp Phe Ser Asp Lys Ser His
            740                 745                 750
```

```
Gly Thr Pro Asn Leu His Thr Met Tyr Phe Lys Leu Leu Phe Asp Glu
        755                 760                 765

Asn Asn His Gly Gln Ile Arg Leu Ser Gly Gly Ala Glu Leu Phe Met
    770                 775                 780

Arg Arg Ala Ser Leu Lys Lys Glu Glu Leu Val Val His Pro Ala Asn
785                 790                 795                 800

Ser Pro Ile Ala Asn Lys Asn Pro Asp Asn Pro Lys Lys Thr Thr Thr
                805                 810                 815

Leu Ser Tyr Asp Val Tyr Lys Asp Lys Arg Phe Ser Glu Asp Gln Tyr
            820                 825                 830

Glu Leu His Ile Pro Ile Ala Ile Asn Lys Cys Pro Lys Asn Ile Phe
        835                 840                 845

Lys Ile Asn Thr Glu Val Arg Val Leu Leu Lys His Asp Asp Asn Pro
    850                 855                 860

Tyr Val Ile Gly Ile Asp Arg Gly Glu Arg Asn Leu Leu Tyr Ile Val
865                 870                 875                 880

Val Val Asp Gly Lys Gly Asn Ile Val Glu Gln Tyr Ser Leu Asn Glu
                885                 890                 895

Ile Ile Asn Asn Phe Asn Gly Ile Arg Ile Lys Thr Asp Tyr His Ser
            900                 905                 910

Leu Leu Asp Lys Lys Glu Lys Glu Arg Phe Glu Ala Arg Gln Asn Trp
        915                 920                 925

Thr Ser Ile Glu Asn Ile Lys Glu Leu Lys Ala Gly Tyr Ile Ser Gln
    930                 935                 940

Val Val His Lys Ile Cys Glu Leu Val Glu Lys Tyr Asp Ala Val Ile
```

```
945                 950                 955                 960

Ala Leu Glu Asp Leu Asn Ser Gly Phe Lys Asn Ser Arg Val Lys Val
               965                 970                 975

Glu Lys Gln Val Tyr Gln Lys Phe Glu Lys Met Leu Ile Asp Lys Leu
           980                 985                 990

Asn Tyr Met Val Asp Lys Lys Ser  Asn Pro Cys Ala Thr  Gly Gly Ala
        995                 1000                1005

Leu Lys  Gly Tyr Gln Ile Thr  Asn Lys Phe Glu Ser  Phe Lys Ser
    1010                1015                1020

Met Ser  Thr Gln Asn Gly Phe  Ile Phe Tyr Ile Pro  Ala Trp Leu
    1025                1030                1035

Thr Ser  Lys Ile Asp Pro Ser  Thr Gly Phe Val Asn  Leu Leu Lys
    1040                1045                1050

Thr Lys  Tyr Thr Ser Ile Ala  Asp Ser Lys Lys Phe  Ile Ser Ser
    1055                1060                1065

Phe Asp  Arg Ile Met Tyr Val  Pro Glu Glu Asp Leu  Phe Glu Phe
    1070                1075                1080

Ala Leu  Asp Tyr Lys Asn Phe  Ser Arg Thr Asp Ala  Asp Tyr Ile
    1085                1090                1095

Lys Lys  Trp Lys Leu Tyr Ser  Tyr Gly Asn Arg Ile  Arg Ile Phe
    1100                1105                1110

Arg Asn  Pro Lys Lys Asn Asn  Val Phe Asp Trp Glu  Glu Val Cys
    1115                1120                1125

Leu Thr  Ser Ala Tyr Lys Glu  Leu Phe Asn Lys Tyr  Gly Ile Asn
    1130                1135                1140
```

```
Tyr Gln  Gln Gly Asp Ile Arg  Ala Leu Leu Cys Glu  Gln Ser Asp
    1145                1150                1155

Lys Ala  Phe Tyr Ser Ser Phe  Met Ala Leu Met Ser  Leu Met Leu
    1160                1165                1170

Gln Met  Arg Asn Ser Ile Thr  Gly Arg Thr Asp Val  Asp Phe Leu
    1175                1180                1185

Ile Ser  Pro Val Lys Asn Ser  Asp Gly Ile Phe Tyr  Asp Ser Arg
    1190                1195                1200

Asn Tyr  Glu Ala Gln Glu Asn  Ala Ile Leu Pro Lys  Asn Ala Asp
    1205                1210                1215

Ala Asn  Gly Ala Tyr Asn Ile  Ala Arg Lys Val Leu  Trp Ala Ile
    1220                1225                1230

Gly Gln  Phe Lys Lys Ala Glu  Asp Glu Lys Leu Asp  Lys Val Lys
    1235                1240                1245

Ile Ala  Ile Ser Asn Lys Glu  Trp Leu Glu Tyr Ala  Gln Thr Ser
    1250                1255                1260

Val Lys  His Gly Ser Pro Lys  Lys Lys Arg Lys Val  Ser Gly Gly
    1265                1270                1275

Ser Ser  Gly Gly Ser Pro Lys  Lys Lys Arg Lys Val
    1280                1285                1290
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<211> 1491
<212> PRT
<213> Artificial Sequence

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<223> Synthetic

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Ser Gly Gly Gly Gly Gly Ser Gly Gly Gly Gly Gly Ser Gly Gly Gly
            20                  25                  30

Gly Gly Ser Gly Met Ser Ser Glu Thr Gly Pro Val Ala Val Asp Pro
        35                  40                  45

Thr Leu Arg Arg Arg Ile Glu Pro His Glu Phe Glu Val Phe Phe Asp
    50                  55                  60

Pro Arg Glu Leu Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile Asn Trp
65                  70                  75                  80

Gly Gly Arg His Ser Ile Trp Arg His Thr Ser Gln Asn Thr Asn Lys
                85                  90                  95

His Val Glu Val Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg Tyr Phe
            100                 105                 110

Cys Pro Asn Thr Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp Ser Pro
        115                 120                 125

Cys Gly Glu Cys Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg Tyr Pro
    130                 135                 140

His Val Thr Leu Phe Ile Tyr Ile Ala Arg Leu Tyr His His Ala Asp
145                 150                 155                 160

Pro Arg Asn Arg Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly Val Thr
                165                 170                 175

Ile Gln Ile Met Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg Asn Phe
            180                 185                 190

Val Asn Tyr Ser Pro Ser Asn Glu Ala His Trp Pro Arg Tyr Pro His
```

```
        195                 200                 205

Leu Trp Val Arg Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile Leu Gly
    210                 215                 220

Leu Pro Pro Cys Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln Leu Thr
225                 230                 235                 240

Phe Phe Thr Ile Ala Leu Gln Ser Cys His Tyr Gln Arg Leu Pro Pro
                245                 250                 255

His Ile Leu Trp Ala Thr Gly Leu Lys Gly Gly Gly Gly Ser Gly Gly
            260                 265                 270

Gly Gly Ser Gly Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly
        275                 280                 285

Gly Ser Gly Gly Gly Gly Ser Met Ser Lys Leu Glu Lys Phe Thr Asn
    290                 295                 300

Cys Tyr Ser Leu Ser Lys Thr Leu Arg Phe Lys Ala Ile Pro Val Gly
305                 310                 315                 320

Lys Thr Gln Glu Asn Ile Asp Asn Lys Arg Leu Leu Val Glu Asp Glu
                325                 330                 335

Lys Arg Ala Glu Asp Tyr Lys Gly Val Lys Lys Leu Leu Asp Arg Tyr
            340                 345                 350

Tyr Leu Ser Phe Ile Asn Asp Val Leu His Ser Ile Lys Leu Lys Asn
        355                 360                 365

Leu Asn Asn Tyr Ile Ser Leu Phe Arg Lys Lys Thr Arg Thr Glu Lys
    370                 375                 380

Glu Asn Lys Glu Leu Glu Asn Leu Glu Ile Asn Leu Arg Lys Glu Ile
385                 390                 395                 400
```

```
Ala Lys Ala Phe Lys Gly Asn Glu Gly Tyr Lys Ser Leu Phe Lys Lys
                405                 410                 415

Asp Ile Ile Glu Thr Ile Leu Pro Glu Phe Leu Asp Asp Lys Asp Glu
            420                 425                 430

Ile Ala Leu Val Asn Ser Phe Asn Gly Phe Thr Thr Ala Phe Thr Gly
        435                 440                 445

Phe Phe Asp Asn Arg Glu Asn Met Phe Ser Glu Glu Ala Lys Ser Thr
    450                 455                 460

Ser Ile Ala Phe Arg Cys Ile Asn Glu Asn Leu Thr Arg Tyr Ile Ser
465                 470                 475                 480

Asn Met Asp Ile Phe Glu Lys Val Asp Ala Ile Phe Asp Lys His Glu
                485                 490                 495

Val Gln Glu Ile Lys Glu Lys Ile Leu Asn Ser Asp Tyr Asp Val Glu
            500                 505                 510

Asp Phe Phe Glu Gly Glu Phe Phe Asn Phe Val Leu Thr Gln Glu Gly
        515                 520                 525

Ile Asp Val Tyr Asn Ala Ile Ile Gly Gly Phe Val Thr Glu Ser Gly
    530                 535                 540

Glu Lys Ile Lys Gly Leu Asn Glu Tyr Ile Asn Leu Tyr Asn Gln Lys
545                 550                 555                 560

Thr Lys Gln Lys Leu Pro Lys Phe Lys Pro Leu Tyr Lys Gln Val Leu
                565                 570                 575

Ser Asp Arg Glu Ser Leu Ser Phe Tyr Gly Glu Gly Tyr Thr Ser Asp
            580                 585                 590

Glu Glu Val Leu Glu Val Phe Arg Asn Thr Leu Asn Lys Asn Ser Glu
```

```
        595                 600                 605

Ile Phe Ser Ser Ile Lys Lys Leu Glu Lys Leu Phe Lys Asn Phe Asp
    610                 615                 620

Glu Tyr Ser Ser Ala Gly Ile Phe Val Lys Asn Gly Pro Ala Ile Ser
625                 630                 635                 640

Thr Ile Ser Lys Asp Ile Phe Gly Glu Trp Asn Val Ile Arg Asp Lys
                645                 650                 655

Trp Asn Ala Glu Tyr Asp Asp Ile His Leu Lys Lys Lys Ala Val Val
            660                 665                 670

Thr Glu Lys Tyr Glu Asp Asp Arg Arg Lys Ser Phe Lys Lys Ile Gly
        675                 680                 685

Ser Phe Ser Leu Glu Gln Leu Gln Glu Tyr Ala Asp Ala Asp Leu Ser
    690                 695                 700

Val Val Glu Lys Leu Lys Glu Ile Ile Ile Gln Lys Val Asp Glu Ile
705                 710                 715                 720

Tyr Lys Val Tyr Gly Ser Ser Glu Lys Leu Phe Asp Ala Asp Phe Val
                725                 730                 735

Leu Glu Lys Ser Leu Lys Lys Asn Asp Ala Val Val Ala Ile Met Lys
            740                 745                 750

Asp Leu Leu Asp Ser Val Lys Ser Phe Glu Asn Tyr Ile Lys Ala Phe
        755                 760                 765

Phe Gly Glu Gly Lys Glu Thr Asn Arg Asp Glu Ser Phe Tyr Gly Asp
    770                 775                 780

Phe Val Leu Ala Tyr Asp Ile Leu Leu Lys Val Asp His Ile Tyr Asp
785                 790                 795                 800
```

```
Ala Ile Arg Asn Tyr Val Thr Gln Lys Pro Tyr Ser Lys Asp Lys Phe
                805                 810                 815

Lys Leu Tyr Phe Gln Asn Pro Gln Phe Met Gly Gly Trp Asp Lys Asp
            820                 825                 830

Lys Glu Thr Asp Tyr Arg Ala Thr Ile Leu Arg Tyr Gly Ser Lys Tyr
        835                 840                 845

Tyr Leu Ala Ile Met Asp Lys Lys Tyr Ala Lys Cys Leu Gln Lys Ile
    850                 855                 860

Asp Lys Asp Asp Val Asn Gly Asn Tyr Glu Lys Ile Asn Tyr Lys Leu
865                 870                 875                 880

Leu Pro Gly Pro Asn Lys Met Leu Pro Lys Val Phe Phe Ser Lys Lys
                885                 890                 895

Trp Met Ala Tyr Tyr Asn Pro Ser Glu Asp Ile Gln Lys Ile Tyr Lys
            900                 905                 910

Asn Gly Thr Phe Lys Lys Gly Asp Met Phe Asn Leu Asn Asp Cys His
        915                 920                 925

Lys Leu Ile Asp Phe Phe Lys Asp Ser Ile Ser Arg Tyr Pro Lys Trp
    930                 935                 940

Ser Asn Ala Tyr Asp Phe Asn Phe Ser Glu Thr Glu Lys Tyr Lys Asp
945                 950                 955                 960

Ile Ala Gly Phe Tyr Arg Glu Val Glu Glu Gln Gly Tyr Lys Val Ser
                965                 970                 975

Phe Glu Ser Ala Ser Lys Lys Glu Val Asp Lys Leu Val Glu Glu Gly
            980                 985                 990

Lys Leu Tyr Met Phe Gln Ile Tyr  Asn Lys Asp Phe Ser  Asp Lys Ser
```

```
        995                 1000                1005

His Gly  Thr Pro Asn Leu His  Thr Met Tyr Phe Lys  Leu Leu Phe
    1010                1015                1020

Asp Glu  Asn Asn His Gly Gln  Ile Arg Leu Ser Gly  Gly Ala Glu
    1025                1030                1035

Leu Phe  Met Arg Arg Ala Ser  Leu Lys Lys Glu Glu  Leu Val Val
    1040                1045                1050

His Pro  Ala Asn Ser Pro Ile  Ala Asn Lys Asn Pro  Asp Asn Pro
    1055                1060                1065

Lys Lys  Thr Thr Thr Leu Ser  Tyr Asp Val Tyr Lys  Asp Lys Arg
    1070                1075                1080

Phe Ser  Glu Asp Gln Tyr Glu  Leu His Ile Pro Ile  Ala Ile Asn
    1085                1090                1095

Lys Cys  Pro Lys Asn Ile Phe  Lys Ile Asn Thr Glu  Val Arg Val
    1100                1105                1110

Leu Leu  Lys His Asp Asp Asn  Pro Tyr Val Ile Gly  Ile Ala Arg
    1115                1120                1125

Gly Glu  Arg Asn Leu Leu Tyr  Ile Val Val Val Asp  Gly Lys Gly
    1130                1135                1140

Asn Ile  Val Glu Gln Tyr Ser  Leu Asn Glu Ile Ile  Asn Asn Phe
    1145                1150                1155

Asn Gly  Ile Arg Ile Lys Thr  Asp Tyr His Ser Leu  Leu Asp Lys
    1160                1165                1170

Lys Glu  Lys Glu Arg Phe Glu  Ala Arg Gln Asn Trp  Thr Ser Ile
    1175                1180                1185
```

```
Glu Asn  Ile Lys Glu Leu Lys  Ala Gly Tyr Ile Ser  Gln Val Val
    1190                1195                1200

His Lys  Ile Cys Glu Leu Val  Glu Lys Tyr Asp Ala  Val Ile Ala
    1205                1210                1215

Leu Ala  Asp Leu Asn Ser Gly  Phe Lys Asn Ser Arg  Val Lys Val
    1220                1225                1230

Glu Lys  Gln Val Tyr Gln Lys  Phe Glu Lys Met Leu  Ile Asp Lys
    1235                1240                1245

Leu Asn  Tyr Met Val Asp Lys  Lys Ser Asn Pro Cys  Ala Thr Gly
    1250                1255                1260

Gly Ala  Leu Lys Gly Tyr Gln  Ile Thr Asn Lys Phe  Glu Ser Phe
    1265                1270                1275

Lys Ser  Met Ser Thr Gln Asn  Gly Phe Ile Phe Tyr  Ile Pro Ala
    1280                1285                1290

Trp Leu  Thr Ser Lys Ile Asp  Pro Ser Thr Gly Phe  Val Asn Leu
    1295                1300                1305

Leu Lys  Thr Lys Tyr Thr Ser  Ile Ala Asp Ser Lys  Lys Phe Ile
    1310                1315                1320

Ser Ser  Phe Asp Arg Ile Met  Tyr Val Pro Glu Glu  Asp Leu Phe
    1325                1330                1335

Glu Phe  Ala Leu Asp Tyr Lys  Asn Phe Ser Arg Thr  Asp Ala Asp
    1340                1345                1350

Tyr Ile  Lys Lys Trp Lys Leu  Tyr Ser Tyr Gly Asn  Arg Ile Arg
    1355                1360                1365

Ile Phe  Arg Asn Pro Lys Lys  Asn Asn Val Phe Asp  Trp Glu Glu
```

```
    1370                1375                1380

Val Cys  Leu Thr Ser Ala Tyr  Lys Glu Leu Phe Asn  Lys Tyr Gly
    1385                1390                1395

Ile Asn  Tyr Gln Gln Gly Asp  Ile Arg Ala Leu Leu  Cys Glu Gln
    1400                1405                1410

Ser Asp  Lys Ala Phe Tyr Ser  Ser Phe Met Ala Leu  Met Ser Leu
    1415                1420                1425

Met Leu  Gln Met Arg Asn Ser  Ile Thr Gly Arg Thr  Asp Val Ala
    1430                1435                1440

Phe Leu  Ile Ser Pro Val Lys  Asn Ser Asp Gly Ile  Phe Tyr Asp
    1445                1450                1455

Ser Arg  Asn Tyr Glu Ala Gln  Glu Asn Ala Ile Leu  Pro Lys Asn
    1460                1465                1470

Ala Asp  Ala Asn Gly Ala Tyr  Asn Ile Ala Arg Lys  Val Leu Trp
    1475                1480                1485

Ala Ile  Gly
    1490


<210>  58
<211>  1662
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic

<400>  58

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly
1               5                  10                  15

Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Met Pro
```

```
            20                  25                  30

Lys Lys Lys Arg Lys Val Met Ser Ser Glu Thr Gly Pro Val Ala Val
        35                  40                  45

Asp Pro Thr Leu Arg Arg Arg Ile Glu Pro His Glu Phe Glu Val Phe
    50                  55                  60

Phe Asp Pro Arg Glu Leu Arg Lys Glu Thr Cys Leu Leu Tyr Glu Ile
65                  70                  75                  80

Asn Trp Gly Gly Arg His Ser Ile Trp Arg His Thr Ser Gln Asn Thr
                85                  90                  95

Asn Lys His Val Glu Val Asn Phe Ile Glu Lys Phe Thr Thr Glu Arg
            100                 105                 110

Tyr Phe Cys Pro Asn Thr Arg Cys Ser Ile Thr Trp Phe Leu Ser Trp
        115                 120                 125

Ser Pro Cys Gly Glu Cys Ser Arg Ala Ile Thr Glu Phe Leu Ser Arg
    130                 135                 140

Tyr Pro His Val Thr Leu Phe Ile Tyr Ile Ala Arg Leu Tyr His His
145                 150                 155                 160

Ala Asp Pro Arg Asn Arg Gln Gly Leu Arg Asp Leu Ile Ser Ser Gly
                165                 170                 175

Val Thr Ile Gln Ile Met Thr Glu Gln Glu Ser Gly Tyr Cys Trp Arg
            180                 185                 190

Asn Phe Val Asn Tyr Ser Pro Ser Asn Glu Ala His Trp Pro Arg Tyr
        195                 200                 205

Pro His Leu Trp Val Arg Leu Tyr Val Leu Glu Leu Tyr Cys Ile Ile
    210                 215                 220
```

```
Leu Gly Leu Pro Pro Cys Leu Asn Ile Leu Arg Arg Lys Gln Pro Gln
225                 230                 235                 240

Leu Thr Phe Phe Thr Ile Ala Leu Gln Ser Cys His Tyr Gln Arg Leu
                245                 250                 255

Pro Pro His Ile Leu Trp Ala Thr Gly Leu Lys Gly Gly Gly Gly Ser
            260                 265                 270

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly
        275                 280                 285

Gly Gly Gly Ser Gly Gly Gly Gly Ser Met Leu Phe Gln Asp Phe Thr
    290                 295                 300

His Leu Tyr Pro Leu Ser Lys Thr Val Arg Phe Glu Leu Lys Pro Ile
305                 310                 315                 320

Gly Arg Thr Leu Glu His Ile His Ala Lys Asn Phe Leu Ser Gln Asp
                325                 330                 335

Glu Thr Met Ala Asp Met Tyr Gln Lys Val Lys Val Ile Leu Asp Asp
            340                 345                 350

Tyr His Arg Asp Phe Ile Ala Asp Met Met Gly Glu Val Lys Leu Thr
        355                 360                 365

Lys Leu Ala Glu Phe Tyr Asp Val Tyr Leu Lys Phe Arg Lys Asn Pro
    370                 375                 380

Lys Asp Asp Gly Leu Gln Lys Gln Leu Lys Asp Leu Gln Ala Val Leu
385                 390                 395                 400

Arg Lys Glu Ser Val Lys Pro Ile Gly Ser Gly Gly Lys Tyr Lys Thr
                405                 410                 415

Gly Tyr Asp Arg Leu Phe Gly Ala Lys Leu Phe Lys Asp Gly Lys Glu
```

```
            420                 425                 430

Leu Gly Asp Leu Ala Lys Phe Val Ile Ala Gln Glu Gly Glu Ser Ser
        435                 440                 445

Pro Lys Leu Ala His Leu Ala His Phe Glu Lys Phe Ser Thr Tyr Phe
    450                 455                 460

Thr Gly Phe His Asp Asn Arg Lys Asn Met Tyr Ser Asp Glu Asp Lys
465                 470                 475                 480

His Thr Ala Ile Ala Tyr Arg Leu Ile His Glu Asn Leu Pro Arg Phe
                485                 490                 495

Ile Asp Asn Leu Gln Ile Leu Thr Thr Ile Lys Gln Lys His Ser Ala
            500                 505                 510

Leu Tyr Asp Gln Ile Ile Asn Glu Leu Thr Ala Ser Gly Leu Asp Val
        515                 520                 525

Ser Leu Ala Ser His Leu Asp Gly Tyr His Lys Leu Leu Thr Gln Glu
    530                 535                 540

Gly Ile Thr Ala Tyr Asn Arg Ile Ile Gly Glu Val Asn Gly Tyr Thr
545                 550                 555                 560

Asn Lys His Asn Gln Ile Cys His Lys Ser Glu Arg Ile Ala Lys Leu
                565                 570                 575

Arg Pro Leu His Lys Gln Ile Leu Ser Asp Gly Met Gly Val Ser Phe
            580                 585                 590

Leu Pro Ser Lys Phe Ala Asp Asp Ser Glu Met Cys Gln Ala Val Asn
        595                 600                 605

Glu Phe Tyr Arg His Tyr Thr Asp Val Phe Ala Lys Val Gln Ser Leu
    610                 615                 620
```

```
Phe Asp Gly Phe Asp Asp His Gln Lys Asp Gly Ile Tyr Val Glu His
625                 630                 635                 640

Lys Asn Leu Asn Glu Leu Ser Lys Gln Ala Phe Gly Asp Phe Ala Leu
                645                 650                 655

Leu Gly Arg Val Leu Asp Gly Tyr Tyr Val Asp Val Val Asn Pro Glu
            660                 665                 670

Phe Asn Glu Arg Phe Ala Lys Ala Lys Thr Asp Asn Ala Lys Ala Lys
        675                 680                 685

Leu Thr Lys Glu Lys Asp Lys Phe Ile Lys Gly Val His Ser Leu Ala
    690                 695                 700

Ser Leu Glu Gln Ala Ile Glu His His Thr Ala Arg His Asp Asp Glu
705                 710                 715                 720

Ser Val Gln Ala Gly Lys Leu Gly Gln Tyr Phe Lys His Gly Leu Ala
                725                 730                 735

Gly Val Asp Asn Pro Ile Gln Lys Ile His Asn Asn His Ser Thr Ile
            740                 745                 750

Lys Gly Phe Leu Glu Arg Glu Arg Pro Ala Gly Glu Arg Ala Leu Pro
        755                 760                 765

Lys Ile Lys Ser Gly Lys Asn Pro Glu Met Thr Gln Leu Arg Gln Leu
    770                 775                 780

Lys Glu Leu Leu Asp Asn Ala Leu Asn Val Ala His Phe Ala Lys Leu
785                 790                 795                 800

Leu Thr Thr Lys Thr Thr Leu Asp Asn Gln Asp Gly Asn Phe Tyr Gly
                805                 810                 815

Glu Phe Gly Val Leu Tyr Asp Glu Leu Ala Lys Ile Pro Thr Leu Tyr
```

```
            820                 825                 830

Asn Lys Val Arg Asp Tyr Leu Ser Gln Lys Pro Phe Ser Thr Glu Lys
        835                 840                 845

Tyr Lys Leu Asn Phe Gly Asn Pro Thr Leu Leu Asn Gly Trp Asp Leu
    850                 855                 860

Asn Lys Glu Lys Asp Asn Phe Gly Val Ile Leu Gln Lys Asp Gly Cys
865                 870                 875                 880

Tyr Tyr Leu Ala Leu Leu Asp Lys Ala His Lys Lys Val Phe Asp Asn
                885                 890                 895

Ala Pro Asn Thr Gly Lys Asn Val Tyr Gln Lys Met Val Tyr Lys Leu
            900                 905                 910

Leu Pro Gly Pro Asn Lys Met Leu Pro Lys Val Phe Phe Ala Lys Ser
        915                 920                 925

Asn Leu Asp Tyr Tyr Asn Pro Ser Ala Glu Leu Leu Asp Lys Tyr Ala
    930                 935                 940

Lys Gly Thr His Lys Lys Gly Asp Asn Phe Asn Leu Lys Asp Cys His
945                 950                 955                 960

Ala Leu Ile Asp Phe Phe Lys Ala Gly Ile Asn Lys His Pro Glu Trp
                965                 970                 975

Gln His Phe Gly Phe Lys Phe Ser Pro Thr Ser Ser Tyr Arg Asp Leu
            980                 985                 990

Ser Asp Phe Tyr Arg Glu Val Glu  Pro Gln Gly Tyr Gln  Val Lys Phe
        995                 1000                1005

Val Asp  Ile Asn Ala Asp Tyr  Ile Asp Glu Leu Val  Glu Gln Gly
    1010                1015                1020
```

```
Lys Leu  Tyr Leu Phe Gln Ile  Tyr Asn Lys Asp Phe  Ser Pro Lys
    1025                1030                1035

Ala His  Gly Lys Pro Asn Leu  His Thr Leu Tyr Phe  Lys Ala Leu
    1040                1045                1050

Phe Ser  Glu Asp Asn Leu Ala  Asp Pro Ile Tyr Lys  Leu Asn Gly
    1055                1060                1065

Glu Ala  Gln Ile Phe Tyr Arg  Lys Ala Ser Leu Asp  Met Asn Glu
    1070                1075                1080

Thr Thr  Ile His Arg Ala Gly  Glu Val Leu Glu Asn  Lys Asn Pro
    1085                1090                1095

Asp Asn  Pro Lys Lys Arg Gln  Phe Val Tyr Asp Ile  Ile Lys Asp
    1100                1105                1110

Lys Arg  Tyr Thr Gln Asp Lys  Phe Met Leu His Val  Pro Ile Thr
    1115                1120                1125

Met Asn  Phe Gly Val Gln Gly  Met Thr Ile Lys Glu  Phe Asn Lys
    1130                1135                1140

Lys Val  Asn Gln Ser Ile Gln  Gln Tyr Asp Glu Val  Asn Val Ile
    1145                1150                1155

Gly Ile  Ala Arg Gly Glu Arg  His Leu Leu Tyr Leu  Thr Val Ile
    1160                1165                1170

Asn Ser  Lys Gly Glu Ile Leu  Glu Gln Arg Ser Leu  Asn Asp Ile
    1175                1180                1185

Thr Thr  Ala Ser Ala Asn Gly  Thr Gln Val Thr Thr  Pro Tyr His
    1190                1195                1200

Lys Ile  Leu Asp Lys Arg Glu  Ile Glu Arg Leu Asn  Ala Arg Val
```

```
    1205                1210                1215

Gly Trp  Gly Glu Ile Glu Thr  Ile Lys Glu Leu Lys  Ser Gly Tyr
    1220                1225                1230

Leu Ser  His Val Val His Gln  Ile Asn Gln Leu Met  Leu Lys Tyr
    1235                1240                1245

Asn Ala  Ile Val Val Leu Ala  Asp Leu Asn Phe Gly  Phe Lys Arg
    1250                1255                1260

Gly Arg  Phe Lys Val Glu Lys  Gln Ile Tyr Gln Asn  Phe Glu Asn
    1265                1270                1275

Ala Leu  Ile Lys Lys Leu Asn  His Leu Val Leu Lys  Asp Lys Ala
    1280                1285                1290

Asp Asp  Glu Ile Gly Ser Tyr  Lys Asn Ala Leu Gln  Leu Thr Asn
    1295                1300                1305

Asn Phe  Thr Asp Leu Lys Ser  Ile Gly Lys Gln Thr  Gly Phe Leu
    1310                1315                1320

Phe Tyr  Val Pro Ala Trp Asn  Thr Ser Lys Ile Asp  Pro Glu Thr
    1325                1330                1335

Gly Phe  Val Asp Leu Leu Lys  Pro Arg Tyr Glu Asn  Ile Ala Gln
    1340                1345                1350

Ser Gln  Ala Phe Phe Gly Lys  Phe Asp Lys Ile Cys  Tyr Asn Thr
    1355                1360                1365

Asp Lys  Gly Tyr Phe Glu Phe  His Ile Asp Tyr Ala  Lys Phe Thr
    1370                1375                1380

Asp Lys  Ala Lys Asn Ser Arg  Gln Lys Trp Ala Ile  Cys Ser His
    1385                1390                1395
```

```
Gly Asp  Lys Arg Tyr Val Tyr  Asp Lys Thr Ala Asn  Gln Asn Lys
    1400                1405                1410

Gly Ala  Ala Lys Gly Ile Asn  Val Asn Asp Glu Leu  Lys Ser Leu
    1415                1420                1425

Phe Ala  Arg Tyr His Ile Asn  Asp Lys Gln Pro Asn  Leu Val Met
    1430                1435                1440

Asp Ile  Cys Gln Asn Asn Asp  Lys Glu Phe His Lys  Ser Leu Met
    1445                1450                1455

Cys Leu  Leu Lys Thr Leu Leu  Ala Leu Arg Tyr Ser  Asn Ala Ser
    1460                1465                1470

Ser Asp  Glu Ala Phe Ile Leu  Ser Pro Val Ala Asn  Asp Glu Gly
    1475                1480                1485

Val Phe  Phe Asn Ser Ala Leu  Ala Asp Asp Thr Gln  Pro Gln Asn
    1490                1495                1500

Ala Asp  Ala Asn Gly Ala Tyr  His Ile Ala Leu Lys  Gly Leu Trp
    1505                1510                1515

Leu Leu  Asn Glu Leu Lys Asn  Ser Asp Asp Leu Asn  Lys Val Lys
    1520                1525                1530

Leu Ala  Ile Asp Asn Gln Thr  Trp Leu Asn Phe Ala  Gln Asn Arg
    1535                1540                1545

Lys Arg  Pro Ala Ala Thr Lys  Lys Ala Gly Gln Ala  Lys Lys Lys
    1550                1555                1560

Lys Ser  Gly Gly Ser Thr Asn  Leu Ser Asp Ile Ile  Glu Lys Glu
    1565                1570                1575

Thr Gly  Lys Gln Leu Val Ile  Gln Glu Ser Ile Leu  Met Leu Pro
```

```
    1580                1585                1590

Glu Glu  Val Glu Glu Val Ile  Gly Asn Lys Pro Glu  Ser Asp Ile
    1595                1600                1605

Leu Val  His Thr Ala Tyr Asp  Glu Ser Thr Asp Glu  Asn Val Met
    1610                1615                1620

Leu Leu  Thr Ser Asp Ala Pro  Glu Tyr Lys Pro Trp  Ala Leu Val
    1625                1630                1635

Ile Gln  Asp Ser Asn Gly Glu  Asn Lys Ile Lys Met  Leu Ser Gly
    1640                1645                1650

Gly Ser  Pro Lys Lys Lys Arg  Lys Val
    1655                1660
```

<210> 59
<211> 1267
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 59

```
Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser
1               5                   10                  15

Met Leu Phe Gln Asp Phe Thr His Leu Tyr Pro Leu Ser Lys Thr Val
            20                  25                  30

Arg Phe Glu Leu Lys Pro Ile Gly Arg Thr Leu Glu His Ile His Ala
        35                  40                  45

Lys Asn Phe Leu Ser Gln Asp Glu Thr Met Ala Asp Met Tyr Gln Lys
    50                  55                  60

Val Lys Val Ile Leu Asp Asp Tyr His Arg Asp Phe Ile Ala Asp Met
```

```
65                  70                  75                  80

Met Gly Glu Val Lys Leu Thr Lys Leu Ala Glu Phe Tyr Asp Val Tyr
                85                  90                  95

Leu Lys Phe Arg Lys Asn Pro Lys Asp Asp Gly Leu Gln Lys Gln Leu
            100                 105                 110

Lys Asp Leu Gln Ala Val Leu Arg Lys Glu Ser Val Lys Pro Ile Gly
        115                 120                 125

Ser Gly Gly Lys Tyr Lys Thr Gly Tyr Asp Arg Leu Phe Gly Ala Lys
    130                 135                 140

Leu Phe Lys Asp Gly Lys Glu Leu Gly Asp Leu Ala Lys Phe Val Ile
145                 150                 155                 160

Ala Gln Glu Gly Glu Ser Ser Pro Lys Leu Ala His Leu Ala His Phe
                165                 170                 175

Glu Lys Phe Ser Thr Tyr Phe Thr Gly Phe His Asp Asn Arg Lys Asn
            180                 185                 190

Met Tyr Ser Asp Glu Asp Lys His Thr Ala Ile Ala Tyr Arg Leu Ile
        195                 200                 205

His Glu Asn Leu Pro Arg Phe Ile Asp Asn Leu Gln Ile Leu Thr Thr
    210                 215                 220

Ile Lys Gln Lys His Ser Ala Leu Tyr Asp Gln Ile Ile Asn Glu Leu
225                 230                 235                 240

Thr Ala Ser Gly Leu Asp Val Ser Leu Ala Ser His Leu Asp Gly Tyr
                245                 250                 255

His Lys Leu Leu Thr Gln Glu Gly Ile Thr Ala Tyr Asn Arg Ile Ile
            260                 265                 270
```

```
Gly Glu Val Asn Gly Tyr Thr Asn Lys His Asn Gln Ile Cys His Lys
        275                 280                 285

Ser Glu Arg Ile Ala Lys Leu Arg Pro Leu His Lys Gln Ile Leu Ser
    290                 295                 300

Asp Gly Met Gly Val Ser Phe Leu Pro Ser Lys Phe Ala Asp Asp Ser
305                 310                 315                 320

Glu Met Cys Gln Ala Val Asn Glu Phe Tyr Arg His Tyr Thr Asp Val
                325                 330                 335

Phe Ala Lys Val Gln Ser Leu Phe Asp Gly Phe Asp Asp His Gln Lys
            340                 345                 350

Asp Gly Ile Tyr Val Glu His Lys Asn Leu Asn Glu Leu Ser Lys Gln
        355                 360                 365

Ala Phe Gly Asp Phe Ala Leu Leu Gly Arg Val Leu Asp Gly Tyr Tyr
    370                 375                 380

Val Asp Val Val Asn Pro Glu Phe Asn Glu Arg Phe Ala Lys Ala Lys
385                 390                 395                 400

Thr Asp Asn Ala Lys Ala Lys Leu Thr Lys Glu Lys Asp Lys Phe Ile
                405                 410                 415

Lys Gly Val His Ser Leu Ala Ser Leu Glu Gln Ala Ile Glu His His
            420                 425                 430

Thr Ala Arg His Asp Asp Glu Ser Val Gln Ala Gly Lys Leu Gly Gln
        435                 440                 445

Tyr Phe Lys His Gly Leu Ala Gly Val Asp Asn Pro Ile Gln Lys Ile
    450                 455                 460

His Asn Asn His Ser Thr Ile Lys Gly Phe Leu Glu Arg Glu Arg Pro
```

```
465                 470                 475                 480

Ala Gly Glu Arg Ala Leu Pro Lys Ile Lys Ser Gly Lys Asn Pro Glu
                485                 490                 495

Met Thr Gln Leu Arg Gln Leu Lys Glu Leu Leu Asp Asn Ala Leu Asn
            500                 505                 510

Val Ala His Phe Ala Lys Leu Leu Thr Thr Lys Thr Thr Leu Asp Asn
        515                 520                 525

Gln Asp Gly Asn Phe Tyr Gly Glu Phe Gly Val Leu Tyr Asp Glu Leu
    530                 535                 540

Ala Lys Ile Pro Thr Leu Tyr Asn Lys Val Arg Asp Tyr Leu Ser Gln
545                 550                 555                 560

Lys Pro Phe Ser Thr Glu Lys Tyr Lys Leu Asn Phe Gly Asn Pro Thr
                565                 570                 575

Leu Leu Asn Gly Trp Asp Leu Asn Lys Glu Lys Asp Asn Phe Gly Val
            580                 585                 590

Ile Leu Gln Lys Asp Gly Cys Tyr Tyr Leu Ala Leu Leu Asp Lys Ala
        595                 600                 605

His Lys Lys Val Phe Asp Asn Ala Pro Asn Thr Gly Lys Asn Val Tyr
    610                 615                 620

Gln Lys Met Val Tyr Lys Leu Leu Pro Gly Pro Asn Lys Met Leu Pro
625                 630                 635                 640

Lys Val Phe Phe Ala Lys Ser Asn Leu Asp Tyr Tyr Asn Pro Ser Ala
                645                 650                 655

Glu Leu Leu Asp Lys Tyr Ala Lys Gly Thr His Lys Lys Gly Asp Asn
            660                 665                 670
```

```
Phe Asn Leu Lys Asp Cys His Ala Leu Ile Asp Phe Phe Lys Ala Gly
        675                 680                 685

Ile Asn Lys His Pro Glu Trp Gln His Phe Gly Phe Lys Phe Ser Pro
    690                 695                 700

Thr Ser Ser Tyr Arg Asp Leu Ser Asp Phe Tyr Arg Glu Val Glu Pro
705                 710                 715                 720

Gln Gly Tyr Gln Val Lys Phe Val Asp Ile Asn Ala Asp Tyr Ile Asp
                725                 730                 735

Glu Leu Val Glu Gln Gly Lys Leu Tyr Leu Phe Gln Ile Tyr Asn Lys
            740                 745                 750

Asp Phe Ser Pro Lys Ala His Gly Lys Pro Asn Leu His Thr Leu Tyr
        755                 760                 765

Phe Lys Ala Leu Phe Ser Glu Asp Asn Leu Ala Asp Pro Ile Tyr Lys
    770                 775                 780

Leu Asn Gly Glu Ala Gln Ile Phe Tyr Arg Lys Ala Ser Leu Asp Met
785                 790                 795                 800

Asn Glu Thr Thr Ile His Arg Ala Gly Glu Val Leu Glu Asn Lys Asn
                805                 810                 815

Pro Asp Asn Pro Lys Lys Arg Gln Phe Val Tyr Asp Ile Ile Lys Asp
            820                 825                 830

Lys Arg Tyr Thr Gln Asp Lys Phe Met Leu His Val Pro Ile Thr Met
        835                 840                 845

Asn Phe Gly Val Gln Gly Met Thr Ile Lys Glu Phe Asn Lys Lys Val
    850                 855                 860

Asn Gln Ser Ile Gln Gln Tyr Asp Glu Val Asn Val Ile Gly Ile Asp
```

```
865                 870                 875                 880

Arg Gly Glu Arg His Leu Leu Tyr Leu Thr Val Ile Asn Ser Lys Gly
                885                 890                 895

Glu Ile Leu Glu Gln Arg Ser Leu Asn Asp Ile Thr Thr Ala Ser Ala
            900                 905                 910

Asn Gly Thr Gln Val Thr Thr Pro Tyr His Lys Ile Leu Asp Lys Arg
        915                 920                 925

Glu Ile Glu Arg Leu Asn Ala Arg Val Gly Trp Gly Glu Ile Glu Thr
    930                 935                 940

Ile Lys Glu Leu Lys Ser Gly Tyr Leu Ser His Val Val His Gln Ile
945                 950                 955                 960

Asn Gln Leu Met Leu Lys Tyr Asn Ala Ile Val Val Leu Glu Asp Leu
                965                 970                 975

Asn Phe Gly Phe Lys Arg Gly Arg Phe Lys Val Glu Lys Gln Ile Tyr
            980                 985                 990

Gln Asn Phe Glu Asn Ala Leu Ile  Lys Lys Leu Asn His  Leu Val Leu
        995                 1000                1005

Lys Asp  Lys Ala Asp Asp Glu  Ile Gly Ser Tyr Lys  Asn Ala Leu
    1010                1015                1020

Gln Leu  Thr Asn Asn Phe Thr  Asp Leu Lys Ser Ile  Gly Lys Gln
    1025                1030                1035

Thr Gly  Phe Leu Phe Tyr Val  Pro Ala Trp Asn Thr  Ser Lys Ile
    1040                1045                1050

Asp Pro  Glu Thr Gly Phe Val  Asp Leu Leu Lys Pro  Arg Tyr Glu
    1055                1060                1065
```

```
Asn Ile  Ala Gln Ser Gln Ala  Phe Phe Gly Lys Phe  Asp Lys Ile
    1070                1075                1080

Cys Tyr  Asn Thr Asp Lys Gly  Tyr Phe Glu Phe His  Ile Asp Tyr
    1085                1090                1095

Ala Lys  Phe Thr Asp Lys Ala  Lys Asn Ser Arg Gln  Lys Trp Ala
    1100                1105                1110

Ile Cys  Ser His Gly Asp Lys  Arg Tyr Val Tyr Asp  Lys Thr Ala
    1115                1120                1125

Asn Gln  Asn Lys Gly Ala Ala  Lys Gly Ile Asn Val  Asn Asp Glu
    1130                1135                1140

Leu Lys  Ser Leu Phe Ala Arg  Tyr His Ile Asn Asp  Lys Gln Pro
    1145                1150                1155

Asn Leu  Val Met Asp Ile Cys  Gln Asn Asn Asp Lys  Glu Phe His
    1160                1165                1170

Lys Ser  Leu Met Cys Leu Leu  Lys Thr Leu Leu Ala  Leu Arg Tyr
    1175                1180                1185

Ser Asn  Ala Ser Ser Asp Glu  Asp Phe Ile Leu Ser  Pro Val Ala
    1190                1195                1200

Asn Asp  Glu Gly Val Phe Phe  Asn Ser Ala Leu Ala  Asp Asp Thr
    1205                1210                1215

Gln Pro  Gln Asn Ala Asp Ala  Asn Gly Ala Tyr His  Ile Ala Leu
    1220                1225                1230

Lys Gly  Leu Trp Leu Leu Asn  Glu Leu Lys Asn Ser  Asp Asp Leu
    1235                1240                1245

Asn Lys  Val Lys Leu Ala Ile  Asp Asn Gln Thr Trp  Leu Asn Phe
```

1250 1255 1260

Ala Gln Asn Arg
1265

<210> 60
<211> 1368
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 60

Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser
1 5 10 15

Met Thr Gln Phe Glu Gly Phe Thr Asn Leu Tyr Gln Val Ser Lys Thr
20 25 30

Leu Arg Phe Glu Leu Ile Pro Gln Gly Lys Thr Leu Lys His Ile Gln
35 40 45

Glu Gln Gly Phe Ile Glu Glu Asp Lys Ala Arg Asn Asp His Tyr Lys
50 55 60

Glu Leu Lys Pro Ile Ile Asp Arg Ile Tyr Lys Thr Tyr Ala Asp Gln
65 70 75 80

Cys Leu Gln Leu Val Gln Leu Asp Trp Glu Asn Leu Ser Ala Ala Ile
85 90 95

Asp Ser Tyr Arg Lys Glu Lys Thr Glu Glu Thr Arg Asn Ala Leu Ile
100 105 110

Glu Glu Gln Ala Thr Tyr Arg Asn Ala Ile His Asp Tyr Phe Ile Gly
115 120 125

Arg Thr Asp Asn Leu Thr Asp Ala Ile Asn Lys Arg His Ala Glu Ile

```
    130                 135                 140

Tyr Lys Gly Leu Phe Lys Ala Glu Leu Phe Asn Gly Lys Val Leu Lys
145                 150                 155                 160

Gln Leu Gly Thr Val Thr Thr Thr Glu His Glu Asn Ala Leu Leu Arg
                165                 170                 175

Ser Phe Asp Lys Phe Thr Thr Tyr Phe Ser Gly Phe Tyr Glu Asn Arg
            180                 185                 190

Lys Asn Val Phe Ser Ala Glu Asp Ile Ser Thr Ala Ile Pro His Arg
        195                 200                 205

Ile Val Gln Asp Asn Phe Pro Lys Phe Lys Glu Asn Cys His Ile Phe
    210                 215                 220

Thr Arg Leu Ile Thr Ala Val Pro Ser Leu Arg Glu His Phe Glu Asn
225                 230                 235                 240

Val Lys Lys Ala Ile Gly Ile Phe Val Ser Thr Ser Ile Glu Glu Val
                245                 250                 255

Phe Ser Phe Pro Phe Tyr Asn Gln Leu Leu Thr Gln Thr Gln Ile Asp
            260                 265                 270

Leu Tyr Asn Gln Leu Leu Gly Gly Ile Ser Arg Glu Ala Gly Thr Glu
        275                 280                 285

Lys Ile Lys Gly Leu Asn Glu Val Leu Asn Leu Ala Ile Gln Lys Asn
    290                 295                 300

Asp Glu Thr Ala His Ile Ile Ala Ser Leu Pro His Arg Phe Ile Pro
305                 310                 315                 320

Leu Phe Lys Gln Ile Leu Ser Asp Arg Asn Thr Leu Ser Phe Ile Leu
                325                 330                 335
```

```
Glu Glu Phe Lys Ser Asp Glu Glu Val Ile Gln Ser Phe Cys Lys Tyr
            340                 345                 350

Lys Thr Leu Leu Arg Asn Glu Asn Val Leu Glu Thr Ala Glu Ala Leu
        355                 360                 365

Phe Asn Glu Leu Asn Ser Ile Asp Leu Thr His Ile Phe Ile Ser His
    370                 375                 380

Lys Lys Leu Glu Thr Ile Ser Ser Ala Leu Cys Asp His Trp Asp Thr
385                 390                 395                 400

Leu Arg Asn Ala Leu Tyr Glu Arg Arg Ile Ser Glu Leu Thr Gly Lys
                405                 410                 415

Ile Thr Lys Ser Ala Lys Glu Lys Val Gln Arg Ser Leu Lys His Glu
            420                 425                 430

Asp Ile Asn Leu Gln Glu Ile Ile Ser Ala Ala Gly Lys Glu Leu Ser
        435                 440                 445

Glu Ala Phe Lys Gln Lys Thr Ser Glu Ile Leu Ser His Ala His Ala
    450                 455                 460

Ala Leu Asp Gln Pro Leu Pro Thr Thr Leu Lys Lys Gln Glu Glu Lys
465                 470                 475                 480

Glu Ile Leu Lys Ser Gln Leu Asp Ser Leu Leu Gly Leu Tyr His Leu
                485                 490                 495

Leu Asp Trp Phe Ala Val Asp Glu Ser Asn Glu Val Asp Pro Glu Phe
            500                 505                 510

Ser Ala Arg Leu Thr Gly Ile Lys Leu Glu Met Glu Pro Ser Leu Ser
        515                 520                 525

Phe Tyr Asn Lys Ala Arg Asn Tyr Ala Thr Lys Lys Pro Tyr Ser Val
```

```
    530                 535                 540

Glu Lys Phe Lys Leu Asn Phe Gln Met Pro Thr Leu Ala Ser Gly Trp
545                 550                 555                 560

Asp Val Asn Lys Glu Lys Asn Asn Gly Ala Ile Leu Phe Val Lys Asn
                565                 570                 575

Gly Leu Tyr Tyr Leu Gly Ile Met Pro Lys Gln Lys Gly Arg Tyr Lys
            580                 585                 590

Ala Leu Ser Phe Glu Pro Thr Glu Lys Thr Ser Glu Gly Phe Asp Lys
        595                 600                 605

Met Tyr Tyr Asp Tyr Phe Pro Asp Ala Ala Lys Met Ile Pro Lys Cys
    610                 615                 620

Ser Thr Gln Leu Lys Ala Val Thr Ala His Phe Gln Thr His Thr Thr
625                 630                 635                 640

Pro Ile Leu Leu Ser Asn Asn Phe Ile Glu Pro Leu Glu Ile Thr Lys
                645                 650                 655

Glu Ile Tyr Asp Leu Asn Asn Pro Glu Lys Glu Pro Lys Lys Phe Gln
            660                 665                 670

Thr Ala Tyr Ala Lys Lys Thr Gly Asp Gln Lys Gly Tyr Arg Glu Ala
        675                 680                 685

Leu Cys Lys Trp Ile Asp Phe Thr Arg Asp Phe Leu Ser Lys Tyr Thr
    690                 695                 700

Lys Thr Thr Ser Ile Asp Leu Ser Ser Leu Arg Pro Ser Ser Gln Tyr
705                 710                 715                 720

Lys Asp Leu Gly Glu Tyr Tyr Ala Glu Leu Asn Pro Leu Leu Tyr His
                725                 730                 735
```

```
Ile Ser Phe Gln Arg Ile Ala Glu Lys Glu Ile Met Asp Ala Val Glu
            740                 745                 750

Thr Gly Lys Leu Tyr Leu Phe Gln Ile Tyr Asn Lys Asp Phe Ala Lys
        755                 760                 765

Gly His His Gly Lys Pro Asn Leu His Thr Leu Tyr Trp Thr Gly Leu
    770                 775                 780

Phe Ser Pro Glu Asn Leu Ala Lys Thr Ser Ile Lys Leu Asn Gly Gln
785                 790                 795                 800

Ala Glu Leu Phe Tyr Arg Pro Lys Ser Arg Met Lys Arg Met Ala His
                805                 810                 815

Arg Leu Gly Glu Lys Met Leu Asn Lys Lys Leu Lys Asp Gln Lys Thr
            820                 825                 830

Pro Ile Pro Asp Thr Leu Tyr Gln Glu Leu Tyr Asp Tyr Val Asn His
        835                 840                 845

Arg Leu Ser His Asp Leu Ser Asp Glu Ala Arg Ala Leu Leu Pro Asn
    850                 855                 860

Val Ile Thr Lys Glu Val Ser His Glu Ile Ile Lys Asp Arg Arg Phe
865                 870                 875                 880

Thr Ser Asp Lys Phe Phe Phe His Val Pro Ile Thr Leu Asn Tyr Gln
                885                 890                 895

Ala Ala Asn Ser Pro Ser Lys Phe Asn Gln Arg Val Asn Ala Tyr Leu
            900                 905                 910

Lys Glu His Pro Glu Thr Pro Ile Ile Gly Ile Asp Arg Gly Glu Arg
        915                 920                 925

Asn Leu Ile Tyr Ile Thr Val Ile Asp Ser Thr Gly Lys Ile Leu Glu
```

```
    930                 935                 940

Gln Arg Ser Leu Asn Thr Ile Gln Gln Phe Asp Tyr Gln Lys Lys Leu
945                 950                 955                 960

Asp Asn Arg Glu Lys Glu Arg Val Ala Ala Arg Gln Ala Trp Ser Val
                965                 970                 975

Val Gly Thr Ile Lys Asp Leu Lys Gln Gly Tyr Leu Ser Gln Val Ile
            980                 985                 990

His Glu Ile Val Asp Leu Met Ile  His Tyr Gln Ala Val  Val Val Leu
        995                 1000                1005

Glu Asn  Leu Asn Phe Gly Phe  Lys Ser Lys Arg Thr  Gly Ile Ala
    1010                1015                1020

Glu Lys  Ala Val Tyr Gln Gln  Phe Glu Lys Met Leu  Ile Asp Lys
    1025                1030                1035

Leu Asn  Cys Leu Val Leu Lys  Asp Tyr Pro Ala Glu  Lys Val Gly
    1040                1045                1050

Gly Val  Leu Asn Pro Tyr Gln  Leu Thr Asp Gln Phe  Thr Ser Phe
    1055                1060                1065

Ala Lys  Met Gly Thr Gln Ser  Gly Phe Leu Phe Tyr  Val Pro Ala
    1070                1075                1080

Pro Tyr  Thr Ser Lys Ile Asp  Pro Leu Thr Gly Phe  Val Asp Pro
    1085                1090                1095

Phe Val  Trp Lys Thr Ile Lys  Asn His Glu Ser Arg  Lys His Phe
    1100                1105                1110

Leu Glu  Gly Phe Asp Phe Leu  His Tyr Asp Val Lys  Thr Gly Asp
    1115                1120                1125
```

```
Phe Ile  Leu His Phe Lys Met  Asn Arg Asn Leu Ser  Phe Gln Arg
    1130                1135                1140

Gly Leu  Pro Gly Phe Met Pro  Ala Trp Asp Ile Val  Phe Glu Lys
    1145                1150                1155

Asn Glu  Thr Gln Phe Asp Ala  Lys Gly Thr Pro Phe  Ile Ala Gly
    1160                1165                1170

Lys Arg  Ile Val Pro Val Ile  Glu Asn His Arg Phe  Thr Gly Arg
    1175                1180                1185

Tyr Arg  Asp Leu Tyr Pro Ala  Asn Glu Leu Ile Ala  Leu Leu Glu
    1190                1195                1200

Glu Lys  Gly Ile Val Phe Arg  Asp Gly Ser Asn Ile  Leu Pro Lys
    1205                1210                1215

Leu Leu  Glu Asn Asp Asp Ser  His Ala Ile Asp Thr  Met Val Ala
    1220                1225                1230

Leu Ile  Arg Ser Val Leu Gln  Met Arg Asn Ser Asn  Ala Ala Thr
    1235                1240                1245

Gly Glu  Asp Tyr Ile Asn Ser  Pro Val Arg Asp Leu  Asn Gly Val
    1250                1255                1260

Cys Phe  Asp Ser Arg Phe Gln  Asn Pro Glu Trp Pro  Met Asp Ala
    1265                1270                1275

Asp Ala  Asn Gly Ala Tyr His  Ile Ala Leu Lys Gly  Gln Leu Leu
    1280                1285                1290

Leu Asn  His Leu Lys Glu Ser  Lys Asp Leu Lys Leu  Gln Asn Gly
    1295                1300                1305

Ile Ser  Asn Gln Asp Trp Leu  Ala Tyr Ile Gln Glu  Leu Arg Asn
```

1310 1315 1320

Lys Arg Pro Ala Ala Thr Lys Lys Ala Gly Gln Ala Lys Lys Lys
1325 1330 1335

Lys Gly Ser Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Tyr Pro Tyr
1340 1345 1350

Asp Val Pro Asp Tyr Ala Tyr Pro Tyr Asp Val Pro Asp Tyr Ala
1355 1360 1365

<210> 61
<211> 1332
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 61

Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser
1 5 10 15

Met Thr Gln Phe Glu Gly Phe Thr Asn Leu Tyr Gln Val Ser Lys Thr
20 25 30

Leu Arg Phe Glu Leu Ile Pro Gln Gly Lys Thr Leu Lys His Ile Gln
35 40 45

Glu Gln Gly Phe Ile Glu Glu Asp Lys Ala Arg Asn Asp His Tyr Lys
50 55 60

Glu Leu Lys Pro Ile Ile Asp Arg Ile Tyr Lys Thr Tyr Ala Asp Gln
65 70 75 80

Cys Leu Gln Leu Val Gln Leu Asp Trp Glu Asn Leu Ser Ala Ala Ile
85 90 95

Asp Ser Tyr Arg Lys Glu Lys Thr Glu Glu Thr Arg Asn Ala Leu Ile

```
            100                 105                 110

Glu Glu Gln Ala Thr Tyr Arg Asn Ala Ile His Asp Tyr Phe Ile Gly
        115                 120                 125

Arg Thr Asp Asn Leu Thr Asp Ala Ile Asn Lys Arg His Ala Glu Ile
    130                 135                 140

Tyr Lys Gly Leu Phe Lys Ala Glu Leu Phe Asn Gly Lys Val Leu Lys
145                 150                 155                 160

Gln Leu Gly Thr Val Thr Thr Thr Glu His Glu Asn Ala Leu Leu Arg
                165                 170                 175

Ser Phe Asp Lys Phe Thr Thr Tyr Phe Ser Gly Phe Tyr Glu Asn Arg
            180                 185                 190

Lys Asn Val Phe Ser Ala Glu Asp Ile Ser Thr Ala Ile Pro His Arg
        195                 200                 205

Ile Val Gln Asp Asn Phe Pro Lys Phe Lys Glu Asn Cys His Ile Phe
    210                 215                 220

Thr Arg Leu Ile Thr Ala Val Pro Ser Leu Arg Glu His Phe Glu Asn
225                 230                 235                 240

Val Lys Lys Ala Ile Gly Ile Phe Val Ser Thr Ser Ile Glu Glu Val
                245                 250                 255

Phe Ser Phe Pro Phe Tyr Asn Gln Leu Leu Thr Gln Thr Gln Ile Asp
            260                 265                 270

Leu Tyr Asn Gln Leu Leu Gly Gly Ile Ser Arg Glu Ala Gly Thr Glu
        275                 280                 285

Lys Ile Lys Gly Leu Asn Glu Val Leu Asn Leu Ala Ile Gln Lys Asn
    290                 295                 300
```

```
Asp Glu Thr Ala His Ile Ile Ala Ser Leu Pro His Arg Phe Ile Pro
305                 310                 315                 320

Leu Phe Lys Gln Ile Leu Ser Asp Arg Asn Thr Leu Ser Phe Ile Leu
                325                 330                 335

Glu Glu Phe Lys Ser Asp Glu Glu Val Ile Gln Ser Phe Cys Lys Tyr
            340                 345                 350

Lys Thr Leu Leu Arg Asn Glu Asn Val Leu Glu Thr Ala Glu Ala Leu
        355                 360                 365

Phe Asn Glu Leu Asn Ser Ile Asp Leu Thr His Ile Phe Ile Ser His
    370                 375                 380

Lys Lys Leu Glu Thr Ile Ser Ser Ala Leu Cys Asp His Trp Asp Thr
385                 390                 395                 400

Leu Arg Asn Ala Leu Tyr Glu Arg Arg Ile Ser Glu Leu Thr Gly Lys
                405                 410                 415

Ile Thr Lys Ser Ala Lys Glu Lys Val Gln Arg Ser Leu Lys His Glu
            420                 425                 430

Asp Ile Asn Leu Gln Glu Ile Ile Ser Ala Ala Gly Lys Glu Leu Ser
        435                 440                 445

Glu Ala Phe Lys Gln Lys Thr Ser Glu Ile Leu Ser His Ala His Ala
    450                 455                 460

Ala Leu Asp Gln Pro Leu Pro Thr Thr Leu Lys Lys Gln Glu Glu Lys
465                 470                 475                 480

Glu Ile Leu Lys Ser Gln Leu Asp Ser Leu Leu Gly Leu Tyr His Leu
                485                 490                 495

Leu Asp Trp Phe Ala Val Asp Glu Ser Asn Glu Val Asp Pro Glu Phe
```

```
            500                 505                 510

Ser Ala Arg Leu Thr Gly Ile Lys Leu Glu Met Glu Pro Ser Leu Ser
        515                 520                 525

Phe Tyr Asn Lys Ala Arg Asn Tyr Ala Thr Lys Lys Pro Tyr Ser Val
    530                 535                 540

Glu Lys Phe Lys Leu Asn Phe Gln Met Pro Thr Leu Ala Ser Gly Trp
545                 550                 555                 560

Asp Val Asn Lys Glu Lys Asn Asn Gly Ala Ile Leu Phe Val Lys Asn
                565                 570                 575

Gly Leu Tyr Tyr Leu Gly Ile Met Pro Lys Gln Lys Gly Arg Tyr Lys
            580                 585                 590

Ala Leu Ser Phe Glu Pro Thr Glu Lys Thr Ser Glu Gly Phe Asp Lys
        595                 600                 605

Met Tyr Tyr Asp Tyr Phe Pro Asp Ala Ala Lys Met Ile Pro Lys Cys
    610                 615                 620

Ser Thr Gln Leu Lys Ala Val Thr Ala His Phe Gln Thr His Thr Thr
625                 630                 635                 640

Pro Ile Leu Leu Ser Asn Asn Phe Ile Glu Pro Leu Glu Ile Thr Lys
                645                 650                 655

Glu Ile Tyr Asp Leu Asn Asn Pro Glu Lys Glu Pro Lys Lys Phe Gln
            660                 665                 670

Thr Ala Tyr Ala Lys Lys Thr Gly Asp Gln Lys Gly Tyr Arg Glu Ala
        675                 680                 685

Leu Cys Lys Trp Ile Asp Phe Thr Arg Asp Phe Leu Ser Lys Tyr Thr
    690                 695                 700
```

```
Lys Thr Thr Ser Ile Asp Leu Ser Ser Leu Arg Pro Ser Ser Gln Tyr
705                 710                 715                 720


Lys Asp Leu Gly Glu Tyr Tyr Ala Glu Leu Asn Pro Leu Leu Tyr His
                725                 730                 735


Ile Ser Phe Gln Arg Ile Ala Glu Lys Glu Ile Met Asp Ala Val Glu
            740                 745                 750


Thr Gly Lys Leu Tyr Leu Phe Gln Ile Tyr Asn Lys Asp Phe Ala Lys
        755                 760                 765


Gly His His Gly Lys Pro Asn Leu His Thr Leu Tyr Trp Thr Gly Leu
    770                 775                 780


Phe Ser Pro Glu Asn Leu Ala Lys Thr Ser Ile Lys Leu Asn Gly Gln
785                 790                 795                 800


Ala Glu Leu Phe Tyr Arg Pro Lys Ser Arg Met Lys Arg Met Ala His
                805                 810                 815


Arg Leu Gly Glu Lys Met Leu Asn Lys Lys Leu Lys Asp Gln Lys Thr
            820                 825                 830


Pro Ile Pro Asp Thr Leu Tyr Gln Glu Leu Tyr Asp Tyr Val Asn His
        835                 840                 845


Arg Leu Ser His Asp Leu Ser Asp Glu Ala Arg Ala Leu Leu Pro Asn
    850                 855                 860


Val Ile Thr Lys Glu Val Ser His Glu Ile Ile Lys Asp Arg Arg Phe
865                 870                 875                 880


Thr Ser Asp Lys Phe Phe Phe His Val Pro Ile Thr Leu Asn Tyr Gln
                885                 890                 895


Ala Ala Asn Ser Pro Ser Lys Phe Asn Gln Arg Val Asn Ala Tyr Leu
```

```
            900                 905                 910

Lys Glu His Pro Glu Thr Pro Ile Ile Gly Ile Ala Arg Gly Glu Arg
        915                 920                 925

Asn Leu Ile Tyr Ile Thr Val Ile Asp Ser Thr Gly Lys Ile Leu Glu
    930                 935                 940

Gln Arg Ser Leu Asn Thr Ile Gln Gln Phe Asp Tyr Gln Lys Lys Leu
945                 950                 955                 960

Asp Asn Arg Glu Lys Glu Arg Val Ala Ala Arg Gln Ala Trp Ser Val
                965                 970                 975

Val Gly Thr Ile Lys Asp Leu Lys Gln Gly Tyr Leu Ser Gln Val Ile
            980                 985                 990

His Glu Ile Val Asp Leu Met Ile  His Tyr Gln Ala Val  Val Val Leu
        995                 1000                1005

Ala Asn  Leu Asn Phe Gly Phe  Lys Ser Lys Arg Thr  Gly Ile Ala
    1010                1015                1020

Glu Lys  Ala Val Tyr Gln Gln  Phe Glu Lys Met Leu  Ile Asp Lys
    1025                1030                1035

Leu Asn  Cys Leu Val Leu Lys  Asp Tyr Pro Ala Glu  Lys Val Gly
    1040                1045                1050

Gly Val  Leu Asn Pro Tyr Gln  Leu Thr Asp Gln Phe  Thr Ser Phe
    1055                1060                1065

Ala Lys  Met Gly Thr Gln Ser  Gly Phe Leu Phe Tyr  Val Pro Ala
    1070                1075                1080

Pro Tyr  Thr Ser Lys Ile Asp  Pro Leu Thr Gly Phe  Val Asp Pro
    1085                1090                1095
```

```
Phe Val  Trp Lys Thr Ile Lys  Asn His Glu Ser Arg  Lys His Phe
    1100                1105                1110

Leu Glu  Gly Phe Asp Phe Leu  His Tyr Asp Val Lys  Thr Gly Asp
    1115                1120                1125

Phe Ile  Leu His Phe Lys Met  Asn Arg Asn Leu Ser  Phe Gln Arg
    1130                1135                1140

Gly Leu  Pro Gly Phe Met Pro  Ala Trp Asp Ile Val  Phe Glu Lys
    1145                1150                1155

Asn Glu  Thr Gln Phe Asp Ala  Lys Gly Thr Pro Phe  Ile Ala Gly
    1160                1165                1170

Lys Arg  Ile Val Pro Val Ile  Glu Asn His Arg Phe  Thr Gly Arg
    1175                1180                1185

Tyr Arg  Asp Leu Tyr Pro Ala  Asn Glu Leu Ile Ala  Leu Leu Glu
    1190                1195                1200

Glu Lys  Gly Ile Val Phe Arg  Asp Gly Ser Asn Ile  Leu Pro Lys
    1205                1210                1215

Leu Leu  Glu Asn Asp Asp Ser  His Ala Ile Asp Thr  Met Val Ala
    1220                1225                1230

Leu Ile  Arg Ser Val Leu Gln  Met Arg Asn Ser Asn  Ala Ala Thr
    1235                1240                1245

Gly Glu  Ala Tyr Ile Asn Ser  Pro Val Arg Asp Leu  Asn Gly Val
    1250                1255                1260

Cys Phe  Asp Ser Arg Phe Gln  Asn Pro Glu Trp Pro  Met Asp Ala
    1265                1270                1275

Asp Ala  Asn Gly Ala Tyr His  Ile Ala Leu Lys Gly  Gln Leu Leu
```

1280 1285 1290

Leu Asn His Leu Lys Glu Ser Lys Asp Leu Lys Leu Gln Asn Gly
1295 1300 1305

Ile Ser Asn Gln Asp Trp Leu Ala Tyr Ile Gln Glu Leu Arg Asn
1310 1315 1320

Gly Ser Pro Lys Lys Lys Arg Lys Val
1325 1330

<210> 62
<211> 1403
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 62

Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser
1 5 10 15

Met Pro Lys Lys Lys Arg Lys Val Gly Gly Gly Gly Ser Gly Gly Gly
20 25 30

Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
35 40 45

Ser Gly Gly Gly Gly Ser Met Ser Ile Tyr Gln Glu Phe Val Asn Lys
50 55 60

Tyr Ser Leu Ser Lys Thr Leu Arg Phe Glu Leu Ile Pro Gln Gly Lys
65 70 75 80

Thr Leu Glu Asn Ile Lys Ala Arg Gly Leu Ile Leu Asp Asp Glu Lys
85 90 95

Arg Ala Lys Asp Tyr Lys Lys Ala Lys Gln Ile Ile Asp Lys Tyr His

```
            100                 105                 110

Gln Phe Phe Ile Glu Glu Ile Leu Ser Ser Val Cys Ile Ser Glu Asp
        115                 120                 125

Leu Leu Gln Asn Tyr Ser Asp Val Tyr Phe Lys Leu Lys Lys Ser Asp
    130                 135                 140

Asp Asp Asn Leu Gln Lys Asp Phe Lys Ser Ala Lys Asp Thr Ile Lys
145                 150                 155                 160

Lys Gln Ile Ser Glu Tyr Ile Lys Asp Ser Glu Lys Phe Lys Asn Leu
                165                 170                 175

Phe Asn Gln Asn Leu Ile Asp Ala Lys Lys Gly Gln Glu Ser Asp Leu
            180                 185                 190

Ile Leu Trp Leu Lys Gln Ser Lys Asp Asn Gly Ile Glu Leu Phe Lys
        195                 200                 205

Ala Asn Ser Asp Ile Thr Asp Ile Asp Glu Ala Leu Glu Ile Ile Lys
    210                 215                 220

Ser Phe Lys Gly Trp Thr Thr Tyr Phe Lys Gly Phe His Glu Asn Arg
225                 230                 235                 240

Lys Asn Val Tyr Ser Ser Asn Asp Ile Pro Thr Ser Ile Ile Tyr Arg
                245                 250                 255

Ile Val Asp Asp Asn Leu Pro Lys Phe Leu Glu Asn Lys Ala Lys Tyr
            260                 265                 270

Glu Ser Leu Lys Asp Lys Ala Pro Glu Ala Ile Asn Tyr Glu Gln Ile
        275                 280                 285

Lys Lys Asp Leu Ala Glu Glu Leu Thr Phe Asp Ile Asp Tyr Lys Thr
    290                 295                 300
```

```
Ser Glu Val Asn Gln Arg Val Phe Ser Leu Asp Glu Val Phe Glu Ile
305                 310                 315                 320

Ala Asn Phe Asn Asn Tyr Leu Asn Gln Ser Gly Ile Thr Lys Phe Asn
                325                 330                 335

Thr Ile Ile Gly Gly Lys Phe Val Asn Gly Glu Asn Thr Lys Arg Lys
            340                 345                 350

Gly Ile Asn Glu Tyr Ile Asn Leu Tyr Ser Gln Gln Ile Asn Asp Lys
        355                 360                 365

Thr Leu Lys Lys Tyr Lys Met Ser Val Leu Phe Lys Gln Ile Leu Ser
    370                 375                 380

Asp Thr Glu Ser Lys Ser Phe Val Ile Asp Lys Leu Glu Asp Asp Ser
385                 390                 395                 400

Asp Val Val Thr Thr Met Gln Ser Phe Tyr Glu Gln Ile Ala Ala Phe
                405                 410                 415

Lys Thr Val Glu Glu Lys Ser Ile Lys Glu Thr Leu Ser Leu Leu Phe
            420                 425                 430

Asp Asp Leu Lys Ala Gln Lys Leu Asp Leu Ser Lys Ile Tyr Phe Lys
        435                 440                 445

Asn Asp Lys Ser Leu Thr Asp Leu Ser Gln Gln Val Phe Asp Asp Tyr
    450                 455                 460

Ser Val Ile Gly Thr Ala Val Leu Glu Tyr Ile Thr Gln Gln Ile Ala
465                 470                 475                 480

Pro Lys Asn Leu Asp Asn Pro Ser Lys Lys Glu Gln Glu Leu Ile Ala
                485                 490                 495

Lys Lys Thr Glu Lys Ala Lys Tyr Leu Ser Leu Glu Thr Ile Lys Leu
```

```
            500                 505                 510

Ala Leu Glu Glu Phe Asn Lys His Arg Asp Ile Asp Lys Gln Cys Arg
        515                 520                 525

Phe Glu Glu Ile Leu Ala Asn Phe Ala Ala Ile Pro Met Ile Phe Asp
    530                 535                 540

Glu Ile Ala Gln Asn Lys Asp Asn Leu Ala Gln Ile Ser Ile Lys Tyr
545                 550                 555                 560

Gln Asn Gln Gly Lys Lys Asp Leu Leu Gln Ala Ser Ala Glu Asp Asp
                565                 570                 575

Val Lys Ala Ile Lys Asp Leu Leu Asp Gln Thr Asn Asn Leu Leu His
            580                 585                 590

Lys Leu Lys Ile Phe His Ile Ser Gln Ser Glu Asp Lys Ala Asn Ile
        595                 600                 605

Leu Asp Lys Asp Glu His Phe Tyr Leu Val Phe Glu Glu Cys Tyr Phe
    610                 615                 620

Glu Leu Ala Asn Ile Val Pro Leu Tyr Asn Lys Ile Arg Asn Tyr Ile
625                 630                 635                 640

Thr Gln Lys Pro Tyr Ser Asp Glu Lys Phe Lys Leu Asn Phe Glu Asn
                645                 650                 655

Ser Thr Leu Ala Asn Gly Trp Asp Lys Asn Lys Glu Pro Asp Asn Thr
            660                 665                 670

Ala Ile Leu Phe Ile Lys Asp Asp Lys Tyr Tyr Leu Gly Val Met Asn
        675                 680                 685

Lys Lys Asn Asn Lys Ile Phe Asp Asp Lys Ala Ile Lys Glu Asn Lys
    690                 695                 700
```

```
Gly Glu Gly Tyr Lys Lys Ile Val Tyr Lys Leu Leu Pro Gly Ala Asn
705                 710                 715                 720

Lys Met Leu Pro Lys Val Phe Phe Ser Ala Lys Ser Ile Lys Phe Tyr
                725                 730                 735

Asn Pro Ser Glu Asp Ile Leu Arg Ile Arg Asn His Ser Thr His Thr
            740                 745                 750

Lys Asn Gly Ser Pro Gln Lys Gly Tyr Glu Lys Phe Glu Phe Asn Ile
        755                 760                 765

Glu Asp Cys Arg Lys Phe Ile Asp Phe Tyr Lys Gln Ser Ile Ser Lys
    770                 775                 780

His Pro Glu Trp Lys Asp Phe Gly Phe Arg Phe Ser Asp Thr Gln Arg
785                 790                 795                 800

Tyr Asn Ser Ile Asp Glu Phe Tyr Arg Glu Val Glu Asn Gln Gly Tyr
                805                 810                 815

Lys Leu Thr Phe Glu Asn Ile Ser Glu Ser Tyr Ile Asp Ser Val Val
            820                 825                 830

Asn Gln Gly Lys Leu Tyr Leu Phe Gln Ile Tyr Asn Lys Asp Phe Ser
        835                 840                 845

Ala Tyr Ser Lys Gly Arg Pro Asn Leu His Thr Leu Tyr Trp Lys Ala
    850                 855                 860

Leu Phe Asp Glu Arg Asn Leu Gln Asp Val Val Tyr Lys Leu Asn Gly
865                 870                 875                 880

Glu Ala Glu Leu Phe Tyr Arg Lys Gln Ser Ile Pro Lys Lys Ile Thr
                885                 890                 895

His Pro Ala Lys Glu Ala Ile Ala Asn Lys Asn Lys Asp Asn Pro Lys
```

```
            900                 905                 910

Lys Glu Ser Val Phe Glu Tyr Asp Leu Ile Lys Asp Lys Arg Phe Thr
        915                 920                 925

Glu Asp Lys Phe Phe Phe His Cys Pro Ile Thr Ile Asn Phe Lys Ser
    930                 935                 940

Ser Gly Ala Asn Lys Phe Asn Asp Glu Ile Asn Leu Leu Leu Lys Glu
945                 950                 955                 960

Lys Ala Asn Asp Val His Ile Leu Ser Ile Asp Arg Gly Glu Arg His
                965                 970                 975

Leu Ala Tyr Tyr Thr Leu Val Asp Gly Lys Gly Asn Ile Ile Lys Gln
            980                 985                 990

Asp Thr Phe Asn Ile Ile Gly Asn  Asp Arg Met Lys Thr  Asn Tyr His
        995                 1000                1005

Asp Lys  Leu Ala Ala Ile Glu  Lys Asp Arg Asp Ser  Ala Arg Lys
    1010                1015                1020

Asp Trp  Lys Lys Ile Asn Asn  Ile Lys Glu Met Lys  Glu Gly Tyr
    1025                1030                1035

Leu Ser  Gln Val Val His Glu  Ile Ala Lys Leu Val  Ile Glu Tyr
    1040                1045                1050

Asn Ala  Ile Val Val Phe Glu  Asp Leu Asn Phe Gly  Phe Lys Arg
    1055                1060                1065

Gly Arg  Phe Lys Val Glu Lys  Gln Val Tyr Gln Lys  Leu Glu Lys
    1070                1075                1080

Met Leu  Ile Glu Lys Leu Asn  Tyr Leu Val Phe Lys  Asp Asn Glu
    1085                1090                1095
```

```
Phe Asp  Lys Thr Gly Gly Val  Leu Arg Ala Tyr Gln  Leu Thr Ala
    1100                1105                1110

Pro Phe  Glu Thr Phe Lys Lys  Met Gly Lys Gln Thr  Gly Ile Ile
    1115                1120                1125

Tyr Tyr  Val Pro Ala Gly Phe  Thr Ser Lys Ile Cys  Pro Val Thr
    1130                1135                1140

Gly Phe  Val Asn Gln Leu Tyr  Pro Lys Tyr Glu Ser  Val Ser Lys
    1145                1150                1155

Ser Gln  Glu Phe Phe Ser Lys  Phe Asp Lys Ile Cys  Tyr Asn Leu
    1160                1165                1170

Asp Lys  Gly Tyr Phe Glu Phe  Ser Phe Asp Tyr Lys  Asn Phe Gly
    1175                1180                1185

Asp Lys  Ala Ala Lys Gly Lys  Trp Thr Ile Ala Ser  Phe Gly Ser
    1190                1195                1200

Arg Leu  Ile Asn Phe Arg Asn  Ser Asp Lys Asn His  Asn Trp Asp
    1205                1210                1215

Thr Arg  Glu Val Tyr Pro Thr  Lys Glu Leu Glu Lys  Leu Leu Lys
    1220                1225                1230

Asp Tyr  Ser Ile Glu Tyr Gly  His Gly Glu Cys Ile  Lys Ala Ala
    1235                1240                1245

Ile Cys  Gly Glu Ser Asp Lys  Lys Phe Phe Ala Lys  Leu Thr Ser
    1250                1255                1260

Val Leu  Asn Thr Ile Leu Gln  Met Arg Asn Ser Lys  Thr Gly Thr
    1265                1270                1275

Glu Leu  Asp Tyr Leu Ile Ser  Pro Val Ala Asp Val  Asn Gly Asn
```

```
    1280                1285                1290

Phe Phe  Asp Ser Arg Gln Ala  Pro Lys Asn Met Pro  Gln Asp Ala
    1295                1300                1305

Asp Ala  Asn Gly Ala Tyr His  Ile Gly Leu Lys Gly  Leu Met Leu
    1310                1315                1320

Leu Gly  Arg Ile Lys Asn Asn  Gln Glu Gly Lys Lys  Leu Asn Leu
    1325                1330                1335

Val Ile  Lys Asn Glu Glu Tyr  Phe Glu Phe Val Gln  Asn Arg Asn
    1340                1345                1350

Asn Pro  Lys Lys Lys Arg Lys  Val Ser Gly Gly Ser  Ser Gly Gly
    1355                1360                1365

Ser Pro  Lys Lys Lys Arg Lys  Val Tyr Pro Tyr Asp  Val Pro Asp
    1370                1375                1380

Tyr Ala  Tyr Pro Tyr Asp Val  Pro Asp Tyr Ala Tyr  Pro Tyr Asp
    1385                1390                1395

Val Pro  Asp Tyr Ala
    1400
```

<210> 63
<211> 1382
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 63

```
Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly
1               5                   10                  15

Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Met Thr
```

```
            20                  25                  30

Gln Phe Glu Gly Phe Thr Asn Leu Tyr Gln Val Ser Lys Thr Leu Arg
        35                  40                  45

Phe Glu Leu Ile Pro Gln Gly Lys Thr Leu Lys His Ile Gln Glu Gln
    50                  55                  60

Gly Phe Ile Glu Glu Asp Lys Ala Arg Asn Asp His Tyr Lys Glu Leu
65                  70                  75                  80

Lys Pro Ile Ile Asp Arg Ile Tyr Lys Thr Tyr Ala Asp Gln Cys Leu
                85                  90                  95

Gln Leu Val Gln Leu Asp Trp Glu Asn Leu Ser Ala Ala Ile Asp Ser
            100                 105                 110

Tyr Arg Lys Glu Lys Thr Glu Glu Thr Arg Asn Ala Leu Ile Glu Glu
        115                 120                 125

Gln Ala Thr Tyr Arg Asn Ala Ile His Asp Tyr Phe Ile Gly Arg Thr
    130                 135                 140

Asp Asn Leu Thr Asp Ala Ile Asn Lys Arg His Ala Glu Ile Tyr Lys
145                 150                 155                 160

Gly Leu Phe Lys Ala Glu Leu Phe Asn Gly Lys Val Leu Lys Gln Leu
                165                 170                 175

Gly Thr Val Thr Thr Thr Glu His Glu Asn Ala Leu Leu Arg Ser Phe
            180                 185                 190

Asp Lys Phe Thr Thr Tyr Phe Ser Gly Phe Tyr Glu Asn Arg Lys Asn
        195                 200                 205

Val Phe Ser Ala Glu Asp Ile Ser Thr Ala Ile Pro His Arg Ile Val
    210                 215                 220
```

```
Gln Asp Asn Phe Pro Lys Phe Lys Glu Asn Cys His Ile Phe Thr Arg
225                 230                 235                 240


Leu Ile Thr Ala Val Pro Ser Leu Arg Glu His Phe Glu Asn Val Lys
                245                 250                 255


Lys Ala Ile Gly Ile Phe Val Ser Thr Ser Ile Glu Glu Val Phe Ser
            260                 265                 270


Phe Pro Phe Tyr Asn Gln Leu Leu Thr Gln Thr Gln Ile Asp Leu Tyr
        275                 280                 285


Asn Gln Leu Leu Gly Gly Ile Ser Arg Glu Ala Gly Thr Glu Lys Ile
    290                 295                 300


Lys Gly Leu Asn Glu Val Leu Asn Leu Ala Ile Gln Lys Asn Asp Glu
305                 310                 315                 320


Thr Ala His Ile Ile Ala Ser Leu Pro His Arg Phe Ile Pro Leu Phe
                325                 330                 335


Lys Gln Ile Leu Ser Asp Arg Asn Thr Leu Ser Phe Ile Leu Glu Glu
            340                 345                 350


Phe Lys Ser Asp Glu Glu Val Ile Gln Ser Phe Cys Lys Tyr Lys Thr
        355                 360                 365


Leu Leu Arg Asn Glu Asn Val Leu Glu Thr Ala Glu Ala Leu Phe Asn
    370                 375                 380


Glu Leu Asn Ser Ile Asp Leu Thr His Ile Phe Ile Ser His Lys Lys
385                 390                 395                 400


Leu Glu Thr Ile Ser Ser Ala Leu Cys Asp His Trp Asp Thr Leu Arg
                405                 410                 415


Asn Ala Leu Tyr Glu Arg Arg Ile Ser Glu Leu Thr Gly Lys Ile Thr
```

```
            420                 425                 430

Lys Ser Ala Lys Glu Lys Val Gln Arg Ser Leu Lys His Glu Asp Ile
        435                 440                 445

Asn Leu Gln Glu Ile Ile Ser Ala Ala Gly Lys Glu Leu Ser Glu Ala
    450                 455                 460

Phe Lys Gln Lys Thr Ser Glu Ile Leu Ser His Ala His Ala Ala Leu
465                 470                 475                 480

Asp Gln Pro Leu Pro Thr Thr Leu Lys Lys Gln Glu Glu Lys Glu Ile
                485                 490                 495

Leu Lys Ser Gln Leu Asp Ser Leu Leu Gly Leu Tyr His Leu Leu Asp
            500                 505                 510

Trp Phe Ala Val Asp Glu Ser Asn Glu Val Asp Pro Glu Phe Ser Ala
        515                 520                 525

Arg Leu Thr Gly Ile Lys Leu Glu Met Glu Pro Ser Leu Ser Phe Tyr
    530                 535                 540

Asn Lys Ala Arg Asn Tyr Ala Thr Lys Lys Pro Tyr Ser Val Glu Lys
545                 550                 555                 560

Phe Lys Leu Asn Phe Gln Met Pro Thr Leu Ala Ser Gly Trp Asp Val
                565                 570                 575

Asn Lys Glu Lys Asn Asn Gly Ala Ile Leu Phe Val Lys Asn Gly Leu
            580                 585                 590

Tyr Tyr Leu Gly Ile Met Pro Lys Gln Lys Gly Arg Tyr Lys Ala Leu
        595                 600                 605

Ser Phe Glu Pro Thr Glu Lys Thr Ser Glu Gly Phe Asp Lys Met Tyr
    610                 615                 620
```

```
Tyr Asp Tyr Phe Pro Asp Ala Ala Lys Met Ile Pro Lys Cys Ser Thr
625                 630                 635                 640

Gln Leu Lys Ala Val Thr Ala His Phe Gln Thr His Thr Thr Pro Ile
                645                 650                 655

Leu Leu Ser Asn Asn Phe Ile Glu Pro Leu Glu Ile Thr Lys Glu Ile
            660                 665                 670

Tyr Asp Leu Asn Asn Pro Glu Lys Glu Pro Lys Lys Phe Gln Thr Ala
        675                 680                 685

Tyr Ala Lys Lys Thr Gly Asp Gln Lys Gly Tyr Arg Glu Ala Leu Cys
    690                 695                 700

Lys Trp Ile Asp Phe Thr Arg Asp Phe Leu Ser Lys Tyr Thr Lys Thr
705                 710                 715                 720

Thr Ser Ile Asp Leu Ser Ser Leu Arg Pro Ser Ser Gln Tyr Lys Asp
                725                 730                 735

Leu Gly Glu Tyr Tyr Ala Glu Leu Asn Pro Leu Leu Tyr His Ile Ser
            740                 745                 750

Phe Gln Arg Ile Ala Glu Lys Glu Ile Met Asp Ala Val Glu Thr Gly
        755                 760                 765

Lys Leu Tyr Leu Phe Gln Ile Tyr Asn Lys Asp Phe Ala Lys Gly His
    770                 775                 780

His Gly Lys Pro Asn Leu His Thr Leu Tyr Trp Thr Gly Leu Phe Ser
785                 790                 795                 800

Pro Glu Asn Leu Ala Lys Thr Ser Ile Lys Leu Asn Gly Gln Ala Glu
                805                 810                 815

Leu Phe Tyr Arg Pro Lys Ser Arg Met Lys Arg Met Ala His Arg Leu
```

```
            820                 825                 830

Gly Glu Lys Met Leu Asn Lys Lys Leu Lys Asp Gln Lys Thr Pro Ile
        835                 840                 845

Pro Asp Thr Leu Tyr Gln Glu Leu Tyr Asp Tyr Val Asn His Arg Leu
    850                 855                 860

Ser His Asp Leu Ser Asp Glu Ala Arg Ala Leu Leu Pro Asn Val Ile
865                 870                 875                 880

Thr Lys Glu Val Ser His Glu Ile Ile Lys Asp Arg Arg Phe Thr Ser
                885                 890                 895

Asp Lys Phe Phe Phe His Val Pro Ile Thr Leu Asn Tyr Gln Ala Ala
            900                 905                 910

Asn Ser Pro Ser Lys Phe Asn Gln Arg Val Asn Ala Tyr Leu Lys Glu
        915                 920                 925

His Pro Glu Thr Pro Ile Ile Gly Ile Asp Arg Gly Glu Arg Asn Leu
    930                 935                 940

Ile Tyr Ile Thr Val Ile Asp Ser Thr Gly Lys Ile Leu Glu Gln Arg
945                 950                 955                 960

Ser Leu Asn Thr Ile Gln Gln Phe Asp Tyr Gln Lys Lys Leu Asp Asn
                965                 970                 975

Arg Glu Lys Glu Arg Val Ala Ala Arg Gln Ala Trp Ser Val Val Gly
            980                 985                 990

Thr Ile Lys Asp Leu Lys Gln Gly  Tyr Leu Ser Gln Val  Ile His Glu
        995                 1000                1005

Ile Val  Asp Leu Met Ile His  Tyr Gln Ala Val Val  Val Leu Glu
    1010                1015                1020
```

```
Asn Leu  Asn Phe Gly Phe Lys  Ser Lys Arg Thr Gly  Ile Ala Glu
    1025                1030                1035

Lys Ala  Val Tyr Gln Gln Phe  Glu Lys Met Leu Ile  Asp Lys Leu
    1040                1045                1050

Asn Cys  Leu Val Leu Lys Asp  Tyr Pro Ala Glu Lys  Val Gly Gly
    1055                1060                1065

Val Leu  Asn Pro Tyr Gln Leu  Thr Asp Gln Phe Thr  Ser Phe Ala
    1070                1075                1080

Lys Met  Gly Thr Gln Ser Gly  Phe Leu Phe Tyr Val  Pro Ala Pro
    1085                1090                1095

Tyr Thr  Ser Lys Ile Asp Pro  Leu Thr Gly Phe Val  Asp Pro Phe
    1100                1105                1110

Val Trp  Lys Thr Ile Lys Asn  His Glu Ser Arg Lys  His Phe Leu
    1115                1120                1125

Glu Gly  Phe Asp Phe Leu His  Tyr Asp Val Lys Thr  Gly Asp Phe
    1130                1135                1140

Ile Leu  His Phe Lys Met Asn  Arg Asn Leu Ser Phe  Gln Arg Gly
    1145                1150                1155

Leu Pro  Gly Phe Met Pro Ala  Trp Asp Ile Val Phe  Glu Lys Asn
    1160                1165                1170

Glu Thr  Gln Phe Asp Ala Lys  Gly Thr Pro Phe Ile  Ala Gly Lys
    1175                1180                1185

Arg Ile  Val Pro Val Ile Glu  Asn His Arg Phe Thr  Gly Arg Tyr
    1190                1195                1200

Arg Asp  Leu Tyr Pro Ala Asn  Glu Leu Ile Ala Leu  Leu Glu Glu
```

```
    1205                1210                1215

Lys Gly  Ile Val Phe Arg Asp  Gly Ser Asn Ile Leu  Pro Lys Leu
    1220                1225                1230

Leu Glu  Asn Asp Asp Ser His  Ala Ile Asp Thr Met  Val Ala Leu
    1235                1240                1245

Ile Arg  Ser Val Leu Gln Met  Arg Asn Ser Asn Ala  Ala Thr Gly
    1250                1255                1260

Glu Asp  Tyr Ile Asn Ser Pro  Val Arg Asp Leu Asn  Gly Val Cys
    1265                1270                1275

Phe Asp  Ser Arg Phe Gln Asn  Pro Glu Trp Pro Met  Asp Ala Asp
    1280                1285                1290

Ala Asn  Gly Ala Tyr His Ile  Ala Leu Lys Gly Gln  Leu Leu Leu
    1295                1300                1305

Asn His  Leu Lys Glu Ser Lys  Asp Leu Lys Leu Gln  Asn Gly Ile
    1310                1315                1320

Ser Asn  Gln Asp Trp Leu Ala  Tyr Ile Gln Glu Leu  Arg Asn Lys
    1325                1330                1335

Arg Pro  Ala Ala Thr Lys Lys  Ala Gly Gln Ala Lys  Lys Lys Lys
    1340                1345                1350

Gly Ser  Tyr Pro Tyr Asp Val  Pro Asp Tyr Ala Tyr  Pro Tyr Asp
    1355                1360                1365

Val Pro  Asp Tyr Ala Tyr Pro  Tyr Asp Val Pro Asp  Tyr Ala
    1370                1375                1380
```

<210> 64
<211> 1346
<212> PRT

<213> Artificial Sequence

<220>
<223> Synthetic

<400> 64

```
Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly
1               5                   10                  15


Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Met Thr
            20                  25                  30


Gln Phe Glu Gly Phe Thr Asn Leu Tyr Gln Val Ser Lys Thr Leu Arg
        35                  40                  45


Phe Glu Leu Ile Pro Gln Gly Lys Thr Leu Lys His Ile Gln Glu Gln
    50                  55                  60


Gly Phe Ile Glu Glu Asp Lys Ala Arg Asn Asp His Tyr Lys Glu Leu
65                  70                  75                  80


Lys Pro Ile Ile Asp Arg Ile Tyr Lys Thr Tyr Ala Asp Gln Cys Leu
                85                  90                  95


Gln Leu Val Gln Leu Asp Trp Glu Asn Leu Ser Ala Ala Ile Asp Ser
            100                 105                 110


Tyr Arg Lys Glu Lys Thr Glu Glu Thr Arg Asn Ala Leu Ile Glu Glu
        115                 120                 125


Gln Ala Thr Tyr Arg Asn Ala Ile His Asp Tyr Phe Ile Gly Arg Thr
    130                 135                 140


Asp Asn Leu Thr Asp Ala Ile Asn Lys Arg His Ala Glu Ile Tyr Lys
145                 150                 155                 160


Gly Leu Phe Lys Ala Glu Leu Phe Asn Gly Lys Val Leu Lys Gln Leu
                165                 170                 175
```

```
Gly Thr Val Thr Thr Thr Glu His Glu Asn Ala Leu Leu Arg Ser Phe
            180                 185                 190

Asp Lys Phe Thr Thr Tyr Phe Ser Gly Phe Tyr Glu Asn Arg Lys Asn
        195                 200                 205

Val Phe Ser Ala Glu Asp Ile Ser Thr Ala Ile Pro His Arg Ile Val
    210                 215                 220

Gln Asp Asn Phe Pro Lys Phe Lys Glu Asn Cys His Ile Phe Thr Arg
225                 230                 235                 240

Leu Ile Thr Ala Val Pro Ser Leu Arg Glu His Phe Glu Asn Val Lys
                245                 250                 255

Lys Ala Ile Gly Ile Phe Val Ser Thr Ser Ile Glu Glu Val Phe Ser
            260                 265                 270

Phe Pro Phe Tyr Asn Gln Leu Leu Thr Gln Thr Gln Ile Asp Leu Tyr
        275                 280                 285

Asn Gln Leu Leu Gly Gly Ile Ser Arg Glu Ala Gly Thr Glu Lys Ile
    290                 295                 300

Lys Gly Leu Asn Glu Val Leu Asn Leu Ala Ile Gln Lys Asn Asp Glu
305                 310                 315                 320

Thr Ala His Ile Ile Ala Ser Leu Pro His Arg Phe Ile Pro Leu Phe
                325                 330                 335

Lys Gln Ile Leu Ser Asp Arg Asn Thr Leu Ser Phe Ile Leu Glu Glu
            340                 345                 350

Phe Lys Ser Asp Glu Glu Val Ile Gln Ser Phe Cys Lys Tyr Lys Thr
        355                 360                 365

Leu Leu Arg Asn Glu Asn Val Leu Glu Thr Ala Glu Ala Leu Phe Asn
```

```
    370                 375                 380

Glu Leu Asn Ser Ile Asp Leu Thr His Ile Phe Ile Ser His Lys Lys
385                 390                 395                 400

Leu Glu Thr Ile Ser Ser Ala Leu Cys Asp His Trp Asp Thr Leu Arg
                405                 410                 415

Asn Ala Leu Tyr Glu Arg Arg Ile Ser Glu Leu Thr Gly Lys Ile Thr
            420                 425                 430

Lys Ser Ala Lys Glu Lys Val Gln Arg Ser Leu Lys His Glu Asp Ile
        435                 440                 445

Asn Leu Gln Glu Ile Ile Ser Ala Ala Gly Lys Glu Leu Ser Glu Ala
    450                 455                 460

Phe Lys Gln Lys Thr Ser Glu Ile Leu Ser His Ala His Ala Ala Leu
465                 470                 475                 480

Asp Gln Pro Leu Pro Thr Thr Leu Lys Lys Gln Glu Glu Lys Glu Ile
                485                 490                 495

Leu Lys Ser Gln Leu Asp Ser Leu Leu Gly Leu Tyr His Leu Leu Asp
            500                 505                 510

Trp Phe Ala Val Asp Glu Ser Asn Glu Val Asp Pro Glu Phe Ser Ala
        515                 520                 525

Arg Leu Thr Gly Ile Lys Leu Glu Met Glu Pro Ser Leu Ser Phe Tyr
    530                 535                 540

Asn Lys Ala Arg Asn Tyr Ala Thr Lys Lys Pro Tyr Ser Val Glu Lys
545                 550                 555                 560

Phe Lys Leu Asn Phe Gln Met Pro Thr Leu Ala Ser Gly Trp Asp Val
                565                 570                 575
```

```
Asn Lys Glu Lys Asn Asn Gly Ala Ile Leu Phe Val Lys Asn Gly Leu
            580                 585                 590

Tyr Tyr Leu Gly Ile Met Pro Lys Gln Lys Gly Arg Tyr Lys Ala Leu
        595                 600                 605

Ser Phe Glu Pro Thr Glu Lys Thr Ser Glu Gly Phe Asp Lys Met Tyr
    610                 615                 620

Tyr Asp Tyr Phe Pro Asp Ala Ala Lys Met Ile Pro Lys Cys Ser Thr
625                 630                 635                 640

Gln Leu Lys Ala Val Thr Ala His Phe Gln Thr His Thr Thr Pro Ile
                645                 650                 655

Leu Leu Ser Asn Asn Phe Ile Glu Pro Leu Glu Ile Thr Lys Glu Ile
            660                 665                 670

Tyr Asp Leu Asn Asn Pro Glu Lys Glu Pro Lys Lys Phe Gln Thr Ala
        675                 680                 685

Tyr Ala Lys Lys Thr Gly Asp Gln Lys Gly Tyr Arg Glu Ala Leu Cys
    690                 695                 700

Lys Trp Ile Asp Phe Thr Arg Asp Phe Leu Ser Lys Tyr Thr Lys Thr
705                 710                 715                 720

Thr Ser Ile Asp Leu Ser Ser Leu Arg Pro Ser Ser Gln Tyr Lys Asp
                725                 730                 735

Leu Gly Glu Tyr Tyr Ala Glu Leu Asn Pro Leu Leu Tyr His Ile Ser
            740                 745                 750

Phe Gln Arg Ile Ala Glu Lys Glu Ile Met Asp Ala Val Glu Thr Gly
        755                 760                 765

Lys Leu Tyr Leu Phe Gln Ile Tyr Asn Lys Asp Phe Ala Lys Gly His
```

```
    770                 775                 780

His Gly Lys Pro Asn Leu His Thr Leu Tyr Trp Thr Gly Leu Phe Ser
785                 790                 795                 800

Pro Glu Asn Leu Ala Lys Thr Ser Ile Lys Leu Asn Gly Gln Ala Glu
                805                 810                 815

Leu Phe Tyr Arg Pro Lys Ser Arg Met Lys Arg Met Ala His Arg Leu
            820                 825                 830

Gly Glu Lys Met Leu Asn Lys Lys Leu Lys Asp Gln Lys Thr Pro Ile
        835                 840                 845

Pro Asp Thr Leu Tyr Gln Glu Leu Tyr Asp Tyr Val Asn His Arg Leu
    850                 855                 860

Ser His Asp Leu Ser Asp Glu Ala Arg Ala Leu Leu Pro Asn Val Ile
865                 870                 875                 880

Thr Lys Glu Val Ser His Glu Ile Ile Lys Asp Arg Arg Phe Thr Ser
                885                 890                 895

Asp Lys Phe Phe Phe His Val Pro Ile Thr Leu Asn Tyr Gln Ala Ala
            900                 905                 910

Asn Ser Pro Ser Lys Phe Asn Gln Arg Val Asn Ala Tyr Leu Lys Glu
        915                 920                 925

His Pro Glu Thr Pro Ile Ile Gly Ile Ala Arg Gly Glu Arg Asn Leu
    930                 935                 940

Ile Tyr Ile Thr Val Ile Asp Ser Thr Gly Lys Ile Leu Glu Gln Arg
945                 950                 955                 960

Ser Leu Asn Thr Ile Gln Gln Phe Asp Tyr Gln Lys Lys Leu Asp Asn
                965                 970                 975
```

```
Arg Glu Lys Glu Arg Val Ala Ala Arg Gln Ala Trp Ser Val Val Gly
            980                 985                 990


Thr Ile Lys Asp Leu Lys Gln Gly  Tyr Leu Ser Gln Val  Ile His Glu
        995                 1000                1005


Ile Val  Asp Leu Met Ile His  Tyr Gln Ala Val Val  Val Leu Ala
    1010                1015                1020


Asn Leu  Asn Phe Gly Phe Lys  Ser Lys Arg Thr Gly  Ile Ala Glu
    1025                1030                1035


Lys Ala  Val Tyr Gln Gln Phe  Glu Lys Met Leu Ile  Asp Lys Leu
    1040                1045                1050


Asn Cys  Leu Val Leu Lys Asp  Tyr Pro Ala Glu Lys  Val Gly Gly
    1055                1060                1065


Val Leu  Asn Pro Tyr Gln Leu  Thr Asp Gln Phe Thr  Ser Phe Ala
    1070                1075                1080


Lys Met  Gly Thr Gln Ser Gly  Phe Leu Phe Tyr Val  Pro Ala Pro
    1085                1090                1095


Tyr Thr  Ser Lys Ile Asp Pro  Leu Thr Gly Phe Val  Asp Pro Phe
    1100                1105                1110


Val Trp  Lys Thr Ile Lys Asn  His Glu Ser Arg Lys  His Phe Leu
    1115                1120                1125


Glu Gly  Phe Asp Phe Leu His  Tyr Asp Val Lys Thr  Gly Asp Phe
    1130                1135                1140


Ile Leu  His Phe Lys Met Asn  Arg Asn Leu Ser Phe  Gln Arg Gly
    1145                1150                1155


Leu Pro  Gly Phe Met Pro Ala  Trp Asp Ile Val Phe  Glu Lys Asn
```

```
    1160                1165                1170

Glu Thr  Gln Phe Asp Ala Lys  Gly Thr Pro Phe Ile  Ala Gly Lys
    1175                1180                1185

Arg Ile  Val Pro Val Ile Glu  Asn His Arg Phe Thr  Gly Arg Tyr
    1190                1195                1200

Arg Asp  Leu Tyr Pro Ala Asn  Glu Leu Ile Ala Leu  Leu Glu Glu
    1205                1210                1215

Lys Gly  Ile Val Phe Arg Asp  Gly Ser Asn Ile Leu  Pro Lys Leu
    1220                1225                1230

Leu Glu  Asn Asp Asp Ser His  Ala Ile Asp Thr Met  Val Ala Leu
    1235                1240                1245

Ile Arg  Ser Val Leu Gln Met  Arg Asn Ser Asn Ala  Ala Thr Gly
    1250                1255                1260

Glu Ala  Tyr Ile Asn Ser Pro  Val Arg Asp Leu Asn  Gly Val Cys
    1265                1270                1275

Phe Asp  Ser Arg Phe Gln Asn  Pro Glu Trp Pro Met  Asp Ala Asp
    1280                1285                1290

Ala Asn  Gly Ala Tyr His Ile  Ala Leu Lys Gly Gln  Leu Leu Leu
    1295                1300                1305

Asn His  Leu Lys Glu Ser Lys  Asp Leu Lys Leu Gln  Asn Gly Ile
    1310                1315                1320

Ser Asn  Gln Asp Trp Leu Ala  Tyr Ile Gln Glu Leu  Arg Asn Gly
    1325                1330                1335

Ser Pro  Lys Lys Lys Arg Lys  Val
    1340                1345
```

<210> 65
<211> 1417
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic

<400> 65

```
Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly
1               5                   10                  15


Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Met Pro
            20                  25                  30


Lys Lys Lys Arg Lys Val Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
        35                  40                  45


Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly
    50                  55                  60


Gly Gly Gly Ser Met Ser Ile Tyr Gln Glu Phe Val Asn Lys Tyr Ser
65                  70                  75                  80


Leu Ser Lys Thr Leu Arg Phe Glu Leu Ile Pro Gln Gly Lys Thr Leu
                85                  90                  95


Glu Asn Ile Lys Ala Arg Gly Leu Ile Leu Asp Asp Glu Lys Arg Ala
            100                 105                 110


Lys Asp Tyr Lys Lys Ala Lys Gln Ile Ile Asp Lys Tyr His Gln Phe
        115                 120                 125


Phe Ile Glu Glu Ile Leu Ser Ser Val Cys Ile Ser Glu Asp Leu Leu
    130                 135                 140


Gln Asn Tyr Ser Asp Val Tyr Phe Lys Leu Lys Lys Ser Asp Asp Asp
145                 150                 155                 160
```

```
Asn Leu Gln Lys Asp Phe Lys Ser Ala Lys Asp Thr Ile Lys Lys Gln
                165                 170                 175

Ile Ser Glu Tyr Ile Lys Asp Ser Glu Lys Phe Lys Asn Leu Phe Asn
            180                 185                 190

Gln Asn Leu Ile Asp Ala Lys Lys Gly Gln Glu Ser Asp Leu Ile Leu
        195                 200                 205

Trp Leu Lys Gln Ser Lys Asp Asn Gly Ile Glu Leu Phe Lys Ala Asn
    210                 215                 220

Ser Asp Ile Thr Asp Ile Asp Glu Ala Leu Glu Ile Ile Lys Ser Phe
225                 230                 235                 240

Lys Gly Trp Thr Thr Tyr Phe Lys Gly Phe His Glu Asn Arg Lys Asn
                245                 250                 255

Val Tyr Ser Ser Asn Asp Ile Pro Thr Ser Ile Ile Tyr Arg Ile Val
            260                 265                 270

Asp Asp Asn Leu Pro Lys Phe Leu Glu Asn Lys Ala Lys Tyr Glu Ser
        275                 280                 285

Leu Lys Asp Lys Ala Pro Glu Ala Ile Asn Tyr Glu Gln Ile Lys Lys
    290                 295                 300

Asp Leu Ala Glu Glu Leu Thr Phe Asp Ile Asp Tyr Lys Thr Ser Glu
305                 310                 315                 320

Val Asn Gln Arg Val Phe Ser Leu Asp Glu Val Phe Glu Ile Ala Asn
                325                 330                 335

Phe Asn Asn Tyr Leu Asn Gln Ser Gly Ile Thr Lys Phe Asn Thr Ile
            340                 345                 350

Ile Gly Gly Lys Phe Val Asn Gly Glu Asn Thr Lys Arg Lys Gly Ile
```

```
        355                 360                 365

Asn Glu Tyr Ile Asn Leu Tyr Ser Gln Gln Ile Asn Asp Lys Thr Leu
    370                 375                 380

Lys Lys Tyr Lys Met Ser Val Leu Phe Lys Gln Ile Leu Ser Asp Thr
385                 390                 395                 400

Glu Ser Lys Ser Phe Val Ile Asp Lys Leu Glu Asp Asp Ser Asp Val
                405                 410                 415

Val Thr Thr Met Gln Ser Phe Tyr Glu Gln Ile Ala Ala Phe Lys Thr
            420                 425                 430

Val Glu Glu Lys Ser Ile Lys Glu Thr Leu Ser Leu Leu Phe Asp Asp
        435                 440                 445

Leu Lys Ala Gln Lys Leu Asp Leu Ser Lys Ile Tyr Phe Lys Asn Asp
    450                 455                 460

Lys Ser Leu Thr Asp Leu Ser Gln Gln Val Phe Asp Asp Tyr Ser Val
465                 470                 475                 480

Ile Gly Thr Ala Val Leu Glu Tyr Ile Thr Gln Gln Ile Ala Pro Lys
                485                 490                 495

Asn Leu Asp Asn Pro Ser Lys Lys Glu Gln Glu Leu Ile Ala Lys Lys
            500                 505                 510

Thr Glu Lys Ala Lys Tyr Leu Ser Leu Glu Thr Ile Lys Leu Ala Leu
        515                 520                 525

Glu Glu Phe Asn Lys His Arg Asp Ile Asp Lys Gln Cys Arg Phe Glu
    530                 535                 540

Glu Ile Leu Ala Asn Phe Ala Ala Ile Pro Met Ile Phe Asp Glu Ile
545                 550                 555                 560
```

```
Ala Gln Asn Lys Asp Asn Leu Ala Gln Ile Ser Ile Lys Tyr Gln Asn
                565                 570                 575

Gln Gly Lys Lys Asp Leu Leu Gln Ala Ser Ala Glu Asp Asp Val Lys
            580                 585                 590

Ala Ile Lys Asp Leu Leu Asp Gln Thr Asn Asn Leu Leu His Lys Leu
        595                 600                 605

Lys Ile Phe His Ile Ser Gln Ser Glu Asp Lys Ala Asn Ile Leu Asp
    610                 615                 620

Lys Asp Glu His Phe Tyr Leu Val Phe Glu Glu Cys Tyr Phe Glu Leu
625                 630                 635                 640

Ala Asn Ile Val Pro Leu Tyr Asn Lys Ile Arg Asn Tyr Ile Thr Gln
                645                 650                 655

Lys Pro Tyr Ser Asp Glu Lys Phe Lys Leu Asn Phe Glu Asn Ser Thr
            660                 665                 670

Leu Ala Asn Gly Trp Asp Lys Asn Lys Glu Pro Asp Asn Thr Ala Ile
        675                 680                 685

Leu Phe Ile Lys Asp Asp Lys Tyr Tyr Leu Gly Val Met Asn Lys Lys
    690                 695                 700

Asn Asn Lys Ile Phe Asp Asp Lys Ala Ile Lys Glu Asn Lys Gly Glu
705                 710                 715                 720

Gly Tyr Lys Lys Ile Val Tyr Lys Leu Leu Pro Gly Ala Asn Lys Met
                725                 730                 735

Leu Pro Lys Val Phe Phe Ser Ala Lys Ser Ile Lys Phe Tyr Asn Pro
            740                 745                 750

Ser Glu Asp Ile Leu Arg Ile Arg Asn His Ser Thr His Thr Lys Asn
```

```
        755                 760                 765

Gly Ser Pro Gln Lys Gly Tyr Glu Lys Phe Glu Phe Asn Ile Glu Asp
    770                 775                 780

Cys Arg Lys Phe Ile Asp Phe Tyr Lys Gln Ser Ile Ser Lys His Pro
785                 790                 795                 800

Glu Trp Lys Asp Phe Gly Phe Arg Phe Ser Asp Thr Gln Arg Tyr Asn
                805                 810                 815

Ser Ile Asp Glu Phe Tyr Arg Glu Val Glu Asn Gln Gly Tyr Lys Leu
            820                 825                 830

Thr Phe Glu Asn Ile Ser Glu Ser Tyr Ile Asp Ser Val Val Asn Gln
        835                 840                 845

Gly Lys Leu Tyr Leu Phe Gln Ile Tyr Asn Lys Asp Phe Ser Ala Tyr
    850                 855                 860

Ser Lys Gly Arg Pro Asn Leu His Thr Leu Tyr Trp Lys Ala Leu Phe
865                 870                 875                 880

Asp Glu Arg Asn Leu Gln Asp Val Val Tyr Lys Leu Asn Gly Glu Ala
                885                 890                 895

Glu Leu Phe Tyr Arg Lys Gln Ser Ile Pro Lys Lys Ile Thr His Pro
            900                 905                 910

Ala Lys Glu Ala Ile Ala Asn Lys Asn Lys Asp Asn Pro Lys Lys Glu
        915                 920                 925

Ser Val Phe Glu Tyr Asp Leu Ile Lys Asp Lys Arg Phe Thr Glu Asp
    930                 935                 940

Lys Phe Phe Phe His Cys Pro Ile Thr Ile Asn Phe Lys Ser Ser Gly
945                 950                 955                 960
```

```
Ala Asn Lys Phe Asn Asp Glu Ile Asn Leu Leu Leu Lys Glu Lys Ala
               965                 970                 975

Asn Asp Val His Ile Leu Ser Ile Asp Arg Gly Glu Arg His Leu Ala
            980                 985                 990

Tyr Tyr Thr Leu Val Asp Gly Lys  Gly Asn Ile Ile Lys  Gln Asp Thr
        995                 1000                1005

Phe Asn  Ile Ile Gly Asn Asp  Arg Met Lys Thr Asn  Tyr His Asp
    1010                1015                1020

Lys Leu  Ala Ala Ile Glu Lys  Asp Arg Asp Ser Ala  Arg Lys Asp
    1025                1030                1035

Trp Lys  Lys Ile Asn Asn Ile  Lys Glu Met Lys Glu  Gly Tyr Leu
    1040                1045                1050

Ser Gln  Val Val His Glu Ile  Ala Lys Leu Val Ile  Glu Tyr Asn
    1055                1060                1065

Ala Ile  Val Val Phe Glu Asp  Leu Asn Phe Gly Phe  Lys Arg Gly
    1070                1075                1080

Arg Phe  Lys Val Glu Lys Gln  Val Tyr Gln Lys Leu  Glu Lys Met
    1085                1090                1095

Leu Ile  Glu Lys Leu Asn Tyr  Leu Val Phe Lys Asp  Asn Glu Phe
    1100                1105                1110

Asp Lys  Thr Gly Gly Val Leu  Arg Ala Tyr Gln Leu  Thr Ala Pro
    1115                1120                1125

Phe Glu  Thr Phe Lys Lys Met  Gly Lys Gln Thr Gly  Ile Ile Tyr
    1130                1135                1140

Tyr Val  Pro Ala Gly Phe Thr  Ser Lys Ile Cys Pro  Val Thr Gly
```

```
    1145                1150                1155

Phe Val  Asn Gln Leu Tyr Pro  Lys Tyr Glu Ser Val  Ser Lys Ser
    1160                1165                1170

Gln Glu  Phe Phe Ser Lys Phe  Asp Lys Ile Cys Tyr  Asn Leu Asp
    1175                1180                1185

Lys Gly  Tyr Phe Glu Phe Ser  Phe Asp Tyr Lys Asn  Phe Gly Asp
    1190                1195                1200

Lys Ala  Ala Lys Gly Lys Trp  Thr Ile Ala Ser Phe  Gly Ser Arg
    1205                1210                1215

Leu Ile  Asn Phe Arg Asn Ser  Asp Lys Asn His Asn  Trp Asp Thr
    1220                1225                1230

Arg Glu  Val Tyr Pro Thr Lys  Glu Leu Glu Lys Leu  Leu Lys Asp
    1235                1240                1245

Tyr Ser  Ile Glu Tyr Gly His  Gly Glu Cys Ile Lys  Ala Ala Ile
    1250                1255                1260

Cys Gly  Glu Ser Asp Lys Lys  Phe Phe Ala Lys Leu  Thr Ser Val
    1265                1270                1275

Leu Asn  Thr Ile Leu Gln Met  Arg Asn Ser Lys Thr  Gly Thr Glu
    1280                1285                1290

Leu Asp  Tyr Leu Ile Ser Pro  Val Ala Asp Val Asn  Gly Asn Phe
    1295                1300                1305

Phe Asp  Ser Arg Gln Ala Pro  Lys Asn Met Pro Gln  Asp Ala Asp
    1310                1315                1320

Ala Asn  Gly Ala Tyr His Ile  Gly Leu Lys Gly Leu  Met Leu Leu
    1325                1330                1335
```

```
Gly Arg  Ile Lys Asn Asn Gln  Glu Gly Lys Lys Leu  Asn Leu Val
    1340                1345                1350


Ile Lys  Asn Glu Glu Tyr Phe  Glu Phe Val Gln Asn  Arg Asn Asn
    1355                1360                1365


Pro Lys  Lys Lys Arg Lys Val  Ser Gly Gly Ser Ser  Gly Gly Ser
    1370                1375                1380


Pro Lys  Lys Lys Arg Lys Val  Tyr Pro Tyr Asp Val  Pro Asp Tyr
    1385                1390                1395


Ala Tyr  Pro Tyr Asp Val Pro  Asp Tyr Ala Tyr Pro  Tyr Asp Val
    1400                1405                1410


Pro Asp  Tyr Ala
    1415


<210>  66
<211>  1287
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Syntheti

<400>  66

Gly Gly Gly Gly Ser Gly Gly Gly Gly Gly Ser Gly Gly Gly Gly Gly
1               5                   10                  15


Ser Gly Gly Gly Gly Gly Ser Gly Gly Gly Gly Gly Ser Gly Gly Gly
            20                  25                  30


Gly Gly Ser Gly Met Leu Phe Gln Asp Phe Thr His Leu Tyr Pro Leu
        35                  40                  45


Ser Lys Thr Val Arg Phe Glu Leu Lys Pro Ile Gly Arg Thr Leu Glu
    50                  55                  60
```

```
His Ile His Ala Lys Asn Phe Leu Ser Gln Asp Glu Thr Met Ala Asp
65                  70                  75                  80

Met Tyr Gln Lys Val Lys Val Ile Leu Asp Asp Tyr His Arg Asp Phe
                85                  90                  95

Ile Ala Asp Met Met Gly Glu Val Lys Leu Thr Lys Leu Ala Glu Phe
            100                 105                 110

Tyr Asp Val Tyr Leu Lys Phe Arg Lys Asn Pro Lys Asp Asp Gly Leu
        115                 120                 125

Gln Lys Gln Leu Lys Asp Leu Gln Ala Val Leu Arg Lys Glu Ser Val
    130                 135                 140

Lys Pro Ile Gly Ser Gly Gly Lys Tyr Lys Thr Gly Tyr Asp Arg Leu
145                 150                 155                 160

Phe Gly Ala Lys Leu Phe Lys Asp Gly Lys Glu Leu Gly Asp Leu Ala
                165                 170                 175

Lys Phe Val Ile Ala Gln Glu Gly Glu Ser Ser Pro Lys Leu Ala His
            180                 185                 190

Leu Ala His Phe Glu Lys Phe Ser Thr Tyr Phe Thr Gly Phe His Asp
        195                 200                 205

Asn Arg Lys Asn Met Tyr Ser Asp Glu Asp Lys His Thr Ala Ile Ala
    210                 215                 220

Tyr Arg Leu Ile His Glu Asn Leu Pro Arg Phe Ile Asp Asn Leu Gln
225                 230                 235                 240

Ile Leu Thr Thr Ile Lys Gln Lys His Ser Ala Leu Tyr Asp Gln Ile
                245                 250                 255

Ile Asn Glu Leu Thr Ala Ser Gly Leu Asp Val Ser Leu Ala Ser His
```

```
            260                 265                 270

Leu Asp Gly Tyr His Lys Leu Leu Thr Gln Glu Gly Ile Thr Ala Tyr
        275                 280                 285

Asn Arg Ile Ile Gly Glu Val Asn Gly Tyr Thr Asn Lys His Asn Gln
    290                 295                 300

Ile Cys His Lys Ser Glu Arg Ile Ala Lys Leu Arg Pro Leu His Lys
305                 310                 315                 320

Gln Ile Leu Ser Asp Gly Met Gly Val Ser Phe Leu Pro Ser Lys Phe
                325                 330                 335

Ala Asp Asp Ser Glu Met Cys Gln Ala Val Asn Glu Phe Tyr Arg His
            340                 345                 350

Tyr Thr Asp Val Phe Ala Lys Val Gln Ser Leu Phe Asp Gly Phe Asp
        355                 360                 365

Asp His Gln Lys Asp Gly Ile Tyr Val Glu His Lys Asn Leu Asn Glu
    370                 375                 380

Leu Ser Lys Gln Ala Phe Gly Asp Phe Ala Leu Leu Gly Arg Val Leu
385                 390                 395                 400

Asp Gly Tyr Tyr Val Asp Val Val Asn Pro Glu Phe Asn Glu Arg Phe
                405                 410                 415

Ala Lys Ala Lys Thr Asp Asn Ala Lys Ala Lys Leu Thr Lys Glu Lys
            420                 425                 430

Asp Lys Phe Ile Lys Gly Val His Ser Leu Ala Ser Leu Glu Gln Ala
        435                 440                 445

Ile Glu His His Thr Ala Arg His Asp Asp Glu Ser Val Gln Ala Gly
    450                 455                 460
```

```
Lys Leu Gly Gln Tyr Phe Lys His Gly Leu Ala Gly Val Asp Asn Pro
465                 470                 475                 480

Ile Gln Lys Ile His Asn Asn His Ser Thr Ile Lys Gly Phe Leu Glu
                485                 490                 495

Arg Glu Arg Pro Ala Gly Glu Arg Ala Leu Pro Lys Ile Lys Ser Gly
            500                 505                 510

Lys Asn Pro Glu Met Thr Gln Leu Arg Gln Leu Lys Glu Leu Leu Asp
        515                 520                 525

Asn Ala Leu Asn Val Ala His Phe Ala Lys Leu Leu Thr Thr Lys Thr
    530                 535                 540

Thr Leu Asp Asn Gln Asp Gly Asn Phe Tyr Gly Glu Phe Gly Val Leu
545                 550                 555                 560

Tyr Asp Glu Leu Ala Lys Ile Pro Thr Leu Tyr Asn Lys Val Arg Asp
                565                 570                 575

Tyr Leu Ser Gln Lys Pro Phe Ser Thr Glu Lys Tyr Lys Leu Asn Phe
            580                 585                 590

Gly Asn Pro Thr Leu Leu Asn Gly Trp Asp Leu Asn Lys Glu Lys Asp
        595                 600                 605

Asn Phe Gly Val Ile Leu Gln Lys Asp Gly Cys Tyr Tyr Leu Ala Leu
    610                 615                 620

Leu Asp Lys Ala His Lys Lys Val Phe Asp Asn Ala Pro Asn Thr Gly
625                 630                 635                 640

Lys Asn Val Tyr Gln Lys Met Val Tyr Lys Leu Leu Pro Gly Pro Asn
                645                 650                 655

Lys Met Leu Pro Lys Val Phe Phe Ala Lys Ser Asn Leu Asp Tyr Tyr
```

```
            660                 665                 670

Asn Pro Ser Ala Glu Leu Leu Asp Lys Tyr Ala Lys Gly Thr His Lys
        675                 680                 685

Lys Gly Asp Asn Phe Asn Leu Lys Asp Cys His Ala Leu Ile Asp Phe
    690                 695                 700

Phe Lys Ala Gly Ile Asn Lys His Pro Glu Trp Gln His Phe Gly Phe
705                 710                 715                 720

Lys Phe Ser Pro Thr Ser Ser Tyr Arg Asp Leu Ser Asp Phe Tyr Arg
                725                 730                 735

Glu Val Glu Pro Gln Gly Tyr Gln Val Lys Phe Val Asp Ile Asn Ala
            740                 745                 750

Asp Tyr Ile Asp Glu Leu Val Glu Gln Gly Lys Leu Tyr Leu Phe Gln
        755                 760                 765

Ile Tyr Asn Lys Asp Phe Ser Pro Lys Ala His Gly Lys Pro Asn Leu
    770                 775                 780

His Thr Leu Tyr Phe Lys Ala Leu Phe Ser Glu Asp Asn Leu Ala Asp
785                 790                 795                 800

Pro Ile Tyr Lys Leu Asn Gly Glu Ala Gln Ile Phe Tyr Arg Lys Ala
                805                 810                 815

Ser Leu Asp Met Asn Glu Thr Thr Ile His Arg Ala Gly Glu Val Leu
            820                 825                 830

Glu Asn Lys Asn Pro Asp Asn Pro Lys Lys Arg Gln Phe Val Tyr Asp
        835                 840                 845

Ile Ile Lys Asp Lys Arg Tyr Thr Gln Asp Lys Phe Met Leu His Val
    850                 855                 860
```

```
Pro Ile Thr Met Asn Phe Gly Val Gln Gly Met Thr Ile Lys Glu Phe
865                 870                 875                 880


Asn Lys Lys Val Asn Gln Ser Ile Gln Gln Tyr Asp Glu Val Asn Val
                885                 890                 895


Ile Gly Ile Asp Arg Gly Glu Arg His Leu Leu Tyr Leu Thr Val Ile
            900                 905                 910


Asn Ser Lys Gly Glu Ile Leu Glu Gln Arg Ser Leu Asn Asp Ile Thr
        915                 920                 925


Thr Ala Ser Ala Asn Gly Thr Gln Val Thr Thr Pro Tyr His Lys Ile
    930                 935                 940


Leu Asp Lys Arg Glu Ile Glu Arg Leu Asn Ala Arg Val Gly Trp Gly
945                 950                 955                 960


Glu Ile Glu Thr Ile Lys Glu Leu Lys Ser Gly Tyr Leu Ser His Val
                965                 970                 975


Val His Gln Ile Asn Gln Leu Met Leu Lys Tyr Asn Ala Ile Val Val
            980                 985                 990


Leu Glu Asp Leu Asn Phe Gly Phe  Lys Arg Gly Arg Phe  Lys Val Glu
        995                 1000                1005


Lys Gln  Ile Tyr Gln Asn Phe  Glu Asn Ala Leu Ile  Lys Lys Leu
    1010                1015                1020


Asn His  Leu Val Leu Lys Asp  Lys Ala Asp Asp Glu  Ile Gly Ser
    1025                1030                1035


Tyr Lys  Asn Ala Leu Gln Leu  Thr Asn Asn Phe Thr  Asp Leu Lys
    1040                1045                1050


Ser Ile  Gly Lys Gln Thr Gly  Phe Leu Phe Tyr Val  Pro Ala Trp
```

```
    1055                1060                1065

Asn Thr  Ser Lys Ile Asp Pro  Glu Thr Gly Phe Val  Asp Leu Leu
    1070                1075                1080

Lys Pro  Arg Tyr Glu Asn Ile  Ala Gln Ser Gln Ala  Phe Phe Gly
    1085                1090                1095

Lys Phe  Asp Lys Ile Cys Tyr  Asn Thr Asp Lys Gly  Tyr Phe Glu
    1100                1105                1110

Phe His  Ile Asp Tyr Ala Lys  Phe Thr Asp Lys Ala  Lys Asn Ser
    1115                1120                1125

Arg Gln  Lys Trp Ala Ile Cys  Ser His Gly Asp Lys  Arg Tyr Val
    1130                1135                1140

Tyr Asp  Lys Thr Ala Asn Gln  Asn Lys Gly Ala Ala  Lys Gly Ile
    1145                1150                1155

Asn Val  Asn Asp Glu Leu Lys  Ser Leu Phe Ala Arg  Tyr His Ile
    1160                1165                1170

Asn Asp  Lys Gln Pro Asn Leu  Val Met Asp Ile Cys  Gln Asn Asn
    1175                1180                1185

Asp Lys  Glu Phe His Lys Ser  Leu Met Cys Leu Leu  Lys Thr Leu
    1190                1195                1200

Leu Ala  Leu Arg Tyr Ser Asn  Ala Ser Ser Asp Glu  Asp Phe Ile
    1205                1210                1215

Leu Ser  Pro Val Ala Asn Asp  Glu Gly Val Phe Phe  Asn Ser Ala
    1220                1225                1230

Leu Ala  Asp Asp Thr Gln Pro  Gln Asn Ala Asp Ala  Asn Gly Ala
    1235                1240                1245
```

```
Tyr His  Ile Ala Leu Lys Gly  Leu Trp Leu Leu Asn  Glu Leu Lys
    1250                1255                1260


Asn Ser  Asp Asp Leu Asn Lys  Val Lys Leu Ala Ile  Asp Asn Gln
    1265                1270                1275


Thr Trp  Leu Asn Phe Ala Gln  Asn Arg
    1280                1285


<210>  67
<211>  1388
<212>  PRT
<213>  Artificial Sequence

<220>
<223>  Synthetic

<400>  67

Gly Gly Gly Gly Ser Gly Gly Gly Gly Gly Ser Gly Gly Gly Gly Gly
1               5                   10                  15


Ser Gly Gly Gly Gly Gly Ser Gly Gly Gly Gly Gly Ser Gly Gly Gly
            20                  25                  30


Gly Gly Ser Gly Met Thr Gln Phe Glu Gly Phe Thr Asn Leu Tyr Gln
        35                  40                  45


Val Ser Lys Thr Leu Arg Phe Glu Leu Ile Pro Gln Gly Lys Thr Leu
    50                  55                  60


Lys His Ile Gln Glu Gln Gly Phe Ile Glu Glu Asp Lys Ala Arg Asn
65                  70                  75                  80


Asp His Tyr Lys Glu Leu Lys Pro Ile Ile Asp Arg Ile Tyr Lys Thr
                85                  90                  95


Tyr Ala Asp Gln Cys Leu Gln Leu Val Gln Leu Asp Trp Glu Asn Leu
            100                 105                 110
```

```
Ser Ala Ala Ile Asp Ser Tyr Arg Lys Glu Lys Thr Glu Glu Thr Arg
        115                 120                 125

Asn Ala Leu Ile Glu Glu Gln Ala Thr Tyr Arg Asn Ala Ile His Asp
    130                 135                 140

Tyr Phe Ile Gly Arg Thr Asp Asn Leu Thr Asp Ala Ile Asn Lys Arg
145                 150                 155                 160

His Ala Glu Ile Tyr Lys Gly Leu Phe Lys Ala Glu Leu Phe Asn Gly
                165                 170                 175

Lys Val Leu Lys Gln Leu Gly Thr Val Thr Thr Thr Glu His Glu Asn
            180                 185                 190

Ala Leu Leu Arg Ser Phe Asp Lys Phe Thr Thr Tyr Phe Ser Gly Phe
        195                 200                 205

Tyr Glu Asn Arg Lys Asn Val Phe Ser Ala Glu Asp Ile Ser Thr Ala
    210                 215                 220

Ile Pro His Arg Ile Val Gln Asp Asn Phe Pro Lys Phe Lys Glu Asn
225                 230                 235                 240

Cys His Ile Phe Thr Arg Leu Ile Thr Ala Val Pro Ser Leu Arg Glu
                245                 250                 255

His Phe Glu Asn Val Lys Lys Ala Ile Gly Ile Phe Val Ser Thr Ser
            260                 265                 270

Ile Glu Glu Val Phe Ser Phe Pro Phe Tyr Asn Gln Leu Leu Thr Gln
        275                 280                 285

Thr Gln Ile Asp Leu Tyr Asn Gln Leu Leu Gly Gly Ile Ser Arg Glu
    290                 295                 300

Ala Gly Thr Glu Lys Ile Lys Gly Leu Asn Glu Val Leu Asn Leu Ala
```

```
305                 310                 315                 320

Ile Gln Lys Asn Asp Glu Thr Ala His Ile Ile Ala Ser Leu Pro His
                325                 330                 335

Arg Phe Ile Pro Leu Phe Lys Gln Ile Leu Ser Asp Arg Asn Thr Leu
            340                 345                 350

Ser Phe Ile Leu Glu Glu Phe Lys Ser Asp Glu Glu Val Ile Gln Ser
        355                 360                 365

Phe Cys Lys Tyr Lys Thr Leu Leu Arg Asn Glu Asn Val Leu Glu Thr
    370                 375                 380

Ala Glu Ala Leu Phe Asn Glu Leu Asn Ser Ile Asp Leu Thr His Ile
385                 390                 395                 400

Phe Ile Ser His Lys Lys Leu Glu Thr Ile Ser Ser Ala Leu Cys Asp
                405                 410                 415

His Trp Asp Thr Leu Arg Asn Ala Leu Tyr Glu Arg Arg Ile Ser Glu
            420                 425                 430

Leu Thr Gly Lys Ile Thr Lys Ser Ala Lys Glu Lys Val Gln Arg Ser
        435                 440                 445

Leu Lys His Glu Asp Ile Asn Leu Gln Glu Ile Ile Ser Ala Ala Gly
    450                 455                 460

Lys Glu Leu Ser Glu Ala Phe Lys Gln Lys Thr Ser Glu Ile Leu Ser
465                 470                 475                 480

His Ala His Ala Ala Leu Asp Gln Pro Leu Pro Thr Thr Leu Lys Lys
                485                 490                 495

Gln Glu Glu Lys Glu Ile Leu Lys Ser Gln Leu Asp Ser Leu Leu Gly
            500                 505                 510
```

```
Leu Tyr His Leu Leu Asp Trp Phe Ala Val Asp Glu Ser Asn Glu Val
        515                 520                 525

Asp Pro Glu Phe Ser Ala Arg Leu Thr Gly Ile Lys Leu Glu Met Glu
    530                 535                 540

Pro Ser Leu Ser Phe Tyr Asn Lys Ala Arg Asn Tyr Ala Thr Lys Lys
545                 550                 555                 560

Pro Tyr Ser Val Glu Lys Phe Lys Leu Asn Phe Gln Met Pro Thr Leu
                565                 570                 575

Ala Ser Gly Trp Asp Val Asn Lys Glu Lys Asn Asn Gly Ala Ile Leu
            580                 585                 590

Phe Val Lys Asn Gly Leu Tyr Tyr Leu Gly Ile Met Pro Lys Gln Lys
        595                 600                 605

Gly Arg Tyr Lys Ala Leu Ser Phe Glu Pro Thr Glu Lys Thr Ser Glu
    610                 615                 620

Gly Phe Asp Lys Met Tyr Tyr Asp Tyr Phe Pro Asp Ala Ala Lys Met
625                 630                 635                 640

Ile Pro Lys Cys Ser Thr Gln Leu Lys Ala Val Thr Ala His Phe Gln
                645                 650                 655

Thr His Thr Thr Pro Ile Leu Leu Ser Asn Asn Phe Ile Glu Pro Leu
            660                 665                 670

Glu Ile Thr Lys Glu Ile Tyr Asp Leu Asn Asn Pro Glu Lys Glu Pro
        675                 680                 685

Lys Lys Phe Gln Thr Ala Tyr Ala Lys Lys Thr Gly Asp Gln Lys Gly
    690                 695                 700

Tyr Arg Glu Ala Leu Cys Lys Trp Ile Asp Phe Thr Arg Asp Phe Leu
```

```
705                 710                 715                 720

Ser Lys Tyr Thr Lys Thr Thr Ser Ile Asp Leu Ser Ser Leu Arg Pro
                725                 730                 735

Ser Ser Gln Tyr Lys Asp Leu Gly Glu Tyr Tyr Ala Glu Leu Asn Pro
            740                 745                 750

Leu Leu Tyr His Ile Ser Phe Gln Arg Ile Ala Glu Lys Glu Ile Met
        755                 760                 765

Asp Ala Val Glu Thr Gly Lys Leu Tyr Leu Phe Gln Ile Tyr Asn Lys
    770                 775                 780

Asp Phe Ala Lys Gly His His Gly Lys Pro Asn Leu His Thr Leu Tyr
785                 790                 795                 800

Trp Thr Gly Leu Phe Ser Pro Glu Asn Leu Ala Lys Thr Ser Ile Lys
                805                 810                 815

Leu Asn Gly Gln Ala Glu Leu Phe Tyr Arg Pro Lys Ser Arg Met Lys
            820                 825                 830

Arg Met Ala His Arg Leu Gly Glu Lys Met Leu Asn Lys Lys Leu Lys
        835                 840                 845

Asp Gln Lys Thr Pro Ile Pro Asp Thr Leu Tyr Gln Glu Leu Tyr Asp
    850                 855                 860

Tyr Val Asn His Arg Leu Ser His Asp Leu Ser Asp Glu Ala Arg Ala
865                 870                 875                 880

Leu Leu Pro Asn Val Ile Thr Lys Glu Val Ser His Glu Ile Ile Lys
                885                 890                 895

Asp Arg Arg Phe Thr Ser Asp Lys Phe Phe Phe His Val Pro Ile Thr
            900                 905                 910
```

```
Leu Asn Tyr Gln Ala Ala Asn Ser Pro Ser Lys Phe Asn Gln Arg Val
        915                 920                 925

Asn Ala Tyr Leu Lys Glu His Pro Glu Thr Pro Ile Ile Gly Ile Asp
    930                 935                 940

Arg Gly Glu Arg Asn Leu Ile Tyr Ile Thr Val Ile Asp Ser Thr Gly
945                 950                 955                 960

Lys Ile Leu Glu Gln Arg Ser Leu Asn Thr Ile Gln Gln Phe Asp Tyr
                965                 970                 975

Gln Lys Lys Leu Asp Asn Arg Glu Lys Glu Arg Val Ala Ala Arg Gln
            980                 985                 990

Ala Trp Ser Val Val Gly Thr Ile  Lys Asp Leu Lys Gln  Gly Tyr Leu
        995                 1000                1005

Ser Gln  Val Ile His Glu Ile  Val Asp Leu Met Ile  His Tyr Gln
    1010                1015                1020

Ala Val  Val Val Leu Glu Asn  Leu Asn Phe Gly Phe  Lys Ser Lys
    1025                1030                1035

Arg Thr  Gly Ile Ala Glu Lys  Ala Val Tyr Gln Gln  Phe Glu Lys
    1040                1045                1050

Met Leu  Ile Asp Lys Leu Asn  Cys Leu Val Leu Lys  Asp Tyr Pro
    1055                1060                1065

Ala Glu  Lys Val Gly Gly Val  Leu Asn Pro Tyr Gln  Leu Thr Asp
    1070                1075                1080

Gln Phe  Thr Ser Phe Ala Lys  Met Gly Thr Gln Ser  Gly Phe Leu
    1085                1090                1095

Phe Tyr  Val Pro Ala Pro Tyr  Thr Ser Lys Ile Asp  Pro Leu Thr
```

```
    1100                1105                1110

Gly Phe  Val Asp Pro Phe Val  Trp Lys Thr Ile Lys  Asn His Glu
    1115                1120                1125

Ser Arg  Lys His Phe Leu Glu  Gly Phe Asp Phe Leu  His Tyr Asp
    1130                1135                1140

Val Lys  Thr Gly Asp Phe Ile  Leu His Phe Lys Met  Asn Arg Asn
    1145                1150                1155

Leu Ser  Phe Gln Arg Gly Leu  Pro Gly Phe Met Pro  Ala Trp Asp
    1160                1165                1170

Ile Val  Phe Glu Lys Asn Glu  Thr Gln Phe Asp Ala  Lys Gly Thr
    1175                1180                1185

Pro Phe  Ile Ala Gly Lys Arg  Ile Val Pro Val Ile  Glu Asn His
    1190                1195                1200

Arg Phe  Thr Gly Arg Tyr Arg  Asp Leu Tyr Pro Ala  Asn Glu Leu
    1205                1210                1215

Ile Ala  Leu Leu Glu Glu Lys  Gly Ile Val Phe Arg  Asp Gly Ser
    1220                1225                1230

Asn Ile  Leu Pro Lys Leu Leu  Glu Asn Asp Asp Ser  His Ala Ile
    1235                1240                1245

Asp Thr  Met Val Ala Leu Ile  Arg Ser Val Leu Gln  Met Arg Asn
    1250                1255                1260

Ser Asn  Ala Ala Thr Gly Glu  Asp Tyr Ile Asn Ser  Pro Val Arg
    1265                1270                1275

Asp Leu  Asn Gly Val Cys Phe  Asp Ser Arg Phe Gln  Asn Pro Glu
    1280                1285                1290
```

```
Trp Pro  Met Asp Ala Asp Ala  Asn Gly Ala Tyr His  Ile Ala Leu
    1295                1300                1305


Lys Gly  Gln Leu Leu Leu Asn  His Leu Lys Glu Ser  Lys Asp Leu
    1310                1315                1320


Lys Leu  Gln Asn Gly Ile Ser  Asn Gln Asp Trp Leu  Ala Tyr Ile
    1325                1330                1335


Gln Glu  Leu Arg Asn Lys Arg  Pro Ala Ala Thr Lys  Lys Ala Gly
    1340                1345                1350


Gln Ala  Lys Lys Lys Lys Gly  Ser Tyr Pro Tyr Asp  Val Pro Asp
    1355                1360                1365


Tyr Ala  Tyr Pro Tyr Asp Val  Pro Asp Tyr Ala Tyr  Pro Tyr Asp
    1370                1375                1380


Val Pro  Asp Tyr Ala
    1385
```

<210> 68
<211> 1352
<212> PRT
<213> Artificial Sequence

<220>
<223> Syntheti

<400> 68

```
Gly Gly Gly Gly Ser Gly Gly Gly Gly Gly Ser Gly Gly Gly Gly Gly
1               5                   10                  15


Ser Gly Gly Gly Gly Gly Ser Gly Gly Gly Gly Gly Ser Gly Gly Gly
            20                  25                  30


Gly Gly Ser Gly Met Thr Gln Phe Glu Gly Phe Thr Asn Leu Tyr Gln
        35                  40                  45
```

```
Val Ser Lys Thr Leu Arg Phe Glu Leu Ile Pro Gln Gly Lys Thr Leu
    50                  55                  60

Lys His Ile Gln Glu Gln Gly Phe Ile Glu Glu Asp Lys Ala Arg Asn
65                  70                  75                  80

Asp His Tyr Lys Glu Leu Lys Pro Ile Ile Asp Arg Ile Tyr Lys Thr
                85                  90                  95

Tyr Ala Asp Gln Cys Leu Gln Leu Val Gln Leu Asp Trp Glu Asn Leu
            100                 105                 110

Ser Ala Ala Ile Asp Ser Tyr Arg Lys Glu Lys Thr Glu Glu Thr Arg
        115                 120                 125

Asn Ala Leu Ile Glu Glu Gln Ala Thr Tyr Arg Asn Ala Ile His Asp
    130                 135                 140

Tyr Phe Ile Gly Arg Thr Asp Asn Leu Thr Asp Ala Ile Asn Lys Arg
145                 150                 155                 160

His Ala Glu Ile Tyr Lys Gly Leu Phe Lys Ala Glu Leu Phe Asn Gly
                165                 170                 175

Lys Val Leu Lys Gln Leu Gly Thr Val Thr Thr Thr Glu His Glu Asn
            180                 185                 190

Ala Leu Leu Arg Ser Phe Asp Lys Phe Thr Thr Tyr Phe Ser Gly Phe
        195                 200                 205

Tyr Glu Asn Arg Lys Asn Val Phe Ser Ala Glu Asp Ile Ser Thr Ala
    210                 215                 220

Ile Pro His Arg Ile Val Gln Asp Asn Phe Pro Lys Phe Lys Glu Asn
225                 230                 235                 240

Cys His Ile Phe Thr Arg Leu Ile Thr Ala Val Pro Ser Leu Arg Glu
```

```
               245                 250                 255

His Phe Glu Asn Val Lys Lys Ala Ile Gly Ile Phe Val Ser Thr Ser
            260                 265                 270

Ile Glu Glu Val Phe Ser Phe Pro Phe Tyr Asn Gln Leu Leu Thr Gln
        275                 280                 285

Thr Gln Ile Asp Leu Tyr Asn Gln Leu Leu Gly Gly Ile Ser Arg Glu
    290                 295                 300

Ala Gly Thr Glu Lys Ile Lys Gly Leu Asn Glu Val Leu Asn Leu Ala
305                 310                 315                 320

Ile Gln Lys Asn Asp Glu Thr Ala His Ile Ile Ala Ser Leu Pro His
                325                 330                 335

Arg Phe Ile Pro Leu Phe Lys Gln Ile Leu Ser Asp Arg Asn Thr Leu
            340                 345                 350

Ser Phe Ile Leu Glu Glu Phe Lys Ser Asp Glu Glu Val Ile Gln Ser
        355                 360                 365

Phe Cys Lys Tyr Lys Thr Leu Leu Arg Asn Glu Asn Val Leu Glu Thr
    370                 375                 380

Ala Glu Ala Leu Phe Asn Glu Leu Asn Ser Ile Asp Leu Thr His Ile
385                 390                 395                 400

Phe Ile Ser His Lys Lys Leu Glu Thr Ile Ser Ser Ala Leu Cys Asp
                405                 410                 415

His Trp Asp Thr Leu Arg Asn Ala Leu Tyr Glu Arg Arg Ile Ser Glu
            420                 425                 430

Leu Thr Gly Lys Ile Thr Lys Ser Ala Lys Glu Lys Val Gln Arg Ser
        435                 440                 445
```

```
Leu Lys His Glu Asp Ile Asn Leu Gln Glu Ile Ile Ser Ala Ala Gly
    450                 455                 460

Lys Glu Leu Ser Glu Ala Phe Lys Gln Lys Thr Ser Glu Ile Leu Ser
465                 470                 475                 480

His Ala His Ala Ala Leu Asp Gln Pro Leu Pro Thr Thr Leu Lys Lys
                485                 490                 495

Gln Glu Glu Lys Glu Ile Leu Lys Ser Gln Leu Asp Ser Leu Leu Gly
            500                 505                 510

Leu Tyr His Leu Leu Asp Trp Phe Ala Val Asp Glu Ser Asn Glu Val
        515                 520                 525

Asp Pro Glu Phe Ser Ala Arg Leu Thr Gly Ile Lys Leu Glu Met Glu
    530                 535                 540

Pro Ser Leu Ser Phe Tyr Asn Lys Ala Arg Asn Tyr Ala Thr Lys Lys
545                 550                 555                 560

Pro Tyr Ser Val Glu Lys Phe Lys Leu Asn Phe Gln Met Pro Thr Leu
                565                 570                 575

Ala Ser Gly Trp Asp Val Asn Lys Glu Lys Asn Asn Gly Ala Ile Leu
            580                 585                 590

Phe Val Lys Asn Gly Leu Tyr Tyr Leu Gly Ile Met Pro Lys Gln Lys
        595                 600                 605

Gly Arg Tyr Lys Ala Leu Ser Phe Glu Pro Thr Glu Lys Thr Ser Glu
    610                 615                 620

Gly Phe Asp Lys Met Tyr Tyr Asp Tyr Phe Pro Asp Ala Ala Lys Met
625                 630                 635                 640

Ile Pro Lys Cys Ser Thr Gln Leu Lys Ala Val Thr Ala His Phe Gln
```

```
               645                 650                 655

Thr His Thr Thr Pro Ile Leu Leu Ser Asn Asn Phe Ile Glu Pro Leu
            660                 665                 670

Glu Ile Thr Lys Glu Ile Tyr Asp Leu Asn Asn Pro Glu Lys Glu Pro
        675                 680                 685

Lys Lys Phe Gln Thr Ala Tyr Ala Lys Lys Thr Gly Asp Gln Lys Gly
    690                 695                 700

Tyr Arg Glu Ala Leu Cys Lys Trp Ile Asp Phe Thr Arg Asp Phe Leu
705                 710                 715                 720

Ser Lys Tyr Thr Lys Thr Thr Ser Ile Asp Leu Ser Ser Leu Arg Pro
                725                 730                 735

Ser Ser Gln Tyr Lys Asp Leu Gly Glu Tyr Tyr Ala Glu Leu Asn Pro
            740                 745                 750

Leu Leu Tyr His Ile Ser Phe Gln Arg Ile Ala Glu Lys Glu Ile Met
        755                 760                 765

Asp Ala Val Glu Thr Gly Lys Leu Tyr Leu Phe Gln Ile Tyr Asn Lys
    770                 775                 780

Asp Phe Ala Lys Gly His His Gly Lys Pro Asn Leu His Thr Leu Tyr
785                 790                 795                 800

Trp Thr Gly Leu Phe Ser Pro Glu Asn Leu Ala Lys Thr Ser Ile Lys
                805                 810                 815

Leu Asn Gly Gln Ala Glu Leu Phe Tyr Arg Pro Lys Ser Arg Met Lys
            820                 825                 830

Arg Met Ala His Arg Leu Gly Glu Lys Met Leu Asn Lys Lys Leu Lys
        835                 840                 845
```

```
Asp Gln Lys Thr Pro Ile Pro Asp Thr Leu Tyr Gln Glu Leu Tyr Asp
    850                 855                 860

Tyr Val Asn His Arg Leu Ser His Asp Leu Ser Asp Glu Ala Arg Ala
865                 870                 875                 880

Leu Leu Pro Asn Val Ile Thr Lys Glu Val Ser His Glu Ile Ile Lys
                885                 890                 895

Asp Arg Arg Phe Thr Ser Asp Lys Phe Phe Phe His Val Pro Ile Thr
            900                 905                 910

Leu Asn Tyr Gln Ala Ala Asn Ser Pro Ser Lys Phe Asn Gln Arg Val
        915                 920                 925

Asn Ala Tyr Leu Lys Glu His Pro Glu Thr Pro Ile Ile Gly Ile Ala
    930                 935                 940

Arg Gly Glu Arg Asn Leu Ile Tyr Ile Thr Val Ile Asp Ser Thr Gly
945                 950                 955                 960

Lys Ile Leu Glu Gln Arg Ser Leu Asn Thr Ile Gln Gln Phe Asp Tyr
                965                 970                 975

Gln Lys Lys Leu Asp Asn Arg Glu Lys Glu Arg Val Ala Ala Arg Gln
            980                 985                 990

Ala Trp Ser Val Val Gly Thr Ile  Lys Asp Leu Lys Gln  Gly Tyr Leu
        995                 1000                1005

Ser Gln  Val Ile His Glu Ile  Val Asp Leu Met Ile  His Tyr Gln
    1010                1015                1020

Ala Val  Val Val Leu Ala Asn  Leu Asn Phe Gly Phe  Lys Ser Lys
    1025                1030                1035

Arg Thr  Gly Ile Ala Glu Lys  Ala Val Tyr Gln Gln  Phe Glu Lys
```

```
    1040                1045                1050

Met Leu  Ile Asp Lys Leu Asn  Cys Leu Val Leu Lys  Asp Tyr Pro
    1055                1060                1065

Ala Glu  Lys Val Gly Gly Val  Leu Asn Pro Tyr Gln  Leu Thr Asp
    1070                1075                1080

Gln Phe  Thr Ser Phe Ala Lys  Met Gly Thr Gln Ser  Gly Phe Leu
    1085                1090                1095

Phe Tyr  Val Pro Ala Pro Tyr  Thr Ser Lys Ile Asp  Pro Leu Thr
    1100                1105                1110

Gly Phe  Val Asp Pro Phe Val  Trp Lys Thr Ile Lys  Asn His Glu
    1115                1120                1125

Ser Arg  Lys His Phe Leu Glu  Gly Phe Asp Phe Leu  His Tyr Asp
    1130                1135                1140

Val Lys  Thr Gly Asp Phe Ile  Leu His Phe Lys Met  Asn Arg Asn
    1145                1150                1155

Leu Ser  Phe Gln Arg Gly Leu  Pro Gly Phe Met Pro  Ala Trp Asp
    1160                1165                1170

Ile Val  Phe Glu Lys Asn Glu  Thr Gln Phe Asp Ala  Lys Gly Thr
    1175                1180                1185

Pro Phe  Ile Ala Gly Lys Arg  Ile Val Pro Val Ile  Glu Asn His
    1190                1195                1200

Arg Phe  Thr Gly Arg Tyr Arg  Asp Leu Tyr Pro Ala  Asn Glu Leu
    1205                1210                1215

Ile Ala  Leu Leu Glu Glu Lys  Gly Ile Val Phe Arg  Asp Gly Ser
    1220                1225                1230
```

```
Asn Ile  Leu Pro Lys Leu Leu  Glu Asn Asp Asp Ser  His Ala Ile
    1235                1240                1245


Asp Thr  Met Val Ala Leu Ile  Arg Ser Val Leu Gln  Met Arg Asn
    1250                1255                1260


Ser Asn  Ala Ala Thr Gly Glu  Ala Tyr Ile Asn Ser  Pro Val Arg
    1265                1270                1275


Asp Leu  Asn Gly Val Cys Phe  Asp Ser Arg Phe Gln  Asn Pro Glu
    1280                1285                1290


Trp Pro  Met Asp Ala Asp Ala  Asn Gly Ala Tyr His  Ile Ala Leu
    1295                1300                1305


Lys Gly  Gln Leu Leu Leu Asn  His Leu Lys Glu Ser  Lys Asp Leu
    1310                1315                1320


Lys Leu  Gln Asn Gly Ile Ser  Asn Gln Asp Trp Leu  Ala Tyr Ile
    1325                1330                1335


Gln Glu  Leu Arg Asn Gly Ser  Pro Lys Lys Lys Arg  Lys Val
    1340                1345                1350


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<212>  PRT
<213>  Artificial Sequence

<220>
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<400>  69

Gly Gly Gly Gly Ser Gly Gly Gly Gly Gly Ser Gly Gly Gly Gly Gly
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Ser Gly Gly Gly Gly Gly Ser Gly Gly Gly Gly Gly Ser Gly Gly Gly
            20                  25                  30
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Gly Gly Ser Gly Met Pro Lys Lys Lys Arg Lys Val Gly Gly Gly Gly
        35                  40                  45

Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
    50                  55                  60

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Met Ser Ile Tyr Gln Glu
65                  70                  75                  80

Phe Val Asn Lys Tyr Ser Leu Ser Lys Thr Leu Arg Phe Glu Leu Ile
                85                  90                  95

Pro Gln Gly Lys Thr Leu Glu Asn Ile Lys Ala Arg Gly Leu Ile Leu
            100                 105                 110

Asp Asp Glu Lys Arg Ala Lys Asp Tyr Lys Lys Ala Lys Gln Ile Ile
        115                 120                 125

Asp Lys Tyr His Gln Phe Phe Ile Glu Glu Ile Leu Ser Ser Val Cys
    130                 135                 140

Ile Ser Glu Asp Leu Leu Gln Asn Tyr Ser Asp Val Tyr Phe Lys Leu
145                 150                 155                 160

Lys Lys Ser Asp Asp Asp Asn Leu Gln Lys Asp Phe Lys Ser Ala Lys
                165                 170                 175

Asp Thr Ile Lys Lys Gln Ile Ser Glu Tyr Ile Lys Asp Ser Glu Lys
            180                 185                 190

Phe Lys Asn Leu Phe Asn Gln Asn Leu Ile Asp Ala Lys Lys Gly Gln
        195                 200                 205

Glu Ser Asp Leu Ile Leu Trp Leu Lys Gln Ser Lys Asp Asn Gly Ile
    210                 215                 220

Glu Leu Phe Lys Ala Asn Ser Asp Ile Thr Asp Ile Asp Glu Ala Leu
```

```
225                 230                 235                 240

Glu Ile Ile Lys Ser Phe Lys Gly Trp Thr Thr Tyr Phe Lys Gly Phe
                245                 250                 255

His Glu Asn Arg Lys Asn Val Tyr Ser Ser Asn Asp Ile Pro Thr Ser
            260                 265                 270

Ile Ile Tyr Arg Ile Val Asp Asp Asn Leu Pro Lys Phe Leu Glu Asn
        275                 280                 285

Lys Ala Lys Tyr Glu Ser Leu Lys Asp Lys Ala Pro Glu Ala Ile Asn
    290                 295                 300

Tyr Glu Gln Ile Lys Lys Asp Leu Ala Glu Glu Leu Thr Phe Asp Ile
305                 310                 315                 320

Asp Tyr Lys Thr Ser Glu Val Asn Gln Arg Val Phe Ser Leu Asp Glu
                325                 330                 335

Val Phe Glu Ile Ala Asn Phe Asn Asn Tyr Leu Asn Gln Ser Gly Ile
            340                 345                 350

Thr Lys Phe Asn Thr Ile Ile Gly Gly Lys Phe Val Asn Gly Glu Asn
        355                 360                 365

Thr Lys Arg Lys Gly Ile Asn Glu Tyr Ile Asn Leu Tyr Ser Gln Gln
    370                 375                 380

Ile Asn Asp Lys Thr Leu Lys Lys Tyr Lys Met Ser Val Leu Phe Lys
385                 390                 395                 400

Gln Ile Leu Ser Asp Thr Glu Ser Lys Ser Phe Val Ile Asp Lys Leu
                405                 410                 415

Glu Asp Asp Ser Asp Val Val Thr Thr Met Gln Ser Phe Tyr Glu Gln
            420                 425                 430
```

```
Ile Ala Ala Phe Lys Thr Val Glu Glu Lys Ser Ile Lys Glu Thr Leu
        435                 440                 445

Ser Leu Leu Phe Asp Asp Leu Lys Ala Gln Lys Leu Asp Leu Ser Lys
    450                 455                 460

Ile Tyr Phe Lys Asn Asp Lys Ser Leu Thr Asp Leu Ser Gln Gln Val
465                 470                 475                 480

Phe Asp Asp Tyr Ser Val Ile Gly Thr Ala Val Leu Glu Tyr Ile Thr
                485                 490                 495

Gln Gln Ile Ala Pro Lys Asn Leu Asp Asn Pro Ser Lys Lys Glu Gln
            500                 505                 510

Glu Leu Ile Ala Lys Lys Thr Glu Lys Ala Lys Tyr Leu Ser Leu Glu
        515                 520                 525

Thr Ile Lys Leu Ala Leu Glu Glu Phe Asn Lys His Arg Asp Ile Asp
    530                 535                 540

Lys Gln Cys Arg Phe Glu Glu Ile Leu Ala Asn Phe Ala Ala Ile Pro
545                 550                 555                 560

Met Ile Phe Asp Glu Ile Ala Gln Asn Lys Asp Asn Leu Ala Gln Ile
                565                 570                 575

Ser Ile Lys Tyr Gln Asn Gln Gly Lys Lys Asp Leu Leu Gln Ala Ser
            580                 585                 590

Ala Glu Asp Asp Val Lys Ala Ile Lys Asp Leu Leu Asp Gln Thr Asn
        595                 600                 605

Asn Leu Leu His Lys Leu Lys Ile Phe His Ile Ser Gln Ser Glu Asp
    610                 615                 620

Lys Ala Asn Ile Leu Asp Lys Asp Glu His Phe Tyr Leu Val Phe Glu
```

```
625                 630                 635                 640

Glu Cys Tyr Phe Glu Leu Ala Asn Ile Val Pro Leu Tyr Asn Lys Ile
                645                 650                 655

Arg Asn Tyr Ile Thr Gln Lys Pro Tyr Ser Asp Glu Lys Phe Lys Leu
            660                 665                 670

Asn Phe Glu Asn Ser Thr Leu Ala Asn Gly Trp Asp Lys Asn Lys Glu
        675                 680                 685

Pro Asp Asn Thr Ala Ile Leu Phe Ile Lys Asp Asp Lys Tyr Tyr Leu
    690                 695                 700

Gly Val Met Asn Lys Lys Asn Asn Lys Ile Phe Asp Asp Lys Ala Ile
705                 710                 715                 720

Lys Glu Asn Lys Gly Glu Gly Tyr Lys Lys Ile Val Tyr Lys Leu Leu
                725                 730                 735

Pro Gly Ala Asn Lys Met Leu Pro Lys Val Phe Phe Ser Ala Lys Ser
            740                 745                 750

Ile Lys Phe Tyr Asn Pro Ser Glu Asp Ile Leu Arg Ile Arg Asn His
        755                 760                 765

Ser Thr His Thr Lys Asn Gly Ser Pro Gln Lys Gly Tyr Glu Lys Phe
    770                 775                 780

Glu Phe Asn Ile Glu Asp Cys Arg Lys Phe Ile Asp Phe Tyr Lys Gln
785                 790                 795                 800

Ser Ile Ser Lys His Pro Glu Trp Lys Asp Phe Gly Phe Arg Phe Ser
                805                 810                 815

Asp Thr Gln Arg Tyr Asn Ser Ile Asp Glu Phe Tyr Arg Glu Val Glu
            820                 825                 830
```

```
Asn Gln Gly Tyr Lys Leu Thr Phe Glu Asn Ile Ser Glu Ser Tyr Ile
        835                 840                 845

Asp Ser Val Val Asn Gln Gly Lys Leu Tyr Leu Phe Gln Ile Tyr Asn
    850                 855                 860

Lys Asp Phe Ser Ala Tyr Ser Lys Gly Arg Pro Asn Leu His Thr Leu
865                 870                 875                 880

Tyr Trp Lys Ala Leu Phe Asp Glu Arg Asn Leu Gln Asp Val Val Tyr
                885                 890                 895

Lys Leu Asn Gly Glu Ala Glu Leu Phe Tyr Arg Lys Gln Ser Ile Pro
            900                 905                 910

Lys Lys Ile Thr His Pro Ala Lys Glu Ala Ile Ala Asn Lys Asn Lys
        915                 920                 925

Asp Asn Pro Lys Lys Glu Ser Val Phe Glu Tyr Asp Leu Ile Lys Asp
    930                 935                 940

Lys Arg Phe Thr Glu Asp Lys Phe Phe Phe His Cys Pro Ile Thr Ile
945                 950                 955                 960

Asn Phe Lys Ser Ser Gly Ala Asn Lys Phe Asn Asp Glu Ile Asn Leu
                965                 970                 975

Leu Leu Lys Glu Lys Ala Asn Asp Val His Ile Leu Ser Ile Asp Arg
            980                 985                 990

Gly Glu Arg His Leu Ala Tyr Tyr  Thr Leu Val Asp Gly  Lys Gly Asn
        995                 1000                1005

Ile Ile  Lys Gln Asp Thr Phe  Asn Ile Ile Gly Asn  Asp Arg Met
    1010                1015                1020

Lys Thr  Asn Tyr His Asp Lys  Leu Ala Ala Ile Glu  Lys Asp Arg
```

```
    1025                1030                1035

Asp Ser  Ala Arg Lys Asp Trp  Lys Lys Ile Asn Asn  Ile Lys Glu
    1040                1045                1050

Met Lys  Glu Gly Tyr Leu Ser  Gln Val Val His Glu  Ile Ala Lys
    1055                1060                1065

Leu Val  Ile Glu Tyr Asn Ala  Ile Val Val Phe Glu  Asp Leu Asn
    1070                1075                1080

Phe Gly  Phe Lys Arg Gly Arg  Phe Lys Val Glu Lys  Gln Val Tyr
    1085                1090                1095

Gln Lys  Leu Glu Lys Met Leu  Ile Glu Lys Leu Asn  Tyr Leu Val
    1100                1105                1110

Phe Lys  Asp Asn Glu Phe Asp  Lys Thr Gly Gly Val  Leu Arg Ala
    1115                1120                1125

Tyr Gln  Leu Thr Ala Pro Phe  Glu Thr Phe Lys Lys  Met Gly Lys
    1130                1135                1140

Gln Thr  Gly Ile Ile Tyr Tyr  Val Pro Ala Gly Phe  Thr Ser Lys
    1145                1150                1155

Ile Cys  Pro Val Thr Gly Phe  Val Asn Gln Leu Tyr  Pro Lys Tyr
    1160                1165                1170

Glu Ser  Val Ser Lys Ser Gln  Glu Phe Phe Ser Lys  Phe Asp Lys
    1175                1180                1185

Ile Cys  Tyr Asn Leu Asp Lys  Gly Tyr Phe Glu Phe  Ser Phe Asp
    1190                1195                1200

Tyr Lys  Asn Phe Gly Asp Lys  Ala Ala Lys Gly Lys  Trp Thr Ile
    1205                1210                1215
```

```
Ala Ser  Phe Gly Ser Arg Leu  Ile Asn Phe Arg Asn  Ser Asp Lys
    1220                1225                1230

Asn His  Asn Trp Asp Thr Arg  Glu Val Tyr Pro Thr  Lys Glu Leu
    1235                1240                1245

Glu Lys  Leu Leu Lys Asp Tyr  Ser Ile Glu Tyr Gly  His Gly Glu
    1250                1255                1260

Cys Ile  Lys Ala Ala Ile Cys  Gly Glu Ser Asp Lys  Lys Phe Phe
    1265                1270                1275

Ala Lys  Leu Thr Ser Val Leu  Asn Thr Ile Leu Gln  Met Arg Asn
    1280                1285                1290

Ser Lys  Thr Gly Thr Glu Leu  Asp Tyr Leu Ile Ser  Pro Val Ala
    1295                1300                1305

Asp Val  Asn Gly Asn Phe Phe  Asp Ser Arg Gln Ala  Pro Lys Asn
    1310                1315                1320

Met Pro  Gln Asp Ala Asp Ala  Asn Gly Ala Tyr His  Ile Gly Leu
    1325                1330                1335

Lys Gly  Leu Met Leu Leu Gly  Arg Ile Lys Asn Asn  Gln Glu Gly
    1340                1345                1350

Lys Lys  Leu Asn Leu Val Ile  Lys Asn Glu Glu Tyr  Phe Glu Phe
    1355                1360                1365

Val Gln  Asn Arg Asn Asn Pro  Lys Lys Lys Arg Lys  Val Ser Gly
    1370                1375                1380

Gly Ser  Ser Gly Gly Ser Pro  Lys Lys Lys Arg Lys  Val Tyr Pro
    1385                1390                1395

Tyr Asp  Val Pro Asp Tyr Ala  Tyr Pro Tyr Asp Val  Pro Asp Tyr
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Ala Tyr Pro Tyr Asp Val Pro Asp Tyr Ala
1415 1420

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35 40 45

Ile Gly Arg His Asp Pro Thr Ala His Ala Glu Ile Met Ala Leu Arg
50 55 60

Gln Gly Gly Leu Val Met Gln Asn Tyr Arg Leu Ile Asp Ala Thr Leu
65 70 75 80

Tyr Val Thr Leu Glu Pro Cys Val Met Cys Ala Gly Ala Met Ile His
85 90 95

Ser Arg Ile Gly Arg Val Val Phe Gly Ala Arg Asp Ala Lys Thr Gly
100 105 110

```
Ala Ala Gly Ser Leu Met Asp Val Leu His His Pro Gly Met Asn His
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Arg Val Glu Ile Thr Glu Gly Ile Leu Ala Asp Glu Cys Ala Ala Leu
    130                 135                 140

Leu Ser Asp Phe Phe Arg Met Arg Arg Gln Glu Ile Lys Ala Gln Lys
145                 150                 155                 160

Lys Ala Gln Ser Ser Thr Asp Ser Gly Gly Ser Ser Gly Gly Ser Ser
                165                 170                 175

Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser Ser
            180                 185                 190

Gly Gly Ser Ser Gly Gly Ser Ser Glu Val Glu Phe Ser His Glu Tyr
        195                 200                 205

Trp Met Arg His Ala Leu Thr Leu Ala Lys Arg Ala Arg Asp Glu Arg
    210                 215                 220

Glu Val Pro Val Gly Ala Val Leu Val Leu Asn Asn Arg Val Ile Gly
225                 230                 235                 240

Glu Gly Trp Asn Arg Ala Ile Gly Leu His Asp Pro Thr Ala His Ala
                245                 250                 255

Glu Ile Met Ala Leu Arg Gln Gly Gly Leu Val Met Gln Asn Tyr Arg
            260                 265                 270

Leu Ile Asp Ala Thr Leu Tyr Val Thr Phe Glu Pro Cys Val Met Cys
        275                 280                 285

Ala Gly Ala Met Ile His Ser Arg Ile Gly Arg Val Val Phe Gly Val
    290                 295                 300

Arg Asn Ala Lys Thr Gly Ala Ala Gly Ser Leu Met Asp Val Leu His
305                 310                 315                 320
```

```
Tyr Pro Gly Met Asn His Arg Val Glu Ile Thr Glu Gly Ile Leu Ala
                325                 330                 335

Asp Glu Cys Ala Ala Leu Leu Cys Tyr Phe Phe Arg Met Pro Arg Gln
            340                 345                 350

Val Phe Asn Ala Gln Lys Lys Ala Gln Ser Ser Thr Asp Ser Gly Gly
        355                 360                 365

Ser Ser Gly Gly Ser Ser Gly Ser Glu Thr Pro Gly Thr Ser Glu Ser
    370                 375                 380

Ala Thr Pro Glu Ser Ser Gly Gly Ser Ser Gly Gly Ser Asp Lys Lys
385                 390                 395                 400

Tyr Ser Ile Gly Leu Ala Ile Gly Thr Asn Ser Val Gly Trp Ala Val
                405                 410                 415

Ile Thr Asp Glu Tyr Lys Val Pro Ser Lys Lys Phe Lys Val Leu Gly
            420                 425                 430

Asn Thr Asp Arg His Ser Ile Lys Lys Asn Leu Ile Gly Ala Leu Leu
        435                 440                 445

Phe Asp Ser Gly Glu Thr Ala Glu Ala Thr Arg Leu Lys Arg Thr Ala
    450                 455                 460

Arg Arg Arg Tyr Thr Arg Arg Lys Asn Arg Ile Cys Tyr Leu Gln Glu
465                 470                 475                 480

Ile Phe Ser Asn Glu Met Ala Lys Val Asp Asp Ser Phe Phe His Arg
                485                 490                 495

Leu Glu Glu Ser Phe Leu Val Glu Glu Asp Lys Lys His Glu Arg His
            500                 505                 510
```

```
Pro Ile Phe Gly Asn Ile Val Asp Glu Val Ala Tyr His Glu Lys Tyr
        515                 520                 525

Pro Thr Ile Tyr His Leu Arg Lys Lys Leu Val Asp Ser Thr Asp Lys
    530                 535                 540

Ala Asp Leu Arg Leu Ile Tyr Leu Ala Leu Ala His Met Ile Lys Phe
545                 550                 555                 560

Arg Gly His Phe Leu Ile Glu Gly Asp Leu Asn Pro Asp Asn Ser Asp
                565                 570                 575

Val Asp Lys Leu Phe Ile Gln Leu Val Gln Thr Tyr Asn Gln Leu Phe
            580                 585                 590

Glu Glu Asn Pro Ile Asn Ala Ser Gly Val Asp Ala Lys Ala Ile Leu
        595                 600                 605

Ser Ala Arg Leu Ser Lys Ser Arg Arg Leu Glu Asn Leu Ile Ala Gln
    610                 615                 620

Leu Pro Gly Glu Lys Lys Asn Gly Leu Phe Gly Asn Leu Ile Ala Leu
625                 630                 635                 640

Ser Leu Gly Leu Thr Pro Asn Phe Lys Ser Asn Phe Asp Leu Ala Glu
                645                 650                 655

Asp Ala Lys Leu Gln Leu Ser Lys Asp Thr Tyr Asp Asp Asp Leu Asp
            660                 665                 670

Asn Leu Leu Ala Gln Ile Gly Asp Gln Tyr Ala Asp Leu Phe Leu Ala
        675                 680                 685

Ala Lys Asn Leu Ser Asp Ala Ile Leu Leu Ser Asp Ile Leu Arg Val
    690                 695                 700

Asn Thr Glu Ile Thr Lys Ala Pro Leu Ser Ala Ser Met Ile Lys Arg
705                 710                 715                 720
```

```
Tyr Asp Glu His His Gln Asp Leu Thr Leu Leu Lys Ala Leu Val Arg
                725                 730                 735

Gln Gln Leu Pro Glu Lys Tyr Lys Glu Ile Phe Phe Asp Gln Ser Lys
            740                 745                 750

Asn Gly Tyr Ala Gly Tyr Ile Asp Gly Gly Ala Ser Gln Glu Glu Phe
        755                 760                 765

Tyr Lys Phe Ile Lys Pro Ile Leu Glu Lys Met Asp Gly Thr Glu Glu
    770                 775                 780

Leu Leu Val Lys Leu Asn Arg Glu Asp Leu Leu Arg Lys Gln Arg Thr
785                 790                 795                 800

Phe Asp Asn Gly Ser Ile Pro His Gln Ile His Leu Gly Glu Leu His
                805                 810                 815

Ala Ile Leu Arg Arg Gln Glu Asp Phe Tyr Pro Phe Leu Lys Asp Asn
            820                 825                 830

Arg Glu Lys Ile Glu Lys Ile Leu Thr Phe Arg Ile Pro Tyr Tyr Val
        835                 840                 845

Gly Pro Leu Ala Arg Gly Asn Ser Arg Phe Ala Trp Met Thr Arg Lys
    850                 855                 860

Ser Glu Glu Thr Ile Thr Pro Trp Asn Phe Glu Glu Val Val Asp Lys
865                 870                 875                 880

Gly Ala Ser Ala Gln Ser Phe Ile Glu Arg Met Thr Asn Phe Asp Lys
                885                 890                 895

Asn Leu Pro Asn Glu Lys Val Leu Pro Lys His Ser Leu Leu Tyr Glu
            900                 905                 910
```

```
Tyr Phe Thr Val Tyr Asn Glu Leu Thr Lys Val Lys Tyr Val Thr Glu
        915                 920                 925


Gly Met Arg Lys Pro Ala Phe Leu Ser Gly Glu Gln Lys Lys Ala Ile
    930                 935                 940


Val Asp Leu Leu Phe Lys Thr Asn Arg Lys Val Thr Val Lys Gln Leu
945                 950                 955                 960


Lys Glu Asp Tyr Phe Lys Lys Ile Glu Cys Phe Asp Ser Val Glu Ile
                965                 970                 975


Ser Gly Val Glu Asp Arg Phe Asn Ala Ser Leu Gly Thr Tyr His Asp
            980                 985                 990


Leu Leu Lys Ile Ile Lys Asp Lys  Asp Phe Leu Asp Asn  Glu Glu Asn
        995                 1000                1005


Glu Asp  Ile Leu Glu Asp Ile  Val Leu Thr Leu Thr  Leu Phe Glu
    1010                1015                1020


Asp Arg  Glu Met Ile Glu Glu  Arg Leu Lys Thr Tyr  Ala His Leu
    1025                1030                1035


Phe Asp  Asp Lys Val Met Lys  Gln Leu Lys Arg Arg  Arg Tyr Thr
    1040                1045                1050


Gly Trp  Gly Arg Leu Ser Arg  Lys Leu Ile Asn Gly  Ile Arg Asp
    1055                1060                1065


Lys Gln  Ser Gly Lys Thr Ile  Leu Asp Phe Leu Lys  Ser Asp Gly
    1070                1075                1080


Phe Ala  Asn Arg Asn Phe Met  Gln Leu Ile His Asp  Asp Ser Leu
    1085                1090                1095


Thr Phe  Lys Glu Asp Ile Gln  Lys Ala Gln Val Ser  Gly Gln Gly
    1100                1105                1110
```

```
Asp Ser  Leu His Glu His Ile  Ala Asn Leu Ala Gly  Ser Pro Ala
    1115                1120                1125

Ile Lys  Lys Gly Ile Leu Gln  Thr Val Lys Val Val  Asp Glu Leu
    1130                1135                1140

Val Lys  Val Met Gly Arg His  Lys Pro Glu Asn Ile  Val Ile Glu
    1145                1150                1155

Met Ala  Arg Glu Asn Gln Thr  Thr Gln Lys Gly Gln  Lys Asn Ser
    1160                1165                1170

Arg Glu  Arg Met Lys Arg Ile  Glu Glu Gly Ile Lys  Glu Leu Gly
    1175                1180                1185

Ser Gln  Ile Leu Lys Glu His  Pro Val Glu Asn Thr  Gln Leu Gln
    1190                1195                1200

Asn Glu  Lys Leu Tyr Leu Tyr  Tyr Leu Gln Asn Gly  Arg Asp Met
    1205                1210                1215

Tyr Val  Asp Gln Glu Leu Asp  Ile Asn Arg Leu Ser  Asp Tyr Asp
    1220                1225                1230

Val Asp  His Ile Val Pro Gln  Ser Phe Leu Lys Asp  Asp Ser Ile
    1235                1240                1245

Asp Asn  Lys Val Leu Thr Arg  Ser Asp Lys Asn Arg  Gly Lys Ser
    1250                1255                1260

Asp Asn  Val Pro Ser Glu Glu  Val Val Lys Lys Met  Lys Asn Tyr
    1265                1270                1275

Trp Arg  Gln Leu Leu Asn Ala  Lys Leu Ile Thr Gln  Arg Lys Phe
    1280                1285                1290
```

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Asp Asn  Leu Thr Lys Ala Glu  Arg Gly Gly Leu Ser  Glu Leu Asp
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Lys Ala  Gly Phe Ile Lys Arg  Gln Leu Val Glu Thr  Arg Gln Ile
    1310                1315                1320

Thr Lys  His Val Ala Gln Ile  Leu Asp Ser Arg Met  Asn Thr Lys
    1325                1330                1335

Tyr Asp  Glu Asn Asp Lys Leu  Ile Arg Glu Val Lys  Val Ile Thr
    1340                1345                1350

Leu Lys  Ser Lys Leu Val Ser  Asp Phe Arg Lys Asp  Phe Gln Phe
    1355                1360                1365

Tyr Lys  Val Arg Glu Ile Asn  Asn Tyr His His Ala  His Asp Ala
    1370                1375                1380

Tyr Leu  Asn Ala Val Val Gly  Thr Ala Leu Ile Lys  Lys Tyr Pro
    1385                1390                1395

Lys Leu  Glu Ser Glu Phe Val  Tyr Gly Asp Tyr Lys  Val Tyr Asp
    1400                1405                1410

Val Arg  Lys Met Ile Ala Lys  Ser Glu Gln Glu Ile  Gly Lys Ala
    1415                1420                1425

Thr Ala  Lys Tyr Phe Phe Tyr  Ser Asn Ile Met Asn  Phe Phe Lys
    1430                1435                1440

Thr Glu  Ile Thr Leu Ala Asn  Gly Glu Ile Arg Lys  Arg Pro Leu
    1445                1450                1455

Ile Glu  Thr Asn Gly Glu Thr  Gly Glu Ile Val Trp  Asp Lys Gly
    1460                1465                1470

Arg Asp  Phe Ala Thr Val Arg  Lys Val Leu Ser Met  Pro Gln Val
    1475                1480                1485
```

```
Asn Ile  Val Lys Lys Thr Glu  Val Gln Thr Gly Gly  Phe Ser Lys
    1490                1495                1500

Glu Ser  Ile Leu Pro Lys Arg  Asn Ser Asp Lys Leu  Ile Ala Arg
    1505                1510                1515

Lys Lys  Asp Trp Asp Pro Lys  Lys Tyr Gly Gly Phe  Asp Ser Pro
    1520                1525                1530

Thr Val  Ala Tyr Ser Val Leu  Val Val Ala Lys Val  Glu Lys Gly
    1535                1540                1545

Lys Ser  Lys Lys Leu Lys Ser  Val Lys Glu Leu Val  Gly Ile Thr
    1550                1555                1560

Ile Met  Glu Arg Ser Ser Phe  Glu Lys Asn Pro Val  Asp Phe Leu
    1565                1570                1575

Glu Ala  Lys Gly Tyr Lys Glu  Val Lys Lys Asp Leu  Ile Ile Lys
    1580                1585                1590

Leu Pro  Lys Tyr Ser Leu Phe  Glu Leu Glu Asn Gly  Arg Lys Arg
    1595                1600                1605

Met Leu  Ala Ser Ala Gly Glu  Leu Gln Lys Gly Asn  Glu Leu Ala
    1610                1615                1620

Leu Pro  Ser Lys Tyr Val Asn  Phe Leu Tyr Leu Ala  Ser His Tyr
    1625                1630                1635

Glu Lys  Leu Lys Gly Ser Pro  Glu Asp Asn Glu Gln  Lys Gln Leu
    1640                1645                1650

Phe Val  Glu Gln His Lys His  Tyr Leu Asp Glu Ile  Ile Glu Gln
    1655                1660                1665
```

```
Ile Ser  Glu Phe Ser Lys Arg  Val Ile Leu Ala Asp  Ala Asn Leu
    1670                1675                1680

Asp Lys  Val Leu Ser Ala Tyr  Asn Lys His Arg Asp  Lys Pro Ile
    1685                1690                1695

Arg Glu  Gln Ala Glu Asn Ile  Ile His Leu Phe Thr  Leu Thr Asn
    1700                1705                1710

Leu Gly  Ala Pro Ala Ala Phe  Lys Tyr Phe Asp Thr  Thr Ile Asp
    1715                1720                1725

Arg Lys  Arg Tyr Thr Ser Thr  Lys Glu Val Leu Asp  Ala Thr Leu
    1730                1735                1740

Ile His  Gln Ser Ile Thr Gly  Leu Tyr Glu Thr Arg  Ile Asp Leu
    1745                1750                1755

Ser Gln  Leu Gly Gly Asp Ser  Ser Pro Pro Lys Lys  Lys Arg Lys
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Val Ser  Trp Lys Asp Ala Ser  Gly Trp Ser Arg Met
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atggctctca ggcagggcgg cctggtcatg cagaactaca ggctgatcga cgcgaccctc      240

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Val Leu Val His Asn Asn Arg Val Ile Gly Glu Gly Trp Asn Arg Pro
35 40 45

Ile Gly Arg His Asp Pro Thr Ala His Ala Glu Ile Met Ala Leu Arg
50 55 60

Gln Gly Gly Leu Val Met Gln Asn Tyr Arg Leu Ile Asp Ala Thr Leu
65 70 75 80

Tyr Val Thr Leu Glu Pro Cys Val Met Val Ser Phe Cys Phe Tyr Leu
85 90 95

Tyr Ile Tyr Asn Asn Tyr His Leu Val Val Ile Tyr Phe Lys Tyr Phe
100 105 110

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Phe Gln Asn Lys Arg Met Tyr Ile Ala Ile Ala Phe Leu Phe Ile Ser
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Val Tyr Ile Leu Ile Tyr Asn Phe Ser Asn Ile Pro Lys Phe Val Asp
    130                 135                 140

Val Gln Cys Ala Gly Ala Met Ile His Ser Arg Ile Gly Arg Val Val
145                 150                 155                 160

Phe Gly Ala Arg Asp Ala Lys Thr Gly Ala Ala Gly Ser Leu Met Asp
                165                 170                 175

Val Leu His His Pro Gly Met Asn His Arg Val Glu Ile Thr Glu Gly
            180                 185                 190

Ile Leu Ala Asp Glu Cys Ala Ala Leu Leu Ser Asp Phe Phe Arg Met
        195                 200                 205

Arg Arg Gln Glu Ile Lys Ala Gln Lys Lys Ala Gln Ser Ser Thr Asp
    210                 215                 220

Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Ser Glu Thr Pro Gly Thr
225                 230                 235                 240

Ser Glu Ser Ala Thr Pro Glu Ser Ser Gly Gly Ser Ser Gly Gly Ser
                245                 250                 255

Ser Glu Val Glu Phe Ser His Glu Tyr Trp Met Arg His Ala Leu Thr
            260                 265                 270

Leu Ala Lys Arg Ala Arg Asp Glu Arg Glu Val Pro Val Gly Ala Val
        275                 280                 285

Leu Val Leu Asn Asn Arg Val Ile Gly Glu Gly Trp Asn Arg Ala Ile
    290                 295                 300

Gly Leu His Asp Pro Thr Ala His Ala Glu Ile Met Ala Leu Arg Gln
305                 310                 315                 320
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Gly Gly Leu Val Met Gln Asn Tyr Arg Leu Ile Asp Ala Thr Leu Tyr
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Val Thr Phe Glu Pro Cys Val Met Cys Ala Gly Ala Met Ile His Ser
            340                 345                 350

Arg Ile Gly Arg Val Val Phe Gly Val Arg Asn Ala Lys Thr Gly Ala
        355                 360                 365

Ala Gly Ser Leu Met Asp Val Leu His Tyr Pro Gly Met Asn His Arg
    370                 375                 380

Val Glu Ile Thr Glu Gly Ile Leu Ala Asp Glu Cys Ala Ala Leu Leu
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Cys Tyr Phe Phe Arg Met Pro Arg Gln Val Phe Asn Ala Gln Lys Lys
                405                 410                 415

Ala Gln Ser Ser Thr Asp Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly
            420                 425                 430

Ser Glu Thr Pro Gly Thr Ser Glu Ser Ala Thr Pro Glu Ser Ser Gly
        435                 440                 445

Gly Ser Ser Gly Gly Ser Met Ser Lys Leu Glu Lys Phe Thr Asn Cys
    450                 455                 460

Tyr Ser Leu Ser Lys Thr Leu Arg Phe Lys Ala Ile Pro Val Gly Lys
465                 470                 475                 480

Thr Gln Glu Asn Ile Asp Asn Lys Arg Leu Leu Val Glu Asp Glu Lys
                485                 490                 495

Arg Ala Glu Asp Tyr Lys Gly Val Lys Lys Leu Leu Asp Arg Tyr Tyr
            500                 505                 510
```

```
Leu Ser Phe Ile Asn Asp Val Leu His Ser Ile Lys Leu Lys Asn Leu
        515                 520                 525

Asn Asn Tyr Ile Ser Leu Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu
    530                 535                 540

Asn Lys Glu Leu Glu Asn Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala
545                 550                 555                 560

Lys Ala Phe Lys Gly Asn Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp
                565                 570                 575

Ile Ile Glu Thr Ile Leu Pro Glu Phe Leu Asp Asp Lys Asp Glu Ile
            580                 585                 590

Ala Leu Val Asn Ser Phe Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe
        595                 600                 605

Phe Asp Asn Arg Glu Asn Met Phe Ser Glu Glu Ala Lys Ser Thr Ser
    610                 615                 620

Ile Ala Phe Arg Cys Ile Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn
625                 630                 635                 640

Met Asp Ile Phe Glu Lys Val Asp Ala Ile Phe Asp Lys His Glu Val
                645                 650                 655

Gln Glu Ile Lys Glu Lys Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp
            660                 665                 670

Phe Phe Glu Gly Glu Phe Phe Asn Phe Val Leu Thr Gln Glu Gly Ile
        675                 680                 685

Asp Val Tyr Asn Ala Ile Ile Gly Gly Phe Val Thr Glu Ser Gly Glu
    690                 695                 700

Lys Ile Lys Gly Leu Asn Glu Tyr Ile Asn Leu Tyr Asn Gln Lys Thr
705                 710                 715                 720
```

```
Lys Gln Lys Leu Pro Lys Phe Lys Pro Leu Tyr Lys Gln Val Leu Ser
               725                 730                 735

Asp Arg Glu Ser Leu Ser Phe Tyr Gly Glu Gly Tyr Thr Ser Asp Glu
            740                 745                 750

Glu Val Leu Glu Val Phe Arg Asn Thr Leu Asn Lys Asn Ser Glu Ile
        755                 760                 765

Phe Ser Ser Ile Lys Lys Leu Glu Lys Leu Phe Lys Asn Phe Asp Glu
    770                 775                 780

Tyr Ser Ser Ala Gly Ile Phe Val Lys Asn Gly Pro Ala Ile Ser Thr
785                 790                 795                 800

Ile Ser Lys Asp Ile Phe Gly Glu Trp Asn Val Ile Arg Asp Lys Trp
               805                 810                 815

Asn Ala Glu Tyr Asp Asp Ile His Leu Lys Lys Lys Ala Val Val Thr
            820                 825                 830

Glu Lys Tyr Glu Asp Asp Arg Arg Lys Ser Phe Lys Lys Ile Gly Ser
        835                 840                 845

Phe Ser Leu Glu Gln Leu Gln Glu Tyr Ala Asp Ala Asp Leu Ser Val
    850                 855                 860

Val Glu Lys Leu Lys Glu Ile Ile Ile Gln Lys Val Asp Glu Ile Tyr
865                 870                 875                 880

Lys Val Tyr Gly Ser Ser Glu Lys Leu Phe Asp Ala Asp Phe Val Leu
               885                 890                 895

Glu Lys Ser Leu Lys Lys Asn Asp Ala Val Val Ala Ile Met Lys Asp
            900                 905                 910
```

```
Leu Leu Asp Ser Val Lys Ser Phe Glu Asn Tyr Ile Lys Ala Phe Phe
        915                 920                 925


Gly Glu Gly Lys Glu Thr Asn Arg Asp Glu Ser Phe Tyr Gly Asp Phe
    930                 935                 940


Val Leu Ala Tyr Asp Ile Leu Leu Lys Val Asp His Ile Tyr Asp Ala
945                 950                 955                 960


Ile Arg Asn Tyr Val Thr Gln Lys Pro Tyr Ser Lys Asp Lys Phe Lys
                965                 970                 975


Leu Tyr Phe Gln Asn Pro Gln Phe Met Gly Gly Trp Asp Lys Asp Lys
            980                 985                 990


Glu Thr Asp Tyr Arg Ala Thr Ile  Leu Arg Tyr Gly Ser  Lys Tyr Tyr
        995                 1000                1005


Leu Ala  Ile Met Asp Lys Lys  Tyr Ala Lys Cys Leu  Gln Lys Ile
    1010                1015                1020


Asp Lys  Asp Asp Val Asn Gly  Asn Tyr Glu Lys Ile  Asn Tyr Lys
    1025                1030                1035


Leu Leu  Pro Gly Pro Asn Lys  Met Leu Pro Lys Val  Phe Phe Ser
    1040                1045                1050


Lys Lys  Trp Met Ala Tyr Tyr  Asn Pro Ser Glu Asp  Ile Gln Lys
    1055                1060                1065


Ile Tyr  Lys Asn Gly Thr Phe  Lys Lys Gly Asp Met  Phe Asn Leu
    1070                1075                1080


Asn Asp  Cys His Lys Leu Ile  Asp Phe Phe Lys Asp  Ser Ile Ser
    1085                1090                1095


Arg Tyr  Pro Lys Trp Ser Asn  Ala Tyr Asp Phe Asn  Phe Ser Glu
    1100                1105                1110
```

```
Thr Glu  Lys Tyr Lys Asp Ile  Ala Gly Phe Tyr Arg  Glu Val Glu
    1115                1120                1125

Glu Gln  Gly Tyr Lys Val Ser  Phe Glu Ser Ala Ser  Lys Lys Glu
    1130                1135                1140

Val Asp  Lys Leu Val Glu Glu  Gly Lys Leu Tyr Met  Phe Gln Ile
    1145                1150                1155

Tyr Asn  Lys Asp Phe Ser Asp  Lys Ser His Gly Thr  Pro Asn Leu
    1160                1165                1170

His Thr  Met Tyr Phe Lys Leu  Leu Phe Asp Glu Asn  Asn His Gly
    1175                1180                1185

Gln Ile  Arg Leu Ser Gly Gly  Ala Glu Leu Phe Met  Arg Arg Ala
    1190                1195                1200

Ser Leu  Lys Lys Glu Glu Leu  Val Val His Pro Ala  Asn Ser Pro
    1205                1210                1215

Ile Ala  Asn Lys Asn Pro Asp  Asn Pro Lys Lys Thr  Thr Thr Leu
    1220                1225                1230

Ser Tyr  Asp Val Tyr Lys Asp  Lys Arg Phe Ser Glu  Asp Gln Tyr
    1235                1240                1245

Glu Leu  His Ile Pro Ile Ala  Ile Asn Lys Cys Pro  Lys Asn Ile
    1250                1255                1260

Phe Lys  Ile Asn Thr Glu Val  Arg Val Leu Leu Lys  His Asp Asp
    1265                1270                1275

Asn Pro  Tyr Val Ile Gly Ile  Ala Arg Gly Glu Arg  Asn Leu Leu
    1280                1285                1290
```

```
Tyr Ile  Val Val Val Asp Gly  Lys Gly Asn Ile Val  Glu Gln Tyr
    1295                1300                1305

Ser Leu  Asn Glu Ile Ile Asn  Asn Phe Asn Gly Ile  Arg Ile Lys
    1310                1315                1320

Thr Asp  Tyr His Ser Leu Leu  Asp Lys Lys Glu Lys  Glu Arg Phe
    1325                1330                1335

Glu Ala  Arg Gln Asn Trp Thr  Ser Ile Glu Asn Ile  Lys Glu Leu
    1340                1345                1350

Lys Ala  Gly Tyr Ile Ser Gln  Val Val His Lys Ile  Cys Glu Leu
    1355                1360                1365

Val Glu  Lys Tyr Asp Ala Val  Ile Ala Leu Ala Asp  Leu Asn Ser
    1370                1375                1380

Gly Phe  Lys Asn Ser Arg Val  Lys Val Glu Lys Gln  Val Tyr Gln
    1385                1390                1395

Lys Phe  Glu Lys Met Leu Ile  Asp Lys Leu Asn Tyr  Met Val Asp
    1400                1405                1410

Lys Lys  Ser Asn Pro Cys Ala  Thr Gly Gly Ala Leu  Lys Gly Tyr
    1415                1420                1425

Gln Ile  Thr Asn Lys Phe Glu  Ser Phe Lys Ser Met  Ser Thr Gln
    1430                1435                1440

Asn Gly  Phe Ile Phe Tyr Ile  Pro Ala Trp Leu Thr  Ser Lys Ile
    1445                1450                1455

Asp Pro  Ser Thr Gly Phe Val  Asn Leu Leu Lys Thr  Lys Tyr Thr
    1460                1465                1470

Ser Ile  Ala Asp Ser Lys Lys  Phe Ile Ser Ser Phe  Asp Arg Ile
    1475                1480                1485
```

```
Met Tyr  Val Pro Glu Glu Asp  Leu Phe Glu Phe Ala  Leu Asp Tyr
    1490                1495                1500

Lys Asn  Phe Ser Arg Thr Asp  Ala Asp Tyr Ile Lys  Lys Trp Lys
    1505                1510                1515

Leu Tyr  Ser Tyr Gly Asn Arg  Ile Arg Ile Phe Arg  Asn Pro Lys
    1520                1525                1530

Lys Asn  Asn Val Phe Asp Trp  Glu Glu Val Cys Leu  Thr Ser Ala
    1535                1540                1545

Tyr Lys  Glu Leu Phe Asn Lys  Tyr Gly Ile Asn Tyr  Gln Gln Gly
    1550                1555                1560

Asp Ile  Arg Ala Leu Leu Cys  Glu Gln Ser Asp Lys  Ala Phe Tyr
    1565                1570                1575

Ser Ser  Phe Met Ala Leu Met  Ser Leu Met Leu Gln  Met Arg Asn
    1580                1585                1590

Ser Ile  Thr Gly Arg Thr Asp  Val Ala Phe Leu Ile  Ser Pro Val
    1595                1600                1605

Lys Asn  Ser Asp Gly Ile Phe  Tyr Asp Ser Arg Asn  Tyr Glu Ala
    1610                1615                1620

Gln Glu  Asn Ala Ile Leu Pro  Lys Asn Ala Asp Ala  Asn Gly Ala
    1625                1630                1635

Tyr Asn  Ile Ala Arg Lys Val  Leu Trp Ala Ile Gly  Gln Phe Lys
    1640                1645                1650

Lys Ala  Glu Asp Glu Lys Leu  Asp Lys Val Lys Ile  Ala Ile Ser
    1655                1660                1665
```

```
Asn Lys  Glu Trp Leu Glu Tyr  Ala Gln Thr Ser Val  Lys His Gly
    1670                1675                1680


Ser Pro  Lys Lys Lys Arg Lys  Val
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```

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atcggcgagg gctggaacag gcccatcggc aggcacgacc caaccgctca cgccgagatc      180

atggctctca ggcagggcgg cctggtcatg cagaactaca ggctgatcga cgcgaccctc      240

tacgtgaccc tcgagccctg cgtcatggta agtttctgct tctacctttg atatatatat      300

aataattatc attaattagt agtaatataa tatttcaaat atttttttca aaataaaaga      360

atgtagtata tagcaattgc ttttctgtag tttataagtg tgtatatttt aatttataac      420

ttttctaata tatgaccaaa atttgttgat gtgcagtgcg cgggcgccat gatccactcc      480

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gcggacgagt gcgctgcgct cctgtccgac ttcttcagga tgcgcaggca ggagatcaag      660

gcccagaaga aggcgcagtc cagcaccgac tccggcggct ccagcggcgg ctccagcggc      720

agcgagaccc cgggcacgtc cgagagcgcg acgcccgaga gcagcggcgg ctccagcggc      780

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aagagggcgc gggatgagcg cgaggtgccg gtgggggccg tgctcgtcct gaacaaccgc      900

gtgatcgggg agggctggaa ccgggctatc ggcctccacg acccaacggc ccatgccgag      960

atcatggccc tgaggcaggg cggcctggtc atgcaaaact acaggctcat cgacgccacc     1020
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Val Leu Val His Asn Asn Arg Val Ile Gly Glu Gly Trp Asn Arg Pro
        35                  40                  45

Ile Gly Arg His Asp Pro Thr Ala His Ala Glu Ile Met Ala Leu Arg
    50                  55                  60

Gln Gly Gly Leu Val Met Gln Asn Tyr Arg Leu Ile Asp Ala Thr Leu
65                  70                  75                  80

Tyr Val Thr Leu Glu Pro Cys Val Met Val Ser Phe Cys Phe Tyr Leu
                85                  90                  95

Tyr Ile Tyr Asn Asn Tyr His Leu Val Val Ile Tyr Phe Lys Tyr Phe
            100                 105                 110

Phe Gln Asn Lys Arg Met Tyr Ile Ala Ile Ala Phe Leu Phe Ile Ser
        115                 120                 125

Val Tyr Ile Leu Ile Tyr Asn Phe Ser Asn Ile Pro Lys Phe Val Asp
    130                 135                 140

Val Gln Cys Ala Gly Ala Met Ile His Ser Arg Ile Gly Arg Val Val
145                 150                 155                 160

Phe Gly Ala Arg Asp Ala Lys Thr Gly Ala Ala Gly Ser Leu Met Asp
                165                 170                 175

Val Leu His His Pro Gly Met Asn His Arg Val Glu Ile Thr Glu Gly
            180                 185                 190

Ile Leu Ala Asp Glu Cys Ala Ala Leu Leu Ser Asp Phe Phe Arg Met
        195                 200                 205
```

```
Arg Arg Gln Glu Ile Lys Ala Gln Lys Lys Ala Gln Ser Ser Thr Asp
    210                 215                 220

Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Ser Glu Thr Pro Gly Thr
225                 230                 235                 240

Ser Glu Ser Ala Thr Pro Glu Ser Ser Gly Gly Ser Ser Gly Gly Ser
                245                 250                 255

Ser Glu Val Glu Phe Ser His Glu Tyr Trp Met Arg His Ala Leu Thr
            260                 265                 270

Leu Ala Lys Arg Ala Arg Asp Glu Arg Glu Val Pro Val Gly Ala Val
        275                 280                 285

Leu Val Leu Asn Asn Arg Val Ile Gly Glu Gly Trp Asn Arg Ala Ile
    290                 295                 300

Gly Leu His Asp Pro Thr Ala His Ala Glu Ile Met Ala Leu Arg Gln
305                 310                 315                 320

Gly Gly Leu Val Met Gln Asn Tyr Arg Leu Ile Asp Ala Thr Leu Tyr
                325                 330                 335

Val Thr Phe Glu Pro Cys Val Met Cys Ala Gly Ala Met Ile His Ser
            340                 345                 350

Arg Ile Gly Arg Val Val Phe Gly Val Arg Asn Ala Lys Thr Gly Ala
        355                 360                 365

Ala Gly Ser Leu Met Asp Val Leu His Tyr Pro Gly Met Asn His Arg
    370                 375                 380

Val Glu Ile Thr Glu Gly Ile Leu Ala Asp Glu Cys Ala Ala Leu Leu
385                 390                 395                 400

Cys Tyr Phe Phe Arg Met Pro Arg Gln Val Phe Asn Ala Gln Lys Lys
                405                 410                 415
```

```
Ala Gln Ser Ser Thr Asp Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
            420                 425                 430

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly
        435                 440                 445

Gly Gly Gly Ser Met Ser Lys Leu Glu Lys Phe Thr Asn Cys Tyr Ser
    450                 455                 460

Leu Ser Lys Thr Leu Arg Phe Lys Ala Ile Pro Val Gly Lys Thr Gln
465                 470                 475                 480

Glu Asn Ile Asp Asn Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala
                485                 490                 495

Glu Asp Tyr Lys Gly Val Lys Lys Leu Leu Asp Arg Tyr Tyr Leu Ser
            500                 505                 510

Phe Ile Asn Asp Val Leu His Ser Ile Lys Leu Lys Asn Leu Asn Asn
        515                 520                 525

Tyr Ile Ser Leu Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn Lys
    530                 535                 540

Glu Leu Glu Asn Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys Ala
545                 550                 555                 560

Phe Lys Gly Asn Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile Ile
                565                 570                 575

Glu Thr Ile Leu Pro Glu Phe Leu Asp Asp Lys Asp Glu Ile Ala Leu
            580                 585                 590

Val Asn Ser Phe Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe Phe Asp
        595                 600                 605
```

```
Asn Arg Glu Asn Met Phe Ser Glu Glu Ala Lys Ser Thr Ser Ile Ala
    610                 615                 620

Phe Arg Cys Ile Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn Met Asp
625                 630                 635                 640

Ile Phe Glu Lys Val Asp Ala Ile Phe Asp Lys His Glu Val Gln Glu
                645                 650                 655

Ile Lys Glu Lys Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp Phe Phe
            660                 665                 670

Glu Gly Glu Phe Phe Asn Phe Val Leu Thr Gln Glu Gly Ile Asp Val
        675                 680                 685

Tyr Asn Ala Ile Ile Gly Gly Phe Val Thr Glu Ser Gly Glu Lys Ile
    690                 695                 700

Lys Gly Leu Asn Glu Tyr Ile Asn Leu Tyr Asn Gln Lys Thr Lys Gln
705                 710                 715                 720

Lys Leu Pro Lys Phe Lys Pro Leu Tyr Lys Gln Val Leu Ser Asp Arg
                725                 730                 735

Glu Ser Leu Ser Phe Tyr Gly Glu Gly Tyr Thr Ser Asp Glu Glu Val
            740                 745                 750

Leu Glu Val Phe Arg Asn Thr Leu Asn Lys Asn Ser Glu Ile Phe Ser
        755                 760                 765

Ser Ile Lys Lys Leu Glu Lys Leu Phe Lys Asn Phe Asp Glu Tyr Ser
    770                 775                 780

Ser Ala Gly Ile Phe Val Lys Asn Gly Pro Ala Ile Ser Thr Ile Ser
785                 790                 795                 800

Lys Asp Ile Phe Gly Glu Trp Asn Val Ile Arg Asp Lys Trp Asn Ala
                805                 810                 815
```

```
Glu Tyr Asp Asp Ile His Leu Lys Lys Lys Ala Val Val Thr Glu Lys
            820                 825                 830

Tyr Glu Asp Asp Arg Arg Lys Ser Phe Lys Lys Ile Gly Ser Phe Ser
        835                 840                 845

Leu Glu Gln Leu Gln Glu Tyr Ala Asp Ala Asp Leu Ser Val Val Glu
    850                 855                 860

Lys Leu Lys Glu Ile Ile Ile Gln Lys Val Asp Glu Ile Tyr Lys Val
865                 870                 875                 880

Tyr Gly Ser Ser Glu Lys Leu Phe Asp Ala Asp Phe Val Leu Glu Lys
                885                 890                 895

Ser Leu Lys Lys Asn Asp Ala Val Val Ala Ile Met Lys Asp Leu Leu
            900                 905                 910

Asp Ser Val Lys Ser Phe Glu Asn Tyr Ile Lys Ala Phe Phe Gly Glu
        915                 920                 925

Gly Lys Glu Thr Asn Arg Asp Glu Ser Phe Tyr Gly Asp Phe Val Leu
    930                 935                 940

Ala Tyr Asp Ile Leu Leu Lys Val Asp His Ile Tyr Asp Ala Ile Arg
945                 950                 955                 960

Asn Tyr Val Thr Gln Lys Pro Tyr Ser Lys Asp Lys Phe Lys Leu Tyr
                965                 970                 975

Phe Gln Asn Pro Gln Phe Met Gly Gly Trp Asp Lys Asp Lys Glu Thr
            980                 985                 990

Asp Tyr Arg Ala Thr Ile Leu Arg  Tyr Gly Ser Lys Tyr  Tyr Leu Ala
        995                 1000                1005
```

```
Ile Met  Asp Lys Lys Tyr Ala  Lys Cys Leu Gln Lys  Ile Asp Lys
    1010                1015                1020

Asp Asp  Val Asn Gly Asn Tyr  Glu Lys Ile Asn Tyr  Lys Leu Leu
    1025                1030                1035

Pro Gly  Pro Asn Lys Met Leu  Pro Lys Val Phe Phe  Ser Lys Lys
    1040                1045                1050

Trp Met  Ala Tyr Tyr Asn Pro  Ser Glu Asp Ile Gln  Lys Ile Tyr
    1055                1060                1065

Lys Asn  Gly Thr Phe Lys Lys  Gly Asp Met Phe Asn  Leu Asn Asp
    1070                1075                1080

Cys His  Lys Leu Ile Asp Phe  Phe Lys Asp Ser Ile  Ser Arg Tyr
    1085                1090                1095

Pro Lys  Trp Ser Asn Ala Tyr  Asp Phe Asn Phe Ser  Glu Thr Glu
    1100                1105                1110

Lys Tyr  Lys Asp Ile Ala Gly  Phe Tyr Arg Glu Val  Glu Glu Gln
    1115                1120                1125

Gly Tyr  Lys Val Ser Phe Glu  Ser Ala Ser Lys Lys  Glu Val Asp
    1130                1135                1140

Lys Leu  Val Glu Glu Gly Lys  Leu Tyr Met Phe Gln  Ile Tyr Asn
    1145                1150                1155

Lys Asp  Phe Ser Asp Lys Ser  His Gly Thr Pro Asn  Leu His Thr
    1160                1165                1170

Met Tyr  Phe Lys Leu Leu Phe  Asp Glu Asn Asn His  Gly Gln Ile
    1175                1180                1185

Arg Leu  Ser Gly Gly Ala Glu  Leu Phe Met Arg Arg  Ala Ser Leu
    1190                1195                1200
```

```
Lys Lys  Glu Glu Leu Val Val  His Pro Ala Asn Ser  Pro Ile Ala
    1205                1210                1215

Asn Lys  Asn Pro Asp Asn Pro  Lys Lys Thr Thr Thr  Leu Ser Tyr
    1220                1225                1230

Asp Val  Tyr Lys Asp Lys Arg  Phe Ser Glu Asp Gln  Tyr Glu Leu
    1235                1240                1245

His Ile  Pro Ile Ala Ile Asn  Lys Cys Pro Lys Asn  Ile Phe Lys
    1250                1255                1260

Ile Asn  Thr Glu Val Arg Val  Leu Leu Lys His Asp  Asp Asn Pro
    1265                1270                1275

Tyr Val  Ile Gly Ile Ala Arg  Gly Glu Arg Asn Leu  Leu Tyr Ile
    1280                1285                1290

Val Val  Val Asp Gly Lys Gly  Asn Ile Val Glu Gln  Tyr Ser Leu
    1295                1300                1305

Asn Glu  Ile Ile Asn Asn Phe  Asn Gly Ile Arg Ile  Lys Thr Asp
    1310                1315                1320

Tyr His  Ser Leu Leu Asp Lys  Lys Glu Lys Glu Arg  Phe Glu Ala
    1325                1330                1335

Arg Gln  Asn Trp Thr Ser Ile  Glu Asn Ile Lys Glu  Leu Lys Ala
    1340                1345                1350

Gly Tyr  Ile Ser Gln Val Val  His Lys Ile Cys Glu  Leu Val Glu
    1355                1360                1365

Lys Tyr  Asp Ala Val Ile Ala  Leu Ala Asp Leu Asn  Ser Gly Phe
    1370                1375                1380
```

```
Lys Asn  Ser Arg Val Lys Val  Glu Lys Gln Val Tyr  Gln Lys Phe
    1385                1390                1395

Glu Lys  Met Leu Ile Asp Lys  Leu Asn Tyr Met Val  Asp Lys Lys
    1400                1405                1410

Ser Asn  Pro Cys Ala Thr Gly  Gly Ala Leu Lys Gly  Tyr Gln Ile
    1415                1420                1425

Thr Asn  Lys Phe Glu Ser Phe  Lys Ser Met Ser Thr  Gln Asn Gly
    1430                1435                1440

Phe Ile  Phe Tyr Ile Pro Ala  Trp Leu Thr Ser Lys  Ile Asp Pro
    1445                1450                1455

Ser Thr  Gly Phe Val Asn Leu  Leu Lys Thr Lys Tyr  Thr Ser Ile
    1460                1465                1470

Ala Asp  Ser Lys Lys Phe Ile  Ser Ser Phe Asp Arg  Ile Met Tyr
    1475                1480                1485

Val Pro  Glu Glu Asp Leu Phe  Glu Phe Ala Leu Asp  Tyr Lys Asn
    1490                1495                1500

Phe Ser  Arg Thr Asp Ala Asp  Tyr Ile Lys Lys Trp  Lys Leu Tyr
    1505                1510                1515

Ser Tyr  Gly Asn Arg Ile Arg  Ile Phe Arg Asn Pro  Lys Lys Asn
    1520                1525                1530

Asn Val  Phe Asp Trp Glu Glu  Val Cys Leu Thr Ser  Ala Tyr Lys
    1535                1540                1545

Glu Leu  Phe Asn Lys Tyr Gly  Ile Asn Tyr Gln Gln  Gly Asp Ile
    1550                1555                1560

Arg Ala  Leu Leu Cys Glu Gln  Ser Asp Lys Ala Phe  Tyr Ser Ser
    1565                1570                1575
```

```
Phe Met  Ala Leu Met Ser Leu  Met Leu Gln Met Arg  Asn Ser Ile
    1580                1585                1590

Thr Gly  Arg Thr Asp Val Ala  Phe Leu Ile Ser Pro  Val Lys Asn
    1595                1600                1605

Ser Asp  Gly Ile Phe Tyr Asp  Ser Arg Asn Tyr Glu  Ala Gln Glu
    1610                1615                1620

Asn Ala  Ile Leu Pro Lys Asn  Ala Asp Ala Asn Gly  Ala Tyr Asn
    1625                1630                1635

Ile Ala  Arg Lys Val Leu Trp  Ala Ile Gly Gln Phe  Lys Lys Ala
    1640                1645                1650

Glu Asp  Glu Lys Leu Asp Lys  Val Lys Ile Ala Ile  Ser Asn Lys
    1655                1660                1665

Glu Trp  Leu Glu Tyr Ala Gln  Thr Ser Val Lys His  Gly Ser Pro
    1670                1675                1680

Lys Lys  Lys Arg Lys Val
    1685
```

<210> 82
<211> 4936
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<220>
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<400> 82

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tgctacgtgc tcttcgagct gaagaggcgc ggcgagcgca gggcctgctt ctggggctac      180

gccgtgaaca agccgcagag cggcaccgag cgcggcatcc acgccgagat cttcagcatc      240
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cgcaaggtgg aggagtacct cagggacaac ccgggccagt tcaccatcaa ctggtacagc 300

tcctggagcc cggtaagttt ctgcttctac ctttgatata tatataataa ttatcattaa 360

ttagtagtaa tataatattt caaatatttt tttcaaaata aaagaatgta gtatatagca 420

attgcttttc tgtagtttat aagtgtgtat attttaattt ataacttttc taatatatga 480

ccaaaatttg ttgatgtgca gtgcgcggac tgcgccgaga agatcctgga gtggtacaac 540

caggagctga ggggcaacgg ccacaccctg aagatctggg cctgcaagct ctactacgag 600

aagaacgcga ggaaccagat cggcctgtgg aacctccgcg acaacggcgt cggcctcaac 660

gtgatggtct ccgagcacta ccagtgctgc cgcaagatct tcatccagtc cagccacaac 720

cagctcaacg agaacaggtg gctggagaag accctgaaga gggccgagaa gcgcaggtcc 780

gagctcagca tcatgatcca ggtgaagatc ctccacacca cgaagtcccc cgccgtgggg 840

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caaggagctc gagaacctgg agatcaacct gaggaaggag atcgccaagg cgttcaaggg 1260

caacgagggc tacaagtccc tcttcaagaa ggacatcatc gagacgatcc tcccggagtt 1320

cctggacgac aaggacgaga tcgccctggt caactccttc aacggcttca ccacggcgtt 1380

caccggcttc ttcgacaacc gcgagaacat gttcagcgag gaggccaagt ccacgagcat 1440

cgcgttcagg tgcatcaacg agaacctcac ccgctacatc tccaacatgg acatcttcga 1500

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cgacgagaac gtgatgctcc tgacctcgga cgctcccgag tacaagccat gggccctggt 4860

catccaggac agcaacggcg agaacaagat caagatgctc tccggcggca gcccgaagaa 4920

gaagcgcaaa gtgtga 4936

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<211> 1636
<212> PRT
<213> Artificial Sequence

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<223> Fusion protein

<400> 83

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Ile His Glu Lys Leu Asp Ile Tyr Thr Phe Lys Lys Gln Phe Phe Asn
20 25 30

Asn Lys Lys Ser Val Ser His Arg Cys Tyr Val Leu Phe Glu Leu Lys
35 40 45

Arg Arg Gly Glu Arg Arg Ala Cys Phe Trp Gly Tyr Ala Val Asn Lys
50 55 60

Pro Gln Ser Gly Thr Glu Arg Gly Ile His Ala Glu Ile Phe Ser Ile
65 70 75 80

Arg Lys Val Glu Glu Tyr Leu Arg Asp Asn Pro Gly Gln Phe Thr Ile
85 90 95

Asn Trp Tyr Ser Ser Trp Ser Pro Val Ser Phe Cys Phe Tyr Leu Tyr
100 105 110

Ile Tyr Asn Asn Tyr His Leu Val Val Ile Tyr Phe Lys Tyr Phe Phe
115 120 125

```
Gln Asn Lys Arg Met Tyr Ile Ala Ile Ala Phe Leu Phe Ile Ser Val
    130                 135                 140

Tyr Ile Leu Ile Tyr Asn Phe Ser Asn Ile Pro Lys Phe Val Asp Val
145                 150                 155                 160

Gln Cys Ala Asp Cys Ala Glu Lys Ile Leu Glu Trp Tyr Asn Gln Glu
                165                 170                 175

Leu Arg Gly Asn Gly His Thr Leu Lys Ile Trp Ala Cys Lys Leu Tyr
            180                 185                 190

Tyr Glu Lys Asn Ala Arg Asn Gln Ile Gly Leu Trp Asn Leu Arg Asp
        195                 200                 205

Asn Gly Val Gly Leu Asn Val Met Val Ser Glu His Tyr Gln Cys Cys
    210                 215                 220

Arg Lys Ile Phe Ile Gln Ser Ser His Asn Gln Leu Asn Glu Asn Arg
225                 230                 235                 240

Trp Leu Glu Lys Thr Leu Lys Arg Ala Glu Lys Arg Arg Ser Glu Leu
                245                 250                 255

Ser Ile Met Ile Gln Val Lys Ile Leu His Thr Thr Lys Ser Pro Ala
            260                 265                 270

Val Gly Gly Arg Gly Leu Arg Arg Gly Arg Glu Arg Arg Arg Gly Leu
        275                 280                 285

Trp Gly Arg Arg Gln Arg Arg Gly Arg Gln Arg Gly Arg Arg Val Asp
    290                 295                 300

Glu Gln Ala Gly Glu Val His Glu Leu Leu Leu Pro Gln Gln Asp Pro
305                 310                 315                 320
```

```
Glu Val Gln Gly Asp Pro Gly Arg Gln Asp Pro Gly Glu His Arg Gln
                325                 330                 335

Gln Ala Ala Ala Gly Gly Gly Arg Glu Glu Gly Gly Leu Gln Gly Arg
            340                 345                 350

Glu Glu Ala Pro Gly Pro Leu Leu Pro Val Leu His Gln Arg Arg Ala
        355                 360                 365

Pro Gln His Gln Ala Gln Glu Pro Glu Gln Leu His Gln Pro Leu Gln
    370                 375                 380

Glu Glu Asp Ala His Arg Glu Gly Glu Gln Gly Ala Arg Glu Pro Gly
385                 390                 395                 400

Asp Gln Pro Glu Glu Gly Asp Arg Gln Gly Val Gln Gly Gln Arg Gly
                405                 410                 415

Leu Gln Val Pro Leu Gln Glu Gly His His Arg Asp Asp Pro Pro Gly
            420                 425                 430

Val Pro Gly Arg Gln Gly Arg Asp Arg Pro Gly Gln Leu Leu Gln Arg
        435                 440                 445

Leu His His Gly Val His Arg Leu Leu Arg Gln Pro Arg Glu His Val
    450                 455                 460

Gln Arg Gly Gly Gln Val His Glu His Arg Val Gln Val His Gln Arg
465                 470                 475                 480

Glu Pro His Pro Leu His Leu Gln His Gly His Leu Arg Glu Gly Arg
                485                 490                 495

Arg Asp Leu Arg Gln Ala Arg Gly Ala Gly Asp Gln Gly Glu Asp Pro
            500                 505                 510

Glu Gln Arg Leu Arg Arg Arg Gly Leu Leu Arg Gly Arg Val Leu Gln
        515                 520                 525
```

```
Leu Arg Pro His Ala Gly Gly His Arg Arg Val Gln Arg His His Arg
    530                 535                 540

Trp Leu Arg Asp Arg Val Arg Arg Glu Asp Gln Gly Pro Glu Arg Val
545                 550                 555                 560

His Gln Pro Leu Gln Pro Glu Asp Gln Ala Glu Ala Ala Glu Val Gln
                565                 570                 575

Ala Pro Val Gln Ala Gly Ala Leu Arg Gln Gly Val Pro Gln Leu Leu
            580                 585                 590

Arg Arg Gly Leu His Glu Arg Arg Gly Gly Pro Gly Gly Val Pro Gln
        595                 600                 605

His Pro Gln Gln Glu Gln Arg Asp Leu Leu Gln His Gln Glu Ala Arg
    610                 615                 620

Glu Ala Val Gln Glu Leu Arg Arg Val Leu Gln Arg Arg His Leu Arg
625                 630                 635                 640

Gln Glu Arg Pro Gly Asp Leu His Asp Gln Gln Gly His Leu Arg Arg
                645                 650                 655

Val Glu Arg Asp Pro Arg Gln Val Glu Arg Arg Val Arg Arg His Pro
            660                 665                 670

Pro Gln Glu Glu Gly Gly Gly His Arg Glu Val Arg Gly Arg Gln Ala
        675                 680                 685

Gln Val Leu Gln Glu Asp Arg Leu Leu Gln Pro Arg Ala Ala Ala Gly
    690                 695                 700

Val Arg Arg Arg Gly Pro Glu Arg Gly Arg Glu Ala Gln Gly Asp His
705                 710                 715                 720
```

```
His Pro Glu Gly Arg Arg Asp Leu Gln Gly Val Arg Leu Gln Arg Glu
                725                 730                 735

Ala Leu Arg Arg Gly Leu Arg Pro Arg Glu Val Pro Glu Glu Glu Arg
            740                 745                 750

Arg Arg Gly Arg Asp His Glu Gly Pro Pro Gly Leu Arg Glu Glu Leu
        755                 760                 765

Arg Glu Leu His Gln Gly Leu Leu Arg Arg Gly Gln Gly Asp Glu Gln
    770                 775                 780

Gly Arg Val Leu Leu Arg Arg Leu Arg Pro Gly Leu Arg His Pro Pro
785                 790                 795                 800

Glu Gly Gly Pro His Leu Arg Arg Asp Pro Gln Leu Arg Asp Pro Glu
                805                 810                 815

Ala Val Gln Gln Gly Gln Val Gln Ala Leu Leu Pro Glu Pro Pro Val
            820                 825                 830

His Gly Arg Leu Gly Gln Gly Gln Gly Asp Gly Leu Gln Gly Asp His
        835                 840                 845

Pro Ala Leu Arg Gln Gln Val Leu Pro Arg His His Gly Gln Glu Val
    850                 855                 860

Arg Glu Val Pro Ala Glu Asp Arg Gln Gly Arg Arg Gln Arg Gln Leu
865                 870                 875                 880

Arg Glu Asp Gln Leu Gln Ala Pro Ala Gly Pro Gln Gln Asp Ala Pro
                885                 890                 895

Glu Gly Val Leu Leu Gln Glu Val Asp Gly Leu Leu Gln Pro Gln Arg
            900                 905                 910

Gly His Pro Glu Asp Leu Gln Glu Arg His Val Gln Glu Gly Arg His
        915                 920                 925
```

```
Val Gln Pro Glu Arg Leu Pro Gln Ala His Arg Leu Leu Gln Gly Leu
    930                 935                 940

His Gln Pro Leu Pro Glu Val Val Gln Arg Leu Arg Leu Gln Leu Gln
945                 950                 955                 960

Arg Asp Arg Glu Val Gln Gly His Arg Gly Leu Leu Pro Arg Gly Arg
                965                 970                 975

Gly Ala Gly Leu Gln Gly Val Leu Arg Val Arg Gln Gln Glu Gly Gly
            980                 985                 990

Arg Gln Ala Gly Gly Gly Gly Gln  Ala Leu His Val Pro  Asp Leu Gln
        995                 1000                1005

Gln Gly  Leu Leu Arg Gln Glu  Pro Arg His Ala Gln  Pro Ala His
    1010                1015                1020

His Val  Leu Gln Ala Pro Val  Arg Arg Glu Gln Pro  Arg Pro Asp
    1025                1030                1035

Gln Ala  Val Arg Arg Arg Arg  Ala Leu His Glu Glu  Gly Glu Pro
    1040                1045                1050

Glu Glu  Gly Gly Ala Gly Gly  Pro Pro Arg Gln Pro  Asn Arg Glu
    1055                1060                1065

Gln Glu  Pro Gly Gln Pro Gln  Glu Asp His Asp Pro  Val Leu Arg
    1070                1075                1080

Arg Val  Gln Gly Gln Glu Val  Gln Arg Gly Pro Val  Arg Ala Pro
    1085                1090                1095

His Pro  Asp Arg Asp Gln Gln  Val Pro Gln Glu His  Leu Gln Asp
    1100                1105                1110
```

```
Gln His  Arg Gly Pro Arg Ala  Pro Glu Ala Arg Arg  Gln Pro Leu
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Arg Asp  Arg His Arg Gly Arg  Glu Glu Pro Pro Val  His Arg Gly
    1130                1135                1140

Arg Gly  Arg Gln Gly Gln His  Arg Gly Ala Val Leu  Pro Gln Arg
    1145                1150                1155

Asp His  Gln Gln Leu Gln Arg  His Gln Asp Gln Asp  Gly Leu Pro
    1160                1165                1170

Gln Pro  Pro Gly Gln Glu Gly  Glu Gly Glu Val Arg  Gly Pro Pro
    1175                1180                1185

Glu Leu  Asp Leu His Arg Glu  His Gln Gly Ala Glu  Gly Gly Leu
    1190                1195                1200

His Gln  Pro Gly Arg Ala Gln  Asp Leu Arg Ala Arg  Arg Glu Val
    1205                1210                1215

Arg Arg  Arg Asp Arg Pro Arg  Gly Pro Glu Leu Arg  Leu Gln Glu
    1220                1225                1230

Gln Pro  Arg Gln Gly Gly Glu  Ala Gly Leu Pro Glu  Val Arg Glu
    1235                1240                1245

Asp Ala  His Arg Gln Ala Glu  Leu His Gly Gly Gln  Glu Val Gln
    1250                1255                1260

Pro Leu  Arg Tyr Gly Arg Arg  Ala Glu Gly Leu Pro  Asp His Gln
    1265                1270                1275

Gln Val  Arg Glu Leu Gln Val  His Glu His Ser Glu  Arg Leu His
    1280                1285                1290

Leu Leu  His Pro Gly Val Ala  His Val Gln Asp Arg  Pro Gln His
    1295                1300                1305
```

```
Arg Leu  Arg Gln Pro Pro Glu  Asp Glu Val His Leu  His Arg Arg
    1310                1315                1320

Gln Gln  Glu Val His Leu Gln  Leu Arg Pro His His  Val Cys Ala
    1325                1330                1335

Gly Gly  Gly Pro Val Arg Val  Arg Pro Arg Leu Gln  Glu Leu Leu
    1340                1345                1350

Pro His  Gly Arg Gly Leu His  Gln Glu Val Glu Ala  Val Gln Leu
    1355                1360                1365

Arg Gln  Pro His Pro His Leu  Gln Glu Pro Gln Glu  Glu Gln Arg
    1370                1375                1380

Leu Arg  Leu Gly Gly Gly Val  Pro Asp Leu Arg Val  Gln Gly Ala
    1385                1390                1395

Leu Gln  Gln Val Arg His Gln  Leu Pro Ala Gly Arg  His Gln Gly
    1400                1405                1410

Ser Pro  Val Arg Ala Glu Arg  Gln Gly Leu Leu Leu  Gln Leu His
    1415                1420                1425

Gly Ala  Asp Val Pro His Ala  Ala Asp Glu Glu Leu  Asp His Arg
    1430                1435                1440

Gln Asp  Gly Arg Gly Leu Pro  His Leu Pro Gly Glu  Glu Gln Arg
    1445                1450                1455

Arg His  Leu Leu Arg Leu Gln  Glu Leu Arg Gly Pro  Gly Glu Arg
    1460                1465                1470

Asp Pro  Pro Lys Glu Arg Gly  Arg Gln Arg Arg Leu  Gln His Arg
    1475                1480                1485
```

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Gln Glu  Gly Pro Leu Gly Tyr  Arg Pro Val Gln Glu  Gly Gly Gly
    1490                1495                1500

Arg Glu  Ala Gly Gln Gly Glu  Asp Arg His Gln Gln  Gln Gly Val
    1505                1510                1515

Ala Arg  Val Arg Pro Asp Leu  Gly Gln Ala Arg Gln  Pro Glu Glu
    1520                1525                1530

Glu Ala  Gln Gly Val Arg Arg  Gln His Glu Pro Val  Arg His His
    1535                1540                1545

Arg Glu  Gly Asp Arg Gln Ala  Ala Arg Asp Pro Gly  Glu His Pro
    1550                1555                1560

His Ala  Ala Gly Gly Gly Arg  Gly Gly His Arg Gln  Gln Ala Arg
    1565                1570                1575

Val Arg  His Pro Arg Pro His  Gly Leu Arg Arg Val  His Arg Arg
    1580                1585                1590

Glu Arg  Asp Ala Pro Asp Leu  Gly Arg Ser Arg Val  Gln Ala Met
    1595                1600                1605

Gly Pro  Gly His Pro Gly Gln  Gln Arg Arg Glu Gln  Asp Gln Asp
    1610                1615                1620

Ala Leu  Arg Arg Gln Pro Glu  Glu Glu Ala Gln Ser  Val
    1625                1630                1635
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35 40 45

Ile Gly Arg His Asp Pro Thr Ala His Ala Glu Ile Met Ala Leu Arg
50 55 60

Gln Gly Gly Leu Val Met Gln Asn Tyr Arg Leu Ile Asp Ala Thr Leu
65 70 75 80

Tyr Val Thr Leu Glu Pro Cys Val Met Val Ser Phe Cys Phe Tyr Leu
85 90 95

Tyr Ile Tyr Asn Asn Tyr His Leu Val Val Ile Tyr Phe Lys Tyr Phe
100 105 110

Phe Gln Asn Lys Arg Met Tyr Ile Ala Ile Ala Phe Leu Phe Ile Ser
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Val Tyr Ile Leu Ile Tyr Asn Phe Ser Asn Ile Pro Lys Phe Val Asp
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Val Gln Cys Ala Gly Ala Met Ile His Ser Arg Ile Gly Arg Val Val
145                 150                 155                 160

Phe Gly Ala Arg Asp Ala Lys Thr Gly Ala Ala Gly Ser Leu Met Asp
                165                 170                 175

Val Leu His His Pro Gly Met Asn His Arg Val Glu Ile Thr Glu Gly
            180                 185                 190

Ile Leu Ala Asp Glu Cys Ala Ala Leu Leu Ser Asp Phe Phe Arg Met
        195                 200                 205

Arg Arg Gln Glu Ile Lys Ala Gln Lys Lys Ala Gln Ser Ser Thr Asp
    210                 215                 220

Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Ser Glu Thr Pro Gly Thr
225                 230                 235                 240

Ser Glu Ser Ala Thr Pro Glu Ser Ser Gly Gly Ser Ser Gly Gly Ser
                245                 250                 255

Ser Glu Val Glu Phe Ser His Glu Tyr Trp Met Arg His Ala Leu Thr
            260                 265                 270

Leu Ala Lys Arg Ala Arg Asp Glu Arg Glu Val Pro Val Gly Ala Val
        275                 280                 285

Leu Val Leu Asn Asn Arg Val Ile Gly Glu Gly Trp Asn Arg Ala Ile
    290                 295                 300

Gly Leu His Asp Pro Thr Ala His Ala Glu Ile Met Ala Leu Arg Gln
305                 310                 315                 320

Gly Gly Leu Val Met Gln Asn Tyr Arg Leu Ile Asp Ala Thr Leu Tyr
                325                 330                 335
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```
Val Thr Phe Glu Pro Cys Val Met Cys Ala Gly Ala Met Ile His Ser
            340                 345                 350

Arg Ile Gly Arg Val Val Phe Gly Val Arg Asn Ala Lys Thr Gly Ala
        355                 360                 365

Ala Gly Ser Leu Met Asp Val Leu His Tyr Pro Gly Met Asn His Arg
    370                 375                 380

Val Glu Ile Thr Glu Gly Ile Leu Ala Asp Glu Cys Ala Ala Leu Leu
385                 390                 395                 400

Cys Tyr Phe Phe Arg Met Pro Arg Gln Val Phe Asn Ala Gln Lys Lys
                405                 410                 415

Ala Gln Ser Ser Thr Asp Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
            420                 425                 430

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly
        435                 440                 445

Gly Gly Gly Ser Met Ser Lys Leu Glu Lys Phe Thr Asn Cys Tyr Ser
    450                 455                 460

Leu Ser Lys Thr Leu Arg Phe Lys Ala Ile Pro Val Gly Lys Thr Gln
465                 470                 475                 480

Glu Asn Ile Asp Asn Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala
                485                 490                 495

Glu Asp Tyr Lys Gly Val Lys Lys Leu Leu Asp Arg Tyr Tyr Leu Ser
            500                 505                 510

Phe Ile Asn Asp Val Leu His Ser Ile Lys Leu Lys Asn Leu Asn Asn
        515                 520                 525
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Tyr Ile Ser Leu Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn Lys
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Glu Leu Glu Asn Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys Ala
545                 550                 555                 560

Phe Lys Gly Asn Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile Ile
                565                 570                 575

Glu Thr Ile Leu Pro Glu Phe Leu Asp Asp Lys Asp Glu Ile Ala Leu
            580                 585                 590

Val Asn Ser Phe Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe Phe Asp
        595                 600                 605

Asn Arg Glu Asn Met Phe Ser Glu Glu Ala Lys Ser Thr Ser Ile Ala
    610                 615                 620

Phe Arg Cys Ile Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn Met Asp
625                 630                 635                 640

Ile Phe Glu Lys Val Asp Ala Ile Phe Asp Lys His Glu Val Gln Glu
                645                 650                 655

Ile Lys Glu Lys Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp Phe Phe
            660                 665                 670

Glu Gly Glu Phe Phe Asn Phe Val Leu Thr Gln Glu Gly Ile Asp Val
        675                 680                 685

Tyr Asn Ala Ile Ile Gly Gly Phe Val Thr Glu Ser Gly Glu Lys Ile
    690                 695                 700

Lys Gly Leu Asn Glu Tyr Ile Asn Leu Tyr Asn Gln Lys Thr Lys Gln
705                 710                 715                 720

Lys Leu Pro Lys Phe Lys Pro Leu Tyr Lys Gln Val Leu Ser Asp Arg
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Glu Ser Leu Ser Phe Tyr Gly Glu Gly Tyr Thr Ser Asp Glu Glu Val
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Leu Glu Val Phe Arg Asn Thr Leu Asn Lys Asn Ser Glu Ile Phe Ser
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Ser Ile Lys Lys Leu Glu Lys Leu Phe Lys Asn Phe Asp Glu Tyr Ser
    770                 775                 780

Ser Ala Gly Ile Phe Val Lys Asn Gly Pro Ala Ile Ser Thr Ile Ser
785                 790                 795                 800

Lys Asp Ile Phe Gly Glu Trp Asn Val Ile Arg Asp Lys Trp Asn Ala
                805                 810                 815

Glu Tyr Asp Asp Ile His Leu Lys Lys Lys Ala Val Val Thr Glu Lys
            820                 825                 830

Tyr Glu Asp Asp Arg Arg Lys Ser Phe Lys Lys Ile Gly Ser Phe Ser
        835                 840                 845

Leu Glu Gln Leu Gln Glu Tyr Ala Asp Ala Asp Leu Ser Val Val Glu
    850                 855                 860

Lys Leu Lys Glu Ile Ile Ile Gln Lys Val Asp Glu Ile Tyr Lys Val
865                 870                 875                 880

Tyr Gly Ser Ser Glu Lys Leu Phe Asp Ala Asp Phe Val Leu Glu Lys
                885                 890                 895

Ser Leu Lys Lys Asn Asp Ala Val Val Ala Ile Met Lys Asp Leu Leu
            900                 905                 910

Asp Ser Val Lys Ser Phe Glu Asn Tyr Ile Lys Ala Phe Phe Gly Glu
        915                 920                 925
```

```
Gly Lys Glu Thr Asn Arg Asp Glu Ser Phe Tyr Gly Asp Phe Val Leu
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Ala Tyr Asp Ile Leu Leu Lys Val Asp His Ile Tyr Asp Ala Ile Arg
945                 950                 955                 960

Asn Tyr Val Thr Gln Lys Pro Tyr Ser Lys Asp Lys Phe Lys Leu Tyr
                965                 970                 975

Phe Gln Asn Pro Gln Phe Met Gly Gly Trp Asp Lys Asp Lys Glu Thr
            980                 985                 990

Asp Tyr Arg Ala Thr Ile Leu Arg  Tyr Gly Ser Lys Tyr  Tyr Leu Ala
        995                 1000                1005

Ile Met  Asp Lys Lys Tyr Ala  Lys Cys Leu Gln Lys  Ile Asp Lys
    1010                1015                1020

Asp Asp  Val Asn Gly Asn Tyr  Glu Lys Ile Asn Tyr  Lys Leu Leu
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Pro Gly  Pro Asn Lys Met Leu  Pro Lys Val Phe Phe  Ser Lys Lys
    1040                1045                1050

Trp Met  Ala Tyr Tyr Asn Pro  Ser Glu Asp Ile Gln  Lys Ile Tyr
    1055                1060                1065

Lys Asn  Gly Thr Phe Lys Lys  Gly Asp Met Phe Asn  Leu Asn Asp
    1070                1075                1080

Cys His  Lys Leu Ile Asp Phe  Phe Lys Asp Ser Ile  Ser Arg Tyr
    1085                1090                1095

Pro Lys  Trp Ser Asn Ala Tyr  Asp Phe Asn Phe Ser  Glu Thr Glu
    1100                1105                1110

Lys Tyr  Lys Asp Ile Ala Gly  Phe Tyr Arg Glu Val  Glu Glu Gln
    1115                1120                1125
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Gly Tyr  Lys Val Ser Phe Glu  Ser Ala Ser Lys Lys  Glu Val Asp
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Lys Leu  Val Glu Glu Gly Lys  Leu Tyr Met Phe Gln  Ile Tyr Asn
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Lys Asp  Phe Ser Asp Lys Ser  His Gly Thr Pro Asn  Leu His Thr
    1160                1165                1170

Met Tyr  Phe Lys Leu Leu Phe  Asp Glu Asn Asn His  Gly Gln Ile
    1175                1180                1185

Arg Leu  Ser Gly Gly Ala Glu  Leu Phe Met Arg Arg  Ala Ser Leu
    1190                1195                1200

Lys Lys  Glu Glu Leu Val Val  His Pro Ala Asn Ser  Pro Ile Ala
    1205                1210                1215

Asn Lys  Asn Pro Asp Asn Pro  Lys Lys Thr Thr Thr  Leu Ser Tyr
    1220                1225                1230

Asp Val  Tyr Lys Asp Lys Arg  Phe Ser Glu Asp Gln  Tyr Glu Leu
    1235                1240                1245

His Ile  Pro Ile Ala Ile Asn  Lys Cys Pro Lys Asn  Ile Phe Lys
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Ile Asn  Thr Glu Val Arg Val  Leu Leu Lys His Asp  Asp Asn Pro
    1265                1270                1275

Tyr Val  Ile Gly Ile Ala Arg  Gly Glu Arg Asn Leu  Leu Tyr Ile
    1280                1285                1290

Val Val  Val Asp Gly Lys Gly  Asn Ile Val Glu Gln  Tyr Ser Leu
    1295                1300                1305
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Asn Glu  Ile Ile Asn Asn Phe  Asn Gly Ile Arg Ile  Lys Thr Asp
    1310                1315                1320

Tyr His  Ser Leu Leu Asp Lys  Lys Glu Lys Glu Arg  Phe Glu Ala
    1325                1330                1335

Arg Gln  Asn Trp Thr Ser Ile  Glu Asn Ile Lys Glu  Leu Lys Ala
    1340                1345                1350

Gly Tyr  Ile Ser Gln Val Val  His Lys Ile Cys Glu  Leu Val Glu
    1355                1360                1365

Lys Tyr  Asp Ala Val Ile Ala  Leu Ala Asp Leu Asn  Ser Gly Phe
    1370                1375                1380

Lys Asn  Ser Arg Val Lys Val  Glu Lys Gln Val Tyr  Gln Lys Phe
    1385                1390                1395

Glu Lys  Met Leu Ile Asp Lys  Leu Asn Tyr Met Val  Asp Lys Lys
    1400                1405                1410

Ser Asn  Pro Cys Ala Thr Gly  Gly Ala Leu Lys Gly  Tyr Gln Ile
    1415                1420                1425

Thr Asn  Lys Phe Glu Ser Phe  Lys Ser Met Ser Thr  Gln Asn Gly
    1430                1435                1440

Phe Ile  Phe Tyr Ile Pro Ala  Trp Leu Thr Ser Lys  Ile Asp Pro
    1445                1450                1455

Ser Thr  Gly Phe Val Asn Leu  Leu Lys Thr Lys Tyr  Thr Ser Ile
    1460                1465                1470

Ala Asp  Ser Lys Lys Phe Ile  Ser Ser Phe Asp Arg  Ile Met Tyr
    1475                1480                1485

Val Pro  Glu Glu Asp Leu Phe  Glu Phe Ala Leu Asp  Tyr Lys Asn
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Phe Ser  Arg Thr Asp Ala Asp  Tyr Ile Lys Lys Trp  Lys Leu Tyr
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Ser Tyr  Gly Asn Arg Ile Arg  Ile Phe Arg Asn Pro  Lys Lys Asn
    1520                1525                1530

Asn Val  Phe Asp Trp Glu Glu  Val Cys Leu Thr Ser  Ala Tyr Lys
    1535                1540                1545

Glu Leu  Phe Asn Lys Tyr Gly  Ile Asn Tyr Gln Gln  Gly Asp Ile
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Arg Ala  Leu Leu Cys Glu Gln  Ser Asp Lys Ala Phe  Tyr Ser Ser
    1565                1570                1575

Phe Met  Ala Leu Met Ser Leu  Met Leu Gln Met Arg  Asn Ser Ile
    1580                1585                1590

Thr Gly  Arg Thr Asp Val Ala  Phe Leu Ile Ser Pro  Val Lys Asn
    1595                1600                1605

Ser Asp  Gly Ile Phe Tyr Asp  Ser Arg Asn Tyr Glu  Ala Gln Glu
    1610                1615                1620

Asn Ala  Ile Leu Pro Lys Asn  Ala Asp Ala Asn Gly  Ala Tyr Asn
    1625                1630                1635

Ile Ala  Arg Lys Val Leu Trp  Ala Ile Gly Gln Phe  Lys Lys Ala
    1640                1645                1650

Glu Asp  Glu Lys Leu Asp Lys  Val Lys Ile Ala Ile  Ser Asn Lys
    1655                1660                1665

Glu Trp  Leu Glu Tyr Ala Gln  Thr Ser Val Lys His  Gly Ser Pro
    1670                1675                1680
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Lys Lys  Lys Arg Lys Val Gly  Ser Ala Glu Tyr Val  Arg Ala Leu
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Phe Asp  Phe Asn Gly Asn Asp  Glu Glu Asp Leu Pro  Phe Lys Lys
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Gly Asp  Ile Leu Arg Ile Arg  Asp Lys Pro Glu Glu  Gln Trp Trp
    1715                1720                1725

Asn Ala  Glu Asp Ser Glu Gly  Lys Arg Gly Met Ile  Pro Val Pro
    1730                1735                1740

Tyr Val  Glu Lys Tyr Met Thr  Asp Ala Glu Tyr Val  Arg Ile His
    1745                1750                1755

Glu Lys  Leu Asp Ile Tyr Thr  Phe Lys Lys Gln Phe  Phe Asn Asn
    1760                1765                1770

Lys Lys  Ser Val Ser His Arg  Cys Tyr Val Leu Phe  Glu Leu Lys
    1775                1780                1785

Arg Arg  Gly Glu Arg Arg Ala  Cys Phe Trp Gly Tyr  Ala Val Asn
    1790                1795                1800

Lys Pro  Gln Ser Gly Thr Glu  Arg Gly Ile His Ala  Glu Ile Phe
    1805                1810                1815

Ser Ile  Arg Lys Val Glu Glu  Tyr Leu Arg Asp Asn  Pro Gly Gln
    1820                1825                1830

Phe Thr  Ile Asn Trp Tyr Ser  Ser Trp Ser Pro Cys  Ala Asp Cys
    1835                1840                1845

Ala Glu  Lys Ile Leu Glu Trp  Tyr Asn Gln Glu Leu  Arg Gly Asn
    1850                1855                1860

Gly His  Thr Leu Lys Ile Trp  Ala Cys Lys Leu Tyr  Tyr Glu Lys
    1865                1870                1875
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Asn Ala  Arg Asn Gln Ile Gly  Leu Trp Asn Leu Arg  Asp Asn Gly
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Val Gly  Leu Asn Val Met Val  Ser Glu His Tyr Gln  Cys Cys Arg
    1895                1900                1905

Lys Ile  Phe Ile Gln Ser Ser  His Asn Gln Leu Asn  Glu Asn Arg
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Trp Leu  Glu Lys Thr Leu Lys  Arg Ala Glu Lys Arg  Arg Ser Glu
    1925                1930                1935

Leu Ser  Ile Met Ile Gln Val  Lys Ile Leu His Thr  Thr Lys Ser
    1940                1945                1950

Pro Ala  Val Gly Ser Pro Lys  Lys Lys Arg Lys Val  Ser Gly Gly
    1955                1960                1965

Ser Thr  Asn Leu Ser Asp Ile  Ile Glu Lys Glu Thr  Gly Lys Gln
    1970                1975                1980

Leu Val  Ile Gln Glu Ser Ile  Leu Met Leu Pro Glu  Glu Val Glu
    1985                1990                1995

Glu Val  Ile Gly Asn Lys Pro  Glu Ser Asp Ile Leu  Val His Thr
    2000                2005                2010

Ala Tyr  Asp Glu Ser Thr Asp  Glu Asn Val Met Leu  Leu Thr Ser
    2015                2020                2025

Asp Ala  Pro Glu Tyr Lys Pro  Trp Ala Leu Val Ile  Gln Asp Ser
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Asn Gly  Glu Asn Lys Ile Lys  Met Leu Ser Gly Gly  Ser Pro Lys
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Asn Lys Lys Ser Val Ser His Arg Cys Tyr Val Leu Phe Glu Leu Lys
35 40 45

Arg Arg Gly Glu Arg Arg Ala Cys Phe Trp Gly Tyr Ala Val Asn Lys
50 55 60

Pro Gln Ser Gly Thr Glu Arg Gly Ile His Ala Glu Ile Phe Ser Ile
65 70 75 80

```
Arg Lys Val Glu Glu Tyr Leu Arg Asp Asn Pro Gly Gln Phe Thr Ile
                85                  90                  95

Asn Trp Tyr Ser Ser Trp Ser Pro Val Ser Phe Cys Phe Tyr Leu Tyr
            100                 105                 110

Ile Tyr Asn Asn Tyr His Leu Val Val Ile Tyr Phe Lys Tyr Phe Phe
        115                 120                 125

Gln Asn Lys Arg Met Tyr Ile Ala Ile Ala Phe Leu Phe Ile Ser Val
    130                 135                 140

Tyr Ile Leu Ile Tyr Asn Phe Ser Asn Ile Pro Lys Phe Val Asp Val
145                 150                 155                 160

Gln Cys Ala Asp Cys Ala Glu Lys Ile Leu Glu Trp Tyr Asn Gln Glu
                165                 170                 175

Leu Arg Gly Asn Gly His Thr Leu Lys Ile Trp Ala Cys Lys Leu Tyr
            180                 185                 190

Tyr Glu Lys Asn Ala Arg Asn Gln Ile Gly Leu Trp Asn Leu Arg Asp
        195                 200                 205

Asn Gly Val Gly Leu Asn Val Met Val Ser Glu His Tyr Gln Cys Cys
    210                 215                 220

Arg Lys Ile Phe Ile Gln Ser Ser His Asn Gln Leu Asn Glu Asn Arg
225                 230                 235                 240

Trp Leu Glu Lys Thr Leu Lys Arg Ala Glu Lys Arg Arg Ser Glu Leu
                245                 250                 255

Ser Ile Met Ile Gln Val Lys Ile Leu His Thr Thr Lys Ser Pro Ala
            260                 265                 270
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```
Val Ala Glu Tyr Val Arg Ala Leu Phe Asp Phe Asn Gly Asn Asp Glu
        275                 280                 285

Glu Asp Leu Pro Phe Lys Lys Gly Asp Ile Leu Arg Ile Arg Asp Lys
    290                 295                 300

Pro Glu Glu Gln Trp Trp Asn Ala Glu Asp Ser Glu Gly Lys Arg Gly
305                 310                 315                 320

Met Ile Pro Val Pro Tyr Val Glu Lys Tyr Met Ser Glu Val Glu Phe
                325                 330                 335

Ser His Glu Tyr Trp Met Arg His Ala Leu Thr Leu Ala Lys Arg Ala
            340                 345                 350

Trp Asp Glu Arg Glu Val Pro Val Gly Ala Val Leu Val His Asn Asn
        355                 360                 365

Arg Val Ile Gly Glu Gly Trp Asn Arg Pro Ile Gly Arg His Asp Pro
    370                 375                 380

Thr Ala His Ala Glu Ile Met Ala Leu Arg Gln Gly Gly Leu Val Met
385                 390                 395                 400

Gln Asn Tyr Arg Leu Ile Asp Ala Thr Leu Tyr Val Thr Leu Glu Pro
                405                 410                 415

Cys Val Met Cys Ala Gly Ala Met Ile His Ser Arg Ile Gly Arg Val
            420                 425                 430

Val Phe Gly Ala Arg Asp Ala Lys Thr Gly Ala Ala Gly Ser Leu Met
        435                 440                 445

Asp Val Leu His His Pro Gly Met Asn His Arg Val Glu Ile Thr Glu
    450                 455                 460

Gly Ile Leu Ala Asp Glu Cys Ala Ala Leu Leu Ser Asp Phe Phe Arg
465                 470                 475                 480
```

```
Met Arg Arg Gln Glu Ile Lys Ala Gln Lys Lys Ala Gln Ser Ser Thr
                485                 490                 495

Asp Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Ser Glu Thr Pro Gly
            500                 505                 510

Thr Ser Glu Ser Ala Thr Pro Glu Ser Ser Gly Gly Ser Ser Gly Gly
        515                 520                 525

Ser Ser Glu Val Glu Phe Ser His Glu Tyr Trp Met Arg His Ala Leu
    530                 535                 540

Thr Leu Ala Lys Arg Ala Arg Asp Glu Arg Glu Val Pro Val Gly Ala
545                 550                 555                 560

Val Leu Val Leu Asn Asn Arg Val Ile Gly Glu Gly Trp Asn Arg Ala
                565                 570                 575

Ile Gly Leu His Asp Pro Thr Ala His Ala Glu Ile Met Ala Leu Arg
            580                 585                 590

Gln Gly Gly Leu Val Met Gln Asn Tyr Arg Leu Ile Asp Ala Thr Leu
        595                 600                 605

Tyr Val Thr Phe Glu Pro Cys Val Met Cys Ala Gly Ala Met Ile His
    610                 615                 620

Ser Arg Ile Gly Arg Val Val Phe Gly Val Arg Asn Ala Lys Thr Gly
625                 630                 635                 640

Ala Ala Gly Ser Leu Met Asp Val Leu His Tyr Pro Gly Met Asn His
                645                 650                 655

Arg Val Glu Ile Thr Glu Gly Ile Leu Ala Asp Glu Cys Ala Ala Leu
            660                 665                 670
```

```
Leu Cys Tyr Phe Phe Arg Met Pro Arg Gln Val Phe Asn Ala Gln Lys
        675                 680                 685

Lys Ala Gln Ser Ser Thr Asp Gly Gly Gly Gly Ser Gly Gly Gly Gly
    690                 695                 700

Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
705                 710                 715                 720

Gly Gly Gly Gly Ser Met Ser Lys Leu Glu Lys Phe Thr Asn Cys Tyr
                725                 730                 735

Ser Leu Ser Lys Thr Leu Arg Phe Lys Ala Ile Pro Val Gly Lys Thr
            740                 745                 750

Gln Glu Asn Ile Asp Asn Lys Arg Leu Leu Val Glu Asp Glu Lys Arg
        755                 760                 765

Ala Glu Asp Tyr Lys Gly Val Lys Lys Leu Leu Asp Arg Tyr Tyr Leu
    770                 775                 780

Ser Phe Ile Asn Asp Val Leu His Ser Ile Lys Leu Lys Asn Leu Asn
785                 790                 795                 800

Asn Tyr Ile Ser Leu Phe Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn
                805                 810                 815

Lys Glu Leu Glu Asn Leu Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys
            820                 825                 830

Ala Phe Lys Gly Asn Glu Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile
        835                 840                 845

Ile Glu Thr Ile Leu Pro Glu Phe Leu Asp Asp Lys Asp Glu Ile Ala
    850                 855                 860

Leu Val Asn Ser Phe Asn Gly Phe Thr Thr Ala Phe Thr Gly Phe Phe
865                 870                 875                 880
```

```
Asp Asn Arg Glu Asn Met Phe Ser Glu Glu Ala Lys Ser Thr Ser Ile
               885                 890                 895


Ala Phe Arg Cys Ile Asn Glu Asn Leu Thr Arg Tyr Ile Ser Asn Met
            900                 905                 910


Asp Ile Phe Glu Lys Val Asp Ala Ile Phe Asp Lys His Glu Val Gln
        915                 920                 925


Glu Ile Lys Glu Lys Ile Leu Asn Ser Asp Tyr Asp Val Glu Asp Phe
    930                 935                 940


Phe Glu Gly Glu Phe Phe Asn Phe Val Leu Thr Gln Glu Gly Ile Asp
945                 950                 955                 960


Val Tyr Asn Ala Ile Ile Gly Gly Phe Val Thr Glu Ser Gly Glu Lys
               965                 970                 975


Ile Lys Gly Leu Asn Glu Tyr Ile Asn Leu Tyr Asn Gln Lys Thr Lys
            980                 985                 990


Gln Lys Leu Pro Lys Phe Lys Pro  Leu Tyr Lys Gln Val  Leu Ser Asp
        995                 1000                1005


Arg Glu  Ser Leu Ser Phe Tyr  Gly Glu Gly Tyr Thr  Ser Asp Glu
    1010                1015                1020


Glu Val  Leu Glu Val Phe Arg  Asn Thr Leu Asn Lys  Asn Ser Glu
    1025                1030                1035


Ile Phe  Ser Ser Ile Lys Lys  Leu Glu Lys Leu Phe  Lys Asn Phe
    1040                1045                1050


Asp Glu  Tyr Ser Ser Ala Gly  Ile Phe Val Lys Asn  Gly Pro Ala
    1055                1060                1065
```

```
Ile Ser  Thr Ile Ser Lys Asp  Ile Phe Gly Glu Trp  Asn Val Ile
    1070                1075                1080

Arg Asp  Lys Trp Asn Ala Glu  Tyr Asp Asp Ile His  Leu Lys Lys
    1085                1090                1095

Lys Ala  Val Val Thr Glu Lys  Tyr Glu Asp Asp Arg  Arg Lys Ser
    1100                1105                1110

Phe Lys  Lys Ile Gly Ser Phe  Ser Leu Glu Gln Leu  Gln Glu Tyr
    1115                1120                1125

Ala Asp  Ala Asp Leu Ser Val  Val Glu Lys Leu Lys  Glu Ile Ile
    1130                1135                1140

Ile Gln  Lys Val Asp Glu Ile  Tyr Lys Val Tyr Gly  Ser Ser Glu
    1145                1150                1155

Lys Leu  Phe Asp Ala Asp Phe  Val Leu Glu Lys Ser  Leu Lys Lys
    1160                1165                1170

Asn Asp  Ala Val Val Ala Ile  Met Lys Asp Leu Leu  Asp Ser Val
    1175                1180                1185

Lys Ser  Phe Glu Asn Tyr Ile  Lys Ala Phe Phe Gly  Glu Gly Lys
    1190                1195                1200

Glu Thr  Asn Arg Asp Glu Ser  Phe Tyr Gly Asp Phe  Val Leu Ala
    1205                1210                1215

Tyr Asp  Ile Leu Leu Lys Val  Asp His Ile Tyr Asp  Ala Ile Arg
    1220                1225                1230

Asn Tyr  Val Thr Gln Lys Pro  Tyr Ser Lys Asp Lys  Phe Lys Leu
    1235                1240                1245

Tyr Phe  Gln Asn Pro Gln Phe  Met Gly Gly Trp Asp  Lys Asp Lys
    1250                1255                1260
```

```
Glu Thr  Asp Tyr Arg Ala Thr  Ile Leu Arg Tyr Gly  Ser Lys Tyr
    1265                1270                1275

Tyr Leu  Ala Ile Met Asp Lys  Lys Tyr Ala Lys Cys  Leu Gln Lys
    1280                1285                1290

Ile Asp  Lys Asp Asp Val Asn  Gly Asn Tyr Glu Lys  Ile Asn Tyr
    1295                1300                1305

Lys Leu  Leu Pro Gly Pro Asn  Lys Met Leu Pro Lys  Val Phe Phe
    1310                1315                1320

Ser Lys  Lys Trp Met Ala Tyr  Tyr Asn Pro Ser Glu  Asp Ile Gln
    1325                1330                1335

Lys Ile  Tyr Lys Asn Gly Thr  Phe Lys Lys Gly Asp  Met Phe Asn
    1340                1345                1350

Leu Asn  Asp Cys His Lys Leu  Ile Asp Phe Phe Lys  Asp Ser Ile
    1355                1360                1365

Ser Arg  Tyr Pro Lys Trp Ser  Asn Ala Tyr Asp Phe  Asn Phe Ser
    1370                1375                1380

Glu Thr  Glu Lys Tyr Lys Asp  Ile Ala Gly Phe Tyr  Arg Glu Val
    1385                1390                1395

Glu Glu  Gln Gly Tyr Lys Val  Ser Phe Glu Ser Ala  Ser Lys Lys
    1400                1405                1410

Glu Val  Asp Lys Leu Val Glu  Glu Gly Lys Leu Tyr  Met Phe Gln
    1415                1420                1425

Ile Tyr  Asn Lys Asp Phe Ser  Asp Lys Ser His Gly  Thr Pro Asn
    1430                1435                1440
```

```
Leu His  Thr Met Tyr Phe Lys  Leu Leu Phe Asp Glu  Asn Asn His
    1445                1450                1455

Gly Gln  Ile Arg Leu Ser Gly  Gly Ala Glu Leu Phe  Met Arg Arg
    1460                1465                1470

Ala Ser  Leu Lys Lys Glu Glu  Leu Val Val His Pro  Ala Asn Ser
    1475                1480                1485

Pro Ile  Ala Asn Lys Asn Pro  Asp Asn Pro Lys Lys  Thr Thr Thr
    1490                1495                1500

Leu Ser  Tyr Asp Val Tyr Lys  Asp Lys Arg Phe Ser  Glu Asp Gln
    1505                1510                1515

Tyr Glu  Leu His Ile Pro Ile  Ala Ile Asn Lys Cys  Pro Lys Asn
    1520                1525                1530

Ile Phe  Lys Ile Asn Thr Glu  Val Arg Val Leu Leu  Lys His Asp
    1535                1540                1545

Asp Asn  Pro Tyr Val Ile Gly  Ile Ala Arg Gly Glu  Arg Asn Leu
    1550                1555                1560

Leu Tyr  Ile Val Val Val Asp  Gly Lys Gly Asn Ile  Val Glu Gln
    1565                1570                1575

Tyr Ser  Leu Asn Glu Ile Ile  Asn Asn Phe Asn Gly  Ile Arg Ile
    1580                1585                1590

Lys Thr  Asp Tyr His Ser Leu  Leu Asp Lys Lys Glu  Lys Glu Arg
    1595                1600                1605

Phe Glu  Ala Arg Gln Asn Trp  Thr Ser Ile Glu Asn  Ile Lys Glu
    1610                1615                1620

Leu Lys  Ala Gly Tyr Ile Ser  Gln Val Val His Lys  Ile Cys Glu
    1625                1630                1635
```

```
Leu Val  Glu Lys Tyr Asp Ala  Val Ile Ala Leu Ala  Asp Leu Asn
    1640                1645                1650

Ser Gly  Phe Lys Asn Ser Arg  Val Lys Val Glu Lys  Gln Val Tyr
    1655                1660                1665

Gln Lys  Phe Glu Lys Met Leu  Ile Asp Lys Leu Asn  Tyr Met Val
    1670                1675                1680

Asp Lys  Lys Ser Asn Pro Cys  Ala Thr Gly Gly Ala  Leu Lys Gly
    1685                1690                1695

Tyr Gln  Ile Thr Asn Lys Phe  Glu Ser Phe Lys Ser  Met Ser Thr
    1700                1705                1710

Gln Asn  Gly Phe Ile Phe Tyr  Ile Pro Ala Trp Leu  Thr Ser Lys
    1715                1720                1725

Ile Asp  Pro Ser Thr Gly Phe  Val Asn Leu Leu Lys  Thr Lys Tyr
    1730                1735                1740

Thr Ser  Ile Ala Asp Ser Lys  Lys Phe Ile Ser Ser  Phe Asp Arg
    1745                1750                1755

Ile Met  Tyr Val Pro Glu Glu  Asp Leu Phe Glu Phe  Ala Leu Asp
    1760                1765                1770

Tyr Lys  Asn Phe Ser Arg Thr  Asp Ala Asp Tyr Ile  Lys Lys Trp
    1775                1780                1785

Lys Leu  Tyr Ser Tyr Gly Asn  Arg Ile Arg Ile Phe  Arg Asn Pro
    1790                1795                1800

Lys Lys  Asn Asn Val Phe Asp  Trp Glu Glu Val Cys  Leu Thr Ser
    1805                1810                1815
```

```
Ala Tyr  Lys Glu Leu Phe Asn  Lys Tyr Gly Ile Asn  Tyr Gln Gln
    1820                1825                1830

Gly Asp  Ile Arg Ala Leu Leu  Cys Glu Gln Ser Asp  Lys Ala Phe
    1835                1840                1845

Tyr Ser  Ser Phe Met Ala Leu  Met Ser Leu Met Leu  Gln Met Arg
    1850                1855                1860

Asn Ser  Ile Thr Gly Arg Thr  Asp Val Ala Phe Leu  Ile Ser Pro
    1865                1870                1875

Val Lys  Asn Ser Asp Gly Ile  Phe Tyr Asp Ser Arg  Asn Tyr Glu
    1880                1885                1890

Ala Gln  Glu Asn Ala Ile Leu  Pro Lys Asn Ala Asp  Ala Asn Gly
    1895                1900                1905

Ala Tyr  Asn Ile Ala Arg Lys  Val Leu Trp Ala Ile  Gly Gln Phe
    1910                1915                1920

Lys Lys  Ala Glu Asp Glu Lys  Leu Asp Lys Val Lys  Ile Ala Ile
    1925                1930                1935

Ser Asn  Lys Glu Trp Leu Glu  Tyr Ala Gln Thr Ser  Val Lys His
    1940                1945                1950

Gly Ser  Pro Lys Lys Lys Arg  Lys Val Ser Gly Gly  Ser Thr Asn
    1955                1960                1965

Leu Ser  Asp Ile Ile Glu Lys  Glu Thr Gly Lys Gln  Leu Val Ile
    1970                1975                1980

Gln Glu  Ser Ile Leu Met Leu  Pro Glu Glu Val Glu  Glu Val Ile
    1985                1990                1995

Gly Asn  Lys Pro Glu Ser Asp  Ile Leu Val His Thr  Ala Tyr Asp
    2000                2005                2010
```

Glu Ser Thr Asp Glu Asn Val Met Leu Leu Thr Ser Asp Ala Pro
    2015   2020   2025

Glu Tyr Lys Pro Trp Ala Leu Val Ile Gln Asp Ser Asn Gly Glu
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Lys Val
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Val Leu Val His Asn Asn Arg Val Ile Gly Glu Gly Trp Asn Arg Pro
        35                  40                  45

Ile Gly Arg His Asp Pro Thr Ala His Ala Glu Ile Met Ala Leu Arg
    50                  55                  60

Gln Gly Gly Leu Val Met Gln Asn Tyr Arg Leu Ile Asp Ala Thr Leu
65                  70                  75                  80

Tyr Val Thr Leu Glu Pro Cys Val Met Val Ser Phe Cys Phe Tyr Leu
                85                  90                  95

Tyr Ile Tyr Asn Asn Tyr His Leu Val Val Ile Tyr Phe Lys Tyr Phe
            100                 105                 110

Phe Gln Asn Lys Arg Met Tyr Ile Ala Ile Ala Phe Leu Phe Ile Ser
        115                 120                 125

Val Tyr Ile Leu Ile Tyr Asn Phe Ser Asn Ile Pro Lys Phe Val Asp
    130                 135                 140

Val Gln Cys Ala Gly Ala Met Ile His Ser Arg Ile Gly Arg Val Val
145                 150                 155                 160

Phe Gly Ala Arg Asp Ala Lys Thr Gly Ala Ala Gly Ser Leu Met Asp
                165                 170                 175

Val Leu His His Pro Gly Met Asn His Arg Val Glu Ile Thr Glu Gly
            180                 185                 190

Ile Leu Ala Asp Glu Cys Ala Ala Leu Leu Ser Asp Phe Phe Arg Met
        195                 200                 205

Arg Arg Gln Glu Ile Lys Ala Gln Lys Lys Ala Gln Ser Ser Thr Asp
    210                 215                 220
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```
Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Ser Glu Thr Pro Gly Thr
225                 230                 235                 240

Ser Glu Ser Ala Thr Pro Glu Ser Ser Gly Gly Ser Ser Gly Gly Ser
                245                 250                 255

Ser Glu Val Glu Phe Ser His Glu Tyr Trp Met Arg His Ala Leu Thr
            260                 265                 270

Leu Ala Lys Arg Ala Arg Asp Glu Arg Glu Val Pro Val Gly Ala Val
        275                 280                 285

Leu Val Leu Asn Asn Arg Val Ile Gly Glu Gly Trp Asn Arg Ala Ile
    290                 295                 300

Gly Leu His Asp Pro Thr Ala His Ala Glu Ile Met Ala Leu Arg Gln
305                 310                 315                 320

Gly Gly Leu Val Met Gln Asn Tyr Arg Leu Ile Asp Ala Thr Leu Tyr
                325                 330                 335

Val Thr Phe Glu Pro Cys Val Met Cys Ala Gly Ala Met Ile His Ser
            340                 345                 350

Arg Ile Gly Arg Val Val Phe Gly Val Arg Asn Ala Lys Thr Gly Ala
        355                 360                 365

Ala Gly Ser Leu Met Asp Val Leu His Tyr Pro Gly Met Asn His Arg
    370                 375                 380

Val Glu Ile Thr Glu Gly Ile Leu Ala Asp Glu Cys Ala Ala Leu Leu
385                 390                 395                 400

Cys Tyr Phe Phe Arg Met Pro Arg Gln Val Phe Asn Ala Gln Lys Lys
                405                 410                 415
```

```
Ala Gln Ser Ser Thr Asp Gly Ser Ala Glu Tyr Val Arg Ala Leu Phe
            420                 425                 430

Asp Phe Asn Gly Asn Asp Glu Glu Asp Leu Pro Phe Lys Lys Gly Asp
        435                 440                 445

Ile Leu Arg Ile Arg Asp Lys Pro Glu Glu Gln Trp Trp Asn Ala Glu
    450                 455                 460

Asp Ser Glu Gly Lys Arg Gly Met Ile Pro Val Pro Tyr Val Glu Lys
465                 470                 475                 480

Tyr Met Thr Asp Ala Glu Tyr Val Arg Ile His Glu Lys Leu Asp Ile
                485                 490                 495

Tyr Thr Phe Lys Lys Gln Phe Phe Asn Asn Lys Lys Ser Val Ser His
            500                 505                 510

Arg Cys Tyr Val Leu Phe Glu Leu Lys Arg Arg Gly Glu Arg Arg Ala
        515                 520                 525

Cys Phe Trp Gly Tyr Ala Val Asn Lys Pro Gln Ser Gly Thr Glu Arg
    530                 535                 540

Gly Ile His Ala Glu Ile Phe Ser Ile Arg Lys Val Glu Glu Tyr Leu
545                 550                 555                 560

Arg Asp Asn Pro Gly Gln Phe Thr Ile Asn Trp Tyr Ser Ser Trp Ser
                565                 570                 575

Pro Cys Ala Asp Cys Ala Glu Lys Ile Leu Glu Trp Tyr Asn Gln Glu
            580                 585                 590

Leu Arg Gly Asn Gly His Thr Leu Lys Ile Trp Ala Cys Lys Leu Tyr
        595                 600                 605

Tyr Glu Lys Asn Ala Arg Asn Gln Ile Gly Leu Trp Asn Leu Arg Asp
    610                 615                 620
```

```
Asn Gly Val Gly Leu Asn Val Met Val Ser Glu His Tyr Gln Cys Cys
625                 630                 635                 640

Arg Lys Ile Phe Ile Gln Ser Ser His Asn Gln Leu Asn Glu Asn Arg
                645                 650                 655

Trp Leu Glu Lys Thr Leu Lys Arg Ala Glu Lys Arg Arg Ser Glu Leu
            660                 665                 670

Ser Ile Met Ile Gln Val Lys Ile Leu His Thr Thr Lys Ser Pro Ala
        675                 680                 685

Val Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
    690                 695                 700

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Met
705                 710                 715                 720

Ser Lys Leu Glu Lys Phe Thr Asn Cys Tyr Ser Leu Ser Lys Thr Leu
                725                 730                 735

Arg Phe Lys Ala Ile Pro Val Gly Lys Thr Gln Glu Asn Ile Asp Asn
            740                 745                 750

Lys Arg Leu Leu Val Glu Asp Glu Lys Arg Ala Glu Asp Tyr Lys Gly
        755                 760                 765

Val Lys Lys Leu Leu Asp Arg Tyr Tyr Leu Ser Phe Ile Asn Asp Val
    770                 775                 780

Leu His Ser Ile Lys Leu Lys Asn Leu Asn Asn Tyr Ile Ser Leu Phe
785                 790                 795                 800

Arg Lys Lys Thr Arg Thr Glu Lys Glu Asn Lys Glu Leu Glu Asn Leu
                805                 810                 815
```

```
Glu Ile Asn Leu Arg Lys Glu Ile Ala Lys Ala Phe Lys Gly Asn Glu
            820                 825                 830

Gly Tyr Lys Ser Leu Phe Lys Lys Asp Ile Ile Glu Thr Ile Leu Pro
        835                 840                 845

Glu Phe Leu Asp Asp Lys Asp Glu Ile Ala Leu Val Asn Ser Phe Asn
    850                 855                 860

Gly Phe Thr Thr Ala Phe Thr Gly Phe Phe Asp Asn Arg Glu Asn Met
865                 870                 875                 880

Phe Ser Glu Glu Ala Lys Ser Thr Ser Ile Ala Phe Arg Cys Ile Asn
                885                 890                 895

Glu Asn Leu Thr Arg Tyr Ile Ser Asn Met Asp Ile Phe Glu Lys Val
            900                 905                 910

Asp Ala Ile Phe Asp Lys His Glu Val Gln Glu Ile Lys Glu Lys Ile
        915                 920                 925

Leu Asn Ser Asp Tyr Asp Val Glu Asp Phe Phe Glu Gly Glu Phe Phe
    930                 935                 940

Asn Phe Val Leu Thr Gln Glu Gly Ile Asp Val Tyr Asn Ala Ile Ile
945                 950                 955                 960

Gly Gly Phe Val Thr Glu Ser Gly Glu Lys Ile Lys Gly Leu Asn Glu
                965                 970                 975

Tyr Ile Asn Leu Tyr Asn Gln Lys Thr Lys Gln Lys Leu Pro Lys Phe
            980                 985                 990

Lys Pro Leu Tyr Lys Gln Val Leu  Ser Asp Arg Glu Ser  Leu Ser Phe
        995                 1000                1005

Tyr Gly  Glu Gly Tyr Thr Ser  Asp Glu Glu Val Leu  Glu Val Phe
    1010                1015                1020
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Arg Asn  Thr Leu Asn Lys Asn  Ser Glu Ile Phe Ser  Ser Ile Lys
    1025                1030                1035

Lys Leu  Glu Lys Leu Phe Lys  Asn Phe Asp Glu Tyr  Ser Ser Ala
    1040                1045                1050

Gly Ile  Phe Val Lys Asn Gly  Pro Ala Ile Ser Thr  Ile Ser Lys
    1055                1060                1065

Asp Ile  Phe Gly Glu Trp Asn  Val Ile Arg Asp Lys  Trp Asn Ala
    1070                1075                1080

Glu Tyr  Asp Asp Ile His Leu  Lys Lys Lys Ala Val  Val Thr Glu
    1085                1090                1095

Lys Tyr  Glu Asp Asp Arg Arg  Lys Ser Phe Lys Lys  Ile Gly Ser
    1100                1105                1110

Phe Ser  Leu Glu Gln Leu Gln  Glu Tyr Ala Asp Ala  Asp Leu Ser
    1115                1120                1125

Val Val  Glu Lys Leu Lys Glu  Ile Ile Ile Gln Lys  Val Asp Glu
    1130                1135                1140

Ile Tyr  Lys Val Tyr Gly Ser  Ser Glu Lys Leu Phe  Asp Ala Asp
    1145                1150                1155

Phe Val  Leu Glu Lys Ser Leu  Lys Lys Asn Asp Ala  Val Val Ala
    1160                1165                1170

Ile Met  Lys Asp Leu Leu Asp  Ser Val Lys Ser Phe  Glu Asn Tyr
    1175                1180                1185

Ile Lys  Ala Phe Phe Gly Glu  Gly Lys Glu Thr Asn  Arg Asp Glu
    1190                1195                1200
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```
Ser Phe  Tyr Gly Asp Phe Val  Leu Ala Tyr Asp Ile  Leu Leu Lys
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Val Asp  His Ile Tyr Asp Ala  Ile Arg Asn Tyr Val  Thr Gln Lys
    1220                1225                1230

Pro Tyr  Ser Lys Asp Lys Phe  Lys Leu Tyr Phe Gln  Asn Pro Gln
    1235                1240                1245

Phe Met  Gly Gly Trp Asp Lys  Asp Lys Glu Thr Asp  Tyr Arg Ala
    1250                1255                1260

Thr Ile  Leu Arg Tyr Gly Ser  Lys Tyr Tyr Leu Ala  Ile Met Asp
    1265                1270                1275

Lys Lys  Tyr Ala Lys Cys Leu  Gln Lys Ile Asp Lys  Asp Asp Val
    1280                1285                1290

Asn Gly  Asn Tyr Glu Lys Ile  Asn Tyr Lys Leu Leu  Pro Gly Pro
    1295                1300                1305

Asn Lys  Met Leu Pro Lys Val  Phe Phe Ser Lys Lys  Trp Met Ala
    1310                1315                1320

Tyr Tyr  Asn Pro Ser Glu Asp  Ile Gln Lys Ile Tyr  Lys Asn Gly
    1325                1330                1335

Thr Phe  Lys Lys Gly Asp Met  Phe Asn Leu Asn Asp  Cys His Lys
    1340                1345                1350

Leu Ile  Asp Phe Phe Lys Asp  Ser Ile Ser Arg Tyr  Pro Lys Trp
    1355                1360                1365

Ser Asn  Ala Tyr Asp Phe Asn  Phe Ser Glu Thr Glu  Lys Tyr Lys
    1370                1375                1380

Asp Ile  Ala Gly Phe Tyr Arg  Glu Val Glu Glu Gln  Gly Tyr Lys
    1385                1390                1395
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Val Ser  Phe Glu Ser Ala Ser  Lys Lys Glu Val Asp  Lys Leu Val
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Glu Glu  Gly Lys Leu Tyr Met  Phe Gln Ile Tyr Asn  Lys Asp Phe
    1415                1420                1425

Ser Asp  Lys Ser His Gly Thr  Pro Asn Leu His Thr  Met Tyr Phe
    1430                1435                1440

Lys Leu  Leu Phe Asp Glu Asn  Asn His Gly Gln Ile  Arg Leu Ser
    1445                1450                1455

Gly Gly  Ala Glu Leu Phe Met  Arg Arg Ala Ser Leu  Lys Lys Glu
    1460                1465                1470

Glu Leu  Val Val His Pro Ala  Asn Ser Pro Ile Ala  Asn Lys Asn
    1475                1480                1485

Pro Asp  Asn Pro Lys Lys Thr  Thr Thr Leu Ser Tyr  Asp Val Tyr
    1490                1495                1500

Lys Asp  Lys Arg Phe Ser Glu  Asp Gln Tyr Glu Leu  His Ile Pro
    1505                1510                1515

Ile Ala  Ile Asn Lys Cys Pro  Lys Asn Ile Phe Lys  Ile Asn Thr
    1520                1525                1530

Glu Val  Arg Val Leu Leu Lys  His Asp Asp Asn Pro  Tyr Val Ile
    1535                1540                1545

Gly Ile  Ala Arg Gly Glu Arg  Asn Leu Leu Tyr Ile  Val Val Val
    1550                1555                1560

Asp Gly  Lys Gly Asn Ile Val  Glu Gln Tyr Ser Leu  Asn Glu Ile
    1565                1570                1575
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```
Ile Asn  Asn Phe Asn Gly Ile  Arg Ile Lys Thr Asp  Tyr His Ser
    1580                1585                1590

Leu Leu  Asp Lys Lys Glu Lys  Glu Arg Phe Glu Ala  Arg Gln Asn
    1595                1600                1605

Trp Thr  Ser Ile Glu Asn Ile  Lys Glu Leu Lys Ala  Gly Tyr Ile
    1610                1615                1620

Ser Gln  Val Val His Lys Ile  Cys Glu Leu Val Glu  Lys Tyr Asp
    1625                1630                1635

Ala Val  Ile Ala Leu Ala Asp  Leu Asn Ser Gly Phe  Lys Asn Ser
    1640                1645                1650

Arg Val  Lys Val Glu Lys Gln  Val Tyr Gln Lys Phe  Glu Lys Met
    1655                1660                1665

Leu Ile  Asp Lys Leu Asn Tyr  Met Val Asp Lys Lys  Ser Asn Pro
    1670                1675                1680

Cys Ala  Thr Gly Gly Ala Leu  Lys Gly Tyr Gln Ile  Thr Asn Lys
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Phe Glu  Ser Phe Lys Ser Met  Ser Thr Gln Asn Gly  Phe Ile Phe
    1700                1705                1710

Tyr Ile  Pro Ala Trp Leu Thr  Ser Lys Ile Asp Pro  Ser Thr Gly
    1715                1720                1725

Phe Val  Asn Leu Leu Lys Thr  Lys Tyr Thr Ser Ile  Ala Asp Ser
    1730                1735                1740

Lys Lys  Phe Ile Ser Ser Phe  Asp Arg Ile Met Tyr  Val Pro Glu
    1745                1750                1755

Glu Asp  Leu Phe Glu Phe Ala  Leu Asp Tyr Lys Asn  Phe Ser Arg
    1760                1765                1770
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Thr Asp  Ala Asp Tyr Ile Lys  Lys Trp Lys Leu Tyr  Ser Tyr Gly
    1775                1780                1785

Asn Arg  Ile Arg Ile Phe Arg  Asn Pro Lys Lys Asn  Asn Val Phe
    1790                1795                1800

Asp Trp  Glu Glu Val Cys Leu  Thr Ser Ala Tyr Lys  Glu Leu Phe
    1805                1810                1815

Asn Lys  Tyr Gly Ile Asn Tyr  Gln Gln Gly Asp Ile  Arg Ala Leu
    1820                1825                1830

Leu Cys  Glu Gln Ser Asp Lys  Ala Phe Tyr Ser Ser  Phe Met Ala
    1835                1840                1845

Leu Met  Ser Leu Met Leu Gln  Met Arg Asn Ser Ile  Thr Gly Arg
    1850                1855                1860

Thr Asp  Val Ala Phe Leu Ile  Ser Pro Val Lys Asn  Ser Asp Gly
    1865                1870                1875

Ile Phe  Tyr Asp Ser Arg Asn  Tyr Glu Ala Gln Glu  Asn Ala Ile
    1880                1885                1890

Leu Pro  Lys Asn Ala Asp Ala  Asn Gly Ala Tyr Asn  Ile Ala Arg
    1895                1900                1905

Lys Val  Leu Trp Ala Ile Gly  Gln Phe Lys Lys Ala  Glu Asp Glu
    1910                1915                1920

Lys Leu  Asp Lys Val Lys Ile  Ala Ile Ser Asn Lys  Glu Trp Leu
    1925                1930                1935

Glu Tyr  Ala Gln Thr Ser Val  Lys His Gly Ser Pro  Lys Lys Lys
    1940                1945                1950
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Arg Lys Val Ser Gly Gly Ser Thr Asn Leu Ser Asp Ile Ile Glu
1955 1960 1965

Lys Glu Thr Gly Lys Gln Leu Val Ile Gln Glu Ser Ile Leu Met
1970 1975 1980

Leu Pro Glu Glu Val Glu Glu Val Ile Gly Asn Lys Pro Glu Ser
1985 1990 1995

Asp Ile Leu Val His Thr Ala Tyr Asp Glu Ser Thr Asp Glu Asn
2000 2005 2010

Val Met Leu Leu Thr Ser Asp Ala Pro Glu Tyr Lys Pro Trp Ala
2015 2020 2025

Leu Val Ile Gln Asp Ser Asn Gly Glu Asn Lys Ile Lys Met Leu
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Ser Gly Gly Ser Pro Lys Lys Lys Arg Lys Val
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            20                  25                  30

Val Leu Val His Asn Asn Arg Val Ile Gly Glu Gly Trp Asn Arg Pro
        35                  40                  45

Ile Gly Arg His Asp Pro Thr Ala His Ala Glu Ile Met Ala Leu Arg
    50                  55                  60

Gln Gly Gly Leu Val Met Gln Asn Tyr Arg Leu Ile Asp Ala Thr Leu
65                  70                  75                  80

Tyr Val Thr Leu Glu Pro Cys Val Met Val Ser Phe Cys Phe Tyr Leu
                85                  90                  95

Tyr Ile Tyr Asn Asn Tyr His Leu Val Val Ile Tyr Phe Lys Tyr Phe
            100                 105                 110

Phe Gln Asn Lys Arg Met Tyr Ile Ala Ile Ala Phe Leu Phe Ile Ser
        115                 120                 125

Val Tyr Ile Leu Ile Tyr Asn Phe Ser Asn Ile Pro Lys Phe Val Asp
    130                 135                 140

Val Gln Cys Ala Gly Ala Met Ile His Ser Arg Ile Gly Arg Val Val
145                 150                 155                 160

Phe Gly Ala Arg Asp Ala Lys Thr Gly Ala Ala Gly Ser Leu Met Asp
                165                 170                 175

Val Leu His His Pro Gly Met Asn His Arg Val Glu Ile Thr Glu Gly
            180                 185                 190

Ile Leu Ala Asp Glu Cys Ala Ala Leu Leu Ser Asp Phe Phe Arg Met
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        195                 200                 205

Arg Arg Gln Glu Ile Lys Ala Gln Lys Lys Ala Gln Ser Ser Thr Asp
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Ser Gly Gly Ser Ser Gly Gly Ser Ser Gly Ser Glu Thr Pro Gly Thr
225                 230                 235                 240

Ser Glu Ser Ala Thr Pro Glu Ser Ser Gly Gly Ser Ser Gly Gly Ser
                245                 250                 255

Ser Glu Val Glu Phe Ser His Glu Tyr Trp Met Arg His Ala Leu Thr
            260                 265                 270

Leu Ala Lys Arg Ala Arg Asp Glu Arg Glu Val Pro Val Gly Ala Val
        275                 280                 285

Leu Val Leu Asn Asn Arg Val Ile Gly Glu Gly Trp Asn Arg Ala Ile
    290                 295                 300

Gly Leu His Asp Pro Thr Ala His Ala Glu Ile Met Ala Leu Arg Gln
305                 310                 315                 320

Gly Gly Leu Val Met Gln Asn Tyr Arg Leu Ile Asp Ala Thr Leu Tyr
                325                 330                 335

Val Thr Phe Glu Pro Cys Val Met Cys Ala Gly Ala Met Ile His Ser
            340                 345                 350

Arg Ile Gly Arg Val Val Phe Gly Val Arg Asn Ala Lys Thr Gly Ala
        355                 360                 365

Ala Gly Ser Leu Met Asp Val Leu His Tyr Pro Gly Met Asn His Arg
    370                 375                 380

Val Glu Ile Thr Glu Gly Ile Leu Ala Asp Glu Cys Ala Ala Leu Leu
385                 390                 395                 400
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Cys Tyr Phe Phe Arg Met Pro Arg Gln Val Phe Asn Ala Gln Lys Lys
                405                 410                 415


Ala Gln Ser Ser Thr Asp
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