

SEQUENCE LISTING

<110> UNICHEM LABORATORIES LTD

<120> RECOMBINANT PROEIN VARIANTS

<130> IN201821032765

<150> IN 201821032765

<151> 2018-08-31

<160> 136

<170> PatentIn version 3.5

<210> 1

<211> 141

<212> PRT

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<223> Modified Sequence

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Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asn Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Arg Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Glu Val Lys Asn Ala Lys Gly Arg Asn Phe Glu Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

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Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Arg Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

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Val Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Ser Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Arg Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

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Val Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asp Gly Gly Thr
20 25 30

Trp Ser Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asp Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asp Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Glu Tyr Tyr
85 90 95

Ser Glu Lys Asp Arg Glu Glu Ala Arg Glu Arg Gln Asn Ser Asn Tyr
100 105 110

Glu Val Lys Asp Ala Lys Gly Arg Asn Phe Glu Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asp Leu Ile Ile Gly
130 135 140

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<223> ULLB-0005/001

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Ser Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asn Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Arg Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Glu Val Lys Asn Ala Lys Gly Arg Asn Phe Glu Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

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tatgctagtt attgctcagc ggt 23

<210> 8

<211> 141

<212> PRT

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<220>

<223> ULLB-0005/002

<400> 8

Ala Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asn Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Arg Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Glu Val Lys Asn Ala Lys Gly Arg Asn Phe Glu Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

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<210> 11

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Pro Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asn Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Arg Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Glu Val Lys Asn Ala Lys Gly Arg Asn Phe Glu Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

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tatgctagtt attgctcagc ggt 23

<210> 14
<211> 141
<212> PRT
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<400> 14

Gly Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asn Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr

85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Arg Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Glu Val Lys Asn Ala Lys Gly Arg Asn Phe Glu Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 15

<211> 27

<212> DNA

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<223> ULLB-0005/004 Forward Primer

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<211> 23

<212> DNA

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<223> ULLB-0005/004 Reverse Primer

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23

<210> 17

<211> 141

<212> PRT

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<223> ULLB-0005/005

<400> 17

Ala Trp Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asn Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Arg Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Glu Val Lys Asn Ala Lys Gly Arg Asn Phe Glu Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

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<210> 19
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<212> DNA
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<400> 19
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<210> 20

<211> 141
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<223> ULLB-0005/008

<400> 20

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asn Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Gly Trp Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Arg Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Glu Val Lys Asn Ala Lys Gly Arg Asn Phe Glu Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 21
<211> 26
<212> DNA
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<223> ULLB-0005/008 Forward Primer

<400> 21

gtgtggaaag gctggaatgg cggtag

<210> 22
<211> 26
<212> DNA
<213> Artificial Sequence

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<223> ULLB-0005/008 Reverse Primer

<400> 22
gtaccgccat tccagccttt ccacac 26

<210> 23
<211> 141
<212> PRT
<213> Artificial Sequence

<220>
<223> ULLB-0005/009

<400> 23

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asn Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Leu Trp
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Arg Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Glu Val Lys Asn Ala Lys Gly Arg Asn Phe Glu Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 24
<211> 24
<212> DNA
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<210> 25
<211> 24
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ccgctggtcc acagaccacc catc 24

<210> 26
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<220>
<223> ULLB-0005/010

<400> 26

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asn Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Phe Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Glu Val Lys Asn Ala Lys Gly Arg Asn Phe Glu Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 30

<211> 22

<212> DNA

<213> Artificial Sequence

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<223> ULLB-0005/011 Forward Primer

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cgaagaagcg ttgaaagcc ag

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<210> 31

<211> 22

<212> DNA

<213> Artificial Sequence

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<223> ULLB-0005/011 Reverse Primer

<400> 31

ctggcgttca aacgcttctt cg

22

<210> 32

<211> 141

<212> PRT

<213> Artificial Sequence

<220>

<223> ULLB-0005/012

<400> 32

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asn Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Phe Gly Val Trp
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Arg Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Glu Val Lys Asn Ala Lys Gly Arg Asn Phe Glu Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 33

<211> 39

<212> DNA

<213> Artificial Sequence

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<223> ULLB-0005/012 Forward Primer

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<210> 34

<211> 40

<212> DNA

<213> Artificial Sequence

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<223> ULLB-0005/012 Reverse Primer

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cagggtccac acgcaaaaac accagcggtt ataattatgc 40

<210> 35

<211> 141

<212> PRT

<213> Artificial Sequence

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<223> ULLB-0005/013

<400> 35

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asn Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Phe Glu Glu Ala Arg Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Glu Val Lys Asn Ala Lys Gly Arg Asn Phe Glu Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 36
<211> 24
<212> DNA
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gtcagaaaaa cttgaagaa gcgc 24

<210> 37
<211> 24
<212> DNA
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<400> 37
gcgcttcttc aaagtttttc tgac 24

<210> 38
<211> 141
<212> PRT
<213> Artificial Sequence

<220>
<223> ULLB-0005/014

<400> 38

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asn Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Arg Glu Arg Gln Leu Ser Asn Gly
100 105 110

Glu Asn Lys Asn Ala Lys Gly Arg Asn Phe Glu Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 39

<211> 30

<212> DNA

<213> Artificial Sequence

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<223> ULLB-0005/014 Forward Primer

<400> 39

ggccagaaca aaaatgcgaa aggccgtaac

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<210> 40

<211> 27

<212> DNA

<213> Artificial Sequence

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<223> ULLB-0005/014 Reverse Primer

<400> 40

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27

<210> 41

<211> 141

<212> PRT

<213> Artificial Sequence

<220>

<223> ULLB-0005/015

<400> 41

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asn Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Gly Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Arg Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Glu Val Lys Asn Ala Lys Gly Arg Asn Phe Glu Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 42

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> ULLB-0005/015 Forward Primer

<400> 42

cgctggggcg atattgtgac c

21

<210> 43

<211> 21

<212> DNA

<213> Artificial Sequence

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<223> ULLB-0005/015 Reverse Primer

<400> 43

ggtcacaata tcgccccagc g

21

<210> 44

<211> 141

<212> PRT

<213> Artificial Sequence

<220>

<223> ULLB-0005/016

<400> 44

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asn Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Val Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Arg Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Glu Val Lys Asn Ala Lys Gly Arg Asn Phe Glu Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 45
<211> 24
<212> DNA
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<220>
<223> ULLB-0005/016 Forward Primer

<400> 45
gaaaccggcg tggttattaa tcag 24

<210> 46
<211> 24
<212> DNA
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<223> ULLB-0005/016 Reverse Primer

<400> 46
ctgattaata accacgccgg ttcc 24

<210> 47
<211> 141
<212> PRT
<213> Artificial Sequence

<220>
<223> ULLB-0005/018

<400> 47

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr

85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Gln Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 48

<211> 21

<212> DNA

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<223> ULLB-0005/018 Forward Primer

<400> 48

gaagaagcgc aggaacgcca g 21

<210> 49

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> ULLB-0005/018 Reverse Primer

<400> 49

ctggcggtcc tgcgttctt c 21

<210> 50

<211> 141

<212> PRT

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<220>

<223> ULLB-0005/019

<400> 50

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Glu Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 51
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<220>
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<400> 51
gaagaagcgg aagaacgcca g 21

<210> 52
<211> 21
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<400> 52
ctggcgttct tccgcttctt c 21

<210> 53

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<400> 53

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Leu Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 54
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> ULLB-0005/020 Forward Primer

<400> 54

gaagaagcgc tggaacgcca g

<210> 55
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> ULLB-0005/020 Reverse Primer

<400> 55
ctggcgttcc agcgcttctt c 21

<210> 56
<211> 141
<212> PRT
<213> Artificial Sequence

<220>
<223> ULLB-0005/021

<400> 56

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Lys Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 57
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> ULLB-0005/021 Forward Primer

<400> 57
gaagaagcga aagaacgcca g 21

<210> 58
<211> 21
<212> DNA
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<220>
<223> ULLB-0005/021 Reverse Primer

<400> 58
ctggcgttct ttcgcttct c 21

<210> 59
<211> 141
<212> PRT
<213> Artificial Sequence

<220>
<223> ULLB-0005/022

<400> 59

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Gln Glu Glu Ala Arg Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 60
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> ULLB-0005/022 Forward Primer

<400> 60
cagaaaaacc aggaagaagc gc 22

<210> 61
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> ULLB-0005/022 Reverse Primer

<400> 61
gcgcttcttc ctggttttc tg 22

<210> 62
<211> 141
<212> PRT
<213> Artificial Sequence

<220>
<223> ULLB-0005/023

<400> 62

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe

1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
 20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
 35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
 50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
 85 90 95

Ser Gln Lys Asn Met Glu Glu Ala Arg Glu Arg Gln Leu Ser Asn Tyr
 100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
 115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
 130 135 140

<210> 63

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> ULLB-0005/023 Forward Primer

<400> 63

cagaaaaaca tggaagaagc gc

22

<210> 64

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> ULLB-0005/023 Reverse Primer

<400> 64

gcgcttcttc catgttttc tg

22

<210> 65

<211> 141

<212> PRT

<213> Artificial Sequence

<220>

<223> ULLB-0005/024

<400> 65

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Glu Glu Glu Ala Arg Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 66

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> ULLB-0005/024 Forward Primer

<400> 66

cagaaaaacg aagaagaagc gc 22

<210> 67

<211> 22

<212> DNA

<213> Artificial Sequence

<220>

<223> ULLB-0005/024 Reverse Primer

<400> 67

gcgcttcttc ttcgttttc tg 22

<210> 68

<211> 141

<212> PRT

<213> Artificial Sequence

<220>

<223> ULLB-0005/025

<400> 68

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Lys Glu Glu Ala Arg Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 69
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> ULLB-0005/025 Forward Primer

<400> 69
cagaaaaaca aagaagaagc gc 22

<210> 70
<211> 22
<212> DNA
<213> Artificial Sequence

<220>
<223> ULLB-0005/025 Reverse Primer

<400> 70
gcgcttcttc ttgttttc tg 22

<210> 71
<211> 141
<212> PRT
<213> Artificial Sequence

<220>
<223> ULLB-0005/026

<400> 71

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Trp Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Arg Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 72

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> ULLB-0005/026 Forward Primer

<400> 72

gtgtggaaat gggcgaatgg c 21

<210> 73

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> ULLB-0005/026 Reverse Primer

<400> 73

gccattcgcc catttcaca c 21

<210> 74

<211> 141

<212> PRT

<213> Artificial Sequence

<220>

<223> ULLB-0005/027

<400> 74

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Phe Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Arg Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 75

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> ULLB-0005/027 Forward Primer

<400> 75

gtgtggaaat ttgcgaatgg c

21

<210> 76

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> ULLB-0005/027 Reverse Primer

<400> 76

gccattcgca aattccaca c

21

<210> 77

<211> 141

<212> PRT

<213> Artificial Sequence

<220>

<223> ULLB-0005/028

<400> 77

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Glu Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Arg Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 78
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> ULLB-0005/028 Forward Primer

<400> 78
gtgtggaaag aagcgaatgg c 21

<210> 79
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> ULLB-0005/028 Reverse Primer

<400> 79
gccattcgct tctttccaca c 21

<210> 80
<211> 141
<212> PRT
<213> Artificial Sequence

<220>
<223> ULLB-0005/029

<400> 80

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys His Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr

85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Arg Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 81

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> ULLB-0005/029 Forward Primer

<400> 81

gtgtggaaac atgcgaatgg c 21

<210> 82

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> ULLB-0005/029 Reverse Primer

<400> 82

gccattcgca tgttccaca c 21

<210> 83

<211> 141

<212> PRT

<213> Artificial Sequence

<220>

<223> ULLB-0005/030

<400> 83

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ser Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Arg Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 84
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> ULLB-0005/030 Forward Primer

<400> 84
ggaaatatag caatggcggg acc 23

<210> 85
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> ULLB-0005/030 Reverse Primer

<400> 85
ggtaccgccca ttgctatatt tcc 23

<210> 86

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

<220>
<223> ULLB-0005/031

<400> 86

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Gly Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Arg Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 87
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> ULLB-0005/031 Forward Primer

<400> 87
ggaaatatgg caatggcgg acc

<210> 88
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> ULLB-0005/031 Reverse Primer

<400> 88
ggtaccgcca ttgcatatt tcc 23

<210> 89
<211> 141
<212> PRT
<213> Artificial Sequence

<220>
<223> ULLB-0005/032

<400> 89

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Asp Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Arg Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 90
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> ULLB-0005/032 Forward Primer

<400> 90
ggaaatatga taatggcgg acc 23

<210> 91
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> ULLB-0005/032 Reverse Primer

<400> 91
ggtaccgccca ttatcatatt tcc 23

<210> 92
<211> 141
<212> PRT
<213> Artificial Sequence

<220>
<223> ULLB-0005/033

<400> 92

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr His Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Arg Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 93
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> ULLB-0005/033 Forward Primer

<400> 93
ggaaatatca taatggcggc acc 23

<210> 94
<211> 23
<212> DNA
<213> Artificial Sequence

<220>
<223> ULLB-0005/033 Reverse Primer

<400> 94
ggtaccgccca ttatgatatt tcc 23

<210> 95
<211> 141
<212> PRT
<213> Artificial Sequence

<220>
<223> ULLB-0005/034

<400> 95

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe

1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Ala Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 96

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> ULLB-0005/034 Forward Primer

<400> 96

gaagaagcgg cggaacgcca g

21

<210> 97

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> ULLB-0005/034 Reverse Primer

<400> 97

ctggcggtcc gccgttctt c

21

<210> 98

<211> 141

<212> PRT

<213> Artificial Sequence

<220>

<223> ULLB-0005/035

<400> 98

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Ser Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 99

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> ULLB-0005/035 Forward Primer

<400> 99

gaagaagcga gcgaacgcca g

21

<210> 100

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> ULLB-0005/035 Reverse Primer

<400> 100

ctggcggttcg ctcgcttctt c

21

<210> 101

<211> 141

<212> PRT

<213> Artificial Sequence

<220>

<223> ULLB-0005/036

<400> 101

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Val Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 102
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> ULLB-0005/036 Forward Primer

<400> 102
gaagaagcgg tggaacgcca g 21

<210> 103
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> ULLB-0005/036 Reverse Primer

<400> 103
ctggcgttcc accgttctt c 21

<210> 104
<211> 141
<212> PRT
<213> Artificial Sequence

<220>
<223> ULLB-0005/037

<400> 104

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Ile Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 105
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> ULLB-0005/037 Forward Primer

<400> 105
gaagaagcga ttgaacgcca g 21

<210> 106
<211> 21
<212> DNA
<213> Artificial Sequence

<220>
<223> ULLB-0005/037 Reverse Primer

<400> 106
ctggcgttca atcgcttctt c 21

<210> 107
<211> 141
<212> PRT
<213> Artificial Sequence

<220>

<223> ULLB-0005/038

<400> 107

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Pro Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 108

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> ULLB-0005/038 Forward Primer

<400> 108

gaagaagcgc cggaacgcc a

21

<210> 109

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> ULLB-0005/038 Reverse Primer

<400> 109

ctggcgttcc ggcgttctt c

21

<210> 110

<211> 141

<212> PRT

<213> Artificial Sequence

<220>

<223> ULLB-0005/039

<400> 110

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Met Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

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<210> 112
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<210> 113
<211> 141
<212> PRT
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<220>
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<400> 113

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr

85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Gly Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 114

<211> 21

<212> DNA

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<223> ULLB-0005/040 Forward Primer

<400> 114

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<400> 115

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<210> 116

<211> 141

<212> PRT

<213> Artificial Sequence

<220>

<223> ULLB-0005/041

<400> 116

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Thr Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 117
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<212> DNA
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<400> 117
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<400> 118
ctggcggtcg gtcgcttct c 21

<210> 119

<211> 141
<212> PRT
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<220>
<223> ULLB-0005/042

<400> 119

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Tyr Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 120
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<212> DNA
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<400> 120
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<400> 121
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<210> 122
<211> 141
<212> PRT
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<220>
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<400> 122

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Trp Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 123
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<212> DNA
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<220>
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<400> 123
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<400> 124
ctggcgttcc cacgcttctt c 21

<210> 125
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<212> PRT
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<220>
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<400> 125

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Asn Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 126
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<212> DNA
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<400> 126
gaagaagcga acgaacgcc a 21

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<220>
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<400> 127
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<210> 128
<211> 141
<212> PRT
<213> Artificial Sequence

<220>
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<400> 128

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe

1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Cys Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 129

<211> 21

<212> DNA

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<400> 129

gaagaagcgt gcgaaccca g

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<210> 130

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<400> 130
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21

<210> 131
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<220>
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<400> 131

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala Asp Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 132
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21

<210> 133

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<212> PRT

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<223> ULLB-0005/047

<400> 134

Thr Tyr Lys Ile Thr Val Arg Val Tyr Gln Thr Asn Pro Asp Ala Phe
1 5 10 15

Phe His Pro Val Glu Lys Thr Val Trp Lys Tyr Ala Asn Gly Gly Thr
20 25 30

Trp Thr Ile Thr Asp Asp Gln His Val Leu Thr Met Gly Gly Ser Gly
35 40 45

Thr Ser Gly Thr Leu Arg Phe His Ala Asp Asn Gly Glu Ser Phe Thr
50 55 60

Ala Thr Phe Gly Val His Asn Tyr Lys Arg Trp Cys Asp Ile Val Thr
65 70 75 80

Asn Leu Ala Ala Asp Glu Thr Gly Met Val Ile Asn Gln Gln Tyr Tyr
85 90 95

Ser Gln Lys Asn Arg Glu Glu Ala His Glu Arg Gln Leu Ser Asn Tyr
100 105 110

Gln Val Lys Asn Ala Lys Gly Arg Asn Phe Gln Ile Val Tyr Thr Glu
115 120 125

Ala Glu Gly Asn Asp Leu His Ala Asn Leu Ile Ile Gly
130 135 140

<210> 135
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<400> 135
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<210> 136
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<400> 136
ctggcgttca tgcgcttctt c 21