

SEQUENCE LISTING

<110> Aduro Biotech Holdings, Europe B.V.

<120> Altered APRIL binding antibodies

<130> 0

<160> 60

<170> BiSSAP 1.2

<210> 1

<211> 363

<212> DNA

<213> Mus musculus

<220>

<221> source

<222> 1..363

<223> /mol_type="unassigned DNA"
/organism="Mus musculus"

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tcctgcaagg cttctggata cacattcact agctatgtga tgcactgggt gaagcagaag	120
cctgggcagg gccttgagtg gattggatat attaatcctt ataatgatgc tcctaaatac	180
aatgagaagt tcaaaggcaa ggccacagtg acttcagaca agtcctccgg cacagcctac	240
atggagctca gcagcctgac ctctgaggac tctgcggtct attactgtgc aaggggcttg	300
ggttacgccc ttactatgc tatggactac tgggggtcaag gaacctcagt caccgtctcc	360
tca	363

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<211> 321

<212> DNA

<213> Mus musculus

<220>

<221> source

<222> 1..321

<223> /mol_type="unassigned DNA"
/organism="Mus musculus"

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gggcaatctc ctaaagcact gatttcctcg gcatccaacc gtgacagtgg agtccctgat 180
cgcttcacag gcagtggatc tgggacagat ttcactctca ccatcagcaa tgtgcagtct 240
gaagacttgg cagactatct ctgtcagcaa tataacatct atccattcac gttcggctcg 300
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<210> 3
<211> 121
<212> PRT
<213> Mus musculus

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

<210> 4
<211> 107
<212> PRT
<213> Mus musculus

<400> 4
Asp Ile Val Met Thr Gln Ser Gln Lys Phe Lys Ser Thr Ser Val Gly
1 5 10 15
Asp Arg Val Ser Val Thr Cys Lys Ala Ser Gln Asn Val Gly Asn Asn
20 25 30
Val Ala Trp Tyr Gln Gln Lys Ala Gly Gln Ser Pro Lys Ala Leu Ile

		35				40				45					
Ser	Ser	Ala	Ser	Asn	Arg	Asp	Ser	Gly	Val	Pro	Asp	Arg	Phe	Thr	Gly
	50					55					60				
Ser	Gly	Ser	Gly	Thr	Asp	Phe	Thr	Leu	Thr	Ile	Ser	Asn	Val	Gln	Ser
65					70					75					80
Glu	Asp	Leu	Ala	Asp	Tyr	Phe	Cys	Gln	Gln	Tyr	Asn	Ile	Tyr	Pro	Phe
				85					90					95	
Thr	Phe	Gly	Ser	Gly	Thr	Lys	Leu	Glu	Ile	Lys					
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 <213> Mus musculus

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 1 5

<210> 6
 <211> 16
 <212> PRT
 <213> Mus musculus

<400> 6
 Tyr Ile Asn Pro Tyr Asn Asp Ala Pro Lys Tyr Asn Glu Lys Phe Lys
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<210> 7
 <211> 12
 <212> PRT
 <213> Mus musculus

<400> 7
 Gly Leu Gly Tyr Ala Leu Tyr Tyr Ala Met Asp Tyr
 1 5 10

<210> 8
 <211> 11
 <212> PRT
 <213> Mus musculus

<400> 8
 Lys Ala Ser Gln Asn Val Gly Asn Asn Val Ala

1 5 10

<210> 9
<211> 7
<212> PRT
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<400> 9
Ser Ala Ser Asn Arg Asp Ser
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<210> 10
<211> 10
<212> PRT
<213> Mus musculus

<400> 10
Gln Gln Tyr Asn Ile Tyr Pro Phe Thr Phe
1 5 10

<210> 11
<211> 363
<212> DNA
<213> Artificial Sequence

<220>
<221> source
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<223> /mol_type="unassigned DNA"
/note="Engineered immunoglobulin VH sequence"
/organism="Artificial Sequence"

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cccggacaaa ggcttgagtg gatgggatat attaatcctt ataatgatgc tcctaaatac 180
aatgagaagt tcaaaggcag agtcaccatt accaggggaca catccgcgag cacagcctac 240
atggagctga gcagcctgag atctgaagac acggctgtgt attactgtgc gagaggcttg 300
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tca 363

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

<220>
<223> Engineered immunoglobulin VH sequence

<400> 12
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
1 5 10 15
Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr
20 25 30
Val Met His Trp Val Arg Gln Ala Pro Gly Gln Arg Leu Glu Trp Met
35 40 45
Gly Tyr Ile Asn Pro Tyr Asn Asp Ala Pro Lys Tyr Asn Glu Lys Phe
50 55 60
Lys Gly Arg Val Thr Ile Thr Arg Asp Thr Ser Ala Ser Thr Ala Tyr
65 70 75 80
Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys
85 90 95
Ala Arg Gly Leu Gly Tyr Ala Leu Tyr Tyr Ala Met Asp Tyr Trp Gly
100 105 110
Gln Gly Thr Thr Val Thr Val Ser Ser
115 120

<210> 13
<211> 363
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<222> 1..363
<223> /mol_type="unassigned DNA"
/note="Engineered immunoglobulin VH sequence"
/organism="Artificial Sequence"

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tcctgcaagg cttctggata cacattcact agctatgtga tgcactgggt gcgacaggcc 120
cctggacaag ggcttgagtg gatgggatat attaatcctt ataatgatgc tcctaaatac 180
aatgagaagt tcaaaggcag ggtcaccatg accaggggaca cgtccatcag cacagcctac 240
atggagctga gcaggctgag atctgacgac acggccgtgt attactgtgc gagaggcttg 300
ggttacgccc ttactatgc tatggactac tggggccaag ggaccacggt caccgtctcg 360

<210> 14
 <211> 121
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Engineered immunoglobulin VH sequence

<400> 14
 Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
 1 5 10 15
 Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr
 20 25 30
 Val Met His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met
 35 40 45
 Gly Tyr Ile Asn Pro Tyr Asn Asp Ala Pro Lys Tyr Asn Glu Lys Phe
 50 55 60
 Lys Gly Arg Val Thr Met Thr Arg Asp Thr Ser Ile Ser Thr Ala Tyr
 65 70 75 80
 Met Glu Leu Ser Arg Leu Arg Ser Asp Asp Thr Ala Val Tyr Tyr Cys
 85 90 95
 Ala Arg Gly Leu Gly Tyr Ala Leu Tyr Tyr Ala Met Asp Tyr Trp Gly
 100 105 110
 Gln Gly Thr Thr Val Thr Val Ser Ser
 115 120

<210> 15
 <211> 363
 <212> DNA
 <213> Artificial Sequence

<220>
 <221> source
 <222> 1..363
 <223> /mol_type="unassigned DNA"
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 /organism="Artificial Sequence"

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 cctggacaag ggcttgagtg gatgggatat attaatcctt ataatgatgc tcctaaatac 180
 aatgagaagt tcaaaggcag agtcaccatg accagggaca cgtccacgag cacagtctac 240

atggagctga gcagcctgag atctgaggac acggccgtgt attactgtgc gagaggcttg 300
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 agc 363

<210> 16
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 <213> Artificial Sequence

<220>
 <223> Engineered immunoglobulin VH sequence

<400> 16
 Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
 1 5 10 15
 Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr
 20 25 30
 Val Met His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met
 35 40 45
 Gly Tyr Ile Asn Pro Tyr Asn Asp Ala Pro Lys Tyr Asn Glu Lys Phe
 50 55 60
 Lys Gly Arg Val Thr Met Thr Arg Asp Thr Ser Thr Ser Thr Val Tyr
 65 70 75 80
 Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys
 85 90 95
 Ala Arg Gly Leu Gly Tyr Ala Leu Tyr Tyr Ala Met Asp Tyr Trp Gly
 100 105 110
 Gln Gly Thr Met Val Thr Val Ser Ser
 115 120

<210> 17
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 <212> DNA
 <213> Artificial Sequence

<220>
 <221> source
 <222> 1..363
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 /organism="Artificial Sequence"

<400> 17
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 agctgcaagg ccagcggata cacattcact agctatgtga tgcactgggt gagacaggcc 120

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cccgccagg gcctggagt gatgggctat attaatcctt ataatgatgc tcctaaatac 180
aatgagaagt tcaaaggcag agtgaccatg accagagaca ccagcgccag caccgcctac 240
atggagctga gcagcctgag aagcgacgac accgccgtgt actactgcgc cagaggcttg 300
ggttacgccc ttactatgc tatggactac tggggccagg gcaccaccgt gaccgtgagc 360
agc 363

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<210> 18
<211> 121
<212> PRT
<213> Artificial Sequence

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<220>
<223> Engineered immunoglobulin VH sequence

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<400> 18
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
1      5      10      15
Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr
20     25     30
Val Met His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met
35     40     45
Gly Tyr Ile Asn Pro Tyr Asn Asp Ala Pro Lys Tyr Asn Glu Lys Phe
50     55     60
Lys Gly Arg Val Thr Met Thr Arg Asp Thr Ser Ala Ser Thr Ala Tyr
65     70     75     80
Met Glu Leu Ser Ser Leu Arg Ser Asp Asp Thr Ala Val Tyr Tyr Cys
85     90     95
Ala Arg Gly Leu Gly Tyr Ala Leu Tyr Tyr Ala Met Asp Tyr Trp Gly
100    105    110
Gln Gly Thr Thr Val Thr Val Ser Ser
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<210> 19
<211> 321
<212> DNA
<213> Artificial Sequence

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<220>
<221> source
<222> 1..321
<223> /mol_type="unassigned DNA"
      /note="Engineered immunoglobulin VL sequence"
      /organism="Artificial Sequence"

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atcacctgca aggccagtc gaattgtgggt aataatgtag cctgggtatca acagaaacca    120
ggacaatctc ctaaattgct gatttactcg gcatccaacc gtgacagtgg agtccctgat     180
cgcttctcag gcagtgggtc tgggacagat ttcactctca ccatcagcaa tatgcagtct    240
gaagacctgg cagattatct ctgccagcaa tataacatct atccattcac gttcggaggg    300
gggaccaagc tggaaatcaa a                                              321

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<210> 20
<211> 107
<212> PRT
<213> Artificial Sequence

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<220>
<223> Engineered immunoglobulin VL sequence

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

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<210> 21
<211> 321
<212> DNA
<213> Artificial Sequence

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<220>
<221> source
<222> 1..321
<223> /mol_type="unassigned DNA"
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      /organism="Artificial Sequence"

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gggcaatctc ctaaagcact gatttactcg gcatccaacc gtgacagtgg agtccctgat    180
cgcttcacag gcagtggatc tgggacagat ttcactctca ccatcaccaa tgtgcagtct    240
gaagacttgg cagagtatct ctgtcagcaa tataacatct atccattcac gttcggtgct    300
gggaccaagc tggagctgaa a                                              321

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<210> 22
<211> 107
<212> PRT
<213> Artificial Sequence

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<220>
<223> Engineered immunoglobulin VL sequence

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<400> 22
Asp Ile Val Met Thr Gln Ser Gln Lys Phe Met Pro Thr Ser Val Gly
1      5      10      15
Asp Arg Val Ser Val Thr Cys Lys Ala Ser Gln Asn Val Gly Asn Asn
20     25     30
Val Ala Trp Tyr Gln Gln Lys Pro Gly Gln Ser Pro Lys Ala Leu Ile
35     40     45
Tyr Ser Ala Ser Asn Arg Asp Ser Gly Val Pro Asp Arg Phe Thr Gly
50     55     60
Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Thr Asn Val Gln Ser
65     70     75     80
Glu Asp Leu Ala Glu Tyr Phe Cys Gln Gln Tyr Asn Ile Tyr Pro Phe
85     90     95
Thr Phe Gly Ala Gly Thr Lys Leu Glu Leu Lys
100    105

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<210> 23
<211> 321
<212> DNA
<213> Artificial Sequence

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<220>
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<222> 1..321
<223> /mol_type="unassigned DNA"
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      /organism="Artificial Sequence"

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atcacttgca aggccagtca gaatgtgggt aataatgtag cctggatatca gcagaaacca 120
gggaaagccc ctaaactcct aatctattcg gcatccaacc gtgacagtgg ggtcccatca 180
aggttcagcg gcagtggatc tgggacagag ttcactctca ccatcagcag cctgcagcct 240
gatgattttg caacttatta ctgccagcaa tataacatct atccattcac gtttggccag 300
gggaccaagc tggagatcaa a 321

<210> 24
<211> 107
<212> PRT
<213> Artificial Sequence

<220>
<223> Engineered immunoglobulin VL sequence

<400> 24
Glu Ile Val Leu Thr Gln Ser Pro Ser Thr Gln Ser Ala Ser Val Gly
1 5 10 15
Asp Arg Val Thr Ile Thr Cys Lys Ala Ser Gln Asn Val Gly Asn Asn
20 25 30
Val Ala Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
35 40 45
Tyr Ser Ala Ser Asn Arg Asp Ser Gly Val Pro Ser Arg Phe Ser Gly
50 55 60
Ser Gly Ser Gly Thr Glu Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80
Asp Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Tyr Asn Ile Tyr Pro Phe
85 90 95
Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys
100 105

<210> 25
<211> 321
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<222> 1..321
<223> /mol_type="unassigned DNA"
/note="Engineered immunoglobulin VL sequence"
/organism="Artificial Sequence"

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 atcacttgca aggccagtca gaatgtgggt aataatgtag cctgggtatca gcagaaacca 120
 gggaaagccc ctaagctcct gatctattcg gcatccaacc gtgacagtgg ggtcccatca 180
 aggttcagcg gcagtggatc tgggacagag ttactctca ccatcagcag cctgcagcct 240
 gatgattttg caacttatta ctgccagcaa tataacatct atccattcac gtttggccag 300
 gggaccaagc tggagatcaa a 321

<210> 26
 <211> 107
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Engineered immunoglobulin VL sequence

<400> 26
 Asp Ile Val Met Thr Gln Ser Pro Ser Thr Leu Ser Ala Ser Val Gly
 1 5 10 15
 Asp Arg Val Thr Ile Thr Cys Lys Ala Ser Gln Asn Val Gly Asn Asn
 20 25 30
 Val Ala Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
 35 40 45
 Tyr Ser Ala Ser Asn Arg Asp Ser Gly Val Pro Ser Arg Phe Ser Gly
 50 55 60
 Ser Gly Ser Gly Thr Glu Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
 65 70 75 80
 Asp Asp Phe Ala Thr Tyr Tyr Cys Gln Gln Tyr Asn Ile Tyr Pro Phe
 85 90 95
 Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys
 100 105

<210> 27
 <211> 321
 <212> DNA
 <213> Artificial Sequence

<220>
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 <223> /mol_type="unassigned DNA"
 /note="Engineered immunoglobulin VL sequence"
 /organism="Artificial Sequence"

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ggacagtctc ctaaagcact gatttactcg gcatccaacc gtgacagtgg agtccctgat     180
cgcttcacag gcagtggatc tgggacagat ttcactctca ccatcaccaa tgtgcagtct     240
gaggacttgg cagagtatct ctgtcagcaa tataacatct atccattcac gttcggtgct     300
gggaccaagc tggacctgaa a                                              321

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<210> 28
<211> 107
<212> PRT
<213> Artificial Sequence

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<220>
<223> Engineered immunoglobulin VL sequence

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<400> 28
Asp Ile Leu Met Thr Gln Ser Gln Lys Ile Met Pro Thr Ser Val Gly
1      5      10      15
Asp Arg Val Ser Val Thr Cys Lys Ala Ser Gln Asn Val Gly Asn Asn
20     25     30
Val Ala Trp Tyr Gln Gln Lys Pro Gly Gln Ser Pro Lys Ala Leu Ile
35     40     45
Tyr Ser Ala Ser Asn Arg Asp Ser Gly Val Pro Asp Arg Phe Thr Gly
50     55     60
Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Thr Asn Val Gln Ser
65     70     75     80
Glu Asp Leu Ala Glu Tyr Phe Cys Gln Gln Tyr Asn Ile Tyr Pro Phe
85     90     95
Thr Phe Gly Ala Gly Thr Lys Leu Asp Leu Lys
100    105

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<210> 29
<211> 321
<212> DNA
<213> Artificial Sequence

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<220>
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<222> 1..321
<223> /mol_type="unassigned DNA"
      /note="Engineered immunoglobulin VL sequence"
      /organism="Artificial Sequence"

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atcacttgca aggccagtca gaatgtgggt aataatgtag cctgggtatca gcagaaacca 120
gggaaagccc ctaagctcct gatctcttcg gcatccaacc gtgacagtgg ggtcccatca 180
aggttcagcg gcagtggatc tgggacagag ttcactctca ccatcagcag cctgcagcct 240
gatgattttg caacttattt ctgccagcaa tataacatct atccattcac gtttggccag 300
gggaccaagc tggagatcaa a 321

<210> 30
<211> 107
<212> PRT
<213> Artificial Sequence

<220>
<223> Engineered immunoglobulin VL sequence

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

<210> 31
<211> 363
<212> DNA
<213> Artificial Sequence

<220>
<221> source
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<223> /mol_type="unassigned DNA"
/note="Engineered immunoglobulin VH sequence"
/organism="Artificial Sequence"

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cccgccagg gcctggagtg gatgggctat attaatcctt ataatgatgc tcctaaatac 180
aatgagaagt tcaaaggcag agtgaccatg accagtgaca ccagcgccag caccgcctac 240
atggagctga gcagcctgag aagcgacgac accgccgtgt actactgcgc cagaggcttg 300
ggttacgccc ttactatgc tatggactac tggggccagg gcaccaccgt gaccgtgagc 360
agc 363

<210> 32
<211> 121
<212> PRT
<213> Artificial Sequence

<220>
<223> Engineered immunoglobulin VH sequence

<400> 32
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
1 5 10 15
Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr
20 25 30
Val Met His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met
35 40 45
Gly Tyr Ile Asn Pro Tyr Asn Asp Ala Pro Lys Tyr Asn Glu Lys Phe
50 55 60
Lys Gly Arg Val Thr Met Thr Ser Asp Thr Ser Ala Ser Thr Ala Tyr
65 70 75 80
Met Glu Leu Ser Ser Leu Arg Ser Asp Asp Thr Ala Val Tyr Tyr Cys
85 90 95
Ala Arg Gly Leu Gly Tyr Ala Leu Tyr Tyr Ala Met Asp Tyr Trp Gly
100 105 110
Gln Gly Thr Thr Val Thr Val Ser Ser
115 120

<210> 33
<211> 363
<212> DNA
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<220>
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<223> /mol_type="unassigned DNA"
/note="Engineered immunoglobulin VH sequence"
/organism="Artificial Sequence"

<400> 33
cagggtccagc ttgtgcagtc tggggctgag gtgaagaagc ccggcgccag cgtgaagggtg 60
agctgcaagg ccagcggata cacattcact agctatgtga tgcactgggt gagacaggcc 120
cccggccagg gcctggagtg gatgggctat attaatcctt ataatgatgc tcctaaatac 180
aatgagaagt tcaaaggcag agtgaccatc accagtgaca ccagcgccag caccgcctac 240
atggagctga gcagcctgag aagcgacgac accgccgtgt actactgcgc cagaggcttg 300
ggttacgccc ttactatgc tatggactac tggggccagg gcaccaccgt gaccgtgagc 360
agc 363

<210> 34
<211> 121
<212> PRT
<213> Artificial Sequence

<220>
<223> Engineered immunoglobulin VH sequence

<400> 34
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
1 5 10 15
Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr
20 25 30
Val Met His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met
35 40 45
Gly Tyr Ile Asn Pro Tyr Asn Asp Ala Pro Lys Tyr Asn Glu Lys Phe
50 55 60
Lys Gly Arg Val Thr Ile Thr Ser Asp Thr Ser Ala Ser Thr Ala Tyr
65 70 75 80
Met Glu Leu Ser Ser Leu Arg Ser Asp Asp Thr Ala Val Tyr Tyr Cys
85 90 95
Ala Arg Gly Leu Gly Tyr Ala Leu Tyr Tyr Ala Met Asp Tyr Trp Gly
100 105 110
Gln Gly Thr Thr Val Thr Val Ser Ser
115 120

<210> 35
<211> 363
<212> DNA
<213> Artificial Sequence

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<220>
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<222> 1..363
<223> /mol_type="unassigned DNA"
      /note="Engineered immunoglobulin VH sequence"
      /organism="Artificial Sequence"

<400> 35
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agctgcaagg ccagcggata cacattcact agctatgtga tgcactgggt gagacaggcc      120
cccggccagg gcctggagtg gatgggctat attaatcctt ataatgatgc tcctaaatac      180
aatgagaagt tcaaaggcag agtgaccatg accagtgaca agagcgccag caccgcctac      240
atggagctga gcagcctgag aagcgacgac accgccgtgt actactgcgc cagaggcttg      300
ggttacgccc ttactatgc tatggactac tggggccagg gcaccaccgt gaccgtgagc      360
agc                                                                    363

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<210> 36
<211> 121
<212> PRT
<213> Artificial Sequence

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<220>
<223> Engineered immunoglobulin VH sequence

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<400> 36
Gln Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
1          5          10          15
Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr
20        25        30
Val Met His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met
35        40        45
Gly Tyr Ile Asn Pro Tyr Asn Asp Ala Pro Lys Tyr Asn Glu Lys Phe
50        55        60
Lys Gly Arg Val Thr Met Thr Ser Asp Lys Ser Ala Ser Thr Ala Tyr
65        70        75        80
Met Glu Leu Ser Ser Leu Arg Ser Asp Asp Thr Ala Val Tyr Tyr Cys
85        90        95
Ala Arg Gly Leu Gly Tyr Ala Leu Tyr Tyr Ala Met Asp Tyr Trp Gly
100       105       110
Gln Gly Thr Thr Val Thr Val Ser Ser
115           120

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<210> 37
<211> 363
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<222> 1..363
<223> /mol_type="unassigned DNA"
/note="Engineered immunoglobulin VH sequence"
/organism="Artificial Sequence"

<400> 37
gaggtccagc ttgtgcagtc tggggctgag gtgaagaagc ccggcgccag cgtgaagggtg 60
agctgcaagg ccagcggata cacattcact agctatgtga tgcactgggt gagacaggcc 120
cccggccagg gcctggagtg gatgggctat attaatcctt ataatgatgc tcctaaatac 180
aatgagaagt tcaaaggcag agtgaccatg accagtgaca ccagcgccag caccgcctac 240
atggagctga gcagcctgag aagcgacgac accgccgtgt actactgcgc cagaggcttg 300
ggttacgccc ttactatgc tatggactac tggggccagg gcaccaccgt gaccgtgagc 360
agc 363

<210> 38
<211> 121
<212> PRT
<213> Artificial Sequence

<220>
<223> Engineered immunoglobulin VH sequence

<400> 38
Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
1 5 10 15
Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr
20 25 30
Val Met His Trp Val Arg Gln Ala Pro Gly Gln Gly Leu Glu Trp Met
35 40 45
Gly Tyr Ile Asn Pro Tyr Asn Asp Ala Pro Lys Tyr Asn Glu Lys Phe
50 55 60
Lys Gly Arg Val Thr Met Thr Ser Asp Thr Ser Ala Ser Thr Ala Tyr
65 70 75 80
Met Glu Leu Ser Ser Leu Arg Ser Asp Asp Thr Ala Val Tyr Tyr Cys
85 90 95
Ala Arg Gly Leu Gly Tyr Ala Leu Tyr Tyr Ala Met Asp Tyr Trp Gly

	100		105		110
Gln Gly Thr Thr Val Thr Val Ser Ser					
	115		120		

<210> 39
 <211> 363
 <212> DNA
 <213> Artificial Sequence

<220>
 <221> source
 <222> 1..363
 <223> /mol_type="unassigned DNA"
 /note="Engineered immunoglobulin VH sequence"
 /organism="Artificial Sequence"

<400> 39
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 agctgcaagg ccagcggata cacattcact agctatgtga tgcactgggt gagacaggcc 120
 cccggccagg gcctggagtg gatgggctat attaatcctt ataatgatgc tcctaaatac 180
 aatgagaagt tcaaaggcaa agcgaccatg accagtgaca ccagcgccag caccgcctac 240
 atggagctga gcagcctgag aagcgacgac accgccgtgt actactgcgc cagaggcttg 300
 ggttacgccc ttactatgc tatggactac tggggccagg gcaccaccgt gaccgtgagc 360
 agc 363

<210> 40
 <211> 121
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Engineered immunoglobulin VH sequence

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

65		70		75		80									
Met	Glu	Leu	Ser	Ser	Leu	Arg	Ser	Asp	Asp	Thr	Ala	Val	Tyr	Tyr	Cys
			85					90						95	
Ala	Arg	Gly	Leu	Gly	Tyr	Ala	Leu	Tyr	Tyr	Ala	Met	Asp	Tyr	Trp	Gly
		100						105					110		
Gln	Gly	Thr	Thr	Val	Thr	Val	Ser	Ser							
		115					120								

<210> 41
 <211> 1344
 <212> DNA
 <213> Artificial Sequence

<220>
 <221> source
 <222> 1..1344
 <223> /mol_type="unassigned DNA"
 /note="Engineered immunoglobulin heavy chain sequence"
 /organism="Artificial Sequence"

<400> 41
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 tcctgcaagg cttctggata cacattcact agctatgtga tgcattgggt gcgccaggcc 120
 cccggacaaa ggcttgagtg gatgggatat attaatcctt ataatgatgc tcctaaatac 180
 aatgagaagt tcaaaggcag agtcaccatt accagggaca catccgcgag cacagcctac 240
 atggagctga gcagcctgag atctgaagac acggctgtgt attactgtgc gagaggcttg 300
 ggttacgccc ttactatgc tatggactac tggggccaag ggaccacggt caccgtctcc 360
 tcagcatcca ccaagggccc atccgtcttc cccctggcgc cctgctccag gagcacctcc 420
 gagagcacag ccgccctggg ctgcctggtc aaggactact tccccgaacc ggtgacgggtg 480
 tcgtggaact caggcgccct gaccagcggc gtgcacacct tcccggctgt cctacagtcc 540
 tcaggactct actccctcag cagcgtgggt accgtgccct ccagcagctt gggcacgaag 600
 acctacacct gcaacgtaga tcacaagccc agcaacacca aggtggacaa gagagttgag 660
 tccaaatatg gtcccccatg cccaccatgc ccagcacctg agttcctggg gggaccatca 720
 gtcttcctgt tcccccaaaa acccaaggac acttcatga tctcccgac ccctgaggtc 780
 acgtgcgtgg tgggtggacgt gagccaggaa gaccccgagg tccagttcaa ctggtacgtg 840
 gatggcgtgg aggtgcataa tgccaagaca aagccgcggg aggagcagtt caacagcacg 900


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<210> 43
<211> 1344
<212> DNA
<213> Artificial Sequence

<220>
<221> source
<222> 1..1344
<223> /mol_type="unassigned DNA"
      /note="Engineered immunoglobulin heavy chain sequence"
      /organism="Artificial Sequence"

<400> 43
caggtccagc ttgtgcagtc tggggctgag gtgaagaagc ctggggcctc agtgaaggtc
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tcctgcaagg cttctggata cacattcact agctatgtga tgcactgggt gcgacaggcc	120
cctggacaag ggcttgagt gatgggatat attaatcctt ataatgatgc tcctaaatac	180
aatgagaagt tcaaaggcag ggtcaccatg accagggaca cgtccatcag cacagcctac	240
atggagctga gcaggctgag atctgacgac acggccgtgt attactgtgc gagaggcttg	300
ggttacgccc ttactatgc tatggactac tggggccaag ggaccacggc caccgtctcg	360
agcgcattcca ccaagggccc atccgtcttc cccctggcgc cctgctccag gagcacctcc	420
gagagcacag ccgccctggg ctgcctggtc aaggactact tccccgaacc ggtgacggtg	480
tcgtggaact caggcgccct gaccagcggc gtgcacacct tcccggctgt cctacagtcc	540
tcaggactct actccctcag cagcgtgggt accgtgccct ccagcagctt gggcacgaag	600
acctacacct gcaacgtaga tcacaagccc agcaacacca aggtggacaa gagagttgag	660
tccaaatatg gtcccccatg cccaccatgc ccagcacctg agttcctggg gggaccatca	720
gtcttcctgt tcccccaaa acccaaggac acttcatga tctcccggac ccctgaggtc	780
acgtgcgtgg tgggtggacgt gagccaggaa gaccccgagg tccagttcaa ctggtacgtg	840
gatggcgtgg aggtgcataa tgccaagaca aagccgcggg aggagcagtt caacagcacg	900
taccgtgtgg tcagcgtcct caccgtcctg caccaggact ggctgaacgg caaggagtac	960
aagtgcagg tctccaacaa aggccctccc tcctccatcg agaaaaccat ctccaaagcc	1020
aaagggcagc cccgagagcc acagggtgtac accctgcccc catcccagga ggagatgacc	1080
aagaaccagg tcagcctgac ctgcctggtc aaaggcttct accccagcga catcgccgtg	1140
gagtgggaga gcaatgggca gccggagaac aactacaaga ccacgcctcc cgtgctggac	1200
tccgacggct ctttcttct ctacagcagg ctaaccgtgg acaagagcag gtggcaggag	1260
gggaatgtct tctcatgctc cgtgatgcat gaggctctgc acaaccacta cacacagaag	1320
agcctctccc tgtctctggg taaa	1344

<210> 44

<211> 448

<212> PRT

<213> Artificial Sequence

<220>

<223> Engineered immunoglobulin heavy chain sequence

<400> 44

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

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

<210> 45

<211> 1344

<212> DNA

<213> Artificial Sequence

<220>

<221> source

<222> 1..1344

<223> /mol_type="unassigned DNA"

/note="Engineered immunoglobulin heavy chain sequence"

/organism="Artificial Sequence"

<400> 45

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tcctgcaagg catctggata cacattcact agctatgtga tgcactgggt gcgacaggcc	120
cctggacaag ggcttgagtg gatgggatat attaatcctt ataatgatgc tcctaaatac	180
aatgagaagt tcaaaggcag agtcaccatg accagggaca cgtccacgag cacagtctac	240
atggagctga gcagcctgag atctgaggac acggccgtgt attactgtgc gagaggcttg	300
ggttacgccc ttactatgc tatggactac tggggccaag ggacaatggt caccgtctcg	360
agcgcattcca ccaagggccc atccgtcttc cccctggcgc cctgctccag gagcacctcc	420
gagagcacag ccgccctggg ctgcctggtc aaggactact tccccgaacc ggtgacggtg	480
tcgtggaact caggcgccct gaccagcggc gtgcacacct tcccggctgt cctacagtcc	540
tcaggactct actccctcag cagcgtgggt accgtgccct ccagcagctt gggcacgaag	600
acctacacct gcaacgtaga tcacaagccc agcaacacca aggtggacaa gagagttgag	660
tccaaatatg gtcccccatg cccacatgc ccagcacctg agttcctggg gggaccatca	720

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gtcttcctgt tcccccaaa acccaaggac acttcatga tctcccgac ccctgaggtc      780
acgtgcgtgg tgggtggacgt gagccaggaa gaccccgagg tccagttcaa ctggtacgtg      840
gatggcgtgg aggtgcataa tgccaagaca aagccgcggg aggagcagtt caacagcacg      900
taccgtgtgg tcagcgtcct caccgtcctg caccaggact ggctgaacgg caaggagtac      960
aagtgaagg tctccaacaa aggcctcccg tcctccatcg agaaaacat ctccaaagcc     1020
aaagggcagc cccgagagcc acaggtgtac accctgcccc catcccagga ggagatgacc     1080
aagaaccagg tcagcctgac ctgcctgggtc aaaggcttct accccagcga catcgccgtg     1140
gagtgggaga gcaatgggca gccggagaac aactacaaga ccacgcctcc cgtgctggac     1200
tccgacggct ctttcttct ctacagcagg ctaaccgtgg acaagagcag gtggcaggag     1260
gggaatgtct tctcatgctc cgtgatgcat gaggctctgc acaaccacta cacacagaag     1320
agcctctccc tgtctctggg taaa                                           1344

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<210> 46

<211> 448

<212> PRT

<213> Artificial Sequence

<220>

<223> Engineered immunoglobulin heavy chain sequence

<400> 46

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

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

<210> 47
 <211> 1344
 <212> DNA
 <213> Artificial Sequence

<220>
 <221> source
 <222> 1..1344

<223> /mol_type="unassigned DNA"
/note="Engineered immunoglobulin heavy chain sequence"
/organism="Artificial Sequence"

<400> 47

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cccggccagg gcctggagtg gatgggctat attaatcctt ataatgatgc tcctaaatac	180
aatgagaagt tcaaaggcag agtgaccatg accagagaca ccagcgccag caccgcctac	240
atggagctga gcagcctgag aagcgacgac accgccgtgt actactgcgc cagaggcttg	300
ggttacgccc ttactatgc tatggactac tggggccagg gcaccaccgt gaccgtgagc	360
agcgcaccca ccaagggccc atccgtcttc cccctggcgc cctgctccag gagcacctcc	420
gagagcacag ccgccctggg ctgcctggtc aaggactact tccccgaacc ggtgacgggtg	480
tcgtggaact caggcgccct gaccagcggc gtgcacacct tcccggctgt cctacagtcc	540
tcaggactct actccctcag cagcgtgggt accgtgccct ccagcagctt gggcacgaag	600
acctacacct gcaacgtaga tcacaagccc agcaacacca aggtggacaa gagagttgag	660
tcctaaatatg gtcccccatg cccaccatgc ccagcacctg agttcctggg gggaccatca	720
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acgtgcgtgg tgggtggacgt gagccaggaa gaccccgagg tccagttcaa ctggtacgtg	840
gatggcgtgg aggtgcataa tgccaagaca aagccgcggg aggagcagtt caacagcacg	900
taccgtgtgg tcagcgtcct caccgtcctg caccaggact ggctgaacgg caaggagtac	960
aagtgcaagg tctccaacaa aggcctcccg tcctccatcg agaaaacat ctccaaagcc	1020
aaagggcagc cccgagagcc acagggtgtac accctgcccc catcccagga ggagatgacc	1080
aagaaccagg tcagcctgac ctgcctggtc aaaggcttct accccagcga catcgccgtg	1140
gagtgggaga gcaatgggca gccggagaac aactacaaga ccacgcctcc cgtgctggac	1200
tccgacggct ccttcttcct ctacagcagg ctaaccgtgg acaagagcag gtggcaggag	1260
gggaatgtct tctcatgctc cgtgatgcat gaggctctgc acaaccacta cacacagaag	1320
agcctctccc tgtctctggg taaa	1344

<210> 48

<211> 448

<212> PRT

<213> Artificial Sequence

<220>

<223> Engineered immunoglobulin heavy chain sequence

<400> 48

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

305		310		315		320
Lys	Cys	Lys	Val	Ser	Asn	Lys
		325		330		335
Ile	Ser	Lys	Ala	Lys	Gly	Gln
		340		345		350
Pro	Pro	Ser	Gln	Glu	Glu	Met
		355		360		365
Leu	Val	Lys	Gly	Phe	Tyr	Pro
		370		375		380
Asn	Gly	Gln	Pro	Glu	Asn	Asn
385				390		395
Ser	Asp	Gly	Ser	Phe	Phe	Leu
				405		410
Arg	Trp	Gln	Glu	Gly	Asn	Val
		420		425		430
Leu	His	Asn	His	Tyr	Thr	Gln
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<210> 49

<211> 642

<212> DNA

<213> Artificial Sequence

<220>

<221> source

<222> 1..642

<223> /mol_type="unassigned DNA"
 /note="Engineered immunoglobulin light chain sequence"
 /organism="Artificial Sequence"

<400> 49

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gggaaagccc ctaagctact gatctcttcc gcatccaacc gggacagtgg tgtgccctca	180
aggttttagcg gcagtggatc agggacagag ttcacattga ccatatccag cctgcagcct	240
gatgattttg ctacttatit ctgccaacaa tataacattt acccattcac gtttggccag	300
ggcaccaagc tagagatcaa acggacgggt gctgcaccct ctgtctttat cttcccgcc	360
tctgatgaac agttgaagtc cggaacagcc tctgttgtgt gcctgctgaa taacttttat	420
ccccgcgagg cgaaagttca gtggaagggt gataacgccc tccaatcagg caattcccag	480
gagagtgtga cagagcaaga ttccaaggac tcaacctaca gcctcagcag tactttaact	540

ctgagcaaag cagactacga gaagcacaaa gtctacgctt gcgaagtcac ccatcagggc 600

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<211> 214

<212> PRT

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<220>

<223> Engineered immunoglobulin light chain sequence

<400> 50

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			20					25					30		
Val	Ala	Trp	Tyr	Gln	Gln	Lys	Pro	Gly	Lys	Ala	Pro	Lys	Leu	Leu	Ile
	35						40					45			
Ser	Ser	Ala	Ser	Asn	Arg	Asp	Ser	Gly	Val	Pro	Ser	Arg	Phe	Ser	Gly
	50					55					60				
Ser	Gly	Ser	Gly	Thr	Glu	Phe	Thr	Leu	Thr	Ile	Ser	Ser	Leu	Gln	Pro
65				70					75					80	
Asp	Asp	Phe	Ala	Thr	Tyr	Phe	Cys	Gln	Gln	Tyr	Asn	Ile	Tyr	Pro	Phe
				85					90					95	
Thr	Phe	Gly	Gln	Gly	Thr	Lys	Leu	Glu	Ile	Lys	Arg	Thr	Val	Ala	Ala
			100					105					110		
Pro	Ser	Val	Phe	Ile	Phe	Pro	Pro	Ser	Asp	Glu	Gln	Leu	Lys	Ser	Gly
	115					120						125			
Thr	Ala	Ser	Val	Val	Cys	Leu	Leu	Asn	Asn	Phe	Tyr	Pro	Arg	Glu	Ala
	130				135						140				
Lys	Val	Gln	Trp	Lys	Val	Asp	Asn	Ala	Leu	Gln	Ser	Gly	Asn	Ser	Gln
145				150						155				160	
Glu	Ser	Val	Thr	Glu	Gln	Asp	Ser	Lys	Asp	Ser	Thr	Tyr	Ser	Leu	Ser
			165						170					175	
Ser	Thr	Leu	Thr	Leu	Ser	Lys	Ala	Asp	Tyr	Glu	Lys	His	Lys	Val	Tyr
			180					185					190		
Ala	Cys	Glu	Val	Thr	His	Gln	Gly	Leu	Ser	Ser	Pro	Val	Thr	Lys	Ser
	195						200						205		
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<210> 51

<211> 1344

<212> DNA

<213> Artificial Sequence

<220>

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<221> source
<222> 1..1344
<223> /mol_type="unassigned DNA"
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      /organism="Artificial Sequence"

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cctggccagg gcctggagtg gatgggggtat attaatcctt ataatgatgc tcctaaatac      180
aatgagaagt tcaaaggaaa agcaactatg accagtgata ctagcgcttc aaccgcctac      240
atggagctga gcagcttaag aagcgacgac accgccgtgt actattgtgc caggggcttg      300
ggttacgccc tttattatgc tatggactac tggggtcagg gcaccacagt gaccgttagc      360
tctgcatcta ctaagggacc atccgtcttc cccctggcgc catgctcccg cagtacaagt      420
gagagcacag cagccctggg ctgtttggta aaggactact tccccgaacc tgtgactgtg      480
tcttggaaact caggcgccct gactagcggc gtgcacactt tccctgctgt cctacagtcc      540
tcaggactat actccctctc gtctgtgggt acagtgcctt cctcatcatt gggaacgaaa      600
acctatactt gcaacgttga tcacaagccc agcaacacca aggtggacaa gagagttgag      660
tccaaatatg gtcccccattg tccaccatgt ccagcacctg agtttcttgg cggaccaagt      720
gttttctgtg tcccccaaaa acccaaggat acttctcatga taagtcgcac ccctgaagtc      780
acttgcgtgg tgggtggacgt tagccaggaa gatcccgaag tccaattcaa ctggtacgta      840
gatggcgtag aagtgcataa tgcgaagaca aagccgagag aggagcagtt taattcgacg      900
tatcgggtgg tcagcgtcct cacagtcctg caccaggact ggctgaacgg caaggagtat      960
aagtgcaagg tctccaacaa aggtctcccg tcctccattg agaaaacaat ctccaaagca     1020
aaagggcagc cccgagaacc acaagtgtac accctgcccc catctcagga ggagatgacc     1080
aagaaccagg tcagtcttac ctgcctgggtc aaaggctttt atccctcaga tatcgccgtt     1140
gagtgggaaa gcaatgggca gccggagaa aactacaaga ccacgcctcc cgttctggat     1200
tctgacggat cgttcttttt atacagcagg ctaaccgtgg acaagtctcg gtggcaggaa     1260
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1344

<210> 52

<211> 448

<212> PRT

<213> Artificial Sequence

<220>

<223> Engineered immunoglobulin heavy chain sequence

<400> 52

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

290		295		300	
Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr					
305		310		315	320
Lys Cys Lys Val Ser Asn Lys Gly Leu Pro Ser Ser Ile Glu Lys Thr					
	325		330		335
Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu					
	340		345		350
Pro Pro Ser Gln Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys					
	355		360		365
Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser					
	370		375		380
Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp					
385		390		395	400
Ser Asp Gly Ser Phe Phe Leu Tyr Ser Arg Leu Thr Val Asp Lys Ser					
	405		410		415
Arg Trp Gln Glu Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala					
	420		425		430
Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Leu Gly Lys					
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<210> 53

<211> 1335

<212> DNA

<213> Mus musculus

<220>

<221> source

<222> 1..1335

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cctgggcagg gccttgagtg gattggatat attaatcctt ataatgatgc tcctaaatac	180
aatgagaagt tcaaaggcaa ggccacagtg acttcagaca agtcctccgg cacagcctac	240
atggagctca gcagcctgac ctctgaggac tctgcggtct attactgtgc aaggggcttg	300
ggttacgccc ttactatgc tatggactac tggggtaag gaacctcagt caccgtctcc	360
tcagccaaaa cgacaccccc atctgtctat cactggcccc ctggatctgc tgcccaaact	420
aactccatgg tgaccctggg atgcctgggtc aagggtatt tccctgagcc agtgacagtg	480

acctggaact ctggatccct gtccagcggg gtgcacacct tcccagctgt cctggagtct	540
gacctctaca ctctgagcag ctcaagtact gtccccctcca gccctcggcc cagcgagacc	600
gtcacctgca acgttgccca cccggccagc agcaccaagg tggacaagaa aattgtgccc	660
agggattgtg gttgtaagcc ttgcatatgt acagtcccag aagtatcatc tgtcttcatc	720
ttccccccaa agcccaagga tgtgctcacc attactctga ctctaaggt cacgtgtgtt	780
gtggtagaca tcagcaagga tgatcccag gtccagttca gctggtttgt agatgatgtg	840
gaggtgcaca cagctcagac gcaaccccgaggaggagcagt tcaacagcac tttccgctca	900
gtcagtgaac ttcccatcat gcaccaggac tggctcaatg gcaaggagtt caaatgcagg	960
gtcaacagtg cagctttccc tgcccccatc gagaaaacca tctccaaaac caaaggcaga	1020
ccgaaggctc cacagggtgta caccattcca cctcccaagg agcagatggc caaggataaa	1080
gtcagtctga cctgcatgat aacagacttc ttccctgaag acattactgt ggagtggcag	1140
tggaatgggc agccagcgga gaactacaag aacactcagc ccatcatgaa cacgaatggc	1200
tcttacttcg tctacagcaa gctcaatgtg cagaagagca actgggaggc aggaaatact	1260
ttcacctgct ctgtgttaca tgagggcctg cacaaccacc atactgagaa ggcctctcc	1320
cactctcctg gtaaa	1335

<210> 54

<211> 642

<212> DNA

<213> Mus musculus

<220>

<221> source

<222> 1..642

<223> /mol_type="unassigned DNA"
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gggcaatctc ctaaagcact gatttcctcg gcatccaacc gtgacagtgg agtccctgat	180
cgcttcacag gcagtggatc tgggacagat ttactctca ccatcagcaa tgtgcagtct	240

gaagacttgg cagactatct ctgtcagcaa tataacatct atccattcac gttcggctcg	300
gggacaaaagt tggaaataaaa acgggctgat gctgcaccaa ctgtatccat cttcccacca	360
tccagtgagc agttaacatc tggagggtgcc tcagtcgtgt gcttcttgaa caacttctac	420
cccaaagaca tcaatgtcaa gtggaagatt gatggcagtg aacgacaaaa tggcgtcctg	480
aacagttgga ctgatcagga cagcaaagac agcacctaca gcatgagcag caccctcacg	540
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<210> 55
 <211> 445
 <212> PRT
 <213> Mus musculus

<400> 55

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

210		215		220
Cys Lys Pro Cys Ile Cys Thr Val Pro Glu Val Ser Ser Val Phe Ile				
225		230		235
Phe Pro Pro Lys Pro Lys Asp Val Leu Thr Ile Thr Leu Thr Pro Lys				
	245		250	255
Val Thr Cys Val Val Val Asp Ile Ser Lys Asp Asp Pro Glu Val Gln				
	260		265	270
Phe Ser Trp Phe Val Asp Asp Val Glu Val His Thr Ala Gln Thr Gln				
	275		280	285
Pro Arg Glu Glu Gln Phe Asn Ser Thr Phe Arg Ser Val Ser Glu Leu				
	290		295	300
Pro Ile Met His Gln Asp Trp Leu Asn Gly Lys Glu Phe Lys Cys Arg				
305		310		315
Val Asn Ser Ala Ala Phe Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys				
	325		330	335
Thr Lys Gly Arg Pro Lys Ala Pro Gln Val Tyr Thr Ile Pro Pro Pro				
	340		345	350
Lys Glu Gln Met Ala Lys Asp Lys Val Ser Leu Thr Cys Met Ile Thr				
	355		360	365
Asp Phe Phe Pro Glu Asp Ile Thr Val Glu Trp Gln Trp Asn Gly Gln				
	370		375	380
Pro Ala Glu Asn Tyr Lys Asn Thr Gln Pro Ile Met Asn Thr Asn Gly				
385		390		395
Ser Tyr Phe Val Tyr Ser Lys Leu Asn Val Gln Lys Ser Asn Trp Glu				
	405		410	415
Ala Gly Asn Thr Phe Thr Cys Ser Val Leu His Glu Gly Leu His Asn				
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His His Thr Glu Lys Ser Leu Ser His Ser Pro Gly Lys				
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<210> 56

<211> 214

<212> PRT

<213> Mus musculus

<400> 56

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	35	40
Ser Ser Ala Ser Asn Arg Asp Ser Gly Val Pro Asp Arg Phe Thr Gly		
	50	55
Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Asn Val Gln Ser		
65	70	75
Glu Asp Leu Ala Asp Tyr Phe Cys Gln Gln Tyr Asn Ile Tyr Pro Phe		
	85	90
Thr Phe Gly Ser Gly Thr Lys Leu Glu Ile Lys Arg Ala Asp Ala Ala		

			100					105				110			
Pro	Thr	Val	Ser	Ile	Phe	Pro	Pro	Ser	Ser	Glu	Gln	Leu	Thr	Ser	Gly
			115					120				125			
Gly	Ala	Ser	Val	Val	Cys	Phe	Leu	Asn	Asn	Phe	Tyr	Pro	Lys	Asp	Ile
			130					135				140			
Asn	Val	Lys	Trp	Lys	Ile	Asp	Gly	Ser	Glu	Arg	Gln	Asn	Gly	Val	Leu
145					150					155					160
Asn	Ser	Trp	Thr	Asp	Gln	Asp	Ser	Lys	Asp	Ser	Thr	Tyr	Ser	Met	Ser
				165					170					175	
Ser	Thr	Leu	Thr	Leu	Thr	Lys	Asp	Glu	Tyr	Glu	Arg	His	Asn	Ser	Tyr
			180					185					190		
Thr	Cys	Glu	Ala	Thr	His	Lys	Thr	Ser	Thr	Ser	Pro	Ile	Val	Lys	Ser
		195					200					205			
Phe	Asn	Arg	Asn	Glu	Cys										
			210												

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 <211> 57
 <212> DNA
 <213> Homo sapiens

<220>
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 <212> PRT
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<400> 58
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 <211> 66
 <212> DNA
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<220>
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<222> 1..66
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<210> 60
<211> 22
<212> PRT
<213> Homo sapiens

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1 5 10 15
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20