

SEQUENCE LISTING

<110> UNIVERSITY HEALTH NETWORK

<120> T CELL RECEPTORS AND METHODS OF USE THEREOF

<130> 4285.006PC01/C-K/BMD

<150> US 62/813,650

<151> 2019-03-04

<160> 194

<170> PatentIn version 3.5

<210> 1

<211> 279

<212> PRT

<213> Artificial Sequence

<220>

<223> alpha chain amino acid sequence

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Asp	Trp	Val	Asn	Ser	Gln	Gln	Lys	Asn	Asp	Asp	Gln	Gln	Val	Lys	Gln
		20					25						30		

Asn	Ser	Pro	Ser	Leu	Ser	Val	Gln	Glu	Gly	Arg	Ile	Ser	Ile	Leu	Asn
		35					40					45			

Cys	Asp	Tyr	Thr	Asn	Ser	Met	Phe	Asp	Tyr	Phe	Leu	Trp	Tyr	Lys	Lys
	50					55					60				

Tyr	Pro	Ala	Glu	Gly	Pro	Thr	Phe	Leu	Ile	Ser	Ile	Ser	Ser	Ile	Lys
65					70					75					80

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

Lys	His	Leu	Ser	Leu	His	Ile	Val	Pro	Ser	Gln	Pro	Gly	Asp	Ser	Ala
		100						105					110		

Val	Tyr	Phe	Cys	Ala	Ala	Asn	Ser	Gly	Asn	Thr	Pro	Leu	Val	Phe	Gly
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115

120

125

Lys Gly Thr Arg Leu Ser Val Ile Ala Asn Ile Gln Asn Pro Asp Pro
 130 135 140

Ala Val Tyr Gln Leu Arg Asp Ser Lys Ser Ser Asp Lys Ser Val Cys
 145 150 155 160

Leu Phe Thr Asp Phe Asp Ser Gln Thr Asn Val Ser Gln Ser Lys Asp
 165 170 175

Ser Asp Val Tyr Ile Thr Asp Lys Thr Val Leu Asp Met Arg Ser Met
 180 185 190

Asp Phe Lys Ser Asn Ser Ala Val Ala Trp Ser Asn Lys Ser Asp Phe
 195 200 205

Ala Cys Ala Asn Ala Phe Asn Asn Ser Ile Ile Pro Glu Asp Thr Phe
 210 215 220

Phe Pro Ser Pro Glu Ser Ser Cys Asp Val Lys Leu Val Glu Lys Ser
 225 230 235 240

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

Phe Arg Ile Leu Leu Leu Lys Val Ala Gly Phe Asn Leu Leu Met Thr
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Leu Arg Leu Trp Ser Ser Glx
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Pro	Glu	Val	Thr
		25	
Gln	Thr	Pro	Ser
			30
His	Gln	Val	Thr
Gln	Met	Gly	Gln
	35		
Glu	Val	Ile	Leu
		40	
Arg	Cys	Val	Pro
			45
Ile	Ser	Asn	His
Leu	Tyr	Phe	Tyr
	50		
Trp	Tyr	Arg	Gln
		55	
Ile	Leu	Gly	Gln
			60
Lys	Val	Glu	Phe
Leu	Val	Ser	Phe
Tyr	Asn	Asn	Glu
	70		
Ile	Ser	Glu	Lys
		75	
Ser	Glu	Ile	Phe
			80
Asp	Asp	Gln	Phe
Ser	Val	Glu	Arg
	85		
Pro	Asp	Gly	Ser
Asn	Phe	Thr	Leu
		95	
Lys	Ile	Arg	Ser
Thr	Lys	Leu	Glu
Asp	Ser	Ala	Met
	100		
Tyr	Phe	Cys	Ala
		110	
Ser	Ser	Leu	Met
Gly	Gly	Gly	Asn
Thr	Ile	Tyr	Phe
Gly	Glu	Gly	Ser
		125	
Trp	Leu	Thr	Val
Val	Glu	Asp	Leu
Asn	Lys	Val	Phe
Pro	Pro	Glu	Val
Ala	Val	Phe	Glu
Pro	Ser	Glu	Ala
Ile	Ser	His	Thr
Gln	Lys	Ala	
		160	
Thr	Leu	Val	Cys
Leu	Ala	Thr	Gly
Phe	Phe	Pro	Asp
His	Val	Glu	Leu
		175	
Ser	Trp	Trp	Val
Asn	Gly	Lys	Glu
Val	His	Ser	Gly
Val	Ser	Thr	Asp
Pro	Gln	Pro	Leu
Lys	Glu	Gln	Pro
Ala	Leu	Asn	Asp
Ser	Arg	Tyr	Cys
Leu	Ser	Ser	Arg
Leu	Arg	Val	Ser
Ala	Thr	Phe	Trp
Gln	Asn	Pro	Arg

Asn His Phe Arg Cys Gln Val Gln Phe Tyr Gly Leu Ser Glu Asn Asp
225 230 235 240

Glu Trp Thr Gln Asp Arg Ala Lys Pro Val Thr Gln Ile Val Ser Ala
245 250 255

Glu Ala Trp Gly Arg Ala Asp Cys Gly Phe Thr Ser Val Ser Tyr Gln
260 265 270

Gln Gly Val Leu Ser Ala Thr Ile Leu Tyr Glu Ile Leu Leu Gly Lys
275 280 285

Ala Thr Leu Tyr Ala Val Leu Val Ser Ala Leu Val Leu Met Ala Met
290 295 300

Val Lys Arg Lys Asp Phe Glx
305 310

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Ser Asn His Leu Tyr

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<223> alpha CDR3

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Cys Ala Ala Asn Ser Gly Asn Thr Pro Leu Val Phe

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<223> beta CDR1

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Ile Ser Ser Ile Lys Asp Lys

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<223> beta CDR2

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Phe Tyr Asn Asn Glu Ile

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<223> beta CDR3

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Cys Ala Ser Ser Leu Met Gly Gly Gly Asn Thr Ile Tyr Phe
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Arg Tyr Gly Ser Phe Ser Val Thr Leu
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Gly Leu Glu Ala Ile Gln Arg Thr Pro Lys Ile Gln Val Tyr Ser Arg
20 25 30

His Pro Ala Glu Asn Gly Lys Ser Asn Phe Leu Asn Cys Tyr Val Ser
35 40 45

Gly Phe His Pro Ser Asp Ile Glu Val Asp Leu Leu Lys Asn Gly Glu
50 55 60

Arg Ile Glu Lys Val Glu His Ser Asp Leu Ser Phe Ser Lys Asp Trp
65 70 75 80

Ser Phe Tyr Leu Leu Tyr Tyr Thr Glu Phe Thr Pro Thr Glu Lys Asp
85 90 95

Glu Tyr Ala Cys Arg Val Asn His Val Thr Leu Ser Gln Pro Lys Ile
100 105 110

Val Lys Trp Asp Arg Asp Met
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gaaggaagaa tttctattct gaactgtgac tatactaaca gcatgtttga ttatttccta 180
tggtacaaaa aataccctgc tgaaggtcct acattcctga tatctataag ttccattaag 240
gataaaaatg aagatggaag attcactgtc ttcttaaaca aaagtgccaa gcacctctct 300
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ggaaacacac ctcttgtctt tggaaagggc acaagacttt ctgtgattgc aaatatccag	420
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ctattcaccg attttgattc tcaaacaaat gtgtcacaaa gtaaggattc tgatgtgtat	540
atcacagaca aaactgtgct agacatgagg tctatggact tcaagagcaa cagtgtgtgtg	600
gcctggagca acaaatctga ctttgcattg gcaaacgcct tcaacaacag cattattcca	660
gaagacacct tcttccccag cccagaaagt tcctgtgatg tcaagctggg cgagaaaagc	720
tttgaaacag atacgaacct aaactttcaa aacctgtcag tgattggggt ccgaatcctc	780
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cgctgtgtcc ccatctctaa tcacttatac ttctattggg acagacaaat cttggggcag	180
aaagtcgagt ttctggtttc cttttataat aatgaaatct cagagaagtc tgaaatattc	240
gatgatcaat tctcagttga aaggcctgat ggatcaaatt tcactctgaa gatccggtcc	300
acaaagctgg aggactcagc catgtacttc tgtgccagca gtttgatggg aggtggaaac	360
accatatatt ttggagaggg aagttggctc actgtttag taggacctgaa caaggtgttc	420
ccacccgagg tcgctgtgtt tgagccatca gaagcagaga tctcccacac caaaaggcc	480
acactgggtg gcctggccac aggcttcttc cctgaccacg tggagctgag ctggtgggtg	540
aatgggaagg aggtgcacag tggggtcagc acggaccgc agcccctcaa ggagcagccc	600
gccctcaatg actccagata ctgcctgagc agccgcctga gggctctggc caccttctgg	660
cagaaccccc gcaaccactt ccgctgtcaa gtccagttct acgggctctc ggagaatgac	720
gagtggaacc aggatagggc caaacccgtc acccagatcg tcagcgccga ggcctggggt	780
agagcagact gtggctttac ctcggtgtcc taccagcaag gggtcctgtc tgccaccatc	840

ctctatgaga tcctgctagg gaaggccacc ctgtatgctg tgctggtcag cgcccttgtg	900
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20 25 30

Leu Gly Val Ser Arg Gln Leu Arg Thr Lys Ala Trp Asn Arg Gln Leu
35 40 45

Tyr Pro Glu Trp Thr Glu Ala Gln Arg Leu Asp Cys Trp Arg Gly Gly
50 55 60

Gln Val Ser Leu Lys Val Ser Asn Asp Gly Pro Thr Leu Ile Gly Ala
65 70 75 80

Asn Ala Ser Phe Ser Ile Ala Leu Asn Phe Pro Gly Ser Gln Lys Val
85 90 95

Leu Pro Asp Gly Gln Val Ile Trp Val Asn Asn Thr Ile Ile Asn Gly
100 105 110

Ser Gln Val Trp Gly Gly Gln Pro Val Tyr Pro Gln Glu Thr Asp Asp
115 120 125

Ala Cys Ile Phe Pro Asp Gly Gly Pro Cys Pro Ser Gly Ser Trp Ser
130 135 140

Gln Lys Arg Ser Phe Val Tyr Val Trp Lys Thr Trp Gly Gln Tyr Trp
145 150 155 160

Gln Val Leu Gly Gly Pro Val Ser Gly Leu Ser Ile Gly Thr Gly Arg
165 170 175

Ala Met Leu Gly Thr His Thr Met Glu Val Thr Val Tyr His Arg Arg
180 185 190

Gly Ser Arg Ser Tyr Val Pro Leu Ala His Ser Ser Ser Ala Phe Thr
195 200 205

Ile Thr Asp Gln Val Pro Phe Ser Val Ser Val Ser Gln Leu Arg Ala
210 215 220

Leu Asp Gly Gly Asn Lys His Phe Leu Arg Asn Gln Pro Leu Thr Phe
225 230 235 240

Ala Leu Gln Leu His Asp Pro Ser Gly Tyr Leu Ala Glu Ala Asp Leu
245 250 255

Ser Tyr Thr Trp Asp Phe Gly Asp Ser Ser Gly Thr Leu Ile Ser Arg
260 265 270

Ala Leu Val Val Thr His Thr Tyr Leu Glu Pro Gly Pro Val Thr Ala
275 280 285

Gln Val Val Leu Gln Ala Ala Ile Pro Leu Thr Ser Cys Gly Ser Ser
290 295 300

Pro Val Pro Gly Thr Thr Asp Gly His Arg Pro Thr Ala Glu Ala Pro
305 310 315 320

Asn Thr Thr Ala Gly Gln Val Pro Thr Thr Glu Val Val Gly Thr Thr
325 330 335

Pro Gly Gln Ala Pro Thr Ala Glu Pro Ser Gly Thr Thr Ser Val Gln
340 345 350

Val Pro Thr Thr Glu Val Ile Ser Thr Ala Pro Val Gln Met Pro Thr
355 360 365

Ala Glu Ser Thr Gly Met Thr Pro Glu Lys Val Pro Val Ser Glu Val
370 375 380

Met Gly Thr Thr Leu Ala Glu Met Ser Thr Pro Glu Ala Thr Gly Met
385 390 395 400

Thr Pro Ala Glu Val Ser Ile Val Val Leu Ser Gly Thr Thr Ala Ala
405 410 415

Gln Val Thr Thr Thr Glu Trp Val Glu Thr Thr Ala Arg Glu Leu Pro
420 425 430

Ile Pro Glu Pro Glu Gly Pro Asp Ala Ser Ser Ile Met Ser Thr Glu
435 440 445

Ser Ile Thr Gly Ser Leu Gly Pro Leu Leu Asp Gly Thr Ala Thr Leu
450 455 460

Arg Leu Val Lys Arg Gln Val Pro Leu Asp Cys Val Leu Tyr Arg Tyr
465 470 475 480

Gly Ser Phe Ser Val Thr Leu Asp Ile Val Gln Gly Ile Glu Ser Ala
485 490 495

Glu Ile Leu Gln Ala Val Pro Ser Gly Glu Gly Asp Ala Phe Glu Leu
500 505 510

Thr Val Ser Cys Gln Gly Gly Leu Pro Lys Glu Ala Cys Met Glu Ile
515 520 525

Ser Ser Pro Gly Cys Gln Pro Pro Ala Gln Arg Leu Cys Gln Pro Val
530 535 540

Leu Pro Ser Pro Ala Cys Gln Leu Val Leu His Gln Ile Leu Lys Gly
545 550 555 560

Gly Ser Gly Thr Tyr Cys Leu Asn Val Ser Leu Ala Asp Thr Asn Ser
565 570 575

Leu Ala Val Val Ser Thr Gln Leu Ile Met Pro Gly Gln Glu Ala Gly
580 585 590

Leu Gly Gln Val Pro Leu Ile Val Gly Ile Leu Leu Val Leu Met Ala
595 600 605

Val Val Leu Ala Ser Leu Ile Tyr Arg Arg Arg Leu Met Lys Gln Asp
610 615 620

Phe Ser Val Pro Gln Leu Pro His Ser Ser Ser His Trp Leu Arg Leu
625 630 635 640

Pro Arg Ile Phe Cys Ser Cys Pro Ile Gly Glu Asn Ser Pro Leu Leu
645 650 655

Ser Gly Gln Gln Val
660

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<223> siRNA-TCRb-1

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<223> MAGE-A1289-297

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Arg Val Arg Phe Phe Phe Pro Ser Leu

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Lys Arg Gln Asp Ile Leu Asp Leu Trp Val Tyr Tyr Phe Pro Asp Trp
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Gln Asn Tyr Thr
20

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Met Asp Leu Val Leu Lys Arg Cys Leu Leu His Leu Ala Val Ile Gly
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Ala Leu Leu Ala
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Lys Arg Cys Leu Leu His Leu Ala Val Ile Gly Ala Leu Leu Ala Val
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Gly Ala Thr Lys

20

<210> 66
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His Leu Ala Val Ile Gly Ala Leu Leu Ala Val Gly Ala Thr Lys Val
1 5 10 15

Pro Arg Asn Gln
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<400> 67

Gly Ala Leu Leu Ala Val Gly Ala Thr Lys Val Pro Arg Asn Gln Asp
1 5 10 15

Trp Leu Gly Val
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<400> 68

Val Gly Ala Thr Lys Val Pro Arg Asn Gln Asp Trp Leu Gly Val Ser
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Arg Gln Leu Arg

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<210> 69
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<400> 69

Val Pro Arg Asn Gln Asp Trp Leu Gly Val Ser Arg Gln Leu Arg Thr
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Lys Ala Trp Asn
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<400> 70

Asp Trp Leu Gly Val Ser Arg Gln Leu Arg Thr Lys Ala Trp Asn Arg
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Gln Leu Tyr Pro
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<210> 71
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<400> 71

Ser Arg Gln Leu Arg Thr Lys Ala Trp Asn Arg Gln Leu Tyr Pro Glu
1 5 10 15

Trp Thr Glu Ala

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Thr	Lys	Ala	Trp	Asn	Arg	Gln	Leu	Tyr	Pro	Glu	Trp	Thr	Glu	Ala	Gln
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Arg	Leu	Asp	Cys
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Arg	Gln	Leu	Tyr	Pro	Glu	Trp	Thr	Glu	Ala	Gln	Arg	Leu	Asp	Cys	Trp
1				5					10					15	

Arg	Gly	Gly	Gln
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Glu	Trp	Thr	Glu	Ala	Gln	Arg	Leu	Asp	Cys	Trp	Arg	Gly	Gly	Gln	Val
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Ser	Leu	Lys	Val
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Gln Arg Leu Asp Cys Trp Arg Gly Gly Gln Val Ser Leu Lys Val Ser
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Asn Asp Gly Pro
20

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<400> 76

Trp Arg Gly Gly Gln Val Ser Leu Lys Val Ser Asn Asp Gly Pro Thr
1 5 10 15

Leu Ile Gly Ala
20

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<400> 77

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

Ala Ser Phe Ser

20

<210> 78
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<400> 78

Ser Asn Asp Gly Pro Thr Leu Ile Gly Ala Asn Ala Ser Phe Ser Ile
1 5 10 15

Ala Leu Asn Phe
20

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<400> 79

Thr Leu Ile Gly Ala Asn Ala Ser Phe Ser Ile Ala Leu Asn Phe Pro
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Gly Ser Gln Lys
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Asn Ala Ser Phe Ser Ile Ala Leu Asn Phe Pro Gly Ser Gln Lys Val
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Leu Pro Asp Gly

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<400> 81

Ile Ala Leu Asn Phe Pro Gly Ser Gln Lys Val Leu Pro Asp Gly Gln
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Val Ile Trp Val
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Pro Gly Ser Gln Lys Val Leu Pro Asp Gly Gln Val Ile Trp Val Asn
1 5 10 15

Asn Thr Ile Ile
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Val Leu Pro Asp Gly Gln Val Ile Trp Val Asn Asn Thr Ile Ile Asn
1 5 10 15

Gly Ser Gln Val

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<212> PRT
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Gln Val Ile Trp Val Asn Asn Thr Ile Ile Asn Gly Ser Gln Val Trp
1 5 10 15

Gly Gly Gln Pro
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Asn Asn Thr Ile Ile Asn Gly Ser Gln Val Trp Gly Gly Gln Pro Val
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Tyr Pro Gln Glu
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<210> 86
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Asn Gly Ser Gln Val Trp Gly Gly Gln Pro Val Tyr Pro Gln Glu Thr
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Asp Asp Ala Cys

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<210> 87
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Trp Gly Gly Gln Pro Val Tyr Pro Gln Glu Thr Asp Asp Ala Cys Ile
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Phe Pro Asp Gly
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<223> Synthetic Peptide

<400> 88

Val Tyr Pro Gln Glu Thr Asp Asp Ala Cys Ile Phe Pro Asp Gly Gly
1 5 10 15

Pro Cys Pro Ser
20

<210> 89
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 89

Thr Asp Asp Ala Cys Ile Phe Pro Asp Gly Gly Pro Cys Pro Ser Gly
1 5 10 15

Ser Trp Ser Gln

20

<210> 90
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
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<400> 90

Ile Phe Pro Asp Gly Gly Pro Cys Pro Ser Gly Ser Trp Ser Gln Lys
1 5 10 15

Arg Ser Phe Val
20

<210> 91
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 91

Gly Pro Cys Pro Ser Gly Ser Trp Ser Gln Lys Arg Ser Phe Val Tyr
1 5 10 15

Val Trp Lys Thr
20

<210> 92
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 92

Gly Ser Trp Ser Gln Lys Arg Ser Phe Val Tyr Val Trp Lys Thr Trp
1 5 10 15

Gly Gln Tyr Trp

20

<210> 93
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 93

Lys Arg Ser Phe Val Tyr Val Trp Lys Thr Trp Gly Gln Tyr Trp Gln
1 5 10 15

Val Leu Gly Gly
20

<210> 94
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 94

Tyr Val Trp Lys Thr Trp Gly Gln Tyr Trp Gln Val Leu Gly Gly Pro
1 5 10 15

Val Ser Gly Leu
20

<210> 95
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 95

Trp Gly Gln Tyr Trp Gln Val Leu Gly Gly Pro Val Ser Gly Leu Ser
1 5 10 15

Ile Gly Thr Gly

20

<210> 96
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
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<400> 96

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

Ala Met Leu Gly
20

<210> 97
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
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<400> 97

Pro Val Ser Gly Leu Ser Ile Gly Thr Gly Arg Ala Met Leu Gly Thr
1 5 10 15

His Thr Met Glu
20

<210> 98
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 98

Ser Ile Gly Thr Gly Arg Ala Met Leu Gly Thr His Thr Met Glu Val
1 5 10 15

Thr Val Tyr His

20

<210> 99
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 99

Arg Ala Met Leu Gly Thr His Thr Met Glu Val Thr Val Tyr His Arg
1 5 10 15

Arg Gly Ser Arg
20

<210> 100
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 100

Thr His Thr Met Glu Val Thr Val Tyr His Arg Arg Gly Ser Arg Ser
1 5 10 15

Tyr Val Pro Leu
20

<210> 101
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 101

Val Thr Val Tyr His Arg Arg Gly Ser Arg Ser Tyr Val Pro Leu Ala
1 5 10 15

His Ser Ser Ser

20

<210> 102
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 102

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

Phe Thr Ile Thr
20

<210> 103
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 103

Ser Tyr Val Pro Leu Ala His Ser Ser Ser Ala Phe Thr Ile Thr Asp
1 5 10 15

Gln Val Pro Phe
20

<210> 104
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 104

Ala His Ser Ser Ser Ala Phe Thr Ile Thr Asp Gln Val Pro Phe Ser
1 5 10 15

Val Ser Val Ser

20

<210> 105
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 105

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

Leu Arg Ala Leu
20

<210> 106
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 106

Asp Gln Val Pro Phe Ser Val Ser Val Ser Gln Leu Arg Ala Leu Asp
1 5 10 15

Gly Gly Asn Lys
20

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

<220>
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<400> 107

Ser Val Ser Val Ser Gln Leu Arg Ala Leu Asp Gly Gly Asn Lys His
1 5 10 15

Phe Leu Arg Asn

20

<210> 108
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 108

Gln Leu Arg Ala Leu Asp Gly Gly Asn Lys His Phe Leu Arg Asn Gln
1 5 10 15

Pro Leu Thr Phe
20

<210> 109
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 109

Asp Gly Gly Asn Lys His Phe Leu Arg Asn Gln Pro Leu Thr Phe Ala
1 5 10 15

Leu Gln Leu His
20

<210> 110
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 110

His Phe Leu Arg Asn Gln Pro Leu Thr Phe Ala Leu Gln Leu His Asp
1 5 10 15

Pro Ser Gly Tyr

20

<210> 111
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 111

Gln Pro Leu Thr Phe Ala Leu Gln Leu His Asp Pro Ser Gly Tyr Leu
1 5 10 15

Ala Glu Ala Asp
20

<210> 112
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 112

Ala Leu Gln Leu His Asp Pro Ser Gly Tyr Leu Ala Glu Ala Asp Leu
1 5 10 15

Ser Tyr Thr Trp
20

<210> 113
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 113

Asp Pro Ser Gly Tyr Leu Ala Glu Ala Asp Leu Ser Tyr Thr Trp Asp
1 5 10 15

Phe Gly Asp Ser

20

<210> 114
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 114

Leu Ala Glu Ala Asp Leu Ser Tyr Thr Trp Asp Phe Gly Asp Ser Ser
1 5 10 15

Gly Thr Leu Ile
20

<210> 115
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 115

Leu Ser Tyr Thr Trp Asp Phe Gly Asp Ser Ser Gly Thr Leu Ile Ser
1 5 10 15

Arg Ala Leu Val
20

<210> 116
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 116

Asp Phe Gly Asp Ser Ser Gly Thr Leu Ile Ser Arg Ala Leu Val Val
1 5 10 15

Thr His Thr Tyr

20

<210> 117
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 117

Ser Gly Thr Leu Ile Ser Arg Ala Leu Val Val Thr His Thr Tyr Leu
1 5 10 15

Glu Pro Gly Pro
20

<210> 118
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 118

Ser Arg Ala Leu Val Val Thr His Thr Tyr Leu Glu Pro Gly Pro Val
1 5 10 15

Thr Ala Gln Val
20

<210> 119
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 119

Val Thr His Thr Tyr Leu Glu Pro Gly Pro Val Thr Ala Gln Val Val
1 5 10 15

Leu Gln Ala Ala

20

<210> 120
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 120

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

Pro Leu Thr Ser
20

<210> 121
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 121

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

Gly Ser Ser Pro
20

<210> 122
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 122

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

Pro Gly Thr Thr

20

<210> 123
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 123

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

Gly His Arg Pro
20

<210> 124
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 124

Cys Gly Ser Ser Pro Val Pro Gly Thr Thr Asp Gly His Arg Pro Thr
1 5 10 15

Ala Glu Ala Pro
20

<210> 125
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 125

Val Pro Gly Thr Thr Asp Gly His Arg Pro Thr Ala Glu Ala Pro Asn
1 5 10 15

Thr Thr Ala Gly

20

<210> 126
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 126

Asp Gly His Arg Pro Thr Ala Glu Ala Pro Asn Thr Thr Ala Gly Gln
1 5 10 15

Val Pro Thr Thr
20

<210> 127
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 127

Thr Ala Glu Ala Pro Asn Thr Thr Ala Gly Gln Val Pro Thr Thr Glu
1 5 10 15

Val Val Gly Thr
20

<210> 128
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 128

Asn Thr Thr Ala Gly Gln Val Pro Thr Thr Glu Val Val Gly Thr Thr
1 5 10 15

Pro Gly Gln Ala

20

<210> 129
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 129

Gln Val Pro Thr Thr Glu Val Val Gly Thr Thr Pro Gly Gln Ala Pro
1 5 10 15

Thr Ala Glu Pro
20

<210> 130
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 130

Glu Val Val Gly Thr Thr Pro Gly Gln Ala Pro Thr Ala Glu Pro Ser
1 5 10 15

Gly Thr Thr Ser
20

<210> 131
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 131

Thr Pro Gly Gln Ala Pro Thr Ala Glu Pro Ser Gly Thr Thr Ser Val
1 5 10 15

Gln Val Pro Thr

20

<210> 132
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 132

Pro Thr Ala Glu Pro Ser Gly Thr Thr Ser Val Gln Val Pro Thr Thr
1 5 10 15

Glu Val Ile Ser
20

<210> 133
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 133

Ser Gly Thr Thr Ser Val Gln Val Pro Thr Thr Glu Val Ile Ser Thr
1 5 10 15

Ala Pro Val Gln
20

<210> 134
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 134

Val Gln Val Pro Thr Thr Glu Val Ile Ser Thr Ala Pro Val Gln Met
1 5 10 15

Pro Thr Ala Glu

20

<210> 135
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 135

Thr Glu Val Ile Ser Thr Ala Pro Val Gln Met Pro Thr Ala Glu Ser
1 5 10 15

Thr Gly Met Thr
20

<210> 136
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 136

Thr Ala Pro Val Gln Met Pro Thr Ala Glu Ser Thr Gly Met Thr Pro
1 5 10 15

Glu Lys Val Pro
20

<210> 137
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 137

Met Pro Thr Ala Glu Ser Thr Gly Met Thr Pro Glu Lys Val Pro Val
1 5 10 15

Ser Glu Val Met

20

<210> 138
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 138

Ser Thr Gly Met Thr Pro Glu Lys Val Pro Val Ser Glu Val Met Gly
1 5 10 15

Thr Thr Leu Ala
20

<210> 139
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 139

Pro Glu Lys Val Pro Val Ser Glu Val Met Gly Thr Thr Leu Ala Glu
1 5 10 15

Met Ser Thr Pro
20

<210> 140
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 140

Val Ser Glu Val Met Gly Thr Thr Leu Ala Glu Met Ser Thr Pro Glu
1 5 10 15

Ala Thr Gly Met

20

<210> 141
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 141

Gly Thr Thr Leu Ala Glu Met Ser Thr Pro Glu Ala Thr Gly Met Thr
1 5 10 15

Pro Ala Glu Val
20

<210> 142
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 142

Glu Met Ser Thr Pro Glu Ala Thr Gly Met Thr Pro Ala Glu Val Ser
1 5 10 15

Ile Val Val Leu
20

<210> 143
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 143

Glu Ala Thr Gly Met Thr Pro Ala Glu Val Ser Ile Val Val Leu Ser
1 5 10 15

Gly Thr Thr Ala

20

<210> 144
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 144

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

Gln Val Thr Thr
20

<210> 145
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 145

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

Glu Trp Val Glu
20

<210> 146
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 146

Ser Gly Thr Thr Ala Ala Gln Val Thr Thr Thr Glu Trp Val Glu Thr
1 5 10 15

Thr Ala Arg Glu

20

<210> 147
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 147

Ala Gln Val Thr Thr Thr Glu Trp Val Glu Thr Thr Ala Arg Glu Leu
1 5 10 15

Pro Ile Pro Glu
20

<210> 148
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 148

Thr Glu Trp Val Glu Thr Thr Ala Arg Glu Leu Pro Ile Pro Glu Pro
1 5 10 15

Glu Gly Pro Asp
20

<210> 149
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 149

Thr Thr Ala Arg Glu Leu Pro Ile Pro Glu Pro Glu Gly Pro Asp Ala
1 5 10 15

Ser Ser Ile Met

20

<210> 150
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 150

Leu Pro Ile Pro Glu Pro Glu Gly Pro Asp Ala Ser Ser Ile Met Ser
1 5 10 15

Thr Glu Ser Ile
20

<210> 151
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 151

Pro Glu Gly Pro Asp Ala Ser Ser Ile Met Ser Thr Glu Ser Ile Thr
1 5 10 15

Gly Ser Leu Gly
20

<210> 152
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 152

Ala Ser Ser Ile Met Ser Thr Glu Ser Ile Thr Gly Ser Leu Gly Pro
1 5 10 15

Leu Leu Asp Gly

20

<210> 153
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 153

Ser Thr Glu Ser Ile Thr Gly Ser Leu Gly Pro Leu Leu Asp Gly Thr
1 5 10 15

Ala Thr Leu Arg
20

<210> 154
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 154

Thr Gly Ser Leu Gly Pro Leu Leu Asp Gly Thr Ala Thr Leu Arg Leu
1 5 10 15

Val Lys Arg Gln
20

<210> 155
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 155

Pro Leu Leu Asp Gly Thr Ala Thr Leu Arg Leu Val Lys Arg Gln Val
1 5 10 15

Pro Leu Asp Cys

20

<210> 156
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 156

Thr Ala Thr Leu Arg Leu Val Lys Arg Gln Val Pro Leu Asp Cys Val
1 5 10 15

Leu Tyr Arg Tyr
20

<210> 157
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 157

Leu Val Lys Arg Gln Val Pro Leu Asp Cys Val Leu Tyr Arg Tyr Gly
1 5 10 15

Ser Phe Ser Val
20

<210> 158
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 158

Val Pro Leu Asp Cys Val Leu Tyr Arg Tyr Gly Ser Phe Ser Val Thr
1 5 10 15

Leu Asp Ile Val

20

<210> 159
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 159

Val Leu Tyr Arg Tyr Gly Ser Phe Ser Val Thr Leu Asp Ile Val Gln
1 5 10 15

Gly Ile Glu Ser
20

<210> 160
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 160

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

Glu Ile Leu Gln
20

<210> 161
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 161

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

Val Pro Ser Gly

20

<210> 162
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 162

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

Gly Asp Ala Phe
20

<210> 163
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 163

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

Leu Thr Val Ser
20

<210> 164
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 164

Ala Val Pro Ser Gly Glu Gly Asp Ala Phe Glu Leu Thr Val Ser Cys
1 5 10 15

Gln Gly Gly Leu

20

<210> 165
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 165

Glu Gly Asp Ala Phe Glu Leu Thr Val Ser Cys Gln Gly Gly Leu Pro
1 5 10 15

Lys Glu Ala Cys
20

<210> 166
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 166

Glu Leu Thr Val Ser Cys Gln Gly Gly Leu Pro Lys Glu Ala Cys Met
1 5 10 15

Glu Ile Ser Ser
20

<210> 167
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 167

Cys Gln Gly Gly Leu Pro Lys Glu Ala Cys Met Glu Ile Ser Ser Pro
1 5 10 15

Gly Cys Gln Pro

20

<210> 168
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 168

Pro Lys Glu Ala Cys Met Glu Ile Ser Ser Pro Gly Cys Gln Pro Pro
1 5 10 15

Ala Gln Arg Leu
20

<210> 169
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 169

Met Glu Ile Ser Ser Pro Gly Cys Gln Pro Pro Ala Gln Arg Leu Cys
1 5 10 15

Gln Pro Val Leu
20

<210> 170
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 170

Pro Gly Cys Gln Pro Pro Ala Gln Arg Leu Cys Gln Pro Val Leu Pro
1 5 10 15

Ser Pro Ala Cys

20

<210> 171
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 171

Pro	Ala	Gln	Arg	Leu	Cys	Gln	Pro	Val	Leu	Pro	Ser	Pro	Ala	Cys	Gln
1				5					10					15	

Leu	Val	Leu	His
			20

<210> 172
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 172

Cys	Gln	Pro	Val	Leu	Pro	Ser	Pro	Ala	Cys	Gln	Leu	Val	Leu	His	Gln
1				5					10					15	

Ile	Leu	Lys	Gly
			20

<210> 173
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 173

Pro	Ser	Pro	Ala	Cys	Gln	Leu	Val	Leu	His	Gln	Ile	Leu	Lys	Gly	Gly
1				5					10					15	

Ser	Gly	Thr	Tyr
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20

<210> 174
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 174

Gln	Leu	Val	Leu	His	Gln	Ile	Leu	Lys	Gly	Gly	Ser	Gly	Thr	Tyr	Cys
1				5					10					15	

Leu	Asn	Val	Ser
			20

<210> 175
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 175

Gln	Ile	Leu	Lys	Gly	Gly	Ser	Gly	Thr	Tyr	Cys	Leu	Asn	Val	Ser	Leu
1				5					10					15	

Ala	Asp	Thr	Asn
			20

<210> 176
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 176

Gly	Ser	Gly	Thr	Tyr	Cys	Leu	Asn	Val	Ser	Leu	Ala	Asp	Thr	Asn	Ser
1				5					10					15	

Leu	Ala	Val	Val
-----	-----	-----	-----

20

<210> 177
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 177

Cys Leu Asn Val Ser Leu Ala Asp Thr Asn Ser Leu Ala Val Val Ser
1 5 10 15

Thr Gln Leu Ile
20

<210> 178
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 178

Leu Ala Asp Thr Asn Ser Leu Ala Val Val Ser Thr Gln Leu Ile Met
1 5 10 15

Pro Gly Gln Glu
20

<210> 179
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 179

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

Gly Leu Gly Gln

20

<210> 180
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 180

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

Pro Leu Ile Val
20

<210> 181
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 181

Met Pro Gly Gln Glu Ala Gly Leu Gly Gln Val Pro Leu Ile Val Gly
1 5 10 15

Ile Leu Leu Val
20

<210> 182
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic Peptide

<400> 182

Ala Gly Leu Gly Gln Val Pro Leu Ile Val Gly Ile Leu Leu Val Leu
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Met Ala Val Val

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Val Pro Leu Ile Val Gly Ile Leu Leu Val Leu Met Ala Val Val Leu
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Ala Ser Leu Ile
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Gly Ile Leu Leu Val Leu Met Ala Val Val Leu Ala Ser Leu Ile Tyr
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Arg Arg Arg Leu
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Leu Met Ala Val Val Leu Ala Ser Leu Ile Tyr Arg Arg Arg Leu Met
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Lys Gln Asp Phe

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Leu Ala Ser Leu Ile Tyr Arg Arg Arg Leu Met Lys Gln Asp Phe Ser
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Val Pro Gln Leu
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Tyr Arg Arg Arg Leu Met Lys Gln Asp Phe Ser Val Pro Gln Leu Pro
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His Ser Ser Ser
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Met Lys Gln Asp Phe Ser Val Pro Gln Leu Pro His Ser Ser Ser His
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Trp Leu Arg Leu

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Ser Val Pro Gln Leu Pro His Ser Ser Ser His Trp Leu Arg Leu Pro
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Arg Ile Phe Cys
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Pro His Ser Ser Ser His Trp Leu Arg Leu Pro Arg Ile Phe Cys Ser
1 5 10 15

Cys Pro Ile Gly
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<400> 191

His Trp Leu Arg Leu Pro Arg Ile Phe Cys Ser Cys Pro Ile Gly Glu
1 5 10 15

Asn Ser Pro Leu

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Pro Arg Ile Phe Cys Ser Cys Pro Ile Gly Glu Asn Ser Pro Leu Leu
1 5 10 15

Ser Gly Gln Gln
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<210> 193
<211> 20
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Arg Ile Phe Cys Ser Cys Pro Ile Gly Glu Asn Ser Pro Leu Leu Ser
1 5 10 15

Gly Gln Gln Val
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<400> 194

Arg Tyr Gly Ser Phe Ser Val Thr His Arg Arg Gly Ser Arg Ser Tyr
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