

SEQUENCE LISTING

<110> PRESIDENT AND FELLOWS OF HARVARD COLLEGE

<120> IN VITRO AND CELL BASED ASSAYS FOR MEASURING THE ACTIVITY OF
BOTULINUM NEUROTOXINS

<130> P000706SG1

<140> 11201903523Y

<141> 2017-10-19

<150> 62/410,558

<151> 2016-10-20

<160> 32

<170> PatentIn version 3.5

<210> 1

<211> 170

<212> PRT

<213> Artificial Sequence

<220>

<221> source

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

<400> 1

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

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

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

Ile Thr Pro Asp Gly Ser Met Leu Phe Arg Val Thr Ile Asn Ser Val
145 150 155 160

Thr Gly Tyr Arg Leu Phe Glu Glu Ile Leu
165 170

<210> 2
<211> 159
<212> PRT
<213> Artificial Sequence

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

<400> 2
Met Val Phe Thr Leu Glu Asp Phe Val Gly Asp Trp Glu Gln Thr Ala
1 5 10 15

Ala Tyr Asn Leu Asp Gln Val Leu Glu Gln Gly Gly Val Ser Ser Leu
20 25 30

Leu Gln Asn Leu Ala Val Ser Val Thr Pro Ile Gln Arg Ile Val Arg
35 40 45

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

Glu Gly Leu Ser Ala Asp Gln Met Ala Gln Ile Glu Glu Val Phe Lys
65 70 75 80

Val Val Tyr Pro Val Asp Asp His His Phe Lys Val Ile Leu Pro Tyr
85 90 95

Gly Thr Leu Val Ile Asp Gly Val Thr Pro Asn Met Leu Asn Tyr Phe
100 105 110

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

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

Ile Thr Pro Asp Gly Ser Met Leu Phe Arg Val Thr Ile Asn Ser
145 150 155

<210> 3
<211> 11
<212> PRT
<213> Artificial Sequence

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

<400> 3
Val Thr Gly Tyr Arg Leu Phe Glu Glu Ile Leu
1 5 10

<210> 4
<211> 15
<212> PRT
<213> Artificial Sequence

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

<400> 4
Gly Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Ser Gly
1 5 10 15

<210> 5
<211> 14
<212> PRT
<213> Artificial Sequence

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

<400> 5
Gly Ser Ser Gly Gly Gly Gly Ser Gly Gly Gly Ser Ser Gly
1 5 10

<210> 6
<211> 5
<212> PRT
<213> Artificial Sequence

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

<400> 6
Gly Gly Gly Gly Ser
1 5

<210> 7
<211> 15
<212> PRT
<213> Artificial Sequence

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

<220>
<221> MISC_FEATURE
<222> (1)..(15)
<223> /note="This sequence may encompass 1-3 'Gly Gly Gly Gly Ser' repeating units"

<400> 7
Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
1 5 10 15

<210> 8
<211> 18
<212> PRT
<213> Artificial Sequence

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

<400> 8
Lys Glu Ser Gly Ser Val Ser Ser Glu Gln Leu Ala Gln Phe Arg Ser
1 5 10 15

Leu Asp

<210> 9
<211> 14
<212> PRT
<213> Artificial Sequence

<220>

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

<400> 9
Glu Gly Lys Ser Ser Gly Ser Gly Ser Glu Ser Lys Ser Thr
1 5 10

<210> 10
<211> 66
<212> PRT
<213> Unknown

<220>
<221> source
<223> /note="Description of Unknown: Human or rat SNAP25b polypeptide"

<400> 10
Ala Arg Glu Asn Glu Met Asp Glu Asn Leu Glu Gln Val Ser Gly Ile
1 5 10 15

Ile Gly Asn Leu Arg His Met Ala Leu Asp Met Gly Asn Glu Ile Asp
20 25 30

Thr Gln Asn Arg Gln Ile Asp Arg Ile Met Glu Lys Ala Asp Ser Asn
35 40 45

Lys Thr Arg Ile Asp Glu Ala Asn Gln Arg Ala Thr Lys Met Leu Gly
50 55 60

Ser Gly
65

<210> 11
<211> 38
<212> PRT
<213> Homo sapiens

<400> 11
Asn Thr Tyr Phe Lys Asn Cys Thr Phe Ile Asp Thr Val Phe Asp Asn
1 5 10 15

Thr Asp Phe Glu Pro Tyr Lys Phe Ile Asp Ser Glu Phe Lys Asn Cys
20 25 30

Ser Phe Phe His Asn Lys
35

<210> 12
<211> 6
<212> PRT
<213> Artificial Sequence

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

<400> 12
His His His His His His
1 5

<210> 13
<211> 550
<212> PRT
<213> *Photinus pyralis*

<400> 13
Met Glu Asp Ala Lys Asn Ile Lys Lys Gly Pro Ala Pro Phe Tyr Pro
1 5 10 15

Leu Glu Asp Gly Thr Ala Gly Glu Gln Leu His Lys Ala Met Lys Arg
20 25 30

Tyr Ala Leu Val Pro Gly Thr Ile Ala Phe Thr Asp Ala His Ile Glu
35 40 45

Val Asp Ile Thr Tyr Ala Glu Tyr Phe Glu Met Ser Val Arg Leu Ala
50 55 60

Glu Ala Met Lys Arg Tyr Gly Leu Asn Thr Asn His Arg Ile Val Val
65 70 75 80

Cys Ser Glu Asn Ser Leu Gln Phe Phe Met Pro Val Leu Gly Ala Leu
85 90 95

Phe Ile Gly Val Ala Val Ala Pro Ala Asn Asp Ile Tyr Asn Glu Arg
100 105 110

Glu Leu Leu Asn Ser Met Gly Ile Ser Gln Pro Thr Val Val Phe Val
115 120 125

Ser Lys Lys Gly Leu Gln Lys Ile Leu Asn Val Gln Lys Lys Leu Pro
130 135 140

Ile Ile Gln Lys Ile Ile Ile Met Asp Ser Lys Thr Asp Tyr Gln Gly

145		150		155		160									
Phe	Gln	Ser	Met	Tyr	Thr	Phe	Val	Thr	Ser	His	Leu	Pro	Pro	Gly	Phe
			165						170					175	
Asn	Glu	Tyr	Asp	Phe	Val	Pro	Glu	Ser	Phe	Asp	Arg	Asp	Lys	Thr	Ile
			180					185					190		
Ala	Leu	Ile	Met	Asn	Ser	Ser	Gly	Ser	Thr	Gly	Leu	Pro	Lys	Gly	Val
		195					200					205			
Ala	Leu	Pro	His	Arg	Thr	Ala	Cys	Val	Arg	Phe	Ser	His	Ala	Arg	Asp
	210					215					220				
Pro	Ile	Phe	Gly	Asn	Gln	Ile	Ile	Pro	Asp	Thr	Ala	Ile	Leu	Ser	Val
225					230					235					240
Val	Pro	Phe	His	His	Gly	Phe	Gly	Met	Phe	Thr	Thr	Leu	Gly	Tyr	Leu
				245					250					255	
Ile	Cys	Gly	Phe	Arg	Val	Val	Leu	Met	Tyr	Arg	Phe	Glu	Glu	Glu	Leu
			260					265					270		
Phe	Leu	Arg	Ser	Leu	Gln	Asp	Tyr	Lys	Ile	Gln	Ser	Ala	Leu	Leu	Val
		275					280					285			
Pro	Thr	Leu	Phe	Ser	Phe	Phe	Ala	Lys	Ser	Thr	Leu	Ile	Asp	Lys	Tyr
	290					295					300				
Asp	Leu	Ser	Asn	Leu	His	Glu	Ile	Ala	Ser	Gly	Gly	Ala	Pro	Leu	Ser
305					310					315					320
Lys	Glu	Val	Gly	Glu	Ala	Val	Ala	Lys	Arg	Phe	His	Leu	Pro	Gly	Ile
				325					330					335	
Arg	Gln	Gly	Tyr	Gly	Leu	Thr	Glu	Thr	Thr	Ser	Ala	Ile	Leu	Ile	Thr
			340					345					350		
Pro	Glu	Gly	Asp	Asp	Lys	Pro	Gly	Ala	Val	Gly	Lys	Val	Val	Pro	Phe
		355					360					365			
Phe	Glu	Ala	Lys	Val	Val	Asp	Leu	Asp	Thr	Gly	Lys	Thr	Leu	Gly	Val
	370					375					380				

Asn Gln Arg Gly Glu Leu Cys Val Arg Gly Pro Met Ile Met Ser Gly
385 390 395 400

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

Trp Leu His Ser Gly Asp Ile Ala Tyr Trp Asp Glu Asp Glu His Phe
420 425 430

Phe Ile Val Asp Arg Leu Lys Ser Leu Ile Lys Tyr Lys Gly Tyr Gln
435 440 445

Val Ala Pro Ala Glu Leu Glu Ser Ile Leu Leu Gln His Pro Asn Ile
450 455 460

Phe Asp Ala Gly Val Ala Gly Leu Pro Asp Asp Asp Ala Gly Glu Leu
465 470 475 480

Pro Ala Ala Val Val Val Leu Glu His Gly Lys Thr Met Thr Glu Lys
485 490 495

Glu Ile Val Asp Tyr Val Ala Ser Gln Val Thr Thr Ala Lys Lys Leu
500 505 510

Arg Gly Gly Val Val Phe Val Asp Glu Val Pro Lys Gly Leu Thr Gly
515 520 525

Lys Leu Asp Ala Arg Lys Ile Arg Glu Ile Leu Ile Lys Ala Lys Lys
530 535 540

Gly Gly Lys Ile Ala Val
545 550

<210> 14
<211> 206
<212> PRT
<213> Homo sapiens

<400> 14
Met Ala Glu Asp Ala Asp Met Arg Asn Glu Leu Glu Glu Met Gln Arg
1 5 10 15

Arg Ala Asp Gln Leu Ala Asp Glu Ser Leu Glu Ser Thr Arg Arg Met
20 25 30

Leu Gln Leu Val Glu Glu Ser Lys Asp Ala Gly Ile Arg Thr Leu Val
35 40 45

Met Leu Asp Glu Gln Gly Glu Gln Leu Glu Arg Ile Glu Glu Gly Met
50 55 60

Asp Gln Ile Asn Lys Asp Met Lys Glu Ala Glu Lys Asn Leu Thr Asp
65 70 75 80

Leu Gly Lys Phe Cys Gly Leu Cys Val Cys Pro Cys Asn Lys Leu Lys
85 90 95

Ser Ser Asp Ala Tyr Lys Lys Ala Trp Gly Asn Asn Gln Asp Gly Val
100 105 110

Val Ala Ser Gln Pro Ala Arg Val Val Asp Glu Arg Glu Gln Met Ala
115 120 125

Ile Ser Gly Gly Phe Ile Arg Arg Val Thr Asn Asp Ala Arg Glu Asn
130 135 140

Glu Met Asp Glu Asn Leu Glu Gln Val Ser Gly Ile Ile Gly Asn Leu
145 150 155 160

Arg His Met Ala Leu Asp Met Gly Asn Glu Ile Asp Thr Gln Asn Arg
165 170 175

Gln Ile Asp Arg Ile Met Glu Lys Ala Asp Ser Asn Lys Thr Arg Ile
180 185 190

Asp Glu Ala Asn Gln Arg Ala Thr Lys Met Leu Gly Ser Gly
195 200 205

<210> 15
<211> 981
<212> DNA
<213> Artificial Sequence

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

<400> 15
atggtcttca cactcgaaga tttcggtggg gactgggaac agacagccgc ctacaacctg
60

gaccaagtcc ttgaacaggg aggtgtgtcc agtttgctgc agaatctcgc cgtgtccgta
120

actccgatcc aaaggattgt ccggagcggg gaaaatgccc tgaagatcga catccatgtc
180

atcatcccgt atgaaggtct gagcgccgac caaatggccc agatcgaaga ggtgtttaag
240

gtggtgtacc ctgtggatga tcatcacttt aaggatgatcc tgccttatgg cacactggta
300

atcgacgggg ttacgccgaa catgctgaac tatttcggac ggccgtatga aggcacgccc
360

gtgttcgacg gcaaaaagat cactgtaaca gggaccctgt ggaacggcaa caaaattatc
420

gacgagcgcc tgatcacccc cgacggctcc atgctgttcc gagtaaccat caacagtggg
480

agttccggtg gtggcgggag cggaggtgga ggctcgagcg gtggagctca gaacacctac
540

ttcaagaact gcacatttat tgacactggt tttgacaaca cagattttga gccatataaa
600

ttcattgaca gtgaatttaa aaactgctcg ttttttcaca acaagggggg cggaggttcc
660

gcccgggaaa atgaaatgga tgaaaaccta gagcaggtga gcggcatcat cggaaacctc
720

cgatcatatg ccctagacat gggcaatgag attgacaccc agaatcgcca gattgacagg
780

atcatggaga aggtgactc caacaaaacc agaattgatg aagccaacca acgtgcaaca
840

aagatgctgg gaagtgggtg gaattctggc tcgagcgggtg gtggcgggag cggaggtgga
900

gggtcgtcag gtgtgaccgg ctaccggctg ttcgaggaga ttctggcggc cgcactcgag
960

caccaccacc accaccactg a
981

<210> 16

<211> 118

<212> PRT

<213> Homo sapiens

<400> 16

Met Ser Ala Pro Ala Gln Pro Pro Ala Glu Gly Thr Glu Gly Thr Ala

1

5

10

15

Pro Gly Gly Gly Pro Pro Gly Pro Pro Pro Asn Met Thr Ser Asn Arg
20 25 30

Arg Leu Gln Gln Thr Gln Ala Gln Val Glu Glu Val Val Asp Ile Ile
35 40 45

Arg Val Asn Val Asp Lys Val Leu Glu Arg Asp Gln Lys Leu Ser Glu
50 55 60

Leu Asp Asp Arg Ala Asp Ala Leu Gln Ala Gly Ala Ser Gln Phe Glu
65 70 75 80

Ser Ser Ala Ala Lys Leu Lys Arg Lys Tyr Trp Trp Lys Asn Cys Lys
85 90 95

Met Met Ile Met Leu Gly Ala Ile Cys Ala Ile Ile Val Val Val Ile
100 105 110

Val Ile Tyr Phe Phe Thr
115

<210> 17
<211> 21
<212> PRT
<213> Homo sapiens

<400> 17
Gly Glu Gly Lys Glu Asp Ala Phe Ser Lys Leu Lys Gln Lys Phe Met
1 5 10 15

Asn Glu Leu His Lys
20

<210> 18
<211> 21
<212> PRT
<213> Homo sapiens

<400> 18
Gly Glu Ser Gln Glu Asp Met Phe Ala Lys Leu Lys Glu Lys Phe Phe
1 5 10 15

Asn Glu Ile Asn Lys
20

<210> 19
<211> 28
<212> PRT
<213> Homo sapiens

<400> 19
Leu Ser Glu Leu Asp Asp Arg Ala Asp Ala Leu Gln Ala Gly Ala Ser
1 5 10 15

Gln Phe Glu Thr Ser Ala Ala Lys Leu Lys Arg Lys
20 25

<210> 20
<211> 28
<212> PRT
<213> Homo sapiens

<400> 20
Leu Ser Glu Leu Asp Asp Arg Ala Asp Ala Leu Gln Ala Gly Ala Ser
1 5 10 15

Gln Phe Glu Thr Ser Ala Ala Lys Leu Lys Arg Lys
20 25

<210> 21
<211> 28
<212> PRT
<213> Homo sapiens

<400> 21
Leu Ser Glu Leu Asp Asp Arg Ala Asp Ala Leu Gln Ala Gly Ala Ser
1 5 10 15

Gln Phe Glu Ser Ser Ala Ala Lys Leu Lys Arg Lys
20 25

<210> 22

<400> 22
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<210> 23
<211> 206
<212> PRT
<213> Homo sapiens

<400> 23
Met Ala Glu Asp Ala Asp Met Arg Asn Glu Leu Glu Glu Met Gln Arg
1 5 10 15

Arg Ala Asp Gln Leu Ala Asp Glu Ser Leu Glu Ser Thr Arg Arg Met
20 25 30

Leu Gln Leu Val Glu Glu Ser Lys Asp Ala Gly Ile Arg Thr Leu Val
35 40 45

Met Leu Asp Glu Gln Gly Glu Gln Leu Glu Arg Ile Glu Glu Gly Met
50 55 60

Asp Gln Ile Asn Lys Asp Met Lys Glu Ala Glu Lys Asn Leu Thr Asp
65 70 75 80

Leu Gly Lys Phe Cys Gly Leu Cys Val Cys Pro Cys Asn Lys Leu Lys
85 90 95

Ser Ser Asp Ala Tyr Lys Lys Ala Trp Gly Asn Asn Gln Asp Gly Val
100 105 110

Val Ala Ser Gln Pro Ala Arg Val Val Asp Glu Arg Glu Gln Met Ala
115 120 125

Ile Ser Gly Gly Phe Ile Arg Arg Val Thr Asn Asp Ala Arg Glu Asn
130 135 140

Glu Met Asp Glu Asn Leu Glu Gln Val Ser Gly Ile Ile Gly Asn Leu
145 150 155 160

Arg His Met Ala Leu Asp Met Gly Asn Glu Ile Asp Thr Gln Asn Arg
165 170 175

Gln Ile Asp Arg Ile Met Glu Lys Ala Asp Ser Asn Lys Thr Arg Ile
180 185 190

Asp Glu Ala Asn Gln Arg Ala Thr Lys Met Leu Gly Ser Gly
195 200 205

<210> 24
<211> 118
<212> PRT
<213> Homo sapiens

<400> 24
Met Ser Ala Pro Ala Gln Pro Pro Ala Glu Gly Thr Glu Gly Thr Ala
1 5 10 15

Pro Gly Gly Gly Pro Pro Gly Pro Pro Pro Asn Met Thr Ser Asn Arg
20 25 30

Arg Leu Gln Gln Thr Gln Ala Gln Val Glu Glu Val Val Asp Ile Ile
35 40 45

Arg Val Asn Val Asp Lys Val Leu Glu Arg Asp Gln Lys Leu Ser Glu
50 55 60

Leu Asp Asp Arg Ala Asp Ala Leu Gln Ala Gly Ala Ser Gln Phe Glu
65 70 75 80

Ser Ser Ala Ala Lys Leu Lys Arg Lys Tyr Trp Trp Lys Asn Cys Lys
85 90 95

Met Met Ile Met Leu Gly Ala Ile Cys Ala Ile Ile Val Val Val Ile
100 105 110

Val Ile Tyr Phe Phe Thr
115

<210> 25
<211> 116
<212> PRT
<213> Homo sapiens

<400> 25
Met Ser Ala Thr Ala Ala Thr Ala Pro Pro Ala Ala Pro Ala Gly Glu
1 5 10 15

Gly Gly Pro Pro Ala Pro Pro Pro Asn Leu Thr Ser Asn Arg Arg Leu
20 25 30

Gln Gln Thr Gln Ala Gln Val Asp Glu Val Val Asp Ile Met Arg Val
35 40 45

Asn Val Asp Lys Val Leu Glu Arg Asp Gln Lys Leu Ser Glu Leu Asp
50 55 60

Asp Arg Ala Asp Ala Leu Gln Ala Gly Ala Ser Gln Phe Glu Thr Ser
65 70 75 80

Ala Ala Lys Leu Lys Arg Lys Tyr Trp Trp Lys Asn Leu Lys Met Met
85 90 95

Ile Ile Leu Gly Val Ile Cys Ala Ile Ile Leu Ile Ile Ile Ile Val
100 105 110

Tyr Phe Ser Thr
115

<210> 26
<211> 100
<212> PRT
<213> Homo sapiens

<400> 26
Met Ser Thr Gly Pro Thr Ala Ala Thr Gly Ser Asn Arg Arg Leu Gln
1 5 10 15

Gln Thr Gln Asn Gln Val Asp Glu Val Val Asp Ile Met Arg Val Asn
20 25 30

Val Asp Lys Val Leu Glu Arg Asp Gln Lys Leu Ser Glu Leu Asp Asp
35 40 45

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

Ala Lys Leu Lys Arg Lys Tyr Trp Trp Lys Asn Cys Lys Met Trp Ala
65 70 75 80

Ile Gly Ile Thr Val Leu Val Ile Phe Ile Ile Ile Ile Ile Val Trp
85 90 95

Val Val Ser Ser
100

<210> 27
<211> 288
<212> PRT
<213> Homo sapiens

<400> 27
Met Lys Asp Arg Thr Gln Glu Leu Arg Thr Ala Lys Asp Ser Asp Asp
1 5 10 15

Asp Asp Asp Val Ala Val Thr Val Asp Arg Asp Arg Phe Met Asp Glu
20 25 30

Phe Phe Glu Gln Val Glu Glu Ile Arg Gly Phe Ile Asp Lys Ile Ala

35

40

45

Glu Asn Val Glu Glu Val Lys Arg Lys His Ser Ala Ile Leu Ala Ser
50 55 60

Pro Asn Pro Asp Glu Lys Thr Lys Glu Glu Leu Glu Glu Leu Met Ser
65 70 75 80

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

Glu Gln Ser Ile Glu Gln Glu Glu Gly Leu Asn Arg Ser Ser Ala Asp
100 105 110

Leu Arg Ile Arg Lys Thr Gln His Ser Thr Leu Ser Arg Lys Phe Val
115 120 125

Glu Val Met Ser Glu Tyr Asn Ala Thr Gln Ser Asp Tyr Arg Glu Arg
130 135 140

Cys Lys Gly Arg Ile Gln Arg Gln Leu Glu Ile Thr Gly Arg Thr Thr
145 150 155 160

Thr Ser Glu Glu Leu Glu Asp Met Leu Glu Ser Gly Asn Pro Ala Ile
165 170 175

Phe Ala Ser Gly Ile Ile Met Asp Ser Ser Ile Ser Lys Gln Ala Leu
180 185 190

Ser Glu Ile Glu Thr Arg His Ser Glu Ile Ile Lys Leu Glu Asn Ser
195 200 205

Ile Arg Glu Leu His Asp Met Phe Met Asp Met Ala Met Leu Val Glu
210 215 220

Ser Gln Gly Glu Met Ile Asp Arg Ile Glu Tyr Asn Val Glu His Ala
225 230 235 240

Val Asp Tyr Val Glu Arg Ala Val Ser Asp Thr Lys Lys Ala Val Lys
245 250 255

Tyr Gln Ser Lys Ala Arg Arg Lys Lys Ile Met Ile Ile Ile Cys Cys
260 265 270

Val Ile Leu Gly Ile Val Ile Ala Ser Thr Val Gly Gly Ile Phe Ala
275 280 285

<210> 28
<211> 288
<212> PRT
<213> Homo sapiens

<400> 28
Met Lys Asp Arg Thr Gln Glu Leu Arg Ser Ala Lys Asp Ser Asp Asp
1 5 10 15

Glu Glu Glu Val Val His Val Asp Arg Asp His Phe Met Asp Glu Phe
20 25 30

Phe Glu Gln Val Glu Glu Ile Arg Gly Cys Ile Glu Lys Leu Ser Glu
35 40 45

Asp Val Glu Gln Val Lys Lys Gln His Ser Ala Ile Leu Ala Ala Pro
50 55 60

Asn Pro Asp Glu Lys Thr Lys Gln Glu Leu Glu Asp Leu Thr Ala Asp
65 70 75 80

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

Gln Ser Ile Glu Gln Glu Glu Gly Leu Asn Arg Ser Ser Ala Asp Leu
100 105 110

Arg Ile Arg Lys Thr Gln His Ser Thr Leu Ser Arg Lys Phe Val Glu
115 120 125

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

Lys Asp Arg Ile Gln Arg Gln Leu Glu Ile Thr Gly Arg Thr Thr Thr
145 150 155 160

Asn Glu Glu Leu Glu Asp Met Leu Glu Ser Gly Lys Leu Ala Ile Phe
165 170 175

Thr Asp Asp Ile Lys Met Asp Ser Gln Met Thr Lys Gln Ala Leu Asn
180 185 190

Glu Ile Glu Thr Arg His Asn Glu Ile Ile Lys Leu Glu Thr Ser Ile
195 200 205

Arg Glu Leu His Asp Met Phe Val Asp Met Ala Met Leu Val Glu Ser
210 215 220

Gln Gly Glu Met Ile Asp Arg Ile Glu Tyr Asn Val Glu His Ser Val
225 230 235 240

Asp Tyr Val Glu Arg Ala Val Ser Asp Thr Lys Lys Ala Val Lys Tyr
245 250 255

Gln Ser Lys Ala Arg Arg Lys Lys Ile Met Ile Ile Ile Cys Cys Val
260 265 270

Val Leu Gly Val Val Leu Ala Ser Ser Ile Gly Gly Thr Leu Gly Leu
275 280 285

<210> 29
<211> 852
<212> DNA
<213> Artificial Sequence

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

<400> 29
atggtcttca cactcgaaga tttcgttggg gactgggaac agacagccgc ctacaacctg
60

gaccaagtcc ttgaacaggg aggtgtgtcc agtttgctgc agaattctgc cgtgtccgta
120

actccgatcc aaaggattgt ccggagcggg gaaaatgccc tgaagatcga catccatgtc
180

atcatcccgt atgaaggtct gagcgccgac caaatggccc agatcgaaga ggtgtttaag
240

gtggtgtacc ctgtggatga tcatcacttt aaggtgatcc tgccctatgg cacactggta
300

atcgacgggg ttacgccgaa catgctgaac tatttcggac ggccgtatga aggcacgccc
360

gtgttcgacg gcaaaaagat cactgtaaca gggaccctgt ggaacggcaa caaaattatc
420

gacgagcgcc tgatcacccc cgacggctcc atgctgttcc gagtaaccat caacagtggg
480

agttccggtg gtggcgggag cggaggtgga ggctcgagcg gtggagctca ggcccgggaa
540

aatgaaatgg atgaaaacct agagcaggtg agcggcatca tcggaaacct ccgtcatatg
600

gccctagaca tgggcaatga gattgacacc cagaatcgcc agattgacag gatcatggag
660

aaggctgact ccaacaaaac cagaattgat gaagccaacc aacgtgcaac aaagatgctg
720

ggaagtgggtg ggaattcttg ctcgagcggg ggtggcggga gcggaggtgg agggtcgtca
780

ggtgtgaccg gctaccggct gttcgaggag attctggcgg ccgcactcga gcaccaccac
840

caccaccact ga
852

<210> 30
<211> 840
<212> DNA
<213> Artificial Sequence

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

<400> 30
atggtcttca cactcgaaga ttcgttggg gactgggaac agacagccgc ctacaacctg
60

gaccaagtcc ttgaacaggg aggtgtgtcc agtttgctgc agaattctgc cgtgtccgta
120

actccgatcc aaaggattgt ccggagcggg gaaaatgccc tgaagatcga catccatgtc
180

atcatcccgt atgaaggtct gagcgccgac caaatggccc agatcgaaga ggtgtttaag
240

gtggtgtacc ctgtggatga tcatcacttt aaggatgatcc tgccttatgg cacactggta
300

atcgacgggg ttacgccgaa catgctgaac tatttcggac ggccgtatga aggcacgccc
360

gtgttcgacg gcaaaaagat cactgtaaca gggaccctgt ggaacggcaa caaaattatc
420

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480

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540

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600

agggaccaga agctgtcaga gctggatgac cgagctgatg ccttgcaggc aggagcatca
660

caatttgaga gcagtgtctgc caagctaaag aggaagtatt ggtggaaaaa ctgcaagggg
720

aattctggct cgagcgggtg tggcgggagc ggaggtggag ggtcgtcagg tgtgaccggc
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<220>
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120

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240

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300

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360

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420

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480

agttccggtg gtggcgggag cggaggtgga ggctcgagcg gtggagctca ggaagatgcc
540

aaaaacatta agaagggccc agcgccattc taccactcg aagacgggac cgccggcgag
600

cagctgcaca aagccatgaa gcgctacgcc ctggtgcccg gcaccatcgc ctttaccgac
660

gcacatatcg aggtggacat tacctacgcc gagtacttcg agatgagcgt tcggctggca
720

gaagctatga agcgctatgg gctgaataca aaccatcgga tcgtggtgtg cagcgagaat
780

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960

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1080

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1200

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1320

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1380

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1560

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1980

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2100

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2340

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2580

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2700

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2760

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<220>
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