

Sequence_Listing
SEQUENCE LISTING

<110> UNIVERSITY OF PITTSBURGH - OF THE COMMONWEALTH SYSTEM OF
HIGHER EDUCATION
Ross, Ted M.
Carter, Donald M.
Crevar, Corey J.

<120> COMPUTATIONALLY OPTIMIZED BROADLY REACTIVE ANTIGENS FOR H3N2,
H2N2, AND B INFLUENZA VIRUSES

<130> 8123-88294-02

<150> US 61/596,014
<151> 2012-02-07

<160> 11

<170> PatentIn version 3.5

<210> 1
<211> 562
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic polypeptide

<400> 1

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

Gln Ile Cys Ile Gly Tyr His Ala Asn Asn Ser Thr Glu Lys Val Asp
20 25 30

Thr Ile Leu Glu Arg Asn Val Thr Val Thr His Ala Lys Asp Ile Leu
35 40 45

Glu Lys Thr His Asn Gly Lys Leu Cys Lys Leu Asn Gly Ile Pro Pro
50 55 60

Leu Glu Leu Gly Asp Cys Ser Ile Ala Gly Trp Leu Leu Gly Asn Pro
65 70 75 80

Glu Cys Asp Arg Leu Leu Arg Val Pro Glu Trp Ser Tyr Ile Met Glu
85 90 95

Lys Glu Asn Pro Arg Asp Gly Leu Cys Tyr Pro Gly Ser Phe Asn Asp
100 105 110

Tyr Glu Glu Leu Lys His Leu Leu Ser Ser Val Lys His Phe Glu Lys
115 120 125

Val Lys Ile Leu Pro Lys Asp Arg Trp Thr Gln His Thr Thr Thr Gly

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

Sequence_Listing

Phe Asp Gly Ile Thr Asn Lys Val Asn Ser Val Ile Glu Lys Met Asn
385 390 395 400

Thr Gln Phe Glu Ala Val Gly Lys Glu Phe Ser Asn Leu Glu Arg Arg
405 410 415

Leu Glu Asn Leu Asn Lys Lys Met Glu Asp Gly Phe Leu Asp Val Trp
420 425 430

Thr Tyr Asn Ala Glu Leu Leu Val Leu Met Glu Asn Glu Arg Thr Leu
435 440 445

Asp Phe His Asp Ser Asn Val Lys Asn Leu Tyr Asp Lys Val Arg Met
450 455 460

Gln Leu Arg Asp Asn Val Lys Glu Leu Gly Asn Gly Cys Phe Glu Phe
465 470 475 480

Tyr His Lys Cys Asp Asp Glu Cys Met Asn Ser Val Lys Asn Gly Thr
485 490 495

Tyr Asp Tyr Pro Lys Tyr Glu Glu Glu Ser Lys Leu Asn Arg Asn Glu
500 505 510

Ile Lys Gly Val Lys Leu Ser Ser Met Gly Val Tyr Gln Ile Leu Ala
515 520 525

Ile Tyr Ala Thr Val Ala Gly Ser Leu Ser Leu Ala Ile Met Met Ala
530 535 540

Gly Ile Ser Phe Trp Met Cys Ser Asn Gly Ser Leu Gln Cys Arg Ile
545 550 555 560

Cys Ile

<210> 2
<211> 562
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic polypeptide

<400> 2

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

Gln Ile Cys Ile Gly Tyr His Ala Asn Asn Ser Thr Glu Lys Val Asp

30

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

Sequence_Listing

Arg Gly Ser Ser Gly Ile Met Lys Thr Glu Gly Thr Leu Gly Asn Cys
275 280 285

Glu Thr Lys Cys Gln Thr Pro Leu Gly Ala Ile Asn Thr Thr Leu Pro
290 295 300

Phe His Asn Val His Pro Leu Thr Ile Gly Glu Cys Pro Lys Tyr Val
305 310 315 320

Lys Ser Glu Lys Leu Val Leu Ala Thr Gly Leu Arg Asn Val Pro Gln
325 330 335

Ile Glu Ser Arg Gly Leu Phe Gly Ala Ile Ala Gly Phe Ile Glu Gly
340 345 350

Gly Trp Gln Gly Met Val Asp Gly Trp Tyr Gly Tyr His His Ser Asn
355 360 365

Asp Gln Gly Ser Gly Tyr Ala Ala Asp Lys Glu Ser Thr Gln Lys Ala
370 375 380

Phe Asp Gly Ile Thr Asn Lys Val Asn Ser Val Ile Glu Lys Met Asn
385 390 395 400

Thr Gln Phe Glu Ala Val Gly Lys Glu Phe Ser Asn Leu Glu Lys Arg
405 410 415

Leu Glu Asn Leu Asn Lys Lys Met Glu Asp Gly Phe Leu Asp Val Trp
420 425 430

Thr Tyr Asn Ala Glu Leu Leu Val Leu Met Glu Asn Glu Arg Thr Leu
435 440 445

Asp Phe His Asp Ser Asn Val Lys Asn Leu Tyr Asp Lys Val Arg Met
450 455 460

Gln Leu Arg Asp Asn Val Lys Glu Leu Gly Asn Gly Cys Phe Glu Phe
465 470 475 480

Tyr His Lys Cys Asp Asp Glu Cys Met Asn Ser Val Lys Asn Gly Thr
485 490 495

Tyr Asp Tyr Pro Lys Tyr Glu Glu Glu Ser Lys Leu Asn Arg Asn Glu
500 505 510

Ile Lys Gly Val Lys Leu Ser Ser Met Gly Val Tyr Gln Ile Leu Ala
515 520 525

Sequence_Listing

Ile Tyr Ala Thr Val Ala Gly Ser Leu Ser Leu Ala Ile Met Met Ala
530 535 540

Gly Ile Ser Phe Trp Met Cys Ser Asn Gly Ser Leu Gln Cys Arg Ile
545 550 555 560

Cys Ile

<210> 3
<211> 562
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic polypeptide

<400> 3

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

Gln Ile Cys Ile Gly Tyr His Ala Asn Asn Ser Thr Glu Lys Val Asp
20 25 30

Thr Ile Leu Glu Arg Asn Val Thr Val Thr His Ala Lys Asp Ile Leu
35 40 45

Glu Lys Thr His Asn Gly Lys Leu Cys Lys Leu Asn Gly Ile Pro Pro
50 55 60

Leu Glu Leu Gly Asp Cys Ser Ile Ala Gly Trp Leu Leu Gly Asn Pro
65 70 75 80

Glu Cys Asp Arg Leu Leu Ser Val Pro Glu Trp Ser Tyr Ile Met Glu
85 90 95

Lys Glu Asn Pro Arg Asp Gly Leu Cys Tyr Pro Gly Ser Phe Asn Asp
100 105 110

Tyr Glu Glu Leu Lys His Leu Leu Ser Ser Val Lys His Phe Glu Lys
115 120 125

Val Lys Ile Leu Pro Lys Asp Arg Trp Thr Gln His Thr Thr Thr Gly
130 135 140

Gly Ser Arg Ala Cys Ala Val Ser Gly Asn Pro Ser Phe Phe Arg Asn
145 150 155 160

Sequence_Listing

Met Val Trp Leu Thr Lys Lys Gly Ser Asn Tyr Pro Val Ala Lys Gly
165 170 175

Ser Tyr Asn Asn Thr Ser Gly Glu Gln Met Leu Ile Ile Trp Gly Val
180 185 190

His His Pro Asn Asp Glu Thr Glu Gln Arg Thr Leu Tyr Gln Asn Val
195 200 205

Gly Thr Tyr Val Ser Val Gly Thr Ser Thr Leu Asn Lys Arg Ser Thr
210 215 220

Pro Glu Ile Ala Thr Arg Pro Lys Val Asn Gly Leu Gly Ser Arg Met
225 230 235 240

Glu Phe Ser Trp Thr Leu Leu Asp Met Trp Asp Thr Ile Asn Phe Glu
245 250 255

Ser Thr Gly Asn Leu Ile Ala Pro Glu Tyr Gly Phe Lys Ile Ser Lys
260 265 270

Arg Gly Ser Ser Gly Ile Met Lys Thr Glu Gly Thr Leu Glu Asn Cys
275 280 285

Glu Thr Lys Cys Gln Thr Pro Leu Gly Ala Ile Asn Thr Thr Leu Pro
290 295 300

Phe His Asn Val His Pro Leu Thr Ile Gly Glu Cys Pro Lys Tyr Val
305 310 315 320

Lys Ser Glu Lys Leu Val Leu Ala Thr Gly Leu Arg Asn Val Pro Gln
325 330 335

Ile Glu Ser Arg Gly Leu Phe Gly Ala Ile Ala Gly Phe Ile Glu Gly
340 345 350

Gly Trp Gln Gly Met Val Asp Gly Trp Tyr Gly Tyr His His Ser Asn
355 360 365

Asp Gln Gly Ser Gly Tyr Ala Ala Asp Lys Glu Ser Thr Gln Lys Ala
370 375 380

Phe Asp Gly Ile Thr Asn Lys Val Asn Ser Val Ile Glu Lys Met Asn
385 390 395 400

Thr Gln Phe Glu Ala Val Gly Lys Glu Phe Ser Asn Leu Glu Arg Arg
405 410 415

Sequence_Listing

Leu Glu Asn Leu Asn Lys Lys Met Glu Asp Gly Phe Leu Asp Val Trp
420 425 430

Thr Tyr Asn Ala Glu Leu Leu Val Leu Met Glu Asn Glu Arg Thr Leu
435 440 445

Asp Phe His Asp Ser Asn Val Lys Asn Leu Tyr Asp Lys Val Arg Met
450 455 460

Gln Leu Arg Asp Asn Val Lys Glu Leu Gly Asn Gly Cys Phe Glu Phe
465 470 475 480

Tyr His Lys Cys Asp Asp Glu Cys Met Asn Ser Val Lys Asn Gly Thr
485 490 495

Tyr Asp Tyr Pro Lys Tyr Glu Glu Glu Ser Lys Leu Asn Arg Asn Glu
500 505 510

Ile Lys Gly Val Lys Leu Ser Ser Met Gly Val Tyr Gln Ile Leu Ala
515 520 525

Ile Tyr Ala Thr Val Ala Gly Ser Leu Ser Leu Ala Ile Met Met Ala
530 535 540

Gly Ile Ser Phe Trp Met Cys Ser Asn Gly Ser Leu Gln Cys Arg Ile
545 550 555 560

Cys Ile

<210> 4
<211> 562
<212> PRT
<213> Artificial sequence

<220>
<223> synthetic polypeptide

<400> 4

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

Gln Ile Cys Ile Gly Tyr His Ala Asn Asn Ser Thr Glu Lys Val Asp
20 25 30

Thr Ile Leu Glu Arg Asn Val Thr Val Thr His Ala Lys Asp Ile Leu
35 40 45

Sequence_Listing

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

Sequence_Listing

Phe His Asn Val His Pro Leu Thr Ile Gly Glu Cys Pro Lys Tyr Val
 305 310 315 320
 Lys Ser Glu Lys Leu Val Leu Ala Thr Gly Leu Arg Asn Val Pro Gln
 325 330 335
 Ile Glu Ser Arg Gly Leu Phe Gly Ala Ile Ala Gly Phe Ile Glu Gly
 340 345 350
 Gly Trp Gln Gly Met Val Asp Gly Trp Tyr Gly Tyr His His Ser Asn
 355 360 365
 Asp Gln Gly Ser Gly Tyr Ala Ala Asp Lys Glu Ser Thr Gln Lys Ala
 370 375 380
 Phe Asp Gly Ile Thr Asn Lys Val Asn Ser Val Ile Glu Lys Met Asn
 385 390 395 400
 Thr Gln Phe Glu Ala Val Gly Lys Glu Phe Ser Asn Leu Glu Arg Arg
 405 410 415
 Leu Glu Asn Leu Asn Lys Lys Met Glu Asp Gly Phe Leu Asp Val Trp
 420 425 430
 Thr Tyr Asn Ala Glu Leu Leu Val Leu Met Glu Asn Glu Arg Thr Leu
 435 440 445
 Asp Phe His Asp Ser Asn Val Lys Asn Leu Tyr Asp Lys Val Arg Met
 450 455 460
 Gln Leu Arg Asp Asn Val Lys Glu Leu Gly Asn Gly Cys Phe Glu Phe
 465 470 475 480
 Tyr His Lys Cys Asp Asp Glu Cys Met Asn Ser Val Lys Asn Gly Thr
 485 490 495
 Tyr Asp Tyr Pro Lys Tyr Glu Glu Glu Ser Lys Leu Asn Arg Asn Glu
 500 505 510
 Ile Lys Gly Val Lys Leu Ser Ser Met Gly Val Tyr Gln Ile Leu Ala
 515 520 525
 Ile Tyr Ala Thr Val Ala Gly Ser Leu Ser Leu Ala Ile Met Met Ala
 530 535 540
 Gly Ile Ser Phe Trp Met Cys Ser Asn Gly Ser Leu Gln Cys Arg Ile
 545 550 555 560

Sequence_Listing

Cys Ile

<210> 5
 <211> 584
 <212> PRT
 <213> Artificial Sequence
 <220>
 <223> Synthetic polypeptide
 <400> 5

Met Lys Ala Ile Ile Val Leu Leu Met Val Val Thr Ser Asn Ala Asp
 1 5 10 15
 Arg Ile Cys Thr Gly Ile Thr Ser Ser Asn Ser Pro His Val Val Lys
 20 25 30
 Thr Ala Thr Gln Gly Glu Val Asn Val Thr Gly Val Ile Pro Leu Thr
 35 40 45
 Thr Thr Pro Thr Lys Ser His Phe Ala Asn Leu Lys Gly Thr Lys Thr
 50 55 60
 Arg Gly Lys Leu Cys Pro Asn Cys Leu Asn Cys Thr Asp Leu Asp Val
 65 70 75 80
 Ala Leu Gly Arg Pro Met Cys Val Gly Thr Thr Pro Ser Ala Lys Ala
 85 90 95
 Ser Ile Leu His Glu Val Arg Pro Val Thr Ser Gly Cys Phe Pro Ile
 100 105 110
 Met His Asp Arg Thr Lys Ile Arg Gln Leu Pro Asn Leu Leu Arg Gly
 115 120 125
 Tyr Glu Asn Ile Arg Leu Ser Thr Gln Asn Val Ile Asn Ala Glu Lys
 130 135 140
 Ala Pro Gly Gly Pro Tyr Arg Leu Gly Thr Ser Gly Ser Cys Pro Asn
 145 150 155 160
 Val Thr Ser Arg Ser Gly Phe Phe Ala Thr Met Ala Trp Ala Val Pro
 165 170 175
 Arg Asp Asn Asn Lys Thr Ala Thr Asn Pro Leu Thr Val Glu Val Pro
 180 185 190

Sequence_Listing

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

Sequence_Listing

Arg Ala Asp Thr Ile Ser Ser Gln Ile Glu Leu Ala Val Leu Leu Ser
450 455 460

Asn Glu Gly Ile Ile Asn Ser Glu Asp Glu His Leu Leu Ala Leu Glu
465 470 475 480

Arg Lys Leu Lys Lys Met Leu Gly Pro Ser Ala Val Asp Ile Gly Asn
485 490 495

Gly Cys Phe Glu Thr Lys His Lys Cys Asn Gln Thr Cys Leu Asp Arg
500 505 510

Ile Ala Ala Gly Thr Phe Asn Ala Gly Glu Phe Ser Leu Pro Thr Phe
515 520 525

Asp Ser Leu Asn Ile Thr Ala Ala Ser Leu Asn Asp Asp Gly Leu Asp
530 535 540

Asn His Thr Ile Leu Leu Tyr Tyr Ser Thr Ala Ala Ser Ser Leu Ala
545 550 555 560

Val Thr Leu Met Ile Ala Ile Phe Ile Val Tyr Met Val Ser Arg Asp
565 570 575

Asn Val Ser Cys Ser Ile Cys Leu
580

<210> 6
<211> 585
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic polypeptide

<400> 6

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

Arg Ile Cys Thr Gly Ile Thr Ser Ser Asn Ser Pro His Val Val Lys
20 25 30

Thr Ala Thr Gln Gly Glu Val Asn Val Thr Gly Val Ile Pro Leu Thr
35 40 45

Thr Thr Pro Thr Lys Ser His Phe Ala Asn Leu Lys Gly Thr Lys Thr
50 55 60

Sequence_Listing

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

Sequence_Listing

Ser Lys Pro Tyr Tyr Thr Gly Glu His Ala Lys Ala Ile Gly Asn Cys
325 330 335

Pro Ile Trp Val Lys Thr Pro Leu Lys Leu Ala Asn Gly Thr Lys Tyr
340 345 350

Arg Pro Pro Ala Lys Leu Leu Lys Glu Arg Gly Phe Phe Gly Ala Ile
355 360 365

Ala Gly Phe Leu Glu Gly Gly Trp Glu Gly Met Ile Ala Gly Trp His
370 375 380

Gly Tyr Thr Ser His Gly Ala His Gly Val Ala Val Ala Ala Asp Leu
385 390 395 400

Lys Ser Thr Gln Glu Ala Ile Asn Lys Ile Thr Lys Asn Leu Asn Ser
405 410 415

Leu Ser Glu Leu Glu Val Lys Asn Leu Gln Arg Leu Ser Gly Ala Met
420 425 430

Asp Glu Leu His Asn Glu Ile Leu Glu Leu Asp Glu Lys Val Asp Asp
435 440 445

Leu Arg Ala Asp Thr Ile Ser Ser Gln Ile Glu Leu Ala Val Leu Leu
450 455 460

Ser Asn Glu Gly Ile Ile Asn Ser Glu Asp Glu His Leu Leu Ala Leu
465 470 475 480

Glu Arg Lys Leu Lys Lys Met Leu Gly Pro Ser Ala Val Asp Ile Gly
485 490 495

Asn Gly Cys Phe Glu Thr Lys His Lys Cys Asn Gln Thr Cys Leu Asp
500 505 510

Arg Ile Ala Ala Gly Thr Phe Asn Ala Gly Glu Phe Ser Leu Pro Thr
515 520 525

Phe Asp Ser Leu Asn Ile Thr Ala Ala Ser Leu Asn Asp Asp Gly Leu
530 535 540

Asp Asn His Thr Ile Leu Leu Tyr Tyr Ser Thr Ala Ala Ser Ser Leu
545 550 555 560

Ala Val Thr Leu Met Ile Ala Ile Phe Ile Val Tyr Met Val Ser Arg

Sequence_Listing
570

565

575

Asp Asn Val Ser Cys Ser Ile Cys Leu
580 585

<210> 7
<211> 585
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic polypeptide

<400> 7

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

Arg Ile Cys Thr Gly Ile Thr Ser Ser Asn Ser Pro His Val Val Lys
20 25 30

Thr Ala Thr Gln Gly Glu Val Asn Val Thr Gly Val Ile Pro Leu Thr
35 40 45

Thr Thr Pro Thr Lys Ser His Phe Ala Asn Leu Lys Gly Thr Lys Thr
50 55 60

Arg Gly Lys Leu Cys Pro Lys Cys Leu Asn Cys Thr Asp Leu Asp Val
65 70 75 80

Ala Leu Gly Arg Pro Lys Cys Thr Gly Asn Ile Pro Ser Ala Lys Val
85 90 95

Ser Ile Leu His Glu Val Arg Pro Val Thr Ser Gly Cys Phe Pro Ile
100 105 110

Met His Asp Arg Thr Lys Ile Arg Gln Leu Pro Asn Leu Leu Arg Gly
115 120 125

Tyr Glu His Ile Arg Leu Ser Thr His Asn Val Ile Asn Ala Glu Lys
130 135 140

Ala Pro Gly Gly Pro Tyr Lys Ile Gly Thr Ser Gly Ser Cys Pro Asn
145 150 155 160

Val Thr Asn Gly Asn Gly Phe Phe Ala Thr Met Ala Trp Ala Val Pro
165 170 175

Lys Asn Asp Asn Asn Lys Thr Ala Thr Asn Pro Leu Thr Ile Glu Val
180 185 190

Sequence_Listing

Pro Tyr Ile Cys Thr Glu Gly Glu Asp Gln Ile Thr Val Trp Gly Phe
195 200 205

His Ser Asp Asn Glu Thr Gln Met Ala Lys Leu Tyr Gly Asp Ser Lys
210 215 220

Pro Gln Lys Phe Thr Ser Ser Ala Asn Gly Val Thr Thr His Tyr Val
225 230 235 240

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

Gln Ser Gly Arg Ile Val Val Asp Tyr Met Val Gln Lys Ser Gly Lys
260 265 270

Thr Gly Thr Ile Thr Tyr Gln Arg Gly Ile Leu Leu Pro Gln Lys Val
275 280 285

Trp Cys Ala Ser Gly Arg Ser Lys Val Ile Lys Gly Ser Leu Pro Leu
290 295 300

Ile Gly Glu Ala Asp Cys Leu His Glu Lys Tyr Gly Gly Leu Asn Lys
305 310 315 320

Ser Lys Pro Tyr Tyr Thr Gly Glu His Ala Lys Ala Ile Gly Asn Cys
325 330 335

Pro Ile Trp Val Lys Thr Pro Leu Lys Leu Ala Asn Gly Thr Lys Tyr
340 345 350

Arg Pro Pro Ala Lys Leu Leu Lys Glu Arg Gly Phe Phe Gly Ala Ile
355 360 365

Ala Gly Phe Leu Glu Gly Gly Trp Glu Gly Met Ile Ala Gly Trp His
370 375 380

Gly Tyr Thr Ser His Gly Ala His Gly Val Ala Val Ala Ala Asp Leu
385 390 395 400

Lys Ser Thr Gln Glu Ala Ile Asn Lys Ile Thr Lys Asn Leu Asn Ser
405 410 415

Leu Ser Glu Leu Glu Val Lys Asn Leu Gln Arg Leu Ser Gly Ala Met
420 425 430

Asp Glu Leu His Asn Glu Ile Leu Glu Leu Asp Glu Lys Val Asp Asp

Sequence_Listing

435

440

445

Leu Arg Ala Asp Thr Ile Ser Ser Gln Ile Glu Leu Ala Val Leu Leu
450 455 460

Ser Asn Glu Gly Ile Ile Asn Ser Glu Asp Glu His Leu Leu Ala Leu
465 470 475 480

Glu Arg Lys Leu Lys Lys Met Leu Gly Pro Ser Ala Val Glu Ile Gly
485 490 495

Asn Gly Cys Phe Glu Thr Lys His Lys Cys Asn Gln Thr Cys Leu Asp
500 505 510

Arg Ile Ala Ala Gly Thr Phe Asp Ala Gly Glu Phe Ser Leu Pro Thr
515 520 525

Phe Asp Ser Leu Asn Ile Thr Ala Ala Ser Leu Asn Asp Asp Gly Leu
530 535 540

Asp Asn His Thr Ile Leu Leu Tyr Tyr Ser Thr Ala Ala Ser Ser Leu
545 550 555 560

Ala Val Thr Leu Met Ile Ala Ile Phe Val Val Tyr Met Val Ser Arg
565 570 575

Asp Asn Val Ser Cys Ser Ile Cys Leu
580 585

<210> 8
<211> 566
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic polypeptide

<400> 8

Met Lys Thr Ile Ile Ala Leu Ser Tyr Ile Leu Cys Leu Val Phe Ala
1 5 10 15

Gln Lys Leu Pro Gly Asn Asp Asn Ser Thr Ala Thr Leu Cys Leu Gly
20 25 30

His His Ala Val Pro Asn Gly Thr Leu Val Lys Thr Ile Thr Asn Asp
35 40 45

Gln Ile Glu Val Thr Asn Ala Thr Glu Leu Val Gln Ser Ser Ser Thr
50 55 60

Sequence_Listing

Gly Arg Ile Cys Asp Ser Pro His Arg Ile Leu Asp Gly Glu Asn Cys
 65 70 75 80
 Thr Leu Ile Asp Ala Leu Leu Gly Asp Pro His Cys Asp Gly Phe Gln
 85 90 95
 Asn Lys Lys Trp Asp Leu Phe Val Glu Arg Ser Lys Ala Tyr Ser Asn
 100 105 110
 Cys Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ser Leu Arg Ser Leu Val
 115 120 125
 Ala Ser Ser Gly Thr Leu Glu Phe Ile Asn Glu Ser Phe Asn Trp Thr
 130 135 140
 Gly Val Thr Gln Asn Gly Gly Ser Ser Ala Cys Lys Arg Gly Ser Val
 145 150 155 160
 Asn Ser Phe Phe Ser Arg Leu Asn Trp Leu Thr Lys Leu Lys Tyr Lys
 165 170 175
 Tyr Pro Ala Leu Asn Val Thr Met Pro Asn Asn Asp Lys Phe Asp Lys
 180 185 190
 Leu Tyr Ile Trp Gly Val His His Pro Ser Thr Asp Gln Asp Gln Thr
 195 200 205
 Ser Leu Tyr Val Gln Ala Ser Gly Arg Val Thr Val Ser Thr Lys Arg
 210 215 220
 Ser Gln Gln Thr Val Ile Pro Asn Ile Gly Ser Arg Pro Trp Val Arg
 225 230 235 240
 Gly Leu Ser Ser Arg Ile Ser Ile Tyr Trp Thr Ile Val Lys Pro Gly
 245 250 255
 Asp Ile Leu Leu Ile Asn Ser Thr Gly Asn Leu Ile Ala Pro Arg Gly
 260 265 270
 Tyr Phe Lys Ile Arg Ser Gly Lys Ser Ser Ile Met Arg Ser Asp Ala
 275 280 285
 Pro Ile Gly Thr Cys Asn Ser Glu Cys Ile Thr Pro Asn Gly Ser Ile
 290 295 300
 Pro Asn Asp Lys Pro Phe Gln Asn Val Asn Arg Ile Thr Tyr Gly Ala
 Page 19

Sequence Listing														
305											310	315	320	
Cys	Pro	Arg	Tyr	Val	Lys	Gln	Asn	Thr	Leu	Lys	Leu	Ala	Thr	Gly Met
				325					330					335
Arg	Asn	Val	Pro	Glu	Lys	Gln	Thr	Arg	Gly	Ile	Phe	Gly	Ala	Ile Ala
			340					345					350	
Gly	Phe	Ile	Glu	Asn	Gly	Trp	Glu	Gly	Met	Val	Asp	Gly	Trp	Tyr Gly
		355					360					365		
Phe	Arg	His	Gln	Asn	Ser	Glu	Gly	Thr	Gly	Gln	Ala	Ala	Asp	Leu Lys
	370					375					380			
Ser	Thr	Gln	Ala	Ala	Ile	Asp	Gln	Ile	Asn	Gly	Lys	Leu	Asn	Arg Leu
385					390					395				400
Ile	Glu	Lys	Thr	Asn	Glu	Lys	Phe	His	Gln	Ile	Glu	Lys	Glu	Phe Ser
				405					410					415
Glu	Val	Glu	Gly	Arg	Ile	Gln	Asp	Leu	Glu	Lys	Tyr	Val	Glu	Asp Thr
			420					425					430	
Lys	Ile	Asp	Leu	Trp	Ser	Tyr	Asn	Ala	Glu	Leu	Leu	Val	Ala	Leu Glu
		435					440					445		
Asn	Gln	His	Thr	Ile	Asp	Leu	Thr	Asp	Ser	Glu	Met	Asn	Lys	Leu Phe
		450				455					460			
Glu	Lys	Thr	Arg	Lys	Gln	Leu	Arg	Glu	Asn	Ala	Glu	Asp	Met	Gly Asn
465					470					475				480
Gly	Cys	Phe	Lys	Ile	Tyr	His	Lys	Cys	Asp	Asn	Ala	Cys	Ile	Gly Ser
				485					490					495
Ile	Arg	Asn	Gly	Thr	Tyr	Asp	His	Asp	Val	Tyr	Arg	Asp	Glu	Ala Leu
			500					505					510	
Asn	Asn	Arg	Phe	Gln	Ile	Lys	Gly	Val	Glu	Leu	Lys	Ser	Gly	Tyr Lys
		515					520					525		
Asp	Trp	Ile	Leu	Trp	Ile	Ser	Phe	Ala	Ile	Ser	Cys	Phe	Leu	Leu Cys
	530					535					540			
Val	Val	Leu	Leu	Gly	Phe	Ile	Met	Trp	Ala	Cys	Gln	Lys	Gly	Asn Ile
545					550					555				560

Sequence_Listing

Arg Cys Asn Ile Cys Ile
565

<210> 9
<211> 566
<212> PRT
<213> Artificial Sequence

<220>
<223> Synthetic polypeptide

<400> 9

Met Lys Thr Ile Ile Ala Leu Ser Tyr Ile Leu Cys Leu Val Phe Ala
1 5 10 15

Gln Lys Leu Pro Gly Asn Asp Asn Ser Thr Ala Thr Leu Cys Leu Gly
20 25 30

His His Ala Val Pro Asn Gly Thr Leu Val Lys Thr Ile Thr Asn Asp
35 40 45

Gln Ile Glu Val Thr Asn Ala Thr Glu Leu Val Gln Ser Ser Ser Thr
50 55 60

Gly Arg Ile Cys Asp Ser Pro His Arg Ile Leu Asp Gly Lys Asn Cys
65 70 75 80

Thr Leu Ile Asp Ala Leu Leu Gly Asp Pro His Cys Asp Gly Phe Gln
85 90 95

Asn Lys Lys Trp Asp Leu Phe Val Glu Arg Ser Lys Ala Phe Ser Asn
100 105 110

Cys Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ser Leu Arg Ser Leu Val
115 120 125

Ala Ser Ser Gly Thr Leu Glu Phe Ile Asn Glu Ser Phe Asn Trp Thr
130 135 140

Gly Val Thr Gln Asn Gly Gly Ser Tyr Ala Cys Lys Arg Gly Ser Val
145 150 155 160

Asn Ser Phe Phe Ser Arg Leu Asn Trp Leu His Lys Ser Glu Ser Lys
165 170 175

Tyr Pro Ala Leu Asn Val Thr Met Pro Asn Asn Asp Lys Phe Asp Lys
180 185 190

Leu Tyr Ile Trp Gly Val His His Pro Ser Thr Asp Gln Glu Gln Thr
Page 21

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

Sequence_Listing

Asn Gln His Thr Ile Asp Leu Thr Asp Ser Glu Met Asn Lys Leu Phe
450 455 460

Glu Lys Thr Arg Lys Gln Leu Arg Glu Asn Ala Glu Asp Met Gly Asn
465 470 475 480

Gly Cys Phe Lys Ile Tyr His Lys Cys Asp Asn Ala Cys Ile Gly Ser
485 490 495

Ile Arg Asn Gly Thr Tyr Asp His Asp Val Tyr Arg Asp Glu Ala Leu
500 505 510

Asn Asn Arg Phe Gln Ile Lys Gly Val Glu Leu Lys Ser Gly Tyr Lys
515 520 525

Asp Trp Ile Leu Trp Ile Ser Phe Ala Ile Ser Cys Phe Leu Leu Cys
530 535 540

Val Val Leu Leu Gly Phe Ile Met Trp Ala Cys Gln Lys Gly Asn Ile
545 550 555 560

Arg Cys Asn Ile Cys Ile
565

<210> 10
<211> 566
<212> PRT
<213> Artificial Sequence

<220>
<223> synthetic polypeptide

<400> 10

Met Lys Thr Ile Ile Ala Leu Ser Tyr Ile Leu Cys Leu Val Phe Ala
1 5 10 15

Gln Lys Leu Pro Gly Asn Asp Asn Ser Thr Ala Thr Leu Cys Leu Gly
20 25 30

His His Ala Val Pro Asn Gly Thr Leu Val Lys Thr Ile Thr Asn Asp
35 40 45

Gln Ile Glu Val Thr Asn Ala Thr Glu Leu Val Gln Ser Ser Ser Thr
50 55 60

Gly Arg Ile Cys Asp Ser Pro His Arg Ile Leu Asp Gly Lys Asn Cys
65 70 75 80

Thr Leu Ile Asp Ala Leu Leu Gly Asp Pro His Cys Asp Gly Phe Gln
Page 23

Sequence_Listing

85

90

95

Asn Lys Lys Trp Asp Leu Phe Val Glu Arg Ser Lys Ala Tyr Ser Asn
100 105 110

Cys Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ser Leu Arg Ser Leu Val
115 120 125

Ala Ser Ser Gly Thr Leu Glu Phe Ile Asn Glu Ser Phe Asn Trp Thr
130 135 140

Gly Val Thr Gln Asn Gly Gly Ser Tyr Ala Cys Lys Arg Gly Ser Asn
145 150 155 160

Asn Ser Phe Phe Ser Arg Leu Asn Trp Leu Thr Lys Ser Glu Ser Lys
165 170 175

Tyr Pro Ala Leu Asn Val Thr Met Pro Asn Asn Glu Lys Phe Asp Lys
180 185 190

Leu Tyr Ile Trp Gly Val His His Pro Ser Thr Asp Lys Glu Gln Thr
195 200 205

Ser Leu Tyr Val Gln Ala Ser Gly Arg Val Thr Val Ser Thr Lys Arg
210 215 220

Ser Gln Gln Thr Val Ile Pro Asn Ile Gly Ser Arg Pro Trp Val Arg
225 230 235 240

Gly Leu Ser Ser Arg Ile Ser Ile Tyr Trp Thr Ile Val Lys Pro Gly
245 250 255

Asp Ile Leu Leu Ile Asn Ser Thr Gly Asn Leu Ile Ala Pro Arg Gly
260 265 270

Tyr Phe Lys Ile Arg Thr Gly Lys Ser Ser Ile Met Arg Ser Asp Ala
275 280 285

Pro Ile Gly Thr Cys Asn Ser Glu Cys Ile Thr Pro Asn Gly Ser Ile
290 295 300

Pro Asn Asp Lys Pro Phe Gln Asn Val Asn Arg Ile Thr Tyr Gly Ala
305 310 315 320

Cys Pro Arg Tyr Val Lys Gln Asn Thr Leu Lys Leu Ala Thr Gly Met
325 330 335

Sequence_Listing

Arg Asn Val Pro Glu Lys Gln Thr Arg Gly Ile Phe Gly Ala Ile Ala
340 345 350

Gly Phe Ile Glu Asn Gly Trp Glu Gly Met Val Asp Gly Trp Tyr Gly
355 360 365

Phe Arg His Gln Asn Ser Glu Gly Thr Gly Gln Ala Ala Asp Leu Lys
370 375 380

Ser Thr Gln Ala Ala Ile Asp Gln Ile Asn Gly Lys Leu Asn Arg Leu
385 390 395 400

Ile Glu Lys Thr Asn Glu Lys Phe His Gln Ile Glu Lys Glu Phe Ser
405 410 415

Glu Val Glu Gly Arg Ile Gln Asp Leu Glu Lys Tyr Val Glu Asp Thr
420 425 430

Lys Ile Asp Leu Trp Ser Tyr Asn Ala Glu Leu Leu Val Ala Leu Glu
435 440 445

Asn Gln His Thr Ile Asp Leu Thr Asp Ser Glu Met Asn Lys Leu Phe
450 455 460

Glu Lys Thr Arg Lys Gln Leu Arg Glu Asn Ala Glu Asp Met Gly Asn
465 470 475 480

Gly Cys Phe Lys Ile Tyr His Lys Cys Asp Asn Ala Cys Ile Gly Ser
485 490 495

Ile Arg Asn Gly Thr Tyr Asp His Asp Val Tyr Arg Asp Glu Ala Leu
500 505 510

Asn Asn Arg Phe Gln Ile Lys Gly Val Glu Leu Lys Ser Gly Tyr Lys
515 520 525

Asp Trp Ile Leu Trp Ile Ser Phe Ala Ile Ser Cys Phe Leu Leu Cys
530 535 540

Val Val Leu Leu Gly Phe Ile Met Trp Ala Cys Gln Lys Gly Asn Ile
545 550 555 560

Arg Cys Asn Ile Cys Ile
565

<210> 11
<211> 566
<212> PRT

Sequence_Listing

<213> Artificial Sequence

<220>

<223> synthetic polypeptide

<400> 11

Met Lys Thr Ile Ile Ala Leu Ser Tyr Ile Phe Cys Leu Val Phe Ala
1 5 10 15

Gln Lys Leu Pro Gly Asn Asp Asn Ser Thr Ala Thr Leu Cys Leu Gly
20 25 30

His His Ala Val Pro Asn Gly Thr Leu Val Lys Thr Ile Thr Asn Asp
35 40 45

Gln Ile Glu Val Thr Asn Ala Thr Glu Leu Val Gln Ser Ser Ser Thr
50 55 60

Gly Arg Ile Cys Asp Ser Pro His Arg Ile Leu Asp Gly Lys Asn Cys
65 70 75 80

Thr Leu Ile Asp Ala Leu Leu Gly Asp Pro His Cys Asp Gly Phe Gln
85 90 95

Asn Glu Lys Trp Asp Leu Phe Val Glu Arg Ser Lys Ala Phe Ser Asn
100 105 110

Cys Tyr Pro Tyr Asp Val Pro Asp Tyr Ala Ser Leu Arg Ser Leu Val
115 120 125

Ala Ser Ser Gly Thr Leu Glu Phe Ile Asn Glu Gly Phe Asn Trp Thr
130 135 140

Gly Val Thr Gln Asn Gly Gly Ser Tyr Ala Cys Lys Arg Gly Ser Val
145 150 155 160

Asn Ser Phe Phe Ser Arg Leu Asn Trp Leu His Lys Ser Glu Ser Lys
165 170 175

Tyr Pro Val Leu Asn Val Thr Met Pro Asn Asn Asp Lys Phe Asp Lys
180 185 190

Leu Tyr Ile Trp Gly Val His His Pro Ser Thr Asp Lys Glu Gln Thr
195 200 205

Ser Leu Tyr Val Gln Ala Ser Gly Arg Val Thr Val Ser Thr Lys Arg
210 215 220

Sequence_Listing

Ser Gln Gln Thr Val Ile Pro Asn Ile Gly Ser Arg Pro Trp Val Arg
225 230 235 240

Gly Leu Ser Ser Arg Ile Ser Ile Tyr Trp Thr Ile Val Lys Pro Gly
245 250 255

Asp Ile Leu Leu Ile Asn Ser Thr Gly Asn Leu Ile Ala Pro Arg Gly
260 265 270

Tyr Phe Lys Ile Arg Thr Gly Lys Ser Ser Ile Met Arg Ser Asp Ala
275 280 285

Pro Ile Gly Thr Cys Ser Ser Glu Cys Ile Thr Pro Asn Gly Ser Ile
290 295 300

Pro Asn Asp Lys Pro Phe Gln Asn Val Asn Lys Ile Thr Tyr Gly Ala
305 310 315 320

Cys Pro Arg Tyr Val Lys Gln Asn Thr Leu Lys Leu Ala Thr Gly Met
325 330 335

Arg Asn Val Pro Glu Lys Gln Thr Arg Gly Ile Phe Gly Ala Ile Ala
340 345 350

Gly Phe Ile Glu Asn Gly Trp Glu Gly Met Val Asp Gly Trp Tyr Gly
355 360 365

Phe Arg His Gln Asn Ser Glu Gly Thr Gly Gln Ala Ala Asp Leu Lys
370 375 380

Ser Thr Gln Ala Ala Ile Asp Gln Ile Asn Gly Lys Leu Asn Arg Leu
385 390 395 400

Ile Glu Lys Thr Asn Glu Lys Phe His Gln Ile Glu Lys Glu Phe Ser
405 410 415

Glu Val Glu Gly Arg Ile Gln Asp Leu Glu Lys Tyr Val Glu Asp Thr
420 425 430

Lys Ile Asp Leu Trp Ser Tyr Asn Ala Glu Leu Leu Val Ala Leu Glu
435 440 445

Asn Gln His Thr Ile Asp Leu Thr Asp Ser Glu Met Asn Lys Leu Phe
450 455 460

Glu Lys Thr Arg Lys Gln Leu Arg Glu Asn Ala Glu Asp Met Gly Asn
465 470 475 480

Sequence_Listing

Gly Cys Phe Lys Ile Tyr His Lys Cys Asp Asn Ala Cys Ile Gly Ser
 485 490 495

Ile Arg Asn Gly Thr Tyr Asp His Asp Val Tyr Arg Asp Glu Ala Leu
 500 505 510

Asn Asn Arg Phe Gln Ile Lys Gly Val Glu Leu Lys Ser Gly Tyr Lys
 515 520 525

Asp Trp Ile Leu Trp Ile Ser Phe Ala Ile Ser Cys Phe Leu Leu Cys
 530 535 540

Val Val Leu Leu Gly Phe Ile Met Trp Ala Cys Gln Lys Gly Asn Ile
 545 550 555 560

Arg Cys Asn Ile Cys Ile
 565