

SEQUENCE LISTING

<110> Biomay AG

<120> TREATMENT AND PREVENTION OF HOUSE DUST MITE ALLERGIES

<130> 25108-WO

<150> EP 18173258.7

<151> 2018-05-18

<160> 81

<170> PatentIn version 3.5

<210> 1

<211> 41

<212> PRT

<213> Artificial Sequence

<220>

<223> allergen fragment

<400> 1

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

Arg	Gln	Met	Arg	Thr	Val	Thr	Pro	Ile	Arg	Met	Gln	Gly	Gly	Cys	Gly
			20					25					30		

Ser	Cys	Trp	Ala	Phe	Ser	Gly	Val	Ala
		35					40	

<210> 2

<211> 43

<212> PRT

<213> Artificial Sequence

<220>

<223> allergen fragment

<400> 2

Ala	Thr	Glu	Ser	Ala	Tyr	Leu	Ala	Tyr	Arg	Asn	Gln	Ser	Leu	Asp	Leu
1				5					10					15	

Ala	Glu	Gln	Glu	Leu	Val	Asp	Cys	Ala	Ser	Gln	His	Gly	Cys	His	Gly
			20					25					30		

Asp Thr Ile Pro Arg Gly Ile Glu Tyr Ile Gln
35 40

<210> 3
<211> 31
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 3

His Asn Gly Val Val Gln Glu Ser Tyr Tyr Arg Tyr Val Ala Arg Glu
1 5 10 15

Gln Ser Cys Arg Arg Pro Asn Ala Gln Arg Phe Gly Ile Ser Asn
20 25 30

<210> 4
<211> 35
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 4

Val Arg Asn Ser Trp Asp Thr Asn Trp Gly Asp Asn Gly Tyr Gly Tyr
1 5 10 15

Phe Ala Ala Asn Ile Asp Leu Met Met Ile Glu Glu Tyr Pro Tyr Val
20 25 30

Val Ile Leu
35

<210> 5
<211> 41
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 5

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

Arg Gln Met Arg Thr Val Thr Pro Ile Arg Met Gln Gly Gly Ser Gly
20 25 30

Ser Ser Trp Ala Phe Ser Gly Val Ala
35 40

<210> 6
<211> 43
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 6

Ala Thr Glu Ser Ala Tyr Leu Ala Tyr Arg Asn Gln Ser Leu Asp Leu
1 5 10 15

Ala Glu Gln Glu Leu Val Asp Ser Ala Ser Gln His Gly Ser His Gly
20 25 30

Asp Thr Ile Pro Arg Gly Ile Glu Tyr Ile Gln
35 40

<210> 7
<211> 31
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 7

His Asn Gly Val Val Gln Glu Ser Tyr Tyr Arg Tyr Val Ala Arg Glu
1 5 10 15

Gln Ser Ser Arg Arg Pro Asn Ala Gln Arg Phe Gly Ile Ser Asn
20 25 30

<210> 8

<211> 31
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 8

Cys His Gly Ser Glu Pro Cys Ile Ile His Arg Gly Lys Pro Phe Gln
1 5 10 15

Leu Glu Ala Val Phe Glu Ala Asn Gln Asn Ser Lys Thr Ala Lys
20 25 30

<210> 9
<211> 42
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 9

Glu Val Asp Val Pro Gly Ile Asp Pro Asn Ala Cys His Tyr Met Lys
1 5 10 15

Cys Pro Leu Val Lys Gly Gln Gln Tyr Asp Ile Lys Tyr Thr Trp Ile
20 25 30

Val Pro Lys Ile Ala Pro Lys Ser Glu Asn
35 40

<210> 10
<211> 30
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 10

His Gly Ser Glu Pro Ser Ile Ile His Arg Gly Lys Pro Phe Gln Leu
1 5 10 15

Glu Ala Val Phe Glu Ala Asn Gln Asn Ser Lys Thr Ala Lys

20

25

30

<210> 11
 <211> 42
 <212> PRT
 <213> Artificial Sequence

<220>
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<400> 11

Glu Val Asp Val Pro Gly Ile Asp Pro Asn Ala Ser His Tyr Met Lys
 1 5 10 15

Ser Pro Leu Val Lys Gly Gln Gln Tyr Asp Ile Lys Tyr Thr Trp Ile
 20 25 30

Val Pro Lys Ile Ala Pro Lys Ser Glu Asn
 35 40

<210> 12
 <211> 29
 <212> PRT
 <213> Artificial Sequence

<220>
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<400> 12

Asp Tyr Gln Asn Glu Phe Asp Phe Leu Leu Met Glu Arg Ile His Glu
 1 5 10 15

Gln Ile Lys Lys Gly Glu Leu Ala Leu Phe Tyr Leu Gln
 20 25

<210> 13
 <211> 31
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> allergen fragment

<400> 13

Glu Gln Tyr Asn Leu Glu Met Ala Lys Lys Ser Gly Asp Ile Leu Glu

1 5 10 15

Arg Asp Leu Lys Lys Glu Glu Ala Arg Val Lys Lys Ile Glu Val
20 25 30

<210> 14
<211> 30
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 14

Asp Pro Ile His Tyr Asp Lys Ile Thr Glu Glu Ile Asn Lys Ala Val
1 5 10 15

Asp Glu Ala Val Ala Ala Ile Glu Lys Ser Glu Thr Phe Asp
20 25 30

<210> 15
<211> 33
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 15

Tyr Asn Tyr Glu Phe Ala Leu Glu Ser Ile Lys Leu Leu Ile Lys Lys
1 5 10 15

Leu Asp Glu Leu Ala Lys Lys Val Lys Ala Val Asn Pro Asp Glu Tyr
20 25 30

Tyr

<210> 16
<211> 39
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 16

Gly Tyr Phe Ala Asp Pro Lys Asp Pro His Lys Phe Tyr Ile Cys Ser
1 5 10 15

Asn Trp Glu Ala Val His Lys Asp Cys Pro Gly Asn Thr Arg Trp Asn
20 25 30

Glu Asp Glu Glu Thr Cys Thr
35

<210> 17

<211> 39

<212> PRT

<213> Artificial Sequence

<220>

<223> allergen fragment

<400> 17

Gly Tyr Phe Ala Asp Pro Lys Asp Pro His Lys Phe Tyr Ile Ser Ser
1 5 10 15

Asn Trp Glu Ala Val His Lys Asp Ser Pro Gly Asn Thr Arg Trp Asn
20 25 30

Glu Asp Glu Glu Thr Ser Thr
35

<210> 18

<211> 192

<212> PRT

<213> Artificial Sequence

<220>

<223> fusion protein

<400> 18

Val Arg Asn Ser Trp Asp Thr Asn Trp Gly Asp Asn Gly Tyr Gly Tyr
1 5 10 15

Phe Ala Ala Asn Ile Asp Leu Met Met Ile Glu Glu Tyr Pro Tyr Val
20 25 30

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

Ala Arg Glu Gln Ser Ser Arg Arg Pro Asn Ala Gln Arg Phe Gly Ile
50 55 60

Ser Asn His Gly Ser Glu Pro Ser Ile Ile His Arg Gly Lys Pro Phe
65 70 75 80

Gln Leu Glu Ala Val Phe Glu Ala Asn Gln Asn Ser Lys Thr Ala Lys
85 90 95

His Gly Ser Glu Pro Ser Ile Ile His Arg Gly Lys Pro Phe Gln Leu
100 105 110

Glu Ala Val Phe Glu Ala Asn Gln Asn Ser Lys Thr Ala Lys Val Arg
115 120 125

Asn Ser Trp Asp Thr Asn Trp Gly Asp Asn Gly Tyr Gly Tyr Phe Ala
130 135 140

Ala Asn Ile Asp Leu Met Met Ile Glu Glu Tyr Pro Tyr Val Val Ile
145 150 155 160

Leu His Asn Gly Val Val Gln Glu Ser Tyr Tyr Arg Tyr Val Ala Arg
165 170 175

Glu Gln Ser Ser Arg Arg Pro Asn Ala Gln Arg Phe Gly Ile Ser Asn
180 185 190

<210> 19
<211> 250
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion protein

<400> 19

Glu Val Asp Val Pro Gly Ile Asp Pro Asn Ala Ser His Tyr Met Lys
1 5 10 15

Ser Pro Leu Val Lys Gly Gln Gln Tyr Asp Ile Lys Tyr Thr Trp Ile
20 25 30

Val Pro Lys Ile Ala Pro Lys Ser Glu Asn Glu Val Asp Val Pro Gly
35 40 45

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

Gln Gln Tyr Asp Ile Lys Tyr Thr Trp Ile Val Pro Lys Ile Ala Pro
65 70 75 80

Lys Ser Glu Asn Ala Thr Glu Ser Ala Tyr Leu Ala Tyr Arg Asn Gln
85 90 95

Ser Leu Asp Leu Ala Glu Gln Glu Leu Val Asp Ser Ala Ser Gln His
100 105 110

Gly Ser His Gly Asp Thr Ile Pro Arg Gly Ile Glu Tyr Ile Gln Thr
115 120 125

Asn Ala Ser Ser Ile Asn Gly Asn Ala Pro Ala Glu Ile Asp Leu Arg
130 135 140

Gln Met Arg Thr Val Thr Pro Ile Arg Met Gln Gly Gly Ser Gly Ser
145 150 155 160

Ser Trp Ala Phe Ser Gly Val Ala Ala Thr Glu Ser Ala Tyr Leu Ala
165 170 175

Tyr Arg Asn Gln Ser Leu Asp Leu Ala Glu Gln Glu Leu Val Asp Ser
180 185 190

Ala Ser Gln His Gly Ser His Gly Asp Thr Ile Pro Arg Gly Ile Glu
195 200 205

Tyr Ile Gln Thr Asn Ala Ser Ser Ile Asn Gly Asn Ala Pro Ala Glu
210 215 220

Ile Asp Leu Arg Gln Met Arg Thr Val Thr Pro Ile Arg Met Gln Gly

225											230											235											240
Gly	Ser	Gly	Ser	Ser	Trp	Ala	Phe	Ser	Gly											250													
																				245													
<210>	20																																
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Tyr	Asn	Tyr	Glu	Phe	Ala	Leu	Glu	Ser	Ile	Lys	Leu	Leu	Ile	Lys	Lys																		
1				5				10						15																			
Leu	Asp	Glu	Leu	Ala	Lys	Lys	Val	Lys	Ala	Val	Asn	Pro	Asp	Glu	Tyr																		
			20				25						30																				
Tyr	Tyr	Asn	Tyr	Glu	Phe	Ala	Leu	Glu	Ser	Ile	Lys	Leu	Leu	Ile	Lys																		
		35				40						45																					
Lys	Leu	Asp	Glu	Leu	Ala	Lys	Lys	Val	Lys	Ala	Val	Asn	Pro	Asp	Glu																		
50					55						60																						
Tyr	Tyr	Tyr	Asn	Tyr	Glu	Phe	Ala	Leu	Glu	Ser	Ile	Lys	Leu	Leu	Ile																		
65					70						75				80																		
Lys	Lys	Leu	Asp	Glu	Leu	Ala	Lys	Lys	Val	Lys	Ala	Val	Asn	Pro	Asp																		
			85						90						95																		
Glu	Tyr	Tyr	Gly	Tyr	Phe	Ala	Asp	Pro	Lys	Asp	Pro	His	Lys	Phe	Tyr																		
			100				105						110																				
Ile	Ser	Ser	Asn	Trp	Glu	Ala	Val	His	Lys	Asp	Ser	Pro	Gly	Asn	Thr																		
		115						120						125																			
Arg	Trp	Asn	Glu	Asp	Glu	Glu	Thr	Ser	Thr	Gly	Tyr	Phe	Ala	Asp	Pro																		
130					135						140																						
Lys	Asp	Pro	His	Lys	Phe	Tyr	Ile	Ser	Ser	Asn	Trp	Glu	Ala	Val	His																		

145 150 155 160
 Lys Asp Ser Pro Gly Asn Thr Arg Trp Asn Glu Asp Glu Glu Thr Ser
 165 170 175
 Thr Gly Tyr Phe Ala Asp Pro Lys Asp Pro His Lys Phe Tyr Ile Ser
 180 185 190
 Ser Asn Trp Glu Ala Val His Lys Asp Ser Pro Gly Asn Thr Arg Trp
 195 200 205
 Asn Glu Asp Glu Glu Thr Ser Thr
 210 215

 <210> 21
 <211> 180
 <212> PRT
 <213> Artificial Sequence

 <220>
 <223> fusion protein

 <400> 21

 Asp Tyr Gln Asn Glu Phe Asp Phe Leu Leu Met Glu Arg Ile His Glu
 1 5 10 15

 Gln Ile Lys Lys Gly Glu Leu Ala Leu Phe Tyr Leu Gln Asp Tyr Gln
 20 25 30

 Asn Glu Phe Asp Phe Leu Leu Met Glu Arg Ile His Glu Gln Ile Lys
 35 40 45

 Lys Gly Glu Leu Ala Leu Phe Tyr Leu Gln Asp Pro Ile His Tyr Asp
 50 55 60

 Lys Ile Thr Glu Glu Ile Asn Lys Ala Val Asp Glu Ala Val Ala Ala
 65 70 75 80

 Ile Glu Lys Ser Glu Thr Phe Asp Asp Pro Ile His Tyr Asp Lys Ile
 85 90 95

 Thr Glu Glu Ile Asn Lys Ala Val Asp Glu Ala Val Ala Ala Ile Glu

100

105

110

Lys Ser Glu Thr Phe Asp Glu Gln Tyr Asn Leu Glu Met Ala Lys Lys
 115 120 125

Ser Gly Asp Ile Leu Glu Arg Asp Leu Lys Lys Glu Glu Ala Arg Val
 130 135 140

Lys Lys Ile Glu Val Glu Gln Tyr Asn Leu Glu Met Ala Lys Lys Ser
 145 150 155 160

Gly Asp Ile Leu Glu Arg Asp Leu Lys Lys Glu Glu Ala Arg Val Lys
 165 170 175

Lys Ile Glu Val
 180

<210> 22

<211> 192

<212> PRT

<213> Artificial Sequence

<220>

<223> fusion protein

<400> 22

Val Arg Asn Ser Trp Asp Thr Thr Trp Gly Asp Ser Gly Tyr Gly Tyr
 1 5 10 15

Phe Gln Ala Gly Asn Asn Leu Met Met Ile Glu Gln Tyr Pro Tyr Val
 20 25 30

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

Ala Arg Glu Gln Gln Cys Arg Arg Pro Asn Ser Gln His Tyr Gly Ile
 50 55 60

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

Asn Leu Glu Ala Ile Phe Asp Ala Asn Gln Asn Thr Lys Thr Ala Lys

85

90

95

His Gly Ser Asp Pro Cys Ile Ile His Arg Gly Lys Pro Phe Asn Leu
 100 105 110

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

Asn Ser Trp Asp Thr Thr Trp Gly Asp Ser Gly Tyr Gly Tyr Phe Gln
 130 135 140

Ala Gly Asn Asn Leu Met Met Ile Glu Gln Tyr Pro Tyr Val Val Ile
 145 150 155 160

Met Gln Asn Gly Val Val Glu Glu Arg Ser Tyr Pro Tyr Val Ala Arg
 165 170 175

Glu Gln Gln Cys Arg Arg Pro Asn Ser Gln His Tyr Gly Ile Ser Asn
 180 185 190

<210> 23

<211> 254

<212> PRT

<213> Artificial Sequence

<220>

<223> fusion protein

<400> 23

Glu Val Asp Val Pro Gly Ile Asp Thr Asn Ala Cys His Tyr Ile Lys
 1 5 10 15

Cys Pro Leu Val Lys Gly Gln Gln Tyr Asp Ala Lys Tyr Thr Trp Asn
 20 25 30

Val Pro Lys Ile Ala Pro Lys Ser Glu Asn Glu Val Asp Val Pro Gly
 35 40 45

Ile Asp Thr Asn Ala Cys His Tyr Ile Lys Cys Pro Leu Val Lys Gly
 50 55 60

Gln Gln Tyr Asp Ala Lys Tyr Thr Trp Asn Val Pro Lys Ile Ala Pro

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

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

 <220>
 <223> fusion protein

<400> 24

Tyr Asn Phe Glu Thr Ala Val Ser Thr Ile Glu Ile Leu Val Lys Asp
1 5 10 15

Leu Ala Glu Leu Ala Lys Lys Val Lys Ala Val Lys Ser Asp Asp Tyr
20 25 30

Asn Phe Glu Thr Ala Val Ser Thr Ile Glu Ile Leu Val Lys Asp Leu
35 40 45

Ala Glu Leu Ala Lys Lys Val Lys Ala Val Lys Ser Asp Asp Tyr Asn
50 55 60

Phe Glu Thr Ala Val Ser Thr Ile Glu Ile Leu Val Lys Asp Leu Ala
65 70 75 80

Glu Leu Ala Lys Lys Val Lys Ala Val Lys Ser Asp Asp Gly Tyr Phe
85 90 95

Ala Asp Pro Lys Asp Pro Cys Lys Phe Tyr Ile Cys Ser Asn Trp Glu
100 105 110

Ala Ile His Lys Ser Cys Pro Gly Asn Thr Arg Trp Asn Glu Lys Glu
115 120 125

Leu Thr Cys Thr Gly Tyr Phe Ala Asp Pro Lys Asp Pro Cys Lys Phe
130 135 140

Tyr Ile Cys Ser Asn Trp Glu Ala Ile His Lys Ser Cys Pro Gly Asn
145 150 155 160

Thr Arg Trp Asn Glu Lys Glu Leu Thr Cys Thr Gly Tyr Phe Ala Asp
165 170 175

Pro Lys Asp Pro Cys Lys Phe Tyr Ile Cys Ser Asn Trp Glu Ala Ile
180 185 190

His Lys Ser Cys Pro Gly Asn Thr Arg Trp Asn Glu Lys Glu Leu Thr
195 200 205

Cys Thr
210

<210> 25
<211> 180
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion protein

<400> 25

Asp Tyr Gln Asn Glu Phe Asp Phe Leu Leu Met Gln Arg Ile His Glu
1 5 10 15

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

Asn Glu Phe Asp Phe Leu Leu Met Gln Arg Ile His Glu Gln Met Arg
35 40 45

Lys Gly Glu Glu Ala Leu Leu His Leu Gln Asp Pro Ile His Tyr Asp
50 55 60

Lys Ile Thr Glu Glu Ile Asn Lys Ala Ile Asp Asp Ala Ile Ala Ala
65 70 75 80

Ile Glu Gln Ser Glu Thr Ile Asp Asp Pro Ile His Tyr Asp Lys Ile
85 90 95

Thr Glu Glu Ile Asn Lys Ala Ile Asp Asp Ala Ile Ala Ala Ile Glu
100 105 110

Gln Ser Glu Thr Ile Asp Glu Arg Tyr Asn Val Glu Ile Ala Leu Lys
115 120 125

Ser Asn Glu Ile Leu Glu Arg Asp Leu Lys Lys Glu Glu Gln Arg Val
130 135 140

Lys Lys Ile Glu Val Glu Arg Tyr Asn Val Glu Ile Ala Leu Lys Ser
145 150 155 160

Asn Glu Ile Leu Glu Arg Asp Leu Lys Lys Glu Glu Gln Arg Val Lys
165 170 175

Lys Ile Glu Val
180

<210> 26
<211> 173
<212> PRT
<213> Artificial Sequence

<220>
<223> PreS carrier protein

<400> 26

Gly Gly Trp Ser Ser Lys Pro Arg Lys Gly Met Gly Thr Asn Leu Ser
1 5 10 15

Val Pro Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro Ala
20 25 30

Phe Gly Ala Asn Ser Asn Asn Pro Asp Trp Asp Phe Asn Pro Ile Lys
35 40 45

Asp His Trp Pro Ala Ala Asn Gln Val Gly Val Gly Ala Phe Gly Pro
50 55 60

Gly Leu Thr Pro Pro His Gly Gly Ile Leu Gly Trp Ser Pro Gln Ala
65 70 75 80

Gln Gly Ile Leu Thr Thr Val Ser Thr Ile Pro Pro Pro Ala Ser Thr
85 90 95

Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg
100 105 110

Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Ala Phe His Gln
115 120 125

Ala Leu Gln Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly
130 135 140

Ser Ser Ser Gly Thr Val Asn Pro Ala Pro Asn Ile Ala Ser His Ile
145 150 155 160

Ser Ser Ile Ser Ala Arg Thr Gly Asp Pro Val Thr Asn
165 170

<210> 27
<211> 615
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion protein

<400> 27

Val Arg Asn Ser Trp Asp Thr Asn Trp Gly Asp Asn Gly Tyr Gly Tyr
1 5 10 15

Phe Ala Ala Asn Ile Asp Leu Met Met Ile Glu Glu Tyr Pro Tyr Val
20 25 30

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

Ala Arg Glu Gln Ser Ser Arg Arg Pro Asn Ala Gln Arg Phe Gly Ile
50 55 60

Ser Asn His Gly Ser Glu Pro Ser Ile Ile His Arg Gly Lys Pro Phe
65 70 75 80

Gln Leu Glu Ala Val Phe Glu Ala Asn Gln Asn Ser Lys Thr Ala Lys
85 90 95

His Gly Ser Glu Pro Ser Ile Ile His Arg Gly Lys Pro Phe Gln Leu
100 105 110

Glu Ala Val Phe Glu Ala Asn Gln Asn Ser Lys Thr Ala Lys Val Arg
115 120 125

Asn Ser Trp Asp Thr Asn Trp Gly Asp Asn Gly Tyr Gly Tyr Phe Ala
130 135 140

Ala Asn Ile Asp Leu Met Met Ile Glu Glu Tyr Pro Tyr Val Val Ile
145 150 155 160

Leu His Asn Gly Val Val Gln Glu Ser Tyr Tyr Arg Tyr Val Ala Arg
165 170 175

Glu Gln Ser Ser Arg Arg Pro Asn Ala Gln Arg Phe Gly Ile Ser Asn
180 185 190

Gly Gly Trp Ser Ser Lys Pro Arg Lys Gly Met Gly Thr Asn Leu Ser
195 200 205

Val Pro Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro Ala
210 215 220

Phe Gly Ala Asn Ser Asn Asn Pro Asp Trp Asp Phe Asn Pro Ile Lys
225 230 235 240

Asp His Trp Pro Ala Ala Asn Gln Val Gly Val Gly Ala Phe Gly Pro
245 250 255

Gly Leu Thr Pro Pro His Gly Gly Ile Leu Gly Trp Ser Pro Gln Ala
260 265 270

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

Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg
290 295 300

Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Ala Phe His Gln
305 310 315 320

Ala Leu Gln Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly
325 330 335

Ser Ser Ser Gly Thr Val Asn Pro Ala Pro Asn Ile Ala Ser His Ile
340 345 350

Ser Ser Ile Ser Ala Arg Thr Gly Asp Pro Val Thr Asn Glu Val Asp

355

360

365

Val Pro Gly Ile Asp Pro Asn Ala Ser His Tyr Met Lys Ser Pro Leu
 370 375 380

Val Lys Gly Gln Gln Tyr Asp Ile Lys Tyr Thr Trp Ile Val Pro Lys
 385 390 395 400

Ile Ala Pro Lys Ser Glu Asn Glu Val Asp Val Pro Gly Ile Asp Pro
 405 410 415

Asn Ala Ser His Tyr Met Lys Ser Pro Leu Val Lys Gly Gln Gln Tyr
 420 425 430

Asp Ile Lys Tyr Thr Trp Ile Val Pro Lys Ile Ala Pro Lys Ser Glu
 435 440 445

Asn Ala Thr Glu Ser Ala Tyr Leu Ala Tyr Arg Asn Gln Ser Leu Asp
 450 455 460

Leu Ala Glu Gln Glu Leu Val Asp Ser Ala Ser Gln His Gly Ser His
 465 470 475 480

Gly Asp Thr Ile Pro Arg Gly Ile Glu Tyr Ile Gln Thr Asn Ala Ser
 485 490 495

Ser Ile Asn Gly Asn Ala Pro Ala Glu Ile Asp Leu Arg Gln Met Arg
 500 505 510

Thr Val Thr Pro Ile Arg Met Gln Gly Gly Ser Gly Ser Ser Trp Ala
 515 520 525

Phe Ser Gly Val Ala Ala Thr Glu Ser Ala Tyr Leu Ala Tyr Arg Asn
 530 535 540

Gln Ser Leu Asp Leu Ala Glu Gln Glu Leu Val Asp Ser Ala Ser Gln
 545 550 555 560

His Gly Ser His Gly Asp Thr Ile Pro Arg Gly Ile Glu Tyr Ile Gln
 565 570 575

Thr Asn Ala Ser Ser Ile Asn Gly Asn Ala Pro Ala Glu Ile Asp Leu
580 585 590

Arg Gln Met Arg Thr Val Thr Pro Ile Arg Met Gln Gly Gly Ser Gly
595 600 605

Ser Ser Trp Ala Phe Ser Gly
610 615

<210> 28
<211> 569
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion protein

<400> 28

Tyr Asn Tyr Glu Phe Ala Leu Glu Ser Ile Lys Leu Leu Ile Lys Lys
1 5 10 15

Leu Asp Glu Leu Ala Lys Lys Val Lys Ala Val Asn Pro Asp Glu Tyr
20 25 30

Tyr Tyr Asn Tyr Glu Phe Ala Leu Glu Ser Ile Lys Leu Leu Ile Lys
35 40 45

Lys Leu Asp Glu Leu Ala Lys Lys Val Lys Ala Val Asn Pro Asp Glu
50 55 60

Tyr Tyr Tyr Asn Tyr Glu Phe Ala Leu Glu Ser Ile Lys Leu Leu Ile
65 70 75 80

Lys Lys Leu Asp Glu Leu Ala Lys Lys Val Lys Ala Val Asn Pro Asp
85 90 95

Glu Tyr Tyr Gly Tyr Phe Ala Asp Pro Lys Asp Pro His Lys Phe Tyr
100 105 110

Ile Ser Ser Asn Trp Glu Ala Val His Lys Asp Ser Pro Gly Asn Thr
115 120 125

Arg Trp Asn Glu Asp Glu Glu Thr Ser Thr Gly Tyr Phe Ala Asp Pro
130 135 140

Lys Asp Pro His Lys Phe Tyr Ile Ser Ser Asn Trp Glu Ala Val His
145 150 155 160

Lys Asp Ser Pro Gly Asn Thr Arg Trp Asn Glu Asp Glu Glu Thr Ser
165 170 175

Thr Gly Tyr Phe Ala Asp Pro Lys Asp Pro His Lys Phe Tyr Ile Ser
180 185 190

Ser Asn Trp Glu Ala Val His Lys Asp Ser Pro Gly Asn Thr Arg Trp
195 200 205

Asn Glu Asp Glu Glu Thr Ser Thr Gly Gly Trp Ser Ser Lys Pro Arg
210 215 220

Lys Gly Met Gly Thr Asn Leu Ser Val Pro Asn Pro Leu Gly Phe Phe
225 230 235 240

Pro Asp His Gln Leu Asp Pro Ala Phe Gly Ala Asn Ser Asn Asn Pro
245 250 255

Asp Trp Asp Phe Asn Pro Ile Lys Asp His Trp Pro Ala Ala Asn Gln
260 265 270

Val Gly Val Gly Ala Phe Gly Pro Gly Leu Thr Pro Pro His Gly Gly
275 280 285

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

Thr Ile Pro Pro Pro Ala Ser Thr Asn Arg Gln Ser Gly Arg Gln Pro
305 310 315 320

Thr Pro Ile Ser Pro Pro Leu Arg Asp Ser His Pro Gln Ala Met Gln
325 330 335

Trp Asn Ser Thr Ala Phe His Gln Ala Leu Gln Asp Pro Arg Val Arg

340

345

350

Gly Leu Tyr Phe Pro Ala Gly Gly Ser Ser Ser Gly Thr Val Asn Pro
 355 360 365

Ala Pro Asn Ile Ala Ser His Ile Ser Ser Ile Ser Ala Arg Thr Gly
 370 375 380

Asp Pro Val Thr Asn Asp Tyr Gln Asn Glu Phe Asp Phe Leu Leu Met
 385 390 395 400

Glu Arg Ile His Glu Gln Ile Lys Lys Gly Glu Leu Ala Leu Phe Tyr
 405 410 415

Leu Gln Asp Tyr Gln Asn Glu Phe Asp Phe Leu Leu Met Glu Arg Ile
 420 425 430

His Glu Gln Ile Lys Lys Gly Glu Leu Ala Leu Phe Tyr Leu Gln Asp
 435 440 445

Pro Ile His Tyr Asp Lys Ile Thr Glu Glu Ile Asn Lys Ala Val Asp
 450 455 460

Glu Ala Val Ala Ala Ile Glu Lys Ser Glu Thr Phe Asp Asp Pro Ile
 465 470 475 480

His Tyr Asp Lys Ile Thr Glu Glu Ile Asn Lys Ala Val Asp Glu Ala
 485 490 495

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

Glu Met Ala Lys Lys Ser Gly Asp Ile Leu Glu Arg Asp Leu Lys Lys
 515 520 525

Glu Glu Ala Arg Val Lys Lys Ile Glu Val Glu Gln Tyr Asn Leu Glu
 530 535 540

Met Ala Lys Lys Ser Gly Asp Ile Leu Glu Arg Asp Leu Lys Lys Glu
 545 550 555 560

Glu Ala Arg Val Lys Lys Ile Glu Val
565

<210> 29
<211> 615
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion protein

<400> 29

Val Arg Asn Ser Trp Asp Thr Asn Trp Gly Asp Asn Gly Tyr Gly Tyr
1 5 10 15

Phe Ala Ala Asn Ile Asp Leu Met Met Ile Glu Glu Tyr Pro Tyr Val
20 25 30

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

Ala Arg Glu Gln Ser Ser Arg Arg Pro Asn Ala Gln Arg Phe Gly Ile
50 55 60

Ser Asn Val Arg Asn Ser Trp Asp Thr Asn Trp Gly Asp Asn Gly Tyr
65 70 75 80

Gly Tyr Phe Ala Ala Asn Ile Asp Leu Met Met Ile Glu Glu Tyr Pro
85 90 95

Tyr Val Val Ile Leu His Asn Gly Val Val Gln Glu Ser Tyr Tyr Arg
100 105 110

Tyr Val Ala Arg Glu Gln Ser Ser Arg Arg Pro Asn Ala Gln Arg Phe
115 120 125

Gly Ile Ser Asn His Gly Ser Glu Pro Ser Ile Ile His Arg Gly Lys
130 135 140

Pro Phe Gln Leu Glu Ala Val Phe Glu Ala Asn Gln Asn Ser Lys Thr
145 150 155 160

Ala Lys His Gly Ser Glu Pro Ser Ile Ile His Arg Gly Lys Pro Phe
165 170 175

Gln Leu Glu Ala Val Phe Glu Ala Asn Gln Asn Ser Lys Thr Ala Lys
180 185 190

Gly Gly Trp Ser Ser Lys Pro Arg Lys Gly Met Gly Thr Asn Leu Ser
195 200 205

Val Pro Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro Ala
210 215 220

Phe Gly Ala Asn Ser Asn Asn Pro Asp Trp Asp Phe Asn Pro Ile Lys
225 230 235 240

Asp His Trp Pro Ala Ala Asn Gln Val Gly Val Gly Ala Phe Gly Pro
245 250 255

Gly Leu Thr Pro Pro His Gly Gly Ile Leu Gly Trp Ser Pro Gln Ala
260 265 270

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

Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg
290 295 300

Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Ala Phe His Gln
305 310 315 320

Ala Leu Gln Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly
325 330 335

Ser Ser Ser Gly Thr Val Asn Pro Ala Pro Asn Ile Ala Ser His Ile
340 345 350

Ser Ser Ile Ser Ala Arg Thr Gly Asp Pro Val Thr Asn Glu Val Asp
355 360 365

Val Pro Gly Ile Asp Pro Asn Ala Ser His Tyr Met Lys Ser Pro Leu

370

375

380

Val Lys Gly Gln Gln Tyr Asp Ile Lys Tyr Thr Trp Ile Val Pro Lys
 385 390 395 400

Ile Ala Pro Lys Ser Glu Asn Glu Val Asp Val Pro Gly Ile Asp Pro
 405 410 415

Asn Ala Ser His Tyr Met Lys Ser Pro Leu Val Lys Gly Gln Gln Tyr
 420 425 430

Asp Ile Lys Tyr Thr Trp Ile Val Pro Lys Ile Ala Pro Lys Ser Glu
 435 440 445

Asn Ala Thr Glu Ser Ala Tyr Leu Ala Tyr Arg Asn Gln Ser Leu Asp
 450 455 460

Leu Ala Glu Gln Glu Leu Val Asp Ser Ala Ser Gln His Gly Ser His
 465 470 475 480

Gly Asp Thr Ile Pro Arg Gly Ile Glu Tyr Ile Gln Thr Asn Ala Ser
 485 490 495

Ser Ile Asn Gly Asn Ala Pro Ala Glu Ile Asp Leu Arg Gln Met Arg
 500 505 510

Thr Val Thr Pro Ile Arg Met Gln Gly Gly Ser Gly Ser Ser Trp Ala
 515 520 525

Phe Ser Gly Val Ala Ala Thr Glu Ser Ala Tyr Leu Ala Tyr Arg Asn
 530 535 540

Gln Ser Leu Asp Leu Ala Glu Gln Glu Leu Val Asp Ser Ala Ser Gln
 545 550 555 560

His Gly Ser His Gly Asp Thr Ile Pro Arg Gly Ile Glu Tyr Ile Gln
 565 570 575

Thr Asn Ala Ser Ser Ile Asn Gly Asn Ala Pro Ala Glu Ile Asp Leu
 580 585 590

Arg Gln Met Arg Thr Val Thr Pro Ile Arg Met Gln Gly Gly Ser Gly
595 600 605

Ser Ser Trp Ala Phe Ser Gly
610 615

<210> 30
<211> 615
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion protein

<400> 30

Val Arg Asn Ser Trp Asp Thr Asn Trp Gly Asp Asn Gly Tyr Gly Tyr
1 5 10 15

Phe Ala Ala Asn Ile Asp Leu Met Met Ile Glu Glu Tyr Pro Tyr Val
20 25 30

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

Ala Arg Glu Gln Ser Ser Arg Arg Pro Asn Ala Gln Arg Phe Gly Ile
50 55 60

Ser Asn Val Arg Asn Ser Trp Asp Thr Asn Trp Gly Asp Asn Gly Tyr
65 70 75 80

Gly Tyr Phe Ala Ala Asn Ile Asp Leu Met Met Ile Glu Glu Tyr Pro
85 90 95

Tyr Val Val Ile Leu His Asn Gly Val Val Gln Glu Ser Tyr Tyr Arg
100 105 110

Tyr Val Ala Arg Glu Gln Ser Ser Arg Arg Pro Asn Ala Gln Arg Phe
115 120 125

Gly Ile Ser Asn His Gly Ser Glu Pro Ser Ile Ile His Arg Gly Lys
130 135 140

Pro Phe Gln Leu Glu Ala Val Phe Glu Ala Asn Gln Asn Ser Lys Thr
145 150 155 160

Ala Lys His Gly Ser Glu Pro Ser Ile Ile His Arg Gly Lys Pro Phe
165 170 175

Gln Leu Glu Ala Val Phe Glu Ala Asn Gln Asn Ser Lys Thr Ala Lys
180 185 190

Gly Gly Trp Ser Ser Lys Pro Arg Lys Gly Met Gly Thr Asn Leu Ser
195 200 205

Val Pro Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro Ala
210 215 220

Phe Gly Ala Asn Ser Asn Asn Pro Asp Trp Asp Phe Asn Pro Ile Lys
225 230 235 240

Asp His Trp Pro Ala Ala Asn Gln Val Gly Val Gly Ala Phe Gly Pro
245 250 255

Gly Leu Thr Pro Pro His Gly Gly Ile Leu Gly Trp Ser Pro Gln Ala
260 265 270

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

Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg
290 295 300

Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Ala Phe His Gln
305 310 315 320

Ala Leu Gln Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly
325 330 335

Ser Ser Ser Gly Thr Val Asn Pro Ala Pro Asn Ile Ala Ser His Ile
340 345 350

Ser Ser Ile Ser Ala Arg Thr Gly Asp Pro Val Thr Asn Ala Thr Glu

355

360

365

Ser Ala Tyr Leu Ala Tyr Arg Asn Gln Ser Leu Asp Leu Ala Glu Gln
 370 375 380

Glu Leu Val Asp Ser Ala Ser Gln His Gly Ser His Gly Asp Thr Ile
 385 390 395 400

Pro Arg Gly Ile Glu Tyr Ile Gln Thr Asn Ala Ser Ser Ile Asn Gly
 405 410 415

Asn Ala Pro Ala Glu Ile Asp Leu Arg Gln Met Arg Thr Val Thr Pro
 420 425 430

Ile Arg Met Gln Gly Gly Ser Gly Ser Ser Trp Ala Phe Ser Gly Val
 435 440 445

Ala Glu Val Asp Val Pro Gly Ile Asp Pro Asn Ala Ser His Tyr Met
 450 455 460

Lys Ser Pro Leu Val Lys Gly Gln Gln Tyr Asp Ile Lys Tyr Thr Trp
 465 470 475 480

Ile Val Pro Lys Ile Ala Pro Lys Ser Glu Asn Glu Val Asp Val Pro
 485 490 495

Gly Ile Asp Pro Asn Ala Ser His Tyr Met Lys Ser Pro Leu Val Lys
 500 505 510

Gly Gln Gln Tyr Asp Ile Lys Tyr Thr Trp Ile Val Pro Lys Ile Ala
 515 520 525

Pro Lys Ser Glu Asn Ala Thr Glu Ser Ala Tyr Leu Ala Tyr Arg Asn
 530 535 540

Gln Ser Leu Asp Leu Ala Glu Gln Glu Leu Val Asp Ser Ala Ser Gln
 545 550 555 560

His Gly Ser His Gly Asp Thr Ile Pro Arg Gly Ile Glu Tyr Ile Gln
 565 570 575

Thr Asn Ala Ser Ser Ile Asn Gly Asn Ala Pro Ala Glu Ile Asp Leu
580 585 590

Arg Gln Met Arg Thr Val Thr Pro Ile Arg Met Gln Gly Gly Ser Gly
595 600 605

Ser Ser Trp Ala Phe Ser Gly
610 615

<210> 31
<211> 568
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion protein

<400> 31

Tyr Asn Tyr Glu Phe Ala Leu Glu Ser Ile Lys Leu Leu Ile Lys Lys
1 5 10 15

Leu Asp Glu Leu Ala Lys Lys Val Lys Ala Val Asn Pro Asp Glu Tyr
20 25 30

Tyr Tyr Asn Tyr Glu Phe Ala Leu Glu Ser Ile Lys Leu Leu Ile Lys
35 40 45

Lys Leu Asp Glu Leu Ala Lys Lys Val Lys Ala Val Asn Pro Asp Glu
50 55 60

Tyr Tyr Tyr Asn Tyr Glu Phe Ala Leu Glu Ser Ile Lys Leu Leu Ile
65 70 75 80

Lys Lys Leu Asp Glu Leu Ala Lys Lys Val Lys Ala Val Asn Pro Asp
85 90 95

Glu Tyr Tyr Gly Tyr Phe Ala Asp Pro Lys Asp Pro His Lys Phe Tyr
100 105 110

Ile Cys Ser Asn Trp Glu Ala Val His Lys Asp Cys Pro Gly Asn Thr
115 120 125

Gly Tyr Phe Ala Asp Pro Lys Asp Pro His Lys Phe Tyr Ile Cys Ser
130 135 140

Asn Trp Glu Ala Val His Lys Asp Cys Pro Gly Asn Thr Gly Gly Trp
145 150 155 160

Ser Ser Lys Pro Arg Lys Gly Met Gly Thr Asn Leu Ser Val Pro Asn
165 170 175

Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro Ala Phe Gly Ala
180 185 190

Asn Ser Asn Asn Pro Asp Trp Asp Phe Asn Pro Ile Lys Asp His Trp
195 200 205

Pro Ala Ala Asn Gln Val Gly Val Gly Ala Phe Gly Pro Gly Leu Thr
210 215 220

Pro Pro His Gly Gly Ile Leu Gly Trp Ser Pro Gln Ala Gln Gly Ile
225 230 235 240

Leu Thr Thr Val Ser Thr Ile Pro Pro Pro Ala Ser Thr Asn Arg Gln
245 250 255

Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg Asp Ser His
260 265 270

Pro Gln Ala Met Gln Trp Asn Ser Thr Ala Phe His Gln Ala Leu Gln
275 280 285

Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly Ser Ser Ser
290 295 300

Gly Thr Val Asn Pro Ala Pro Asn Ile Ala Ser His Ile Ser Ser Ile
305 310 315 320

Ser Ala Arg Thr Gly Asp Pro Val Thr Asn Lys Phe Tyr Ile Cys Ser
325 330 335

Asn Trp Glu Ala Val His Lys Asp Cys Pro Gly Asn Thr Arg Trp Asn

340

345

350

Glu Asp Glu Glu Thr Cys Thr Lys Phe Tyr Ile Cys Ser Asn Trp Glu
 355 360 365

Ala Val His Lys Asp Cys Pro Gly Asn Thr Arg Trp Asn Glu Asp Glu
 370 375 380

Glu Thr Cys Thr Asp Tyr Gln Asn Glu Phe Asp Phe Leu Leu Met Glu
 385 390 395 400

Arg Ile His Glu Gln Ile Lys Lys Gly Glu Leu Ala Leu Phe Tyr Leu
 405 410 415

Gln Asp Tyr Gln Asn Glu Phe Asp Phe Leu Leu Met Glu Arg Ile His
 420 425 430

Glu Gln Ile Lys Lys Gly Glu Leu Ala Leu Phe Tyr Leu Gln Asp Pro
 435 440 445

Ile His Tyr Asp Lys Ile Thr Glu Glu Ile Asn Lys Ala Val Asp Glu
 450 455 460

Ala Val Ala Ala Ile Glu Lys Ser Glu Thr Phe Asp Asp Pro Ile His
 465 470 475 480

Tyr Asp Lys Ile Thr Glu Glu Ile Asn Lys Ala Val Asp Glu Ala Val
 485 490 495

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

Met Ala Lys Lys Ser Gly Asp Ile Leu Glu Arg Asp Leu Lys Lys Glu
 515 520 525

Glu Ala Arg Val Lys Lys Ile Glu Val Glu Gln Tyr Asn Leu Glu Met
 530 535 540

Ala Lys Lys Ser Gly Asp Ile Leu Glu Arg Asp Leu Lys Lys Glu Glu
 545 550 555 560

Ala Arg Val Lys Lys Ile Glu Val
565

<210> 32
<211> 545
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion protein

<400> 32

Tyr Asn Tyr Glu Phe Ala Leu Glu Ser Ile Lys Leu Leu Ile Lys Lys
1 5 10 15

Leu Asp Glu Leu Ala Lys Lys Val Lys Ala Val Asn Pro Asp Glu Tyr
20 25 30

Tyr Tyr Asn Tyr Glu Phe Ala Leu Glu Ser Ile Lys Leu Leu Ile Lys
35 40 45

Lys Leu Asp Glu Leu Ala Lys Lys Val Lys Ala Val Asn Pro Asp Glu
50 55 60

Tyr Tyr Tyr Asn Tyr Glu Phe Ala Leu Glu Ser Ile Lys Leu Leu Ile
65 70 75 80

Lys Lys Leu Asp Glu Leu Ala Lys Lys Val Lys Ala Val Asn Pro Asp
85 90 95

Glu Tyr Tyr Tyr Asn Tyr Glu Phe Ala Leu Glu Ser Ile Lys Leu Leu
100 105 110

Ile Lys Lys Leu Asp Glu Leu Ala Lys Lys Val Lys Ala Val Asn Pro
115 120 125

Asp Glu Tyr Tyr Asp Pro Ile His Tyr Asp Lys Ile Thr Glu Glu Ile
130 135 140

Asn Lys Ala Val Asp Glu Ala Val Ala Ala Ile Glu Lys Ser Glu Thr
145 150 155 160

Phe Asp Asp Pro Ile His Tyr Asp Lys Ile Thr Glu Glu Ile Asn Lys
165 170 175

Ala Val Asp Glu Ala Val Ala Ala Ile Glu Lys Ser Glu Thr Phe Asp
180 185 190

Gly Gly Trp Ser Ser Lys Pro Arg Lys Gly Met Gly Thr Asn Leu Ser
195 200 205

Val Pro Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro Ala
210 215 220

Phe Gly Ala Asn Ser Asn Asn Pro Asp Trp Asp Phe Asn Pro Ile Lys
225 230 235 240

Asp His Trp Pro Ala Ala Asn Gln Val Gly Val Gly Ala Phe Gly Pro
245 250 255

Gly Leu Thr Pro Pro His Gly Gly Ile Leu Gly Trp Ser Pro Gln Ala
260 265 270

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

Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg
290 295 300

Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Ala Phe His Gln
305 310 315 320

Ala Leu Gln Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly
325 330 335

Ser Ser Ser Gly Thr Val Asn Pro Ala Pro Asn Ile Ala Ser His Ile
340 345 350

Ser Ser Ile Ser Ala Arg Thr Gly Asp Pro Val Thr Asn Asp Tyr Gln
355 360 365

Asn Glu Phe Asp Phe Leu Leu Met Glu Arg Ile His Glu Gln Ile Lys

370

375

380

Lys Gly Glu Leu Ala Leu Phe Tyr Leu Gln Asp Tyr Gln Asn Glu Phe
385 390 395 400

Asp Phe Leu Leu Met Glu Arg Ile His Glu Gln Ile Lys Lys Gly Glu
405 410 415

Leu Ala Leu Phe Tyr Leu Gln Asp Pro Ile His Tyr Asp Lys Ile Thr
420 425 430

Glu Glu Ile Asn Lys Ala Val Asp Glu Ala Val Ala Ala Ile Glu Lys
435 440 445

Ser Glu Thr Phe Asp Asp Pro Ile His Tyr Asp Lys Ile Thr Glu Glu
450 455 460

Ile Asn Lys Ala Val Asp Glu Ala Val Ala Ala Ile Glu Lys Ser Glu
465 470 475 480

Thr Phe Asp Glu Gln Tyr Asn Leu Glu Met Ala Lys Lys Ser Gly Asp
485 490 495

Ile Leu Glu Arg Asp Leu Lys Lys Glu Glu Ala Arg Val Lys Lys Ile
500 505 510

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

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

Val
545

<210> 33
<211> 545
<212> PRT
<213> Artificial Sequence

<220>
<223> fusion protein

<400> 33

Tyr Asn Tyr Glu Phe Ala Leu Glu Ser Ile Lys Leu Leu Ile Lys Lys
1 5 10 15

Leu Asp Glu Leu Ala Lys Lys Val Lys Ala Val Asn Pro Asp Glu Tyr
20 25 30

Tyr Tyr Asn Tyr Glu Phe Ala Leu Glu Ser Ile Lys Leu Leu Ile Lys
35 40 45

Lys Leu Asp Glu Leu Ala Lys Lys Val Lys Ala Val Asn Pro Asp Glu
50 55 60

Tyr Tyr Tyr Asn Tyr Glu Phe Ala Leu Glu Ser Ile Lys Leu Leu Ile
65 70 75 80

Lys Lys Leu Asp Glu Leu Ala Lys Lys Val Lys Ala Val Asn Pro Asp
85 90 95

Glu Tyr Tyr Tyr Asn Tyr Glu Phe Ala Leu Glu Ser Ile Lys Leu Leu
100 105 110

Ile Lys Lys Leu Asp Glu Leu Ala Lys Lys Val Lys Ala Val Asn Pro
115 120 125

Asp Glu Tyr Tyr Asp Tyr Gln Asn Glu Phe Asp Phe Leu Leu Met Glu
130 135 140

Arg Ile His Glu Gln Ile Lys Lys Gly Glu Leu Ala Leu Phe Tyr Leu
145 150 155 160

Gln Asp Tyr Gln Asn Glu Phe Asp Phe Leu Leu Met Glu Arg Ile His
165 170 175

Glu Gln Ile Lys Lys Gly Glu Leu Ala Leu Phe Tyr Leu Gln Gly Gly
180 185 190

Trp Ser Ser Lys Pro Arg Lys Gly Met Gly Thr Asn Leu Ser Val Pro
195 200 205

Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro Ala Phe Gly
210 215 220

Ala Asn Ser Asn Asn Pro Asp Trp Asp Phe Asn Pro Ile Lys Asp His
225 230 235 240

Trp Pro Ala Ala Asn Gln Val Gly Val Gly Ala Phe Gly Pro Gly Leu
245 250 255

Thr Pro Pro His Gly Gly Ile Leu Gly Trp Ser Pro Gln Ala Gln Gly
260 265 270

Ile Leu Thr Thr Val Ser Thr Ile Pro Pro Pro Ala Ser Thr Asn Arg
275 280 285

Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg Asp Ser
290 295 300

His Pro Gln Ala Met Gln Trp Asn Ser Thr Ala Phe His Gln Ala Leu
305 310 315 320

Gln Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly Ser Ser
325 330 335

Ser Gly Thr Val Asn Pro Ala Pro Asn Ile Ala Ser His Ile Ser Ser
340 345 350

Ile Ser Ala Arg Thr Gly Asp Pro Val Thr Asn Asp Pro Ile His Tyr
355 360 365

Asp Lys Ile Thr Glu Glu Ile Asn Lys Ala Val Asp Glu Ala Val Ala
370 375 380

Ala Ile Glu Lys Ser Glu Thr Phe Asp Asp Pro Ile His Tyr Asp Lys
385 390 395 400

Ile Thr Glu Glu Ile Asn Lys Ala Val Asp Glu Ala Val Ala Ala Ile
405 410 415

Glu Lys Ser Glu Thr Phe Asp Asp Pro Ile His Tyr Asp Lys Ile Thr

420

425

430

Glu Glu Ile Asn Lys Ala Val Asp Glu Ala Val Ala Ala Ile Glu Lys
 435 440 445

Ser Glu Thr Phe Asp Asp Pro Ile His Tyr Asp Lys Ile Thr Glu Glu
 450 455 460

Ile Asn Lys Ala Val Asp Glu Ala Val Ala Ala Ile Glu Lys Ser Glu
 465 470 475 480

Thr Phe Asp Glu Gln Tyr Asn Leu Glu Met Ala Lys Lys Ser Gly Asp
 485 490 495

Ile Leu Glu Arg Asp Leu Lys Lys Glu Glu Ala Arg Val Lys Lys Ile
 500 505 510

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

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

Val
 545

<210> 34
 <211> 222
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> fusion protein

<400> 34

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

Arg Gln Met Arg Thr Val Thr Pro Ile Arg Met Gln Gly Gly Cys Gly
 20 25 30

Ser Cys Trp Ala Phe Ser Gly Val Ala Ala Thr Glu Ser Ala Tyr Leu

35

40

45

Ala Tyr Arg Asn Gln Ser Leu Asp Leu Ala Glu Gln Glu Leu Val Asp
 50 55 60

Cys Ala Ser Gln His Gly Cys His Gly Asp Thr Ile Pro Arg Gly Ile
 65 70 75 80

Glu Tyr Ile Gln His Asn Gly Val Val Gln Glu Ser Tyr Tyr Arg Tyr
 85 90 95

Val Ala Arg Glu Gln Ser Cys Arg Arg Pro Asn Ala Gln Arg Phe Gly
 100 105 110

Ile Ser Asn Tyr Cys Gln Ile Tyr Pro Pro Asn Val Asn Lys Ile Arg
 115 120 125

Glu Ala Leu Ala Gln Thr His Ser Ala Ile Ala Val Ile Ile Gly Ile
 130 135 140

Lys Asp Leu Asp Ala Phe Arg His Tyr Asp Gly Arg Thr Ile Ile Gln
 145 150 155 160

Arg Asp Asn Gly Tyr Gln Pro Asn Tyr His Ala Val Asn Ile Val Gly
 165 170 175

Tyr Ser Asn Ala Gln Gly Val Asp Tyr Trp Ile Val Arg Asn Ser Trp
 180 185 190

Asp Thr Asn Trp Gly Asp Asn Gly Tyr Gly Tyr Phe Ala Ala Asn Ile
 195 200 205

Asp Leu Met Met Ile Glu Glu Tyr Pro Tyr Val Val Ile Leu
 210 215 220

<210> 35

<211> 131

<212> PRT

<213> Artificial Sequence

<220>

<223> fusion protein

<400> 35

Asp Gln Val Asp Val Lys Asp Cys Ala Asn His Glu Ile Lys Lys Val
1 5 10 15

Leu Val Pro Gly Cys His Gly Ser Glu Pro Cys Ile Ile His Arg Gly
20 25 30

Lys Pro Phe Gln Leu Glu Ala Val Phe Glu Ala Asn Gln Asn Ser Lys
35 40 45

Thr Ala Lys Ile Glu Ile Lys Ala Ser Ile Glu Gly Leu Glu Val Asp
50 55 60

Val Pro Gly Ile Asp Pro Asn Ala Cys His Tyr Met Lys Cys Pro Leu
65 70 75 80

Val Lys Gly Gln Gln Tyr Asp Ile Lys Tyr Thr Trp Ile Val Pro Lys
85 90 95

Ile Ala Pro Lys Ser Glu Asn Val Val Val Thr Val Lys Val Met Glu
100 105 110

Thr Gly Asp Asn Gly Val Leu Ala Cys Ala Ile Ala Thr His Ala Lys
115 120 125

Ile Arg Asp
130

<210> 36

<211> 617

<212> PRT

<213> Artificial Sequence

<220>

<223> fusion protein

<400> 36

Val Arg Asn Ser Trp Asp Thr Thr Trp Gly Asp Ser Gly Tyr Gly Tyr
1 5 10 15

Phe Gln Ala Gly Asn Asn Leu Met Met Ile Glu Gln Tyr Pro Tyr Val

20

25

30

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

Ala Arg Glu Gln Gln Ser Arg Arg Pro Asn Ser Gln His Tyr Gly Ile
 50 55 60

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

Asn Leu Glu Ala Ile Phe Asp Ala Asn Gln Asn Thr Lys Thr Ala Lys
 85 90 95

His Gly Ser Asp Pro Ser Ile Ile His Arg Gly Lys Pro Phe Asn Leu
 100 105 110

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

Asn Ser Trp Asp Thr Thr Trp Gly Asp Ser Gly Tyr Gly Tyr Phe Gln
 130 135 140

Ala Gly Asn Asn Leu Met Met Ile Glu Gln Tyr Pro Tyr Val Val Ile
 145 150 155 160

Met Gln Asn Gly Val Val Glu Glu Arg Ser Tyr Pro Tyr Val Ala Arg
 165 170 175

Glu Gln Gln Ser Arg Arg Pro Asn Ser Gln His Tyr Gly Ile Ser Asn
 180 185 190

Gly Gly Trp Ser Ser Lys Pro Arg Lys Gly Met Gly Thr Asn Leu Ser
 195 200 205

Val Pro Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp Pro Ala
 210 215 220

Phe Gly Ala Asn Ser Asn Asn Pro Asp Trp Asp Phe Asn Pro Ile Lys
 225 230 235 240

Asp His Trp Pro Ala Ala Asn Gln Val Gly Val Gly Ala Phe Gly Pro
245 250 255

Gly Leu Thr Pro Pro His Gly Gly Ile Leu Gly Trp Ser Pro Gln Ala
260 265 270

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

Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro Leu Arg
290 295 300

Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Ala Phe His Gln
305 310 315 320

Ala Leu Gln Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala Gly Gly
325 330 335

Ser Ser Ser Gly Thr Val Asn Pro Ala Pro Asn Ile Ala Ser His Ile
340 345 350

Ser Ser Ile Ser Ala Arg Thr Gly Asp Pro Val Thr Asn Glu Val Asp
355 360 365

Val Pro Gly Ile Asp Thr Asn Ala Ser His Tyr Ile Lys Ser Pro Leu
370 375 380

Val Lys Gly Gln Gln Tyr Asp Ala Lys Tyr Thr Trp Asn Val Pro Lys
385 390 395 400

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

Asn Ala Ser His Tyr Ile Lys Ser Pro Leu Val Lys Gly Gln Gln Tyr
420 425 430

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

Asn Ala Thr Glu Ser Ala Tyr Leu Ala Tyr Arg Asn Thr Ser Leu Asp

450

455

460

Leu Ser Glu Gln Glu Leu Val Asp Ser Ala Ser Gln His Gly Ser His
 465 470 475 480

Gly Asp Thr Ile Pro Arg Gly Ile Glu Tyr Ile Gln Thr Ser Ala Ser
 485 490 495

Arg Ile Asn Ser Val Asn Val Pro Ser Glu Leu Asp Leu Arg Ser Leu
 500 505 510

Arg Thr Val Thr Pro Ile Arg Met Gln Gly Gly Ser Gly Ser Ser Trp
 515 520 525

Ala Phe Ser Gly Val Ala Ala Thr Glu Ser Ala Tyr Leu Ala Tyr Arg
 530 535 540

Asn Thr Ser Leu Asp Leu Ser Glu Gln Glu Leu Val Asp Ser Ala Ser
 545 550 555 560

Gln His Gly Ser His Gly Asp Thr Ile Pro Arg Gly Ile Glu Tyr Ile
 565 570 575

Gln Thr Ser Ala Ser Arg Ile Asn Ser Val Asn Val Pro Ser Glu Leu
 580 585 590

Asp Leu Arg Ser Leu Arg Thr Val Thr Pro Ile Arg Met Gln Gly Gly
 595 600 605

Ser Gly Ser Ser Trp Ala Phe Ser Gly
 610 615

<210> 37

<211> 563

<212> PRT

<213> Artificial Sequence

<220>

<223> fusion protein

<400> 37

Tyr Asn Phe Glu Thr Ala Val Ser Thr Ile Glu Ile Leu Val Lys Asp

1					5					10					15				
Leu	Ala	Glu	Leu	Ala	Lys	Lys	Val	Lys	Ala	Val	Lys	Ser	Asp	Asp	Tyr				
			20				25						30						
Asn	Phe	Glu	Thr	Ala	Val	Ser	Thr	Ile	Glu	Ile	Leu	Val	Lys	Asp	Leu				
			35				40						45						
Ala	Glu	Leu	Ala	Lys	Lys	Val	Lys	Ala	Val	Lys	Ser	Asp	Asp	Tyr	Asn				
			50				55						60						
Phe	Glu	Thr	Ala	Val	Ser	Thr	Ile	Glu	Ile	Leu	Val	Lys	Asp	Leu	Ala				
			65				70						75	80					
Glu	Leu	Ala	Lys	Lys	Val	Lys	Ala	Val	Lys	Ser	Asp	Asp	Gly	Tyr	Phe				
			85						90						95				
Ala	Asp	Pro	Lys	Asp	Pro	Ser	Lys	Phe	Tyr	Ile	Ser	Ser	Asn	Trp	Glu				
			100						105						110				
Ala	Ile	His	Lys	Ser	Ser	Pro	Gly	Asn	Thr	Arg	Trp	Asn	Glu	Lys	Glu				
			115						120						125				
Leu	Thr	Ser	Thr	Gly	Tyr	Phe	Ala	Asp	Pro	Lys	Asp	Pro	Ser	Lys	Phe				
			130						135						140				
Tyr	Ile	Ser	Ser	Asn	Trp	Glu	Ala	Ile	His	Lys	Ser	Ser	Pro	Gly	Asn				
			145						150						155	160			
Thr	Arg	Trp	Asn	Glu	Lys	Glu	Leu	Thr	Ser	Thr	Gly	Tyr	Phe	Ala	Asp				
			165						170						175				
Pro	Lys	Asp	Pro	Ser	Lys	Phe	Tyr	Ile	Ser	Ser	Asn	Trp	Glu	Ala	Ile				
			180						185						190				
His	Lys	Ser	Ser	Pro	Gly	Asn	Thr	Arg	Trp	Asn	Glu	Lys	Glu	Leu	Thr				
			195						200						205				
Ser	Thr	Gly	Gly	Trp	Ser	Ser	Lys	Pro	Arg	Lys	Gly	Met	Gly	Thr	Asn				
			210						215						220				

Leu Ser Val Pro Asn Pro Leu Gly Phe Phe Pro Asp His Gln Leu Asp
225 230 235 240

Pro Ala Phe Gly Ala Asn Ser Asn Asn Pro Asp Trp Asp Phe Asn Pro
245 250 255

Ile Lys Asp His Trp Pro Ala Ala Asn Gln Val Gly Val Gly Ala Phe
260 265 270

Gly Pro Gly Leu Thr Pro Pro His Gly Gly Ile Leu Gly Trp Ser Pro
275 280 285

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

Ser Thr Asn Arg Gln Ser Gly Arg Gln Pro Thr Pro Ile Ser Pro Pro
305 310 315 320

Leu Arg Asp Ser His Pro Gln Ala Met Gln Trp Asn Ser Thr Ala Phe
325 330 335

His Gln Ala Leu Gln Asp Pro Arg Val Arg Gly Leu Tyr Phe Pro Ala
340 345 350

Gly Gly Ser Ser Ser Gly Thr Val Asn Pro Ala Pro Asn Ile Ala Ser
355 360 365

His Ile Ser Ser Ile Ser Ala Arg Thr Gly Asp Pro Val Thr Asn Asp
370 375 380

Tyr Gln Asn Glu Phe Asp Phe Leu Leu Met Gln Arg Ile His Glu Gln
385 390 395 400

Met Arg Lys Gly Glu Glu Ala Leu Leu His Leu Gln Asp Tyr Gln Asn
405 410 415

Glu Phe Asp Phe Leu Leu Met Gln Arg Ile His Glu Gln Met Arg Lys
420 425 430

Gly Glu Glu Ala Leu Leu His Leu Gln Asp Pro Ile His Tyr Asp Lys

435

440

445

Ile Thr Glu Glu Ile Asn Lys Ala Ile Asp Asp Ala Ile Ala Ala Ile
 450 455 460

Glu Gln Ser Glu Thr Ile Asp Asp Pro Ile His Tyr Asp Lys Ile Thr
 465 470 475 480

Glu Glu Ile Asn Lys Ala Ile Asp Asp Ala Ile Ala Ala Ile Glu Gln
 485 490 495

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

Asn Glu Ile Leu Glu Arg Asp Leu Lys Lys Glu Glu Gln Arg Val Lys
 515 520 525

Lys Ile Glu Val Glu Arg Tyr Asn Val Glu Ile Ala Leu Lys Ser Asn
 530 535 540

Glu Ile Leu Glu Arg Asp Leu Lys Lys Glu Glu Gln Arg Val Lys Lys
 545 550 555 560

Ile Glu Val

<210> 38

<211> 42

<212> PRT

<213> Artificial Sequence

<220>

<223> allergen fragment

<400> 38

Thr Ser Ala Cys Arg Ile Asn Ser Val Asn Val Pro Ser Glu Leu Asp
 1 5 10 15

Leu Arg Ser Leu Arg Thr Val Thr Pro Ile Arg Met Gln Gly Gly Cys
 20 25 30

Gly Ser Cys Trp Ala Phe Ser Gly Val Ala

35

40

<210> 39
<211> 43
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 39

Ala Thr Glu Ser Ala Tyr Leu Ala Tyr Arg Asn Thr Ser Leu Asp Leu
1 5 10 15

Ser Glu Gln Glu Leu Val Asp Cys Ala Ser Gln His Gly Cys His Gly
20 25 30

Asp Thr Ile Pro Arg Gly Ile Glu Tyr Ile Gln
35 40

<210> 40
<211> 31
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 40

Gln Asn Gly Val Val Glu Glu Arg Ser Tyr Pro Tyr Val Ala Arg Glu
1 5 10 15

Gln Gln Cys Arg Arg Pro Asn Ser Gln His Tyr Gly Ile Ser Asn
20 25 30

<210> 41
<211> 35
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 41

Val Arg Asn Ser Trp Asp Thr Thr Trp Gly Asp Ser Gly Tyr Gly Tyr

1	5	10	15
Phe	Gln	Ala	Gly
	Asn	Asn	Leu
	Met	Met	Ile
		Glu	Gln
		Tyr	Pro
			Tyr
			Val
	20	25	30

Val Ile Met
35

<210> 42
 <211> 30
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> allergen fragment

<400> 42

His	Gly	Ser	Asp	Pro	Cys	Ile	Ile	His	Arg	Gly	Lys	Pro	Phe	Asn	Leu
1				5					10					15	

Glu	Ala	Ile	Phe	Asp	Ala	Asn	Gln	Asn	Thr	Lys	Thr	Ala	Lys
			20				25					30	

<210> 43
 <211> 42
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> allergen fragment

<400> 43

Glu	Val	Asp	Val	Pro	Gly	Ile	Asp	Thr	Asn	Ala	Cys	His	Tyr	Ile	Lys
1				5					10					15	

Cys	Pro	Leu	Val	Lys	Gly	Gln	Gln	Tyr	Asp	Ala	Lys	Tyr	Thr	Trp	Asn
			20					25					30		

Val	Pro	Lys	Ile	Ala	Pro	Lys	Ser	Glu	Asn
		35					40		

<210> 44
 <211> 29
 <212> PRT

<213> Artificial Sequence

<220>

<223> allergen fragment

<400> 44

Asp	Tyr	Gln	Asn	Glu	Phe	Asp	Phe	Leu	Leu	Met	Gln	Arg	Ile	His	Glu
1				5				10						15	

Gln	Met	Arg	Lys	Gly	Glu	Glu	Ala	Leu	Leu	His	Leu	Gln
			20					25				

<210> 45

<211> 31

<212> PRT

<213> Artificial Sequence

<220>

<223> allergen fragment

<400> 45

Glu	Arg	Tyr	Asn	Val	Glu	Ile	Ala	Leu	Lys	Ser	Asn	Glu	Ile	Leu	Glu
1				5				10						15	

Arg	Asp	Leu	Lys	Lys	Glu	Glu	Gln	Arg	Val	Lys	Lys	Ile	Glu	Val
			20					25					30	

<210> 46

<211> 30

<212> PRT

<213> Artificial Sequence

<220>

<223> allergen fragment

<400> 46

Asp	Pro	Ile	His	Tyr	Asp	Lys	Ile	Thr	Glu	Glu	Ile	Asn	Lys	Ala	Ile
1				5				10						15	

Asp	Asp	Ala	Ile	Ala	Ala	Ile	Glu	Gln	Ser	Glu	Thr	Ile	Asp
			20				25						30

<210> 47

<211> 31

<212> PRT

<213> Artificial Sequence

<220>

<223> allergen fragment

<400> 47

Tyr	Asn	Phe	Glu	Thr	Ala	Val	Ser	Thr	Ile	Glu	Ile	Leu	Val	Lys	Asp
1				5					10					15	

Leu	Ala	Glu	Leu	Ala	Lys	Lys	Val	Lys	Ala	Val	Lys	Ser	Asp	Asp
			20					25					30	

<210> 48

<211> 39

<212> PRT

<213> Artificial Sequence

<220>

<223> allergen fragment

<400> 48

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

Asn	Trp	Glu	Ala	Ile	His	Lys	Ser	Cys	Pro	Gly	Asn	Thr	Arg	Trp	Asn
			20					25					30		

Glu	Lys	Glu	Leu	Thr	Cys	Thr
			35			

<210> 49

<211> 37

<212> PRT

<213> Artificial Sequence

<220>

<223> allergen fragment

<400> 49

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

Asn	Tyr	Cys	Gln	Ile	Tyr	Pro	Pro	Asn	Val	Asn	Lys	Ile	Arg	Glu	Ala
			20					25					30		

Leu Ala Gln Thr His
35

<210> 50
<211> 31
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 50

Lys Asp Leu Asp Ala Phe Arg His Tyr Asp Gly Arg Thr Ile Ile Gln
1 5 10 15

Arg Asp Asn Gly Tyr Gln Pro Asn Tyr His Ala Val Asn Ile Val
20 25 30

<210> 51
<211> 33
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 51

Gly Arg Thr Ile Ile Gln Arg Asp Asn Gly Tyr Gln Pro Asn Tyr His
1 5 10 15

Ala Val Asn Ile Val Gly Tyr Ser Asn Ala Gln Gly Val Asp Tyr Trp
20 25 30

Ile

<210> 52
<211> 34
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 52

Val Gly Tyr Ser Asn Ala Gln Gly Val Asp Tyr Trp Ile Val Arg Asn
1 5 10 15

Ser Trp Asp Thr Asn Trp Gly Asp Asn Gly Tyr Gly Tyr Phe Ala Ala
20 25 30

Asn Ile

<210> 53
<211> 33
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 53

Asp Gln Val Asp Val Lys Asp Cys Ala Asn His Glu Ile Lys Lys Val
1 5 10 15

Leu Val Pro Gly Cys His Gly Ser Glu Pro Cys Ile Ile His Arg Gly
20 25 30

Lys

<210> 54
<211> 32
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 54

Glu Ala Asn Gln Asn Ser Lys Thr Ala Lys Ile Glu Ile Lys Ala Ser
1 5 10 15

Ile Glu Gly Leu Glu Val Asp Val Pro Gly Ile Asp Pro Asn Ala Cys
20 25 30

<210> 55

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

<220>
<223> allergen fragment

<400> 55

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

Asn Gly Val Leu Ala Cys Ala Ile Ala Thr His Ala Lys Ile Arg Asp
20 25 30

<210> 56
<211> 34
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 56

Glu Asp Lys Lys His Asp Tyr Gln Asn Glu Phe Asp Phe Leu Leu Met
1 5 10 15

Glu Arg Ile His Glu Gln Ile Lys Lys Gly Glu Leu Ala Leu Phe Tyr
20 25 30

Leu Gln

<210> 57
<211> 36
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 57

Lys Lys Gly Glu Leu Ala Leu Phe Tyr Leu Gln Glu Gln Ile Asn His
1 5 10 15

Phe Glu Glu Lys Pro Thr Lys Glu Met Lys Asp Lys Ile Val Ala Glu

20

25

30

Met Asp Thr Ile
35

<210> 58
<211> 31
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 58

Asp Gly Val Arg Gly Val Leu Asp Arg Leu Met Gln Arg Lys Asp Leu
1 5 10 15

Asp Ile Phe Glu Gln Tyr Asn Leu Glu Met Ala Lys Lys Ser Gly
20 25 30

<210> 59
<211> 36
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 59

Asp Leu Asp Ile Phe Glu Gln Tyr Asn Leu Glu Met Ala Lys Lys Ser
1 5 10 15

Gly Asp Ile Leu Glu Arg Asp Leu Lys Lys Glu Glu Ala Arg Val Lys
20 25 30

Lys Ile Glu Val
35

<210> 60
<211> 29
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 60

Glu Asp Lys Lys His Asp Tyr Gln Asn Glu Phe Asp Phe Leu Leu Met
1 5 10 15

Glu Arg Ile His Glu Gln Ile Lys Lys Gly Glu Leu Ala
20 25

<210> 61

<211> 31

<212> PRT

<213> Artificial Sequence

<220>

<223> allergen fragment

<400> 61

Asp Leu Asp Ile Phe Glu Gln Tyr Asn Leu Glu Met Ala Lys Lys Ser
1 5 10 15

Gly Asp Ile Leu Glu Arg Asp Leu Lys Lys Glu Glu Ala Arg Val
20 25 30

<210> 62

<211> 34

<212> PRT

<213> Artificial Sequence

<220>

<223> allergen fragment

<400> 62

Phe Ile Val Gly Asp Lys Lys Glu Asp Glu Trp Arg Met Ala Phe Asp
1 5 10 15

Arg Leu Met Met Glu Glu Leu Glu Thr Lys Ile Asp Gln Val Glu Lys
20 25 30

Gly Leu

<210> 63

<211> 37

<212> PRT

<213> Artificial Sequence

<220>

<223> allergen fragment

<400> 63

Leu His Leu Ser Glu Gln Tyr Lys Glu Leu Glu Lys Thr Lys Ser Lys
1 5 10 15

Glu Leu Lys Glu Gln Ile Leu Arg Glu Leu Thr Ile Gly Glu Asn Phe
20 25 30

Met Lys Gly Ala Leu
35

<210> 64

<211> 29

<212> PRT

<213> Artificial Sequence

<220>

<223> allergen fragment

<400> 64

Met Lys Gly Ala Leu Lys Phe Phe Glu Met Glu Ala Lys Arg Thr Asp
1 5 10 15

Leu Asn Met Phe Glu Arg Tyr Asn Tyr Glu Phe Ala Leu
20 25

<210> 65

<211> 31

<212> PRT

<213> Artificial Sequence

<220>

<223> allergen fragment

<400> 65

Val Ala Ala Ile Glu Lys Ser Glu Thr Phe Asp Pro Met Lys Val Pro
1 5 10 15

Asp His Ser Asp Lys Phe Glu Arg His Ile Gly Ile Ile Asp Leu
20 25 30

<210> 66
<211> 31
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 66

Leu Lys Gly Glu Leu Asp Met Arg Asn Ile Gln Val Arg Gly Leu Lys
1 5 10 15

Gln Met Lys Arg Val Gly Asp Ala Asn Val Lys Ser Glu Asp Gly
20 25 30

<210> 67
<211> 36
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 67

Val His Asp Asp Val Val Ser Met Glu Tyr Asp Leu Ala Tyr Lys Leu
1 5 10 15

Gly Asp Leu His Pro Asn Thr His Val Ile Ser Asp Ile Gln Asp Phe
20 25 30

Val Val Glu Leu
35

<210> 68
<211> 26
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 68

Val Glu Leu Ser Leu Glu Val Ser Glu Glu Gly Asn Met Thr Leu Thr
1 5 10 15

Ser Phe Glu Val Arg Gln Phe Ala Asn Val
20 25

<210> 69
<211> 28
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 69

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

Leu Ser Asp Val Leu Thr Ala Ile Phe Gln Asp Thr
20 25

<210> 70
<211> 29
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 70

Thr Ala Ile Phe Gln Asp Thr Val Arg Ala Glu Met Thr Lys Val Leu
1 5 10 15

Ala Pro Ala Phe Lys Lys Glu Leu Glu Arg Asn Asn Gln
20 25

<210> 71
<211> 32
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 71

Met Ala Asn Asp Asn Asp Asp Asp Pro Thr Thr Thr Val His Pro Thr
1 5 10 15

Thr Thr Glu Gln Pro Asp Asp Lys Phe Glu Cys Pro Ser Arg Phe Gly
20 25 30

<210> 72
<211> 34
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 72

Pro Thr Thr Thr Glu Gln Pro Asp Asp Lys Phe Glu Cys Pro Ser Arg
1 5 10 15

Phe Gly Tyr Phe Ala Asp Pro Lys Asp Pro His Lys Phe Tyr Ile Cys
20 25 30

Ser Asn

<210> 73
<211> 39
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 73

Gly Tyr Phe Ala Asp Pro Lys Asp Pro His Lys Phe Ala Ile Cys Ser
1 5 10 15

Asn Trp Ala Ala Val His Lys Ala Cys Pro Gly Asn Thr Arg Trp Asn
20 25 30

Ala Ala Ala Ala Thr Cys Thr
35

<210> 74
<211> 39
<212> PRT
<213> Artificial Sequence

<220>

<223> allergen fragment

<400> 74

Gly	Tyr	Phe	Ala	Asp	Pro	Lys	Asp	Pro	His	Ala	Phe	Tyr	Ile	Cys	Ser
1				5					10					15	

Asn	Trp	Glu	Ala	Val	Ala	Ala	Asp	Cys	Pro	Gly	Asn	Thr	Arg	Trp	Asn
			20					25					30		

Glu	Asp	Glu	Glu	Thr	Cys	Thr
						35

<210> 75

<211> 29

<212> PRT

<213> Artificial Sequence

<220>

<223> allergen fragment

<400> 75

Gly	Tyr	Phe	Ala	Asp	Pro	Lys	Asp	Pro	His	Lys	Phe	Tyr	Ile	Cys	Ser
1				5					10					15	

Asn	Trp	Glu	Ala	Val	His	Lys	Asp	Cys	Pro	Gly	Asn	Thr
			20					25				

<210> 76

<211> 29

<212> PRT

<213> Artificial Sequence

<220>

<223> allergen fragment

<400> 76

Gly	Tyr	Phe	Ala	Asp	Pro	Lys	Asp	Pro	His	Lys	Phe	Tyr	Ile	Ser	Ser
1				5					10					15	

Asn	Trp	Glu	Ala	Val	His	Lys	Asp	Ser	Pro	Gly	Asn	Thr
			20					25				

<210> 77

<211> 29
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 77

Lys Phe Tyr Ile Cys Ser Asn Trp Glu Ala Val His Lys Asp Cys Pro
1 5 10 15

Gly Asn Thr Arg Trp Asn Glu Asp Glu Glu Thr Cys Thr
20 25

<210> 78
<211> 29
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 78

Lys Phe Tyr Ile Ser Ser Asn Trp Glu Ala Val His Lys Asp Ser Pro
1 5 10 15

Gly Asn Thr Arg Trp Asn Glu Asp Glu Glu Thr Ser Thr
20 25

<210> 79
<211> 24
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 79

Ser Asn Trp Glu Ala Val His Lys Asp Cys Pro Gly Asn Thr Arg Trp
1 5 10 15

Asn Glu Asp Glu Glu Thr Cys Thr
20

<210> 80

<211> 33
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 80

Gly Tyr Phe Ala Asp Pro Lys Asp Pro His Lys Phe Tyr Ile Cys Ser
1 5 10 15

Asn Trp Glu Ala Val His Lys Asp Cys Pro Gly Asn Thr Arg Trp Asn
20 25 30

Glu

<210> 81
<211> 37
<212> PRT
<213> Artificial Sequence

<220>
<223> allergen fragment

<400> 81

Gly Tyr Phe Ala Asp Pro Lys Asp Pro His Lys Phe Tyr Ile Cys Ser
1 5 10 15

Asn Trp Glu Ala Val His Lys Asp Cys Pro Gly Asn Thr Arg Trp Asn
20 25 30

Glu Asp Glu Glu Thr
35