

5145415_1

<110> AJOU UNIVERSITY INDUSTRY-ACADEMIC COOPERATION FOUNDATION
 <120> Heterodimeric Fc-fused cytokine and pharmaceutical composition comprising the same
 <130> PP-B1939
 <150> KR 2016-0101823
 <151> 2016-08-10
 <160> 20
 <170> KopatentIn 2.0
 <210> 1
 <211> 107
 <212> PRT
 <213> Artificial Sequence
 <220>
 <223> gamma4-EWRTV

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

<210> 2
 <211> 107
 <212> PRT
 <213> Artificial Sequence
 <220>
 <223> gamma4-EWRTV

<400> 2
 Gly Gln Pro Arg Glu Pro Arg Val Tyr Thr Leu Pro Pro Ser Gln Glu
 1 5 10 15
 Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe
 20 25 30
 Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu
 35 40 45
 Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Val Ser Asp Gly Ser Phe
 50 55 60

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Thr Leu Tyr Ser Arg Leu Thr Val Asp Lys Ser Arg Trp Gln Glu Gly
65 70 75 80

Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr
85 90 95

Thr Gln Lys Ser Leu Ser Leu Ser Leu Gly Lys
100 105

<210> 3
<211> 107
<212> PRT
<213> Artificial Sequence

<220>
<223> gamma4-EWRVTs-s

<400> 3
Gly Gln Pro Arg Glu Pro Gln Val Cys Thr Leu Pro Pro Ser Gln Glu
1 5 10 15

Glu Met Thr Glu Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe
20 25 30

Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu
35 40 45

Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe
50 55 60

Phe Leu Tyr Ser Trp Leu Thr Val Asp Lys Ser Arg Trp Gln Glu Gly
65 70 75 80

Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr
85 90 95

Thr Gln Lys Ser Leu Ser Leu Ser Leu Gly Lys
100 105

<210> 4
<211> 107
<212> PRT
<213> Artificial Sequence

<220>
<223> gamma4-EWRVTs-s

<400> 4
Gly Gln Pro Arg Glu Pro Arg Val Tyr Thr Leu Pro Pro Cys Gln Glu
1 5 10 15

Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe
20 25 30

Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu
35 40 45

Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Val Ser Asp Gly Ser Phe
50 55 60

Thr Leu Tyr Ser Arg Leu Thr Val Asp Lys Ser Arg Trp Gln Glu Gly
65 70 75 80

Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr

Thr Gln Lys Ser₁₀₀ Leu Ser Leu Ser Leu₁₀₅ Gly Lys

<210> 5
 <211> 107
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> gamma4-A107

<400> 5
 Gly Gln Pro Arg Glu₅ Pro Gln Val Tyr Thr₁₀ Leu Pro Pro Ser Gln₁₅ Glu
 1
 Glu Met Thr Lys₂₀ Asn Gln Val Ser Leu₂₅ Thr Cys Leu Val Glu₃₀ Gly Phe
 Tyr Pro Ser₃₅ Asp Ile Ala Val Glu₄₀ Trp Glu Ser Asn Gly₄₅ Gln Pro Glu
 Asn Asn₅₀ Tyr Lys Thr Thr Pro₅₅ Pro Val Leu Asp Ser₆₀ Asp Gly Ser Phe
 Phe Leu Tyr Ser Trp Leu₇₀ Thr Val Asp Lys Ser₇₅ Arg Trp Gln Glu Gly₈₀
 Asn Val Phe Ser Cys₈₅ Ser Val Met His Glu₉₀ Ala Leu His Asn His₉₅ Tyr
 Thr Gln Lys Ser₁₀₀ Leu Ser Leu Ser Leu₁₀₅ Gly Lys

<210> 6
 <211> 107
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> gamma4-A107

<400> 6
 Gly Gln Pro Arg Glu₅ Pro Gln Val Tyr Thr₁₀ Leu Pro Pro Ser Gln₁₅ Glu
 1
 Asn Met Thr Lys₂₀ Asn Gln Val Ser Leu₂₅ Thr Cys Leu Val Lys₃₀ Gly Phe
 Tyr Pro Ser₃₅ Asp Ile Ala Val Glu₄₀ Trp Glu Ser Asn Gly₄₅ Gln Pro Glu
 Asn Asn₅₀ Tyr Lys Thr Thr Pro₅₅ Pro Val Leu Val Ser₆₀ Asp Gly Ser Phe
 Thr Leu Tyr Ser Arg Leu₇₀ Thr Val Asp Lys Ser₇₅ Arg Trp Gln Glu Gly₈₀
 Asn Val Phe Ser Cys₈₅ Ser Val Met His Glu₉₀ Ala Leu His Asn His₉₅ Tyr
 Thr Gln Lys Ser₁₀₀ Leu Ser Leu Ser Leu₁₀₅ Gly Lys

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<210> 7
 <211> 107
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> IgG1

<400> 7
 Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp
 1 5 10 15
 Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe
 20 25 30
 Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu
 35 40 45
 Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe
 50 55 60
 Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly
 65 70 75 80
 Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr
 85 90 95
 Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 100 105

<210> 8
 <211> 107
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> gamma1-A107

<400> 8
 Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp
 1 5 10 15
 Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Glu Gly Phe
 20 25 30
 Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu
 35 40 45
 Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe
 50 55 60
 Phe Leu Tyr Ser Trp Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly
 65 70 75 80
 Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr
 85 90 95
 Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 100 105

<210> 9
 <211> 107

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<212> PRT
 <213> Artificial Sequence

<220>
 <223> gamma1-A107

<400> 9
 Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp
 1 5 10 15
 Asn Leu Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe
 20 25 30
 Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu
 35 40 45
 Asn Asn Tyr Lys Thr Thr Pro Val Leu Val Ser Asp Gly Ser Phe
 50 55 60
 Thr Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly
 65 70 75 80
 Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr
 85 90 95
 Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 100 105

<210> 10
 <211> 107
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> IgG2

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

<210> 11
 <211> 107
 <212> PRT
 <213> Artificial Sequence

<220>

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<223> gamma2-A107

<400> 11

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

<210> 12

<211> 107

<212> PRT

<213> Artificial Sequence

<220>

<223> gamma2-A107

<400> 12

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

<210> 13

<211> 107

<212> PRT

<213> Artificial Sequence

<220>

<223> IgG3

<400> 13

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Gly₁ Gln Pro Arg Glu₅ Pro Gln Val Tyr Thr₁₀ Leu Pro Pro Ser Arg₁₅ Glu
 Glu Met Thr Lys₂₀ Asn Gln Val Ser Leu₂₅ Thr Cys Leu Val Lys₃₀ Gly Phe
 Tyr Pro Ser₃₅ Asp Ile Ala Met Glu₄₀ Trp Glu Ser Ser Gly₄₅ Gln Pro Glu
 Asn Asn₅₀ Tyr Lys Thr Thr Pro₅₅ Pro Val Leu Asp Ser₆₀ Asp Gly Ser Phe
 Phe₆₅ Leu Tyr Ser Lys₇₀ Leu Thr Val Asp Lys₇₅ Arg Trp Gln Gln Gly₈₀
 Asn Ile Phe Ser Cys₈₅ Ser Val Met His Glu₉₀ Ala Leu His Asn₉₅ His Tyr
 Thr Gln Lys Ser₁₀₀ Leu Ser Leu Ser Pro₁₀₅ Gly Lys

<210> 14
 <211> 107
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> gamma3-A107

<400> 14
 Gly₁ Gln Pro Arg Glu₅ Pro Gln Val Tyr Thr₁₀ Leu Pro Pro Ser Arg₁₅ Glu
 Glu Met Thr Lys₂₀ Asn Gln Val Ser Leu₂₅ Thr Cys Leu Val Glu₃₀ Gly Phe
 Tyr Pro Ser₃₅ Asp Ile Ala Met Glu₄₀ Trp Glu Ser Ser Gly₄₅ Gln Pro Glu
 Asn Asn₅₀ Tyr Lys Thr Thr Pro₅₅ Pro Val Leu Asp Ser₆₀ Asp Gly Ser Phe
 Phe₆₅ Leu Tyr Ser Trp₇₀ Leu Thr Val Asp Lys₇₅ Arg Trp Gln Gln Gly₈₀
 Asn Ile Phe Ser Cys₈₅ Ser Val Met His Glu₉₀ Ala Leu His Asn₉₅ His Tyr
 Thr Gln Lys Ser₁₀₀ Leu Ser Leu Ser Pro₁₀₅ Gly Lys

<210> 15
 <211> 107
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> gamma3-A107

<400> 15
 Gly₁ Gln Pro Arg Glu₅ Pro Gln Val Tyr Thr₁₀ Leu Pro Pro Ser Arg₁₅ Glu
 Asn Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe

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20 25 30
 Tyr Pro Ser₃₅ Asp Ile Ala Met Glu₄₀ Trp Glu Ser Ser Gly₄₅ Gln Pro Glu
 Asn Asn₅₀ Tyr Lys Thr Thr Pro₅₅ Pro Val Leu Val Ser₆₀ Asp Gly Ser Phe
 Thr₆₅ Leu Tyr Ser Lys Leu₇₀ Thr Val Asp Lys Ser₇₅ Arg Trp Gln Gln Gly₈₀
 Asn Ile Phe Ser Cys₈₅ Ser Val Met His Glu₉₀ Ala Leu His Asn His₉₅ Tyr
 Thr Gln Lys Ser₁₀₀ Leu Ser Leu Ser Pro₁₀₅ Gly Lys

<210> 16
 <211> 107
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> IgG4

<400> 16
 Gly₁ Gln Pro Arg Glu₅ Pro Gln Val Tyr Thr₁₀ Leu Pro Pro Ser Gln₁₅ Glu
 Glu Met Thr Lys₂₀ Asn Gln Val Ser Leu₂₅ Thr Cys Leu Val Lys₃₀ Gly Phe
 Tyr Pro Ser₃₅ Asp Ile Ala Val Glu₄₀ Trp Glu Ser Asn Gly₄₅ Gln Pro Glu
 Asn Asn₅₀ Tyr Lys Thr Thr Pro₅₅ Pro Val Leu Asp Ser₆₀ Asp Gly Ser Phe
 Phe₆₅ Leu Tyr Ser Arg Leu₇₀ Thr Val Asp Lys Ser₇₅ Arg Trp Gln Glu Gly₈₀
 Asn Val Phe Ser Cys₈₅ Ser Val Met His Glu₉₀ Ala Leu His Asn His₉₅ Tyr
 Thr Gln Lys Ser₁₀₀ Leu Ser Leu Ser Leu₁₀₅ Gly Lys

<210> 17
 <211> 306
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Mature human IL-12

<400> 17
 Ile₁ Trp Glu Leu Lys₅ Lys Asp Val Tyr Val₁₀ Val Glu Leu Asp Trp₁₅ Tyr
 Pro Asp Ala Pro₂₀ Gly Glu Met Val Val₂₅ Leu Thr Cys Asp Thr₃₀ Pro Glu
 Glu Asp Gly₃₅ Ile Thr Trp Thr Leu₄₀ Asp Gln Ser Ser Glu₄₅ Val Leu Gly

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

<210> 18
<211> 197
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature human IL-12

<400> 18
Arg Asn Leu Pro Val Ala Thr Pro Asp Pro Gly Met Phe Pro Cys Leu
1 5 10 15
His His Ser Gln Asn Leu Leu Arg Ala Val Ser Asn Met Leu Gln Lys
20 25 30

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

<210> 19
 <211> 313
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Mature mouse IL-12

<400> 19
 Met Trp Glu Leu Glu Lys Asp Val Tyr Val Val Glu Val Asp Trp Thr
 1 5 10 15
 Pro Asp Ala Pro Gly Glu Thr Val Asn Leu Thr Cys Asp Thr Pro Glu
 20 25 30
 Glu Asp Asp Ile Thr Trp Thr Ser Asp Gln Arg His Gly Val Ile Gly
 35 40 45
 Ser Gly Lys Thr Leu Thr Ile Thr Val Lys Glu Phe Leu Asp Ala Gly
 50 55 60
 Gln Tyr Thr Cys His Lys Gly Gly Glu Thr Leu Ser His Ser His Leu
 65 70 75 80
 Leu Leu His Lys Lys Glu Asn Gly Ile Trp Ser Thr Glu Ile Leu Lys
 85 90 95
 Asn Phe Lys Asn Lys Thr Phe Leu Lys Cys Glu Ala Pro Asn Tyr Ser
 100 105 110
 Gly Arg Phe Thr Cys Ser Trp Leu Val Gln Arg Asn Met Asp Leu Lys
 115 120 125

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Phe Asn Ile Lys Ser Ser Ser Pro Pro Asp Ser Arg Ala Val Thr
130 135 140
Cys Gly Met Ala Ser Leu Ser Ala Glu Lys Val Thr Leu Asp Gln Arg
145 150 155 160
Asp Tyr Glu Lys Tyr Ser Val Ser Cys Gln Glu Asp Val Thr Cys Pro
165 170 175
Thr Ala Glu Glu Thr Leu Pro Ile Glu Leu Ala Leu Glu Ala Arg Gln
180 185 190
Gln Asn Lys Tyr Glu Asn Tyr Ser Thr Ser Phe Phe Ile Arg Asp Ile
195 200 205
Ile Lys Pro Asp Pro Pro Lys Asn Leu Gln Met Lys Pro Leu Lys Asn
210 215 220
Ser Gln Val Glu Val Ser Trp Glu Tyr Pro Asp Ser Trp Ser Thr Pro
225 230 235 240
His Ser Tyr Phe Ser Leu Lys Phe Phe Val Arg Ile Gln Arg Lys Lys
245 250 255
Glu Lys Met Lys Glu Thr Lys Glu Gly Cys Asn Gln Lys Gly Ala Phe
260 265 270
Leu Val Glu Lys Thr Ser Thr Glu Val Gln Cys Lys Gly Gly Asn Val
275 280 285
Cys Val Gln Ala Gln Asp Arg Tyr Tyr Asn Ser Ser Cys Ser Lys Trp
290 295 300
Ala Cys Val Pro Cys Arg Val Arg Ser
305 310

<210> 20
<211> 193
<212> PRT
<213> Artificial Sequence

<220>
<223> Mature mouse IL-12

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

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