

SEQUENCE LISTING

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<120> BISPECIFIC TRANSDUCTION ENHANCER

<130> UMOJ-004/01W0 337798-2139

<160> 46

<170> PatentIn version 3.5

<210> 1

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> anti-CD3epsilon antibody OKT3 CDRH1

<400> 1

Gly Tyr Thr Phe Thr Arg Tyr
1 5

<210> 2

<211> 6

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<213> Artificial Sequence

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<223> anti-CD3epsilon antibody OKT3 CDRH2

<400> 2

Asn Pro Ser Arg Gly Tyr
1 5

<210> 3

<211> 10
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<213> Artificial Sequence

<220>
<223> anti-CD3epsilon antibody OKT3 CDRH3

<400> 3

Tyr Tyr Asp Asp His Tyr Cys Leu Asp Tyr
1 5 10

<210> 4
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> anti-CD3epsilon antibody OKT3 CDRL1

<400> 4

Ser Ala Ser Ser Ser Val Ser Tyr Met Asn
1 5 10

<210> 5
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> anti-CD3epsilon antibody OKT3 CDRL2

<400> 5

Asp Thr Ser Lys Leu Ala Ser
1 5

<210> 6
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> anti-CD3epsilon antibody OKT3 CDRL3

<400> 6

Gln Gln Trp Ser Ser Asn Pro Phe Thr
1 5

<210> 7
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<213> Artificial Sequence

<220>
<223> anti-CD28 antibody 15E8 CDRH1

<400> 7

Gly Phe Ser Leu Thr Ser Tyr
1 5

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

<220>
<223> anti-CD28 antibody 15E8 CDRH2

<400> 8

Trp Ala Gly Gly Ser
1 5

<210> 9
<211> 15
<212> PRT
<213> Artificial Sequence

<220>
<223> anti-CD28 antibody 15E8 CDRH3

<400> 9

Asp Lys Arg Ala Pro Gly Lys Leu Tyr Tyr Gly Tyr Pro Asp Tyr
1 5 10 15

<210> 10
<211> 15
<212> PRT

<213> Artificial Sequence

<220>

<223> anti-CD28 antibody 15E8 CDRL1

<400> 10

Arg	Ala	Ser	Glu	Ser	Val	Glu	Tyr	Tyr	Val	Thr	Ser	Leu	Met	Gln
1				5					10					15

<210> 11

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> anti-CD28 antibody 15E8 CDRL2

<400> 11

Ala	Ala	Ser	Asn	Val	Glu	Ser
1			5			

<210> 12

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> anti-CD28 antibody 15E8 CDRL3

<400> 12

Gln	Gln	Thr	Arg	Lys	Val	Pro	Ser	Thr
1				5				

<210> 13

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> anti-CD28 receptor antibody TGN1412 CDRH1

<400> 13

Gly Tyr Thr Phe Ser Tyr

1 5

<210> 14
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> anti-CD28 receptor antibody TGN1412 CDRH2

<400> 14

Tyr Pro Gly Asn Val Asn
1 5

<210> 15
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> anti-CD28 receptor antibody TGN1412 CDRH3

<400> 15

Ser His Tyr Gly Leu Asp Trp Asn Phe Asp Val
1 5 10

<210> 16
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> anti-CD28 receptor antibody TGN1412 CDRL1

<400> 16

His Ala Ser Gln Asn Ile Tyr Val Leu Asn
1 5 10

<210> 17
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> anti-CD28 receptor antibody TGN1412 CDRL2

<400> 17

Lys Ala Ser Asn Leu His Thr
1 5

<210> 18
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> anti-CD28 receptor antibody TGN1412 CDRL3

<400> 18

Gln Gln Gly Gln Thr Tyr Pro Tyr Thr
1 5

<210> 19
<211> 173
<212> PRT
<213> Unknown

<220>
<223> OX40L native ligand for CD134

<400> 19

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

Pro Arg Phe Glu Arg Asn Lys Leu Leu Leu Val Ala Ser Val Ile Gln
20 25 30

Gly Leu Gly Leu Leu Leu Cys Phe Thr Tyr Ile Cys Leu His Phe Ser
35 40 45

Ala Leu Gln Val Ser His Arg Tyr Pro Arg Ile Gln Ser Ile Lys Val
50 55 60

Gln Phe Thr Glu Tyr Lys Lys Glu Lys Gly Phe Ile Leu Thr Ser Gln

65		70		75		80									
Lys	Glu	Asp	Glu	Ile	Met	Lys	Val	Gln	Asn	Tyr	Leu	Ile	Ser	Leu	Lys
			85					90					95		
Gly	Tyr	Phe	Ser	Gln	Glu	Val	Asn	Ile	Ser	Leu	His	Tyr	Gln	Lys	Asp
			100					105					110		
Glu	Glu	Pro	Leu	Phe	Gln	Leu	Lys	Lys	Val	Arg	Ser	Val	Asn	Ser	Leu
		115					120					125			
Met	Val	Ala	Ser	Leu	Thr	Tyr	Lys	Asp	Lys	Val	Tyr	Leu	Asn	Val	Thr
	130					135					140				
Thr	Asp	Asn	Thr	Ser	Leu	Asp	Asp	Phe	His	Val	Asn	Gly	Gly	Glu	Leu
145					150					155					160
Ile	Leu	Ile	His	Gln	Asn	Pro	Gly	Glu	Phe	Cys	Val	Leu			
				165					170						

<210> 20
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 <213> Unknown

<220>
 <223> 4-1BBL cytokine

<400> 20

Met	Glu	Tyr	Ala	Ser	Asp	Ala	Ser	Leu	Asp	Pro	Glu	Ala	Pro	Trp	Pro
1				5					10					15	
Pro	Ala	Pro	Arg	Ala	Arg	Ala	Cys	Arg	Val	Leu	Pro	Trp	Ala	Leu	Val
			20					25					30		
Ala	Gly	Leu	Leu	Leu	Leu	Leu	Leu	Leu	Ala	Ala	Ala	Cys	Ala	Val	Phe
		35					40					45			
Leu	Ala	Cys	Pro	Trp	Ala	Val	Ser	Gly	Ala	Arg	Ala	Ser	Pro	Gly	Ser

50

55

60

Ala Ala Ser Pro Arg Leu Arg Glu Gly Pro Glu Leu Ser Pro Asp Asp
 65 70 75 80

Pro Ala Gly Leu Leu Asp Leu Arg Gln Gly Met Phe Ala Gln Leu Val
 85 90 95

Ala Gln Asn Val Leu Leu Ile Asp Gly Pro Leu Ser Trp Tyr Ser Asp
 100 105 110

Pro Gly Leu Ala Gly Val Ser Leu Thr Gly Gly Leu Ser Tyr Lys Glu
 115 120 125

Asp Thr Lys Glu Leu Val Val Ala Lys Ala Gly Val Tyr Tyr Val Phe
 130 135 140

Phe Gln Leu Glu Leu Arg Arg Val Val Ala Gly Glu Gly Ser Gly Ser
 145 150 155 160

Val Ser Leu Ala Leu His Leu Gln Pro Leu Arg Ser Ala Ala Gly Ala
 165 170 175

Ala Ala Leu Ala Leu Thr Val Asp Leu Pro Pro Ala Ser Ser Glu Ala
 180 185 190

Arg Asn Ser Ala Phe Gly Phe Gln Gly Arg Leu Leu His Leu Ser Ala
 195 200 205

Gly Gln Arg Leu Gly Val His Leu His Thr Glu Ala Arg Ala Arg His
 210 215 220

Ala Trp Gln Leu Thr Gln Gly Ala Thr Val Leu Gly Leu Phe Arg Val
 225 230 235 240

Thr Pro Glu Ile Pro Ala Gly Leu Pro Ser Pro Arg Ser Glu
 245 250

<210> 21
<211> 233
<212> PRT
<213> Homo sapiens

<400> 21

Ala Glu Pro Lys Ser Pro Asp Lys Thr His Thr Cys Pro Pro Cys Pro
1 5 10 15

Ala Pro Pro Val Ala Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro
20 25 30

Lys Asp Thr Leu Met Ile Ala Arg Thr Pro Glu Val Thr Cys Trp Val
35 40 45

Asp Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp
50 55 60

Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr
65 70 75 80

Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp
85 90 95

Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu
100 105 110

Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg
115 120 125

Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys
130 135 140

Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp
145 150 155 160

Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys
165 170 175

Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser
180 185 190

Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser
195 200 205

Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser
210 215 220

Leu Ser Leu Ser Pro Gly Lys Lys Asp
225 230

<210> 22
<211> 46
<212> PRT
<213> Homo sapiens

<400> 22

Thr Thr Thr Pro Ala Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala
1 5 10 15

Ser Gln Pro Leu Ser Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly
20 25 30

Gly Ala Val His Thr Arg Gly Leu Asp Phe Ala Cys Asp Ile
35 40 45

<210> 23
<211> 20
<212> PRT
<213> Homo sapiens

<400> 23

Ala Glu Pro Lys Ser Pro Asp Lys Thr His Thr Cys Pro Pro Cys Pro
1 5 10 15

Lys Asp Pro Lys
20

<210> 24
<211> 185
<212> PRT
<213> Homo sapiens

<400> 24

Lys Glu Ile Thr Asn Ala Leu Glu Thr Trp Gly Ala Leu Gly Gln Asp
1 5 10 15

Ile Asn Leu Asp Ile Pro Ser Phe Gln Met Ser Asp Asp Ile Asp Asp
20 25 30

Ile Lys Trp Glu Lys Thr Ser Asp Lys Lys Lys Ile Ala Gln Phe Arg
35 40 45

Lys Glu Lys Glu Thr Phe Lys Glu Lys Asp Thr Tyr Lys Leu Phe Lys
50 55 60

Asn Gly Thr Leu Lys Ile Lys His Leu Lys Thr Asp Asp Gln Asp Ile
65 70 75 80

Tyr Lys Val Ser Ile Tyr Asp Thr Lys Gly Lys Asn Val Leu Glu Lys
85 90 95

Ile Phe Asp Leu Lys Ile Gln Glu Arg Val Ser Lys Pro Lys Ile Ser
100 105 110

Trp Thr Cys Ile Asn Thr Thr Leu Thr Cys Glu Val Met Asn Gly Thr
115 120 125

Asp Pro Glu Leu Asn Leu Tyr Gln Asp Gly Lys His Leu Lys Leu Ser
130 135 140

Gln Arg Val Ile Thr His Lys Trp Thr Thr Ser Leu Ser Ala Lys Phe
145 150 155 160

Lys Cys Thr Ala Gly Asn Lys Val Ser Lys Glu Ser Ser Val Glu Pro

165

170

175

Val Ser Cys Pro Glu Lys Gly Leu Asp
 180 185

<210> 25
 <211> 259
 <212> PRT
 <213> Homo sapiens

<400> 25

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

Thr Phe Ser Asn Val Ser Thr Asn Val Ser Tyr Gln Glu Thr Thr Thr
 20 25 30

Pro Ser Thr Leu Gly Ser Thr Ser Leu His Pro Val Ser Gln His Gly
 35 40 45

Asn Glu Ala Thr Thr Asn Ile Thr Glu Thr Thr Val Lys Phe Thr Ser
 50 55 60

Thr Ser Val Ile Thr Ser Val Tyr Gly Asn Thr Asn Ser Ser Val Gln
 65 70 75 80

Ser Gln Thr Ser Val Ile Ser Thr Val Phe Thr Thr Pro Ala Asn Val
 85 90 95

Ser Thr Pro Glu Thr Thr Leu Lys Pro Ser Leu Ser Pro Gly Asn Val
 100 105 110

Ser Asp Leu Ser Thr Thr Ser Thr Ser Leu Ala Thr Ser Pro Thr Lys
 115 120 125

Pro Tyr Thr Ser Ser Ser Pro Ile Leu Ser Asp Ile Lys Ala Glu Ile
 130 135 140

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

Glu Gln Asn Lys Thr Ser Ser Cys Ala Glu Phe Lys Lys Asp Arg Gly
165 170 175

Glu Gly Leu Ala Arg Val Leu Cys Gly Glu Glu Gln Ala Asp Ala Asp
180 185 190

Ala Gly Ala Gln Val Cys Ser Leu Leu Leu Ala Gln Ser Glu Val Arg
195 200 205

Pro Gln Cys Leu Leu Leu Val Leu Ala Asn Arg Thr Glu Ile Ser Ser
210 215 220

Lys Leu Gln Leu Met Lys Lys His Gln Ser Asp Leu Lys Lys Leu Gly
225 230 235 240

Ile Leu Asp Phe Thr Glu Gln Asp Val Ala Ser His Gln Ser Tyr Ser
245 250 255

Gln Lys Thr

<210> 26
<211> 153
<212> PRT
<213> Homo sapiens

<400> 26

Met Tyr Arg Met Gln Leu Leu Ser Cys Ile Ala Leu Ser Leu Ala Leu
1 5 10 15

Val Thr Asn Ser Ala Pro Thr Ser Ser Ser Thr Lys Lys Thr Gln Leu
20 25 30

Gln Leu Glu His Leu Leu Leu Asp Leu Gln Met Ile Leu Asn Gly Ile
35 40 45

Asn Asn Tyr Lys Asn Pro Lys Leu Thr Arg Met Leu Thr Phe Lys Phe
50 55 60

Tyr Met Pro Lys Lys Ala Thr Glu Leu Lys His Leu Gln Cys Leu Glu
65 70 75 80

Glu Glu Leu Lys Pro Leu Glu Glu Val Leu Asn Leu Ala Gln Ser Lys
85 90 95

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

Val Leu Glu Leu Lys Gly Ser Glu Thr Thr Phe Met Cys Glu Tyr Ala
115 120 125

Asp Glu Thr Ala Thr Ile Val Glu Phe Leu Asn Arg Trp Ile Thr Phe
130 135 140

Cys Gln Ser Ile Ile Ser Thr Leu Thr
145 150

<210> 27
<211> 177
<212> PRT
<213> Homo sapiens

<400> 27

Met Phe His Val Ser Phe Arg Tyr Ile Phe Gly Leu Pro Pro Leu Ile
1 5 10 15

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

Asp Gly Lys Gln Tyr Glu Ser Val Leu Met Val Ser Ile Asp Gln Leu
35 40 45

Leu Asp Ser Met Lys Glu Ile Gly Ser Asn Cys Leu Asn Asn Glu Phe
50 55 60

Asn Phe Phe Lys Arg His Ile Cys Asp Ala Asn Lys Glu Gly Met Phe
65 70 75 80

Leu Phe Arg Ala Ala Arg Lys Leu Arg Gln Phe Leu Lys Met Asn Ser
85 90 95

Thr Gly Asp Phe Asp Leu His Leu Leu Lys Val Ser Glu Gly Thr Thr
100 105 110

Ile Leu Leu Asn Cys Thr Gly Gln Val Lys Gly Arg Lys Pro Ala Ala
115 120 125

Leu Gly Glu Ala Gln Pro Thr Lys Ser Leu Glu Glu Asn Lys Ser Leu
130 135 140

Lys Glu Gln Lys Lys Leu Asn Asp Leu Cys Phe Leu Lys Arg Leu Leu
145 150 155 160

Gln Glu Ile Lys Thr Cys Trp Asn Lys Ile Leu Met Gly Thr Lys Glu
165 170 175

His

<210> 28
<211> 162
<212> PRT
<213> Homo sapiens

<400> 28

Met Arg Ile Ser Lys Pro His Leu Arg Ser Ile Ser Ile Gln Cys Tyr
1 5 10 15

Leu Cys Leu Leu Leu Asn Ser His Phe Leu Thr Glu Ala Gly Ile His
20 25 30

Val Phe Ile Leu Gly Cys Phe Ser Ala Gly Leu Pro Lys Thr Glu Ala

35

40

45

Asn Trp Val Asn Val Ile Ser Asp Leu Lys Lys Ile Glu Asp Leu Ile
 50 55 60

Gln Ser Met His Ile Asp Ala Thr Leu Tyr Thr Glu Ser Asp Val His
 65 70 75 80

Pro Ser Cys Lys Val Thr Ala Met Lys Cys Phe Leu Leu Glu Leu Gln
 85 90 95

Val Ile Ser Leu Glu Ser Gly Asp Ala Ser Ile His Asp Thr Val Glu
 100 105 110

Asn Leu Ile Ile Leu Ala Asn Asn Ser Leu Ser Ser Asn Gly Asn Val
 115 120 125

Thr Glu Ser Gly Cys Lys Glu Cys Glu Glu Leu Glu Glu Lys Asn Ile
 130 135 140

Lys Glu Phe Leu Gln Ser Phe Val His Ile Val Gln Met Phe Ile Asn
 145 150 155 160

Thr Ser

<210> 29

<211> 271

<212> PRT

<213> Artificial Sequence

<220>

<223> membrane-IL7

<400> 29

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

Leu Val Leu Leu Pro Val Ala Ser Ser Asp Cys Asp Ile Glu Gly Lys

20

25

30

Asp Gly Lys Gln Tyr Glu Ser Val Leu Met Val Ser Ile Asp Gln Leu
 35 40 45

Leu Asp Ser Met Lys Glu Ile Gly Ser Asn Cys Leu Asn Asn Glu Phe
 50 55 60

Asn Phe Phe Lys Arg His Ile Cys Asp Ala Asn Lys Glu Gly Met Phe
 65 70 75 80

Leu Phe Arg Ala Ala Arg Lys Leu Arg Gln Phe Leu Lys Met Asn Ser
 85 90 95

Thr Gly Asp Phe Asp Leu His Leu Leu Lys Val Ser Glu Gly Thr Thr
 100 105 110

Ile Leu Leu Asn Cys Thr Gly Gln Val Lys Gly Arg Lys Pro Ala Ala
 115 120 125

Leu Gly Glu Ala Gln Pro Thr Lys Ser Leu Glu Glu Asn Lys Ser Leu
 130 135 140

Lys Glu Gln Lys Lys Leu Asn Asp Leu Cys Phe Leu Lys Arg Leu Leu
 145 150 155 160

Gln Glu Ile Lys Thr Cys Trp Asn Lys Ile Leu Met Gly Thr Lys Glu
 165 170 175

His Ser Gly Gly Gly Ser Pro Ala Lys Pro Thr Thr Thr Pro Ala Pro
 180 185 190

Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser Leu
 195 200 205

Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr Arg
 210 215 220

Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala Gly
225 230 235 240

Thr Cys Gly Val Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys Asn
245 250 255

His Arg Asn Arg Arg Arg Val Cys Lys Cys Pro Arg Pro Val Val
260 265 270

<210> 30
<211> 256
<212> PRT
<213> Artificial Sequence

<220>
<223> membrane-IL15

<400> 30

Met Gly Leu Val Arg Arg Gly Ala Arg Ala Gly Pro Arg Met Pro Arg
1 5 10 15

Gly Trp Thr Ala Leu Cys Leu Leu Ser Leu Leu Pro Ser Gly Phe Met
20 25 30

Ala Gly Ile His Val Phe Ile Leu Gly Cys Phe Ser Ala Gly Leu Pro
35 40 45

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

Glu Asp Leu Ile Gln Ser Met His Ile Asp Ala Thr Leu Tyr Thr Glu
65 70 75 80

Ser Asp Val His Pro Ser Cys Lys Val Thr Ala Met Lys Cys Phe Leu
85 90 95

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

Asp Thr Val Glu Asn Leu Ile Ile Leu Ala Asn Asn Ser Leu Ser Ser
115 120 125

Asn Gly Asn Val Thr Glu Ser Gly Cys Lys Glu Cys Glu Glu Leu Glu
130 135 140

Glu Lys Asn Ile Lys Glu Phe Leu Gln Ser Phe Val His Ile Val Gln
145 150 155 160

Met Phe Ile Asn Thr Ser Ser Pro Ala Lys Pro Thr Thr Thr Pro Ala
165 170 175

Pro Arg Pro Pro Thr Pro Ala Pro Thr Ile Ala Ser Gln Pro Leu Ser
180 185 190

Leu Arg Pro Glu Ala Cys Arg Pro Ala Ala Gly Gly Ala Val His Thr
195 200 205

Arg Gly Leu Asp Phe Ala Cys Asp Ile Tyr Ile Trp Ala Pro Leu Ala
210 215 220

Gly Thr Cys Gly Val Leu Leu Leu Ser Leu Val Ile Thr Leu Tyr Cys
225 230 235 240

Asn His Arg Asn Arg Arg Arg Val Cys Lys Cys Pro Arg Pro Val Val
245 250 255

<210> 31
<211> 330
<212> PRT
<213> Homo sapiens

<400> 31

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

Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr
20 25 30

Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser
35 40 45

Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser
50 55 60

Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr
65 70 75 80

Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys
85 90 95

Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys
100 105 110

Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro
115 120 125

Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys
130 135 140

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

Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu
165 170 175

Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu
180 185 190

His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn
195 200 205

Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly
210 215 220

Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu
225 230 235 240

Leu Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr
245 250 255

Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn
260 265 270

Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe
275 280 285

Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn
290 295 300

Val Phe Ser Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr
305 310 315 320

Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
325 330

<210> 32
<211> 327
<212> PRT
<213> Homo sapiens

<400> 32

Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu Ala Pro Cys Ser Arg
1 5 10 15

Ser Thr Ser Glu Ser Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr
20 25 30

Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser
35 40 45

Gly Val His Thr Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser
50 55 60

Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser Leu Gly Thr Lys Thr
65 70 75 80

Tyr Thr Cys Asn Val Asp His Lys Pro Ser Asn Thr Lys Val Asp Lys
85 90 95

Arg Val Glu Ser Lys Tyr Gly Pro Pro Cys Pro Ser Cys Pro Ala Pro
100 105 110

Glu Phe Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys
115 120 125

Asp Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val
130 135 140

Asp Val Ser Gln Glu Asp Pro Glu Val Gln Phe Asn Trp Tyr Val Asp
145 150 155 160

Gly Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Phe
165 170 175

Asn Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp
180 185 190

Trp Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Gly Leu
195 200 205

Pro Ser Ser Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg
210 215 220

Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Gln Glu Glu Met Thr Lys
225 230 235 240

Asn Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp
245 250 255

Ile Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys

260

265

270

Thr Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser
 275 280 285

Arg Leu Thr Val Asp Lys Ser Arg Trp Gln Glu Gly Asn Val Phe Ser
 290 295 300

Cys Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser
 305 310 315 320

Leu Ser Leu Ser Leu Gly Lys
 325

<210> 33
 <211> 511
 <212> PRT
 <213> Vesiculovirus Cocal virus

<400> 33

Asn Phe Leu Leu Leu Thr Phe Ile Val Leu Pro Leu Cys Ser His Ala
 1 5 10 15

Lys Phe Ser Ile Val Phe Pro Gln Ser Gln Lys Gly Asn Trp Lys Asn
 20 25 30

Val Pro Ser Ser Tyr His Tyr Cys Pro Ser Ser Ser Asp Gln Asn Trp
 35 40 45

His Asn Asp Leu Leu Gly Ile Thr Met Lys Val Lys Met Pro Lys Thr
 50 55 60

His Lys Ala Ile Gln Ala Asp Gly Trp Met Cys His Ala Ala Lys Trp
 65 70 75 80

Ile Thr Thr Cys Asp Phe Arg Trp Tyr Gly Pro Lys Tyr Ile Thr His
 85 90 95

Ser Ile His Ser Ile Gln Pro Thr Ser Glu Gln Cys Lys Glu Ser Ile
100 105 110

Lys Gln Thr Lys Gln Gly Thr Trp Met Ser Pro Gly Phe Pro Pro Gln
115 120 125

Asn Cys Gly Tyr Ala Thr Val Thr Asp Ser Val Ala Val Val Val Gln
130 135 140

Ala Thr Pro His His Val Leu Val Asp Glu Tyr Thr Gly Glu Trp Ile
145 150 155 160

Asp Ser Gln Phe Pro Asn Gly Lys Cys Glu Thr Glu Glu Cys Glu Thr
165 170 175

Val His Asn Ser Thr Val Trp Tyr Ser Asp Tyr Lys Val Thr Gly Leu
180 185 190

Cys Asp Ala Thr Leu Val Asp Thr Glu Ile Thr Phe Phe Ser Glu Asp
195 200 205

Gly Lys Lys Glu Ser Ile Gly Lys Pro Asn Thr Gly Tyr Arg Ser Asn
210 215 220

Tyr Phe Ala Tyr Glu Lys Gly Asp Lys Val Cys Lys Met Asn Tyr Cys
225 230 235 240

Lys His Ala Gly Val Arg Leu Pro Ser Gly Val Trp Phe Glu Phe Val
245 250 255

Asp Gln Asp Val Tyr Ala Ala Ala Lys Leu Pro Glu Cys Pro Val Gly
260 265 270

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

Leu Asp Val Glu Arg Ile Leu Asp Tyr Ser Leu Cys Gln Glu Thr Trp
290 295 300

Ser Lys Ile Arg Ser Lys Gln Pro Val Ser Pro Val Asp Leu Ser Tyr
305 310 315 320

Leu Ala Pro Lys Asn Pro Gly Thr Gly Pro Ala Phe Thr Ile Ile Asn
325 330 335

Gly Thr Leu Lys Tyr Phe Glu Thr Arg Tyr Ile Arg Ile Asp Ile Asp
340 345 350

Asn Pro Ile Ile Ser Lys Met Val Gly Lys Ile Ser Gly Ser Gln Thr
355 360 365

Glu Arg Glu Leu Trp Thr Glu Trp Phe Pro Tyr Glu Gly Val Glu Ile
370 375 380

Gly Pro Asn Gly Ile Leu Lys Thr Pro Thr Gly Tyr Lys Phe Pro Leu
385 390 395 400

Phe Met Ile Gly His Gly Met Leu Asp Ser Asp Leu His Lys Thr Ser
405 410 415

Gln Ala Glu Val Phe Glu His Pro His Leu Ala Glu Ala Pro Lys Gln
420 425 430

Leu Pro Glu Glu Glu Thr Leu Phe Phe Gly Asp Thr Gly Ile Ser Lys
435 440 445

Asn Pro Val Glu Leu Ile Glu Gly Trp Phe Ser Ser Trp Lys Ser Thr
450 455 460

Val Val Thr Phe Phe Phe Ala Ile Gly Val Phe Ile Leu Leu Tyr Val
465 470 475 480

Val Ala Arg Ile Val Ile Ala Val Arg Tyr Arg Tyr Gln Gly Ser Asn
485 490 495

Asn Lys Arg Ile Tyr Asn Asp Ile Glu Met Ser Arg Phe Arg Lys
500 505 510

<210> 34
<211> 504
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<213> Artificial Sequence

<220>
<223> Blinatumomab, CD19/CD3-bispecific antibody construct

<400> 34

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

Gln Arg Ala Thr Ile Ser Cys Lys Ala Ser Gln Ser Val Asp Tyr Asp
20 25 30

Gly Asp Ser Tyr Leu Asn Trp Tyr Gln Gln Ile Pro Gly Gln Pro Pro
35 40 45

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

Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Asn Ile His
65 70 75 80

Pro Val Glu Lys Val Asp Ala Ala Thr Tyr His Cys Gln Gln Ser Thr
85 90 95

Glu Asp Pro Trp Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Gly
100 105 110

Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gln Val
115 120 125

Gln Leu Gln Gln Ser Gly Ala Glu Leu Val Arg Pro Gly Ser Ser Val
130 135 140

Lys Ile Ser Cys Lys Ala Ser Gly Tyr Ala Phe Ser Ser Tyr Trp Met
145 150 155 160

Asn Trp Val Lys Gln Arg Pro Gly Gln Gly Leu Glu Trp Ile Gly Gln
165 170 175

Ile Trp Pro Gly Asp Gly Asp Thr Asn Tyr Asn Gly Lys Phe Lys Gly
180 185 190

Lys Ala Thr Leu Thr Ala Asp Glu Ser Ser Ser Thr Ala Tyr Met Gln
195 200 205

Leu Ser Ser Leu Ala Ser Glu Asp Ser Ala Val Tyr Phe Cys Ala Arg
210 215 220

Arg Glu Thr Thr Thr Val Gly Arg Tyr Tyr Tyr Ala Met Asp Tyr Trp
225 230 235 240

Gly Gln Gly Thr Thr Val Thr Val Ser Ser Gly Gly Gly Gly Ser Asp
245 250 255

Ile Lys Leu Gln Gln Ser Gly Ala Glu Leu Ala Arg Pro Gly Ala Ser
260 265 270

Val Lys Met Ser Cys Lys Thr Ser Gly Tyr Thr Phe Thr Arg Tyr Thr
275 280 285

Met His Trp Val Lys Gln Arg Pro Gly Gln Gly Leu Glu Trp Ile Gly
290 295 300

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

Asp Lys Ala Thr Leu Thr Thr Asp Lys Ser Ser Ser Thr Ala Tyr Met
325 330 335

Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Tyr Cys Ala
340 345 350

Arg Tyr Tyr Asp Asp His Tyr Cys Leu Asp Tyr Trp Gly Gln Gly Thr
355 360 365

Thr Leu Thr Val Ser Ser Val Glu Gly Gly Ser Gly Gly Ser Gly Gly
370 375 380

Ser Gly Gly Ser Gly Gly Val Asp Asp Ile Gln Leu Thr Gln Ser Pro
385 390 395 400

Ala Ile Met Ser Ala Ser Pro Gly Glu Lys Val Thr Met Thr Cys Arg
405 410 415

Ala Ser Ser Ser Val Ser Tyr Met Asn Trp Tyr Gln Gln Lys Ser Gly
420 425 430

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

Val Pro Tyr Arg Phe Ser Gly Ser Gly Ser Gly Thr Ser Tyr Ser Leu
450 455 460

Thr Ile Ser Ser Met Glu Ala Glu Asp Ala Ala Thr Tyr Tyr Cys Gln
465 470 475 480

Gln Trp Ser Ser Asn Pro Leu Thr Phe Gly Ala Gly Thr Lys Leu Glu
485 490 495

Leu Lys His His His His His
500

<210> 35

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Blinatumomab, CD19 CDRL1

<400> 35

Gln Ser Val Asp Tyr Asp Gly Asp Ser Tyr
1 5 10

<210> 36

<211> 3

<212> PRT

<213> Artificial Sequence

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<223> Blinatumomab, CD19 CDRL2

<400> 36

Asp Ala Ser
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<210> 37

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> Blinatumomab, CD19 CDRL3

<400> 37

Gln Gln Ser Thr Glu Asp Pro Trp Thr
1 5

<210> 38

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> Blinatumomab, CD19 CDRH1

<400> 38

Gly Tyr Ala Phe Ser Ser Tyr Trp
1 5

<210> 39

<211> 8

<212> PRT
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<220>
<223> Blinatumomab, CD19 CDRH2

<400> 39

Ile Trp Pro Gly Asp Gly Asp Thr
1 5

<210> 40
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<220>
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<400> 40

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

Tyr

<210> 41
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<400> 41

Gly Tyr Thr Phe Thr Arg Tyr Thr
1 5

<210> 42
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<212> PRT
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<223> Blinatumomab, CD3 CDRH2

<400> 42

Ile Asn Pro Ser Arg Gly Tyr Thr
1 5

<210> 43

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Blinatumomab, CD3 CDRH3

<400> 43

Ala Arg Tyr Tyr Asp Asp His Tyr Cys Leu Asp Tyr
1 5 10

<210> 44

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> Blinatumomab, CD3 CDRL1

<400> 44

Ser Ser Val Ser Tyr
1 5

<210> 45

<211> 3

<212> PRT

<213> Artificial Sequence

<220>

<223> Blinatumomab, CD3 CDRL2

<400> 45

Asp Thr Ser
1

<210> 46
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> Blinatumomab, CD3 CDRL3

<400> 46

Gln Gln Trp Ser Ser Asn Pro
1 5