

SEQUENCE LISTING

<110> Juno Therapeutics, Inc.

<120> ANTI-IDIOTYPIC ANTIBODIES TO
BCMA-TARGETED BINDING DOMAINS AND RELATED COMPOSITIONS AND
METHODS

<130> 735042017940

<140> Not Yet Assigned

<141> Concurrently Herewith

<150> US 62/945,065

<151> 2019-12-06

<150> US 63/061,763

<151> 2020-08-05

<150> US 63/109,839

<151> 2020-11-04

<160> 134

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> CDR-H1; Kabat (Target Antibody 1)

<400> 1

Ser Tyr Trp Ile Gly

1 5

<210> 2

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> CDR-H2; Kabat (Target Antibody 1)

<400> 2

Ile Ile Tyr Pro Gly Asp Ser Asp Thr Arg Tyr Ser Pro Ser Phe Gln

1 5 10 15

Gly

<210> 3
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR-H3; Kabat, Chothia; AbM (Target Antibody 1)

<400> 3
Tyr Ser Gly Ser Phe Asp Asn
1 5

<210> 4
<211> 7
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<213> Artificial Sequence

<220>
<223> CDR-H1; Chothia (Target Antibody 1)

<400> 4
Gly Tyr Ser Phe Thr Ser Tyr
1 5

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

<220>
<223> CDR-H2; Chothia (Target Antibody 1)

<400> 5
Tyr Pro Gly Asp Ser Asp
1 5

<210> 6
<211> 10
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<213> Artificial Sequence

<220>
<223> CDR-H1; AbM (Target Antibody 1)

<400> 6
Gly Tyr Ser Phe Thr Ser Tyr Trp Ile Gly
1 5 10

<210> 7

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

<220>
<223> CDR-H2; AbM (Target Antibody 1)

<400> 7
Ile Ile Tyr Pro Gly Asp Ser Asp Thr Arg
1 5 10

<210> 8
<211> 13
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR-L1; Kabat, Chothia, AbM (Target Antibody 1)

<400> 8
Ser Gly Thr Ser Ser Asn Ile Gly Ser His Ser Val Asn
1 5 10

<210> 9
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR-L2; Kabat, Chothia, AbM (Target Antibody 1)

<400> 9
Thr Asn Asn Gln Arg Pro Ser
1 5

<210> 10
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR-L3; Kabat, Chothia, AbM (Target Antibody 1)

<400> 10
Ala Ala Trp Asp Gly Ser Leu Asn Gly Leu Val
1 5 10

<210> 11
<211> 116
<212> PRT

<213> Artificial Sequence

<220>

<223> VH (Target Antibody 1)

<400> 11

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

<210> 12

<211> 111

<212> PRT

<213> Artificial Sequence

<220>

<223> VL (Target Antibody 1)

<400> 12

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

<210> 13

<211> 248

<212> PRT

<213> Artificial Sequence

<220>

<223> scFv (Target Antibody 1)

<400> 13

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Arg Val Thr Met Ser Cys Ser Gly Thr Ser Ser Asn Ile Gly Ser His
      20          25          30
Ser Val Asn Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu
      35          40          45
Ile Tyr Thr Asn Asn Gln Arg Pro Ser Gly Val Pro Asp Arg Phe Ser
      50          55          60
Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Gln
65          70          75          80
Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Ala Ala Trp Asp Gly Ser Leu
      85          90          95
Asn Gly Leu Val Phe Gly Gly Gly Thr Lys Leu Thr Val Leu Gly Ser
      100          105          110
Arg Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
      115          120          125
Leu Glu Met Ala Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys
      130          135          140
Lys Pro Gly Glu Ser Leu Lys Ile Ser Cys Lys Gly Ser Gly Tyr Ser
145          150          155          160
Phe Thr Ser Tyr Trp Ile Gly Trp Val Arg Gln Met Pro Gly Lys Gly
      165          170          175
Leu Glu Trp Met Gly Ile Ile Tyr Pro Gly Asp Ser Asp Thr Arg Tyr
      180          185          190
Ser Pro Ser Phe Gln Gly His Val Thr Ile Ser Ala Asp Lys Ser Ile
      195          200          205
Ser Thr Ala Tyr Leu Gln Trp Ser Ser Leu Lys Ala Ser Asp Thr Ala
      210          215          220
Met Tyr Tyr Cys Ala Arg Tyr Ser Gly Ser Phe Asp Asn Trp Gly Gln
225          230          235          240
Gly Thr Leu Val Thr Val Ser Ser
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<210> 14

<211> 21

<212> PRT

<213> Artificial Sequence

<220>

<223> Linker

<400> 14

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Ser Arg Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly
 1          5          10          15
Ser Leu Glu Met Ala
      20
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<210> 15

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

<220>
<223> CDR-H1; Kabat (Target Antibody 2)

<400> 15
Asp Tyr Tyr Val Tyr
1 5

<210> 16
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR-H2; Kabat (Target Antibody 2)

<400> 16
Trp Ile Asn Pro Asn Ser Gly Gly Thr Asn Tyr Ala Gln Lys Phe Gln
1 5 10 15
Gly

<210> 17
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR-H3; Kabat, Chothia; AbM (Target Antibody 2)

<400> 17
Ser Gln Arg Asp Gly Tyr Met Asp Tyr
1 5

<210> 18
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR-H1; Chothia (Target Antibody 2)

<400> 18
Gly Tyr Thr Phe Ile Asp Tyr
1 5

<210> 19

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

<220>
<223> CDR-H2; Chothia (Target Antibody 2)

<400> 19
Asn Pro Asn Ser Gly Gly
1 5

<210> 20
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR-H1; AbM (Target Antibody 2)

<400> 20
Gly Tyr Thr Phe Ile Asp Tyr Tyr Val Tyr
1 5 10

<210> 21
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR-H2; AbM (Target Antibody 2)

<400> 21
Trp Ile Asn Pro Asn Ser Gly Gly Thr Asn
1 5 10

<210> 22
<211> 8
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR-L1; Kabat, Chothia, AbM (Target Antibody 2)

<400> 22
Thr Gly Thr Ser Ser Asp Val Gly
1 5

<210> 23
<211> 7
<212> PRT

<213> Artificial Sequence

<220>

<223> CDR-L2; Kabat, Chothia, AbM (Target Antibody 2)

<400> 23

Glu Asp Ser Lys Arg Pro Ser
1 5

<210> 24

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> CDR-L3; Kabat, Chothia, AbM (Target Antibody 2)

<400> 24

Ser Ser Asn Thr Arg Ser Ser Thr Leu Val
1 5 10

<210> 25

<211> 118

<212> PRT

<213> Artificial Sequence

<220>

<223> VH (Target Antibody 2)

<400> 25

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

<210> 26

<211> 105

<212> PRT

<213> Artificial Sequence

<220>

<223> VL (Target Antibody 2)

<400> 26

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

<210> 27

<211> 244

<212> PRT

<213> Artificial Sequence

<220>

<223> scFv (Target Antibody 2)

<400> 27

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

Arg	Val	Thr	Met	Thr	Arg	Asp	Thr	Ser	Ile	Ser	Thr	Ala	Tyr	Met	Glu
		195					200					205			
Leu	Ser	Arg	Leu	Arg	Ser	Asp	Asp	Thr	Ala	Met	Tyr	Tyr	Cys	Ala	Arg
		210				215					220				
Ser	Gln	Arg	Asp	Gly	Tyr	Met	Asp	Tyr	Trp	Gly	Gln	Gly	Thr	Leu	Val
225					230					235					240
Thr	Val	Ser	Ser												

<210> 28
 <211> 5
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> CDR-H1; Kabat (clone 15)

<400> 28
 Ser Tyr Trp Met Asn
 1 5

<210> 29
 <211> 17
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> CDR-H2; Kabat (clone 15)

<400> 29
 Gln Ile Tyr Pro Gly Asn Gly Glu Thr Asn Asn Asn Gly Lys Phe Lys
 1 5 10 15
 Gly

<210> 30
 <211> 7
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> CDR-H3; Kabat, Chothia, AbM (clone 15)

<400> 30
 Gly Gly Trp Tyr Phe Asp Val
 1 5

<210> 31
 <211> 7
 <212> PRT

<213> Artificial Sequence

<220>

<223> CDR-H1; Chothia (clone 15)

<400> 31

Gly Tyr Ala Phe Ser Ser Tyr
1 5

<210> 32

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> CDR-H2; Chothia (clone 15)

<400> 32

Tyr Pro Gly Asn Gly Glu
1 5

<210> 33

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> CDR-H1; AbM (clone 15)

<400> 33

Gly Tyr Ala Phe Ser Ser Tyr Trp Met Asn
1 5 10

<210> 34

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> CDR-H2; AbM (clone 15)

<400> 34

Gln Ile Tyr Pro Gly Asn Gly Glu Thr Asn
1 5 10

<210> 35

<211> 11

<212> PRT

<213> Artificial Sequence

<220>
<223> CDR-L1; Kabat, Chothia, AbM (clone 15)

<400> 35
Arg Ala Ser Glu Asn Ile Tyr Ser Tyr Leu Ala
1 5 10

<210> 36
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR-L2; Kabat, Chothia, AbM (clone 15)

<400> 36
Asn Ala Tyr Thr Leu Ala Glu
1 5

<210> 37
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR-L3; Kabat, Chothia, AbM (clone 15)

<400> 37
Gln His His Tyr Gly Thr Pro Trp Thr
1 5

<210> 38
<211> 116
<212> PRT
<213> Artificial Sequence

<220>
<223> VH (clone 15)

<400> 38
Gln Val Gln Leu Gln Gln Ser Gly Ala Glu Leu Val Lys Pro Gly Ala
1 5 10 15
Ser Val Lys Ile Ser Cys Lys Ala Ser Gly Tyr Ala Phe Ser Ser Tyr
20 25 30
Trp Met Asn Trp Val Lys Gln Arg Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45
Gly Gln Ile Tyr Pro Gly Asn Gly Glu Thr Asn Asn Asn Gly Lys Phe
50 55 60
Lys Gly Lys Ala Thr Leu Thr Ala Asp Ile Ser Ser Ser Thr Ala Tyr
65 70 75 80
Met Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Phe Cys

				85					90					95		
Ala	Arg	Gly	Gly	Trp	Tyr	Phe	Asp	Val	Trp	Gly	Thr	Gly	Thr	Thr	Val	
			100					105						110		
Thr	Val	Ser	Ser													
			115													

<210> 39
 <211> 107
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> VL (clone 15)

<400> 39																
Asp	Ile	Gln	Met	Thr	Gln	Ser	Pro	Ala	Ser	Leu	Ser	Ala	Ser	Val	Gly	
1				5					10					15		
Glu	Thr	Val	Thr	Ile	Thr	Cys	Arg	Ala	Ser	Glu	Asn	Ile	Tyr	Ser	Tyr	
			20					25					30			
Leu	Ala	Trp	Tyr	Gln	Gln	Lys	Gln	Gly	Lys	Ser	Pro	His	Leu	Leu	Val	
		35					40					45				
Tyr	Asn	Ala	Tyr	Thr	Leu	Ala	Glu	Gly	Val	Pro	Ser	Arg	Phe	Ser	Gly	
	50					55					60					
Ser	Gly	Ser	Asp	Thr	Gln	Phe	Ser	Leu	Lys	Ile	Asn	Ser	Leu	Gln	Pro	
65					70					75					80	
Glu	Asp	Phe	Gly	Asn	Tyr	Tyr	Cys	Gln	His	His	Tyr	Gly	Thr	Pro	Trp	
				85					90					95		
Thr	Phe	Gly	Gly	Gly	Thr	Lys	Val	Glu	Ile	Lys						
			100					105								

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

<220>
 <223> Heavy chain (clone 15)

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

Asp	Ile	Gln	Met	Thr	Gln	Ser	Pro	Ala	Ser	Leu	Ser	Ala	Ser	Val	Gly
1				5				10						15	
Glu	Thr	Val	Thr	Ile	Thr	Cys	Arg	Ala	Ser	Glu	Asn	Ile	Tyr	Ser	Tyr
			20					25					30		
Leu	Ala	Trp	Tyr	Gln	Gln	Lys	Gln	Gly	Lys	Ser	Pro	His	Leu	Leu	Val
		35					40					45			
Tyr	Asn	Ala	Tyr	Thr	Leu	Ala	Glu	Gly	Val	Pro	Ser	Arg	Phe	Ser	Gly
	50					55					60				
Ser	Gly	Ser	Asp	Thr	Gln	Phe	Ser	Leu	Lys	Ile	Asn	Ser	Leu	Gln	Pro
65					70					75					80
Glu	Asp	Phe	Gly	Asn	Tyr	Tyr	Cys	Gln	His	His	Tyr	Gly	Thr	Pro	Trp
				85						90				95	
Thr	Phe	Gly	Gly	Gly	Thr	Lys	Val	Glu	Ile	Lys	Arg	Ala	Asp	Ala	Ala
			100					105					110		
Pro	Thr	Val	Ser	Ile	Phe	Pro	Pro	Ser	Ser	Glu	Gln	Leu	Thr	Ser	Gly
		115					120					125			
Gly	Ala	Ser	Val	Val	Cys	Phe	Leu	Asn	Asn	Phe	Tyr	Pro	Lys	Asp	Ile
	130					135					140				
Asn	Val	Lys	Trp	Lys	Ile	Asp	Gly	Ser	Glu	Arg	Gln	Asn	Gly	Val	Leu
145					150					155					160
Asn	Ser	Trp	Thr	Asp	Gln	Asp	Ser	Lys	Asp	Ser	Thr	Tyr	Ser	Met	Ser
				165					170					175	
Ser	Thr	Leu	Thr	Leu	Thr	Lys	Asp	Glu	Tyr	Glu	Arg	His	Asn	Ser	Tyr
			180					185					190		
Thr	Cys	Glu	Ala	Thr	His	Lys	Thr	Ser	Thr	Ser	Pro	Ile	Val	Lys	Ser
		195					200					205			
Phe	Asn	Arg	Asn	Glu	Cys										
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<210> 42

<211> 1323

<212> DNA

<213> Artificial Sequence

<220>

<223> Heavy chain (clone 15)

<400> 42

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aaggatgtgc	tcaccattac	tctgactcct	aaggtcacgt	gtgttggtgt	agacatcagc	780
aaggatgatc	ccgaggtcca	gttcagctgg	tttgtagatg	atgtggaggt	gcacacagct	840
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agcaagctca atgtgcagaa gagcaactgg gaggcaggaa atactttcac ctgctctgtg 1260
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tga
1323

```

<210> 43
 <211> 645
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Light chain (clone 15)

```

<400> 43
gacatccaga tgactcagtc tccagcctcc ctatctgcat ctgtgggaga aactgtcacc 60
atcacatgtc gagcaagtga gaatatttac agttatttag catggatatca gcagaaacag 120
ggaaaatctc ctcacctcct ggtctataat gcatacacct tagcagaagg tgtgccatca 180
agattcagtg gcagtggtac agacacacag ttttctctga agatcaacag tctgcagcct 240
gaagattttg ggaattatta ctgtcaacat cattatggta ctccgtggac gttcgggtgga 300
ggcaccaagg tggaaatcaa acgggctgat gctgcacaa ctgtatccat cttcccacca 360
tccagtgagc agttaacatc tggaggtgcc tcagtcgtgt gcttcttgaa caacttctac 420
cccaaagaca tcaatgtcaa gtggaagatt gatggcagtg aacgacaaaa tggcgtcctg 480
aacagttgga ctgatcagga cagcaaagac agcacctaca gcatgagcag caccctcacg 540
ttgaccaagg acgagtatga acgacataac agctatacct gtgaggccac tcacaagaca 600
tcaacttcac ccattgtcaa gagcttcaac aggaatgagt gttag
645

```

<210> 44
 <211> 19
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Leader sequence; heavy chain (clone 15)

```

<400> 44
Met Glu Trp Pro Leu Ile Phe Leu Phe Leu Leu Ser Gly Thr Ala Gly
1           5           10          15
Val Gln Ser

```

<210> 45
 <211> 57
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Leader sequence; heavy chain (clone 15)

<400> 45

atggaatggc ctttgatctt tctcttcctc ctgtcaggaa ctgcaggtgt ccaatcc 57

<210> 46

<211> 20

<212> PRT

<213> Artificial Sequence

<220>

<223> Leader sequence; light chain (clone 15)

<400> 46

Met Ser Val Pro Thr Gln Val Leu Gly Leu Leu Leu Trp Leu Thr

1

5

10

15

Gly Ala Arg Cys

20

<210> 47

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Leader sequence; light chain (clone 15)

<400> 47

atgagtgtgc ccactcaggt cctgggggttg ctgctgctgt ggcttacagg tgccagatgt 60

<210> 48

<211> 348

<212> DNA

<213> Artificial Sequence

<220>

<223> VH (clone 15)

<400> 48

caggttcagc tgcagcagtc tggggctgag ctggtgaagc ctggggcctc agtgaagatt 60

tcttgcaaag cttctggcta cgcattcagt agctactgga tgaactgggt gaagcagagg 120

cctggaaagg gtcttgaatg gattggacag atttatcctg gaaatgggtga aactaacaac 180

aacggaaagt tcaagggcaa ggccacactg actgcagaca taticctccag cacagcctac 240

atgcagctca gcagcctgac atctgaggac tctgcggtct atttctgtgc aagagggggc 300

tggtacttcg atgtctgggg cacagggacc acggtcaccg tctcctca 348

<210> 49

<211> 321

<212> DNA

<213> Artificial Sequence

<220>

<223> VL (clone 15)

<400> 49

```

gacatccaga tgactcagtc tccagcctcc ctatctgcat ctgtgggaga aactgtcacc 60
atcacatgtc gagcaagtga gaatattttac agttattttag catggtatca gcagaaacag 120
ggaaaatctc ctcacctcct ggtctataat gcatacacct tagcagaagg tgtgccatca 180
agattcagtg gcagtggatc agacacacag ttttctctga agatcaacag tctgcagcct 240
gaagattttg ggaattatta ctgtcaacat cattatggta ctccgtggac gttcgggtgga 300
ggcaccaagg tggaaatcaa a                                     321

```

<210> 50
 <211> 228
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Spacer

```

<400> 50
Glu Ser Lys Tyr Gly Pro Pro Cys Pro Pro Cys Pro Ala Pro Pro Val
 1           5           10           15
Ala Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu
          20           25           30
Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser
      35           40           45
Gln Glu Asp Pro Glu Val Gln Phe Asn Trp Tyr Val Asp Gly Val Glu
      50           55           60
Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Phe Gln Ser Thr
      65           70           75           80
Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn
          85           90           95
Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Gly Leu Pro Ser Ser
          100          105          110
Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln
          115          120          125
Val Tyr Thr Leu Pro Pro Ser Gln Glu Glu Met Thr Lys Asn Gln Val
          130          135          140
Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val
          145          150          155          160
Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro
          165          170          175
Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Arg Leu Thr
          180          185          190
Val Asp Lys Ser Arg Trp Gln Glu Gly Asn Val Phe Ser Cys Ser Val
          195          200          205
Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu
          210          215          220
Ser Leu Gly Lys
225

```

<210> 51
 <211> 357
 <212> PRT
 <213> Artificial Sequence

<220>

<223> Truncated EGFR (tEGFR)

<400> 51

Met	Leu	Leu	Leu	Val	Thr	Ser	Leu	Leu	Leu	Cys	Glu	Leu	Pro	His	Pro
1				5					10					15	
Ala	Phe	Leu	Leu	Ile	Pro	Arg	Lys	Val	Cys	Asn	Gly	Ile	Gly	Ile	Gly
			20					25					30		
Glu	Phe	Lys	Asp	Ser	Leu	Ser	Ile	Asn	Ala	Thr	Asn	Ile	Lys	His	Phe
		35					40					45			
Lys	Asn	Cys	Thr	Ser	Ile	Ser	Gly	Asp	Leu	His	Ile	Leu	Pro	Val	Ala
		50				55					60				
Phe	Arg	Gly	Asp	Ser	Phe	Thr	His	Thr	Pro	Pro	Leu	Asp	Pro	Gln	Glu
65					70				75					80	
Leu	Asp	Ile	Leu	Lys	Thr	Val	Lys	Glu	Ile	Thr	Gly	Phe	Leu	Leu	Ile
				85				90						95	
Gln	Ala	Trp	Pro	Glu	Asn	Arg	Thr	Asp	Leu	His	Ala	Phe	Glu	Asn	Leu
			100					105					110		
Glu	Ile	Ile	Arg	Gly	Arg	Thr	Lys	Gln	His	Gly	Gln	Phe	Ser	Leu	Ala
			115				120					125			
Val	Val	Ser	Leu	Asn	Ile	Thr	Ser	Leu	Gly	Leu	Arg	Ser	Leu	Lys	Glu
	130					135					140				
Ile	Ser	Asp	Gly	Asp	Val	Ile	Ile	Ser	Gly	Asn	Lys	Asn	Leu	Cys	Tyr
145					150				155					160	
Ala	Asn	Thr	Ile	Asn	Trp	Lys	Lys	Leu	Phe	Gly	Thr	Ser	Gly	Gln	Lys
				165				170						175	
Thr	Lys	Ile	Ile	Ser	Asn	Arg	Gly	Glu	Asn	Ser	Cys	Lys	Ala	Thr	Gly
			180				185						190		
Gln	Val	Cys	His	Ala	Leu	Cys	Ser	Pro	Glu	Gly	Cys	Trp	Gly	Pro	Glu
		195					200					205			
Pro	Arg	Asp	Cys	Val	Ser	Cys	Arg	Asn	Val	Ser	Arg	Gly	Arg	Glu	Cys
	210					215					220				
Val	Asp	Lys	Cys	Asn	Leu	Leu	Glu	Gly	Glu	Pro	Arg	Glu	Phe	Val	Glu
225					230				235					240	
Asn	Ser	Glu	Cys	Ile	Gln	Cys	His	Pro	Glu	Cys	Leu	Pro	Gln	Ala	Met
				245				250						255	
Asn	Ile	Thr	Cys	Thr	Gly	Arg	Gly	Pro	Asp	Asn	Cys	Ile	Gln	Cys	Ala
			260				265						270		
His	Tyr	Ile	Asp	Gly	Pro	His	Cys	Val	Lys	Thr	Cys	Pro	Ala	Gly	Val
		275					280					285			
Met	Gly	Glu	Asn	Asn	Thr	Leu	Val	Trp	Lys	Tyr	Ala	Asp	Ala	Gly	His
	290					295					300				
Val	Cys	His	Leu	Cys	His	Pro	Asn	Cys	Thr	Tyr	Gly	Cys	Thr	Gly	Pro
305					310					315				320	
Gly	Leu	Glu	Gly	Cys	Pro	Thr	Asn	Gly	Pro	Lys	Ile	Pro	Ser	Ile	Ala
				325				330						335	
Thr	Gly	Met	Val	Gly	Ala	Leu	Leu	Leu	Leu	Val	Val	Ala	Leu	Gly	
			340				345					350			
Ile	Gly	Leu	Phe	Met											
		355													

<210> 52

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> CDR-H1; Kabat (clone 10)

<400> 52

Arg Tyr Trp Met Ser
1 5

<210> 53

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> CDR-H2; Kabat (clone 10)

<400> 53

Glu Ile Asn Pro Asp Ser Ser Thr Ile Asn Tyr Thr Pro Ser Leu Lys
1 5 10 15
Asp

<210> 54

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> CDR-H3; Kabat, Chothia, AbM (clone 10)

<400> 54

His Gly Tyr Tyr Trp Tyr Phe Asp Val
1 5

<210> 55

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> CDR-H1; Chothia (clone 10)

<400> 55

Gly Phe Asp Phe Ser Arg Tyr
1 5

<210> 56

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> CDR-H2; Chothia (clone 10)

<400> 56

Asn Pro Asp Ser Ser Thr
1 5

<210> 57

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> CDR-H1; AbM (clone 10)

<400> 57

Gly Phe Asp Phe Ser Arg Tyr Trp Met Ser
1 5 10

<210> 58

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> CDR-H2; AbM (clone 10)

<400> 58

Glu Ile Asn Pro Asp Ser Ser Thr Ile Asn
1 5 10

<210> 59

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> CDR-L1; Kabat, Chothia, AbM (clone 10)

<400> 59

Arg Ala Ser Gln Asp Ile Ser Asn Tyr Leu Asn
1 5 10

<210> 60

<211> 7

<212> PRT

<213> Artificial Sequence

<220>
<223> CDR-L2; Kabat, Chothia, AbM (clone 10)

<400> 60
Tyr Thr Ser Arg Leu His Ser
1 5

<210> 61
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR-L3; Kabat, Chothia, AbM (clone 10)

<400> 61
Gln Gln Gly Asn Thr Leu Pro Tyr Thr
1 5

<210> 62
<211> 118
<212> PRT
<213> Artificial Sequence

<220>
<223> VH (clone 10)

<400> 62
Glu Val Lys Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15
Ser Leu Lys Leu Ser Cys Ala Ala Ser Gly Phe Asp Phe Ser Arg Tyr
20 25 30
Trp Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Ile
35 40 45
Gly Glu Ile Asn Pro Asp Ser Thr Ile Asn Tyr Thr Pro Ser Leu
50 55 60
Lys Asp Lys Phe Ile Ile Ser Arg Asp Asn Ala Lys Asn Thr Leu Tyr
65 70 75 80
Leu Gln Met Ser Lys Val Arg Ser Glu Asp Thr Ala Leu Tyr Tyr Cys
85 90 95
Ala Arg His Gly Tyr Tyr Trp Tyr Phe Asp Val Trp Gly Ala Gly Thr
100 105 110
Thr Val Thr Val Ser Ser
115

<210> 63
<211> 107
<212> PRT
<213> Artificial Sequence

<220>

<223> VL (clone 10)

<400> 63

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

<210> 64

<211> 442

<212> PRT

<213> Artificial Sequence

<220>

<223> Heavy chain (clone 10)

<400> 64

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

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

<210> 65

<211> 214

<212> PRT

<213> Artificial Sequence

<220>

<223> Light chain (clone 10)

<400> 65

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

			100					105				110					
Pro	Thr	Val	Ser	Ile	Phe	Pro	Pro	Ser	Ser	Glu	Gln	Leu	Thr	Ser	Gly		
		115					120					125					
Gly	Ala	Ser	Val	Val	Cys	Phe	Leu	Asn	Asn	Phe	Tyr	Pro	Lys	Asp	Ile		
	130					135					140						
Asn	Val	Lys	Trp	Lys	Ile	Asp	Gly	Ser	Glu	Arg	Gln	Asn	Gly	Val	Leu		
145					150					155					160		
Asn	Ser	Trp	Thr	Asp	Gln	Asp	Ser	Lys	Asp	Ser	Thr	Tyr	Ser	Met	Ser		
			165						170					175			
Ser	Thr	Leu	Thr	Leu	Thr	Lys	Asp	Glu	Tyr	Glu	Arg	His	Asn	Ser	Tyr		
		180					185						190				
Thr	Cys	Glu	Ala	Thr	His	Lys	Thr	Ser	Thr	Ser	Pro	Ile	Val	Lys	Ser		
	195						200					205					
Phe	Asn	Arg	Asn	Glu	Cys												
	210																

<210> 66

<211> 1329

<212> DNA

<213> Artificial Sequence

<220>

<223> Heavy chain (clone 10)

<400> 66

```

gaggtgaagc ttctcgagtc tggaggtggc ctggtgcagc ctggaggatc cctgaaactc 60
tcctgtgcag cctcaggatt cgattttagt agatactgga tgagttgggt ccggcaggct 120
ccagggaaag ggctagaatg gattggagaa attaatccag atagcagtac gataaactat 180
acgccatctc taaaggataa attcatcatc tccagagaca acgcaaaaaa tacgctgtac 240
ctgcaaatga gcaaagttag atctgaggac acagcccttt attactgtgc aagacatggc 300
tactactggc acttcgatgt ctggggcgca gggaccacgg tcaccgtctc ctcagccaaa 360
acgacacccc catctgtcta tccactggcc cctggatctg ctgccccaaac taactccatg 420
gtgaccctgg gatgcctggc caagggctat ttccctgagc cagtgcagtc gacctggaac 480
tctggatccc tgtccagcgg tgtgcacacc ttcccagctg tcctgcagtc tgacctctac 540
actctgagca gctcagtgac tgtcccctcc agcacctggc ccagcgagac cgtcacctgc 600
aacgttgccc acccgccag cagcaccaag gtggacaaga aaattgtgcc cagggattgt 660
ggttgtaagc cttgcatatg tacagtcca gaagtatcat ctgtcttcat cttcccccca 720
aagcccaagg atgtgtcac cattactctg actcctaagg tcacgtgtgt tgtggtagac 780
atcagcaagg atgatccga ggtccagttc agctggtttg tagatgatgt ggaggtgcac 840
acagctcaga cgcaaccccg ggaggagcag ttcaacagca ctttccgctc agtcagtga 900
cttcccatca tgcaccagga ctgggtcaat ggcaaggagt tcaaatgcag ggtcaacagt 960
gcagctttcc ctgcccccat cgagaaaacc atctccaaaa ccaaaggcag accgaaggct 1020
ccacaggtgt acaccattcc acctcccaag gagcagatgg ccaaggataa agtcagtctg 1080
acctgcatga taacagactt cttccctgaa gacattactg tggagtggca gtggaatggg 1140
cagccagcgg agaactacaa gaacactcag cccatcatgg acacagatgg ctcttacttc 1200
gtctacagca agctcaatgt gcagaagagc aactgggagg caggaaatac tttcacctgc 1260
tctgtgttac atgagggcct gcacaaccac catactgaga agagcctctc ccactctcct 1320
ggtaaatga                                     1329

```

<210> 67

<211> 354

<212> DNA

<213> Artificial Sequence

<220>

<223> VH (clone 10)

<400> 67

```
gaggtgaagc ttctcgagtc tggaggtggc ctggtgcagc ctggaggatc cctgaaactc 60
tcctgtgcag cctcaggatt cgattttagt agatactgga tgagttgggt ccggcaggct 120
ccagggaaag ggctagaatg gattggagaa attaatccag atagcagtac gataaactat 180
acgccatctc taaaggataa attcatcatc tccagagaca acgcaaaaaa tacgctgtac 240
ctgcaaatga gcaaagttag atctgaggac acagcccttt attactgtgc aagacatggg 300
tactactggg acttcgatgt ctggggcgca gggaccacgg tcaccgtctc ctca      354
```

<210> 68

<211> 321

<212> DNA

<213> Artificial Sequence

<220>

<223> VL (clone 10)

<400> 68

```
gatatccaga tgacacagac tacatcctcc ctgtctgcct ctctgggaga cagagtcacc 60
atcagttgca gggcaagtca ggacattagc aattatttaa actggtatca gcagaaacca 120
gatggaactg ttaaactcct gatctactac acatcaagat tacactcagg agtcccatca 180
aggttcagtg gcagtgggtc tggaacagat tattctctca ccattagcaa cctggagcaa 240
gaagatattg ccacttactt ttgccaacag ggtaatacgc ttccgtacac gttcggaggg 300
gggaccaagc tggaaataaa a      321
```

<210> 69

<211> 645

<212> DNA

<213> Artificial Sequence

<220>

<223> Light chain (clone 10)

<400> 69

```
gatatccaga tgacacagac tacatcctcc ctgtctgcct ctctgggaga cagagtcacc 60
atcagttgca gggcaagtca ggacattagc aattatttaa actggtatca gcagaaacca 120
gatggaactg ttaaactcct gatctactac acatcaagat tacactcagg agtcccatca 180
aggttcagtg gcagtgggtc tggaacagat tattctctca ccattagcaa cctggagcaa 240
gaagatattg ccacttactt ttgccaacag ggtaatacgc ttccgtacac gttcggaggg 300
gggaccaagc tggaaataaa acgggctgat gctgcaccaa ctgtatccat cttcccacca 360
tccagtgagc agttaacatc tggaggtgcc tcagtcgtgt gcttcttgaa caacttctac 420
cccaaagaca tcaatgtcaa gtggaagatt gatggcagtg aacgacaaaa tggcgtcctg 480
aacagttgga ctgatcagga cagcaaagac agcacctaca gcatgagcag caccctcacg 540
ttgaccaagg acgagtatga acgacataac agctatacct gtgaggccac tcacaagaca 600
tcaacttcac ccattgtcaa gagcttcaac aggaatgagt gttag      645
```

<210> 70

<211> 18

<212> PRT

<213> Artificial Sequence

<220>

<223> Leader sequence; heavy chain (clone 10)

<400> 70

Met	Asp	Phe	Gly	Leu	Ile	Phe	Phe	Ile	Val	Ala	Leu	Leu	Lys	Gly	Val
1				5				10					15		
Gln	Cys														

<210> 71

<211> 54

<212> DNA

<213> Artificial Sequence

<220>

<223> Leader sequence; heavy chain (clone 10)

<400> 71

atggattttg ggctgatttt ttttattggt gctcttttaa aaggggtcca gtgt 54

<210> 72

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Leader sequence; light chain (clone 10)

<400> 72

Met	Ser	Ser	Ala	Gln	Phe	Leu	Gly	Leu	Leu	Leu	Leu	Cys	Phe	Gln	Gly
1				5				10					15		
Thr	Arg	Cys													

<210> 73

<211> 57

<212> DNA

<213> Artificial Sequence

<220>

<223> Leader sequence; light chain (clone 10)

<400> 73

atgtcctctg ctcaagttcct tggctctcctg ttgctctggt ttcaaggtac cagatgt 57

<210> 74

<211> 5

<212> PRT

<213> Artificial Sequence

<220>

<223> CDR-H1; Kabat (clone 19)

<400> 74

Ala Tyr Trp Ile Glu
1 5

<210> 75

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> CDR-H2; Kabat (clone 19)

<400> 75

Glu Ile Leu Pro Gly Ser Gly Ile Thr Lys Tyr Ser Glu Lys Phe Lys
1 5 10 15
Gly

<210> 76

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> CDR-H3; Kabat, Chothia, AbM (clone 19)

<400> 76

Asp Tyr Tyr Ser Asp Asn Tyr
1 5

<210> 77

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> CDR-H1; Chothia (clone 19)

<400> 77

Gly Tyr Thr Phe Thr Ala Tyr
1 5

<210> 78

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> CDR-H2; Chothia (clone 19)

<400> 78

Leu Pro Gly Ser Gly Ile
1 5

<210> 79

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> CDR-H1; AbM (clone 19)

<400> 79

Gly Tyr Thr Phe Thr Ala Tyr Trp Ile Glu
1 5 10

<210> 80

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> CDR-H2; AbM (clone 19)

<400> 80

Glu Ile Leu Pro Gly Ser Gly Ile Thr Lys
1 5 10

<210> 81

<211> 16

<212> PRT

<213> Artificial Sequence

<220>

<223> CDR-L1; Kabat, Chothia, AbM (clone 19)

<400> 81

Lys Ser Ser Gln Ser Leu Leu Asp Ser Asp Gly Arg Thr Tyr Leu Asn
1 5 10 15

<210> 82

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> CDR-L2; Kabat, Chothia, AbM (clone 19)

<400> 82

Leu Val Ser Lys Leu Asp Ser
1 5

<210> 83

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> CDR-L3; Kabat, Chothia, AbM (clone 19)

<400> 83

Trp Gln Gly Thr Leu Phe Pro Tyr Thr
1 5

<210> 84

<211> 116

<212> PRT

<213> Artificial Sequence

<220>

<223> VH (clone 19)

<400> 84

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

<210> 85

<211> 112

<212> PRT

<213> Artificial Sequence

<220>

<223> VL (clone 19)

<400> 85

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

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

<210> 86

<211> 452

<212> PRT

<213> Artificial Sequence

<220>

<223> Heavy chain (clone 19)

<400> 86

Gln	Val	Gln	Leu	Gln	Gln	Ser	Gly	Ala	Glu	Leu	Met	Lys	Pro	Gly	Ala	
1				5				10						15		
Ser	Val	Lys	Leu	Ser	Cys	Lys	Ala	Thr	Gly	Tyr	Thr	Phe	Thr	Ala	Tyr	
		20					25						30			
Trp	Ile	Glu	Trp	Val	Lys	Gln	Arg	Pro	Gly	His	Gly	Leu	Glu	Trp	Ile	
	35					40						45				
Gly	Glu	Ile	Leu	Pro	Gly	Ser	Gly	Ile	Thr	Lys	Tyr	Ser	Glu	Lys	Phe	
	50				55					60						
Lys	Gly	Lys	Ala	Thr	Phe	Thr	Ala	Asp	Thr	Ser	Ser	Asn	Thr	Ala	Tyr	
65				70				75						80		
Met	Gln	Leu	Ser	Ser	Leu	Thr	Thr	Glu	Asp	Ser	Ala	Ile	Tyr	Tyr	Cys	
			85					90					95			
Ala	Arg	Asp	Tyr	Tyr	Ser	Asp	Asn	Tyr	Trp	Gly	Gln	Gly	Thr	Ser	Val	
		100					105						110			
Thr	Val	Ser	Ser	Ala	Lys	Thr	Thr	Pro	Pro	Ser	Val	Tyr	Pro	Leu	Ala	
	115					120						125				
Pro	Gly	Cys	Gly	Asp	Thr	Thr	Gly	Ser	Ser	Val	Thr	Leu	Gly	Cys	Leu	
	130				135					140						
Val	Lys	Gly	Tyr	Phe	Pro	Glu	Ser	Val	Thr	Val	Thr	Trp	Asn	Ser	Gly	
145				150				155						160		
Ser	Leu	Ser	Ser	Ser	Val	His	Thr	Phe	Pro	Ala	Leu	Leu	Gln	Ser	Gly	
			165					170						175		
Leu	Tyr	Thr	Met	Ser	Ser	Ser	Val	Thr	Val	Pro	Ser	Ser	Thr	Trp	Pro	
		180					185						190			
Ser	Gln	Thr	Val	Thr	Cys	Ser	Val	Ala	His	Pro	Ala	Ser	Ser	Thr	Thr	
	195					200						205				
Val	Asp	Lys	Lys	Leu	Glu	Pro	Ser	Gly	Pro	Ile	Ser	Thr	Ile	Asn	Pro	
	210				215					220						
Cys	Pro	Pro	Cys	Lys	Glu	Cys	His	Lys	Cys	Pro	Ala	Pro	Asn	Leu	Glu	
225				230						235					240	

Gly	Gly	Pro	Ser	Val	Phe	Ile	Phe	Pro	Pro	Asn	Ile	Lys	Asp	Val	Leu
				245					250					255	
Met	Ile	Ser	Leu	Thr	Pro	Lys	Val	Thr	Cys	Val	Val	Val	Asp	Val	Ser
			260					265					270		
Glu	Asp	Asp	Pro	Asp	Val	Arg	Ile	Ser	Trp	Phe	Val	Asn	Asn	Val	Glu
		275					280					285			
Val	His	Thr	Ala	Gln	Thr	Gln	Thr	His	Arg	Glu	Asp	Tyr	Asn	Ser	Thr
	290					295					300				
Ile	Arg	Val	Val	Ser	Ala	Leu	Pro	Ile	Gln	His	Gln	Asp	Trp	Met	Ser
305					310					315					320
Gly	Lys	Glu	Phe	Lys	Cys	Lys	Val	Asn	Asn	Lys	Asp	Leu	Pro	Ser	Pro
				325					330					335	
Ile	Glu	Arg	Thr	Ile	Ser	Lys	Ile	Lys	Gly	Leu	Val	Arg	Ala	Pro	Gln
			340					345					350		
Val	Tyr	Ile	Leu	Pro	Pro	Pro	Ala	Glu	Gln	Leu	Ser	Arg	Lys	Asp	Val
		355					360					365			
Ser	Leu	Thr	Cys	Leu	Val	Val	Gly	Phe	Asn	Pro	Gly	Asp	Ile	Ser	Val
	370					375					380				
Glu	Trp	Thr	Ser	Asn	Gly	His	Thr	Glu	Glu	Asn	Tyr	Lys	Asp	Thr	Ala
385					390					395					400
Pro	Val	Leu	Asp	Ser	Asp	Gly	Ser	Tyr	Phe	Ile	Tyr	Ser	Lys	Leu	Asp
				405					410					415	
Ile	Lys	Thr	Ser	Lys	Trp	Glu	Lys	Thr	Asp	Ser	Phe	Ser	Cys	Asn	Val
			420					425					430		
Arg	His	Glu	Gly	Leu	Lys	Asn	Tyr	Tyr	Leu	Lys	Lys	Thr	Ile	Ser	Arg
		435					440					445			
Ser	Pro	Gly	Lys												
			450												

<210> 87

<211> 219

<212> PRT

<213> Artificial Sequence

<220>

<223> Light chain (clone 19)

<400> 87

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

	115		120		125										
Gln	Leu	Thr	Ser	Gly	Gly	Ala	Ser	Val	Val	Cys	Phe	Leu	Asn	Asn	Phe
	130					135					140				
Tyr	Pro	Lys	Asp	Ile	Asn	Val	Lys	Trp	Lys	Ile	Asp	Gly	Ser	Glu	Arg
145					150					155					160
Gln	Asn	Gly	Val	Leu	Asn	Ser	Trp	Thr	Asp	Gln	Asp	Ser	Lys	Asp	Ser
				165					170					175	
Thr	Tyr	Ser	Met	Ser	Ser	Thr	Leu	Thr	Leu	Thr	Lys	Asp	Glu	Tyr	Glu
			180					185					190		
Arg	His	Asn	Ser	Tyr	Thr	Cys	Glu	Ala	Thr	His	Lys	Thr	Ser	Thr	Ser
	195					200					205				
Pro	Ile	Val	Lys	Ser	Phe	Asn	Arg	Asn	Glu	Cys					
	210					215									

<210> 88

<211> 1359

<212> DNA

<213> Artificial Sequence

<220>

<223> Heavy chain (clone 19)

<400> 88

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caggttcagc tgcagcagtc tggagctgag ctgatgaagc ctggggcctc agtgaagctt 60
tcctgcaagg ctactggcta cacattcact gcctactgga tagagtgggt aaagcagagg 120
cctggacatg gccttgagtg gattggagag attttacctg gaagtgggtat tactaaatac 180
agtgagaagt tcaagggcaa ggccacattc actgcagata catcctcaa tacagcctac 240
atgcaactca gcagcctgac aactgaggac tctgccatct attactgtgc aagagactac 300
tatagtgaca actactgggg tcaaggaacc tcagtcaccg tctcctcagc caaaacaaca 360
cccccatcag tctatccact ggcccctggg tgtggagata caactggttc ctctgtgact 420
ctgggatgcc tgggtcaaggg ctacttccct gagtcagtga ctgtgacttg gaactctgga 480
tccctgtcca gcagtgtgca caccttccca gctctcctgc agtctggact ctacactatg 540
agcagctcag tgactgtccc ctccagcacc tggccaagtc agaccgtcac ctgcagcggt 600
gtcaccag ccagcagcac cacggtggac aaaaaacttg agcccagcgg gccatttca 660
acaatcaacc cctgtcctcc atgcaaggag tgtcacaat gccagctcc taacctcgag 720
gggtggaccat ccgtcttcat cttccctcca aatatcaagg atgtactcat gatctcctg 780
acaccaagg tcacgtgtgt ggtggtggat gtgagcgagg atgaccaga cgtccggtc 840
agctggtttg tgaacaacgt ggaagtacac acagctcaga cacaaacca tagagaggat 900
tacaacagta ctatccgggt ggtcagtgcc ctccccatcc agcaccagga ctggatgagt 960
ggcaaggagt tcaaagcaa ggtcaacaac aaagacctcc catcacccat cgagagaacc 1020
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gagcagttgt ccaggaaaga tgtcagtctc acttgccctgg tcgtgggctt caaccctgga 1140
gacatcagtg tggagtggac cagcaatggg catacagagg agaactaaa ggacaccgca 1200
ccagtcctgg actctgacgg ttcttacttc atatacagca agctcgatat aaaaacaagc 1260
aagtgggaga aaacagattc cttctcatgc aacgtgagac acgagggtct gaaaaattac 1320
tacctgaaga agaccatctc ccggtctccg ggtaaata 1359

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<210> 89

<211> 660

<212> DNA

<213> Artificial Sequence

<220>

<223> Light chain (clone 19)

<400> 89

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gatgttgtga tgaccagat tccactcact ttgtcggtta ccattggaca accagcctcc 60
atctcttgca agtcaagtca gagcctctta gatagtgatg gaaggacata tttgaattgg 120
ttgttacaga ggccaggcca gtctccaaag cgcctaactc atctggtgtc taaactggac 180
tctggagtcc ctgacagggt cactggcagt ggatcaggga cagatttcac attgaaaatc 240
agcagagtgg aggctgagga tttgggagtt tattattgct ggcaaggtag actttttccg 300
tacacgttcg gaggggggac caagctggag ataaaacggg ctgatgctgc accaactgta 360
tccatcttcc caccatccag tgagcagtta acatctggag gtgcctcagt cgtgtgcttc 420
ttgaacaact tctaccccaa agacatcaat gtcaagtgga agattgatgg cagtgaacga 480
caaatggcg tcctgaacag ttggactgat caggacagca aagacagcac ctacagcatg 540
agcagcacc tcacgttgac caaggacgag tatgaacgac ataacagcta tacctgtgag 600
gccactcaca agacatcaac ttcacccatt gtcaagagct tcaacaggaa tgagtgttag 660
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<210> 90

<211> 348

<212> DNA

<213> Artificial Sequence

<220>

<223> VH (clone 19)

<400> 90

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caggttcagc tgcagcagtc tggagctgag ctgatgaagc ctggggcctc agtgaagctt 60
tcctgcaagg ctactggcta cacattcact gcctactgga tagagtgggt aaagcagagg 120
cctggacatg gccttgagtg gattggagag attttacctg gaagtgggtat tactaaatac 180
agtgagaagt tcaagggcaa ggccacattc actgcagata catcctcaa tacagcctac 240
atgcaactca gcagcctgac aactgaggac tctgccatct attactgtgc aagagactac 300
tatagtgaca actactgggg tcaaggaacc tcagtcaccg tctcctca 348
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<210> 91

<211> 336

<212> DNA

<213> Artificial Sequence

<220>

<223> VL (clone 19)

<400> 91

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atctcttgca agtcaagtca gagcctctta gatagtgatg gaaggacata tttgaattgg 120
ttgttacaga ggccaggcca gtctccaaag cgcctaactc atctggtgtc taaactggac 180
tctggagtcc ctgacagggt cactggcagt ggatcaggga cagatttcac attgaaaatc 240
agcagagtgg aggctgagga tttgggagtt tattattgct ggcaaggtag actttttccg 300
tacacgttcg gaggggggac caagctggag ataaaa 336
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<210> 92

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Leader sequence; heavy chain (clone 19)

<400> 92

Met	Glu	Trp	Thr	Trp	Val	Phe	Leu	Phe	Leu	Leu	Ser	Val	Thr	Ala	Gly
1				5				10						15	
Val	His	Ser													

<210> 93

<211> 57

<212> DNA

<213> Artificial Sequence

<220>

<223> Leader sequence; heavy chain (clone 19)

<400> 93

atggaatgga cctgggtctt tctcttcctc ctgtcagtaa ctgcaggtgt ccactcc 57

<210> 94

<211> 19

<212> PRT

<213> Artificial Sequence

<220>

<223> Leader sequence; light chain (clone 19)

<400> 94

Met	Ser	Pro	Ala	Gln	Phe	Leu	Phe	Leu	Leu	Val	Leu	Trp	Ile	Arg	Glu
1				5				10						15	
Thr	Asn	Gly													

<210> 95

<211> 57

<212> DNA

<213> Artificial Sequence

<220>

<223> Leader sequence; light chain (clone 19)

<400> 95

atgagtcctg cccagttcct gtttctgtta gtgctctgga ttcgggaaac caacggt 57

<210> 96

<211> 28

<212> PRT

<213> Homo sapiens

<220>

<223> CD28 transmembrane domain

<400> 96

Met	Phe	Trp	Val	Leu	Val	Val	Val	Gly	Gly	Val	Leu	Ala	Cys	Tyr	Ser
1				5				10					15		
Leu	Leu	Val	Thr	Val	Ala	Phe	Ile	Ile	Phe	Trp	Val				
			20				25								

<210> 97

<211> 41

<212> PRT

<213> Homo sapiens

<220>

<223> CD28 (amino acids 180-220 of P10747)

<400> 97

Arg	Ser	Lys	Arg	Ser	Arg	Leu	Leu	His	Ser	Asp	Tyr	Met	Asn	Met	Thr
1				5				10					15		
Pro	Arg	Arg	Pro	Gly	Pro	Thr	Arg	Lys	His	Tyr	Gln	Pro	Tyr	Ala	Pro
			20				25					30			
Pro	Arg	Asp	Phe	Ala	Ala	Tyr	Arg	Ser							
		35					40								

<210> 98

<211> 41

<212> PRT

<213> Homo sapiens

<220>

<223> CD28 (LL to GG)

<400> 98

Arg	Ser	Lys	Arg	Ser	Arg	Gly	Gly	His	Ser	Asp	Tyr	Met	Asn	Met	Thr
1				5				10					15		
Pro	Arg	Arg	Pro	Gly	Pro	Thr	Arg	Lys	His	Tyr	Gln	Pro	Tyr	Ala	Pro
			20				25					30			
Pro	Arg	Asp	Phe	Ala	Ala	Tyr	Arg	Ser							
		35					40								

<210> 99

<211> 42

<212> PRT

<213> Homo sapiens

<220>

<223> 4-1BB (amino acids 214-255 of Q07011.1)

<400> 99

Lys	Arg	Gly	Arg	Lys	Lys	Leu	Leu	Tyr	Ile	Phe	Lys	Gln	Pro	Phe	Met
1				5				10					15		
Arg	Pro	Val	Gln	Thr	Thr	Gln	Glu	Glu	Asp	Gly	Cys	Ser	Cys	Arg	Phe
			20				25					30			

Pro Glu Glu Glu Glu Gly Gly Cys Glu Leu
35 40

<210> 100
<211> 112
<212> PRT
<213> Homo sapiens

<220>
<223> CD3-zeta derived intracellular signaling domain

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

<210> 101
<211> 12
<212> PRT
<213> Homo sapiens

<220>
<223> Spacer (IgG4hinge)

<400> 101
Glu Ser Lys Tyr Gly Pro Pro Cys Pro Pro Cys Pro
1 5 10

<210> 102
<211> 119
<212> PRT
<213> Homo sapiens

<220>
<223> Hinge-CH3 spacer

<400> 102
Glu Ser Lys Tyr Gly Pro Pro Cys Pro Pro Cys Pro Gly Gln Pro Arg
1 5 10 15
Glu Pro Gln Val Tyr Thr Leu Pro Pro Ser Gln Glu Glu Met Thr Lys

<210> 104
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR-H1; Kabat (clone 16)

<400> 104
Asp Phe Tyr Ile Asn
1 5

<210> 105
<211> 17
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR-H2; Kabat (clone 16)

<400> 105
Trp Ile Phe Pro Arg Ser Gly Ser Thr Tyr Tyr Asn Glu Lys Phe Lys
1 5 10 15
Gly

<210> 106
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR-H3; Kabat, Chothia, AbM (clone 16)

<400> 106
Gly Asp Gly Tyr Ser Gly Ala Met Asp Tyr
1 5 10

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

<220>
<223> CDR-H1; Chothia (clone 16)

<400> 107
Gly Tyr Thr Gly Thr Asp Phe
1 5

<210> 108
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR-H2; Chothia (clone 16)

<400> 108
Phe Pro Arg Ser Gly Ser
1 5

<210> 109
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR-H1; AbM (clone 16)

<400> 109
Gly Tyr Thr Gly Thr Asp Phe Tyr Ile Asn
1 5 10

<210> 110
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR-H2; AbM (clone 16)

<400> 110
Trp Ile Phe Pro Arg Ser Gly Ser Thr Tyr
1 5 10

<210> 111
<211> 11
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR-L1; Kabat, Chothia, AbM (clone 16)

<400> 111
Ser Ala Ser Gln Gly Ile Arg Asn Tyr Leu Asn
1 5 10

<210> 112
<211> 7
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR-L2; Kabat, Chothia, AbM (clone 16)

<400> 112
Tyr Thr Ser Asn Leu His Ser
1 5

<210> 113
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> CDR-L3; Kabat, Chothia, AbM (clone 16)

<400> 113
Gln Gln Tyr Asn Asn Leu Pro Arg Thr
1 5

<210> 114
<211> 119
<212> PRT
<213> Artificial Sequence

<220>
<223> VH (clone 16)

<400> 114
Gln Val Gln Leu Gln Gln Ser Gly Pro Glu Leu Val Lys Pro Gly Ala
1 5 10 15
Ser Val Lys Ile Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Asp Phe
20 25 30
Tyr Ile Asn Trp Val Lys Gln Arg Pro Gly Gln Gly Leu Glu Trp Ile
35 40 45
Gly Trp Ile Phe Pro Arg Ser Gly Ser Thr Tyr Tyr Asn Glu Lys Phe
50 55 60
Lys Gly Lys Ala Thr Leu Ser Val Asp Lys Ser Ser Ile Thr Ala Tyr
65 70 75 80
Met Leu Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Phe Cys
85 90 95
Ala Arg Gly Asp Gly Tyr Ser Gly Ala Met Asp Tyr Trp Gly Gln Gly
100 105 110
Thr Ser Val Thr Val Ser Ser
115

<210> 115

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

<220>
<223> VL (clone 16)

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

<210> 116
<211> 443
<212> PRT
<213> Artificial Sequence

<220>
<223> Heavy chain (clone 16)

<400> 116
Gln Val Gln Leu Gln Gln Ser Gly Pro Glu Leu Val Lys Pro Gly Ala
1 5 10 15
Ser Val Lys Ile Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Asp Phe
20 25 30
Tyr Ile Asn Trp Val Lys Gln Arg Pro Gly Gln Gly Leu Glu Trp Ile
35 40 45
Gly Trp Ile Phe Pro Arg Ser Gly Ser Thr Tyr Tyr Asn Glu Lys Phe
50 55 60
Lys Gly Lys Ala Thr Leu Ser Val Asp Lys Ser Ser Ile Thr Ala Tyr
65 70 75 80
Met Leu Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Phe Cys
85 90 95
Ala Arg Gly Asp Gly Tyr Ser Gly Ala Met Asp Tyr Trp Gly Gln Gly
100 105 110
Thr Ser Val Thr Val Ser Ser Ala Lys Thr Thr Pro Pro Ser Val Tyr
115 120 125
Pro Leu Ala Pro Gly Ser Ala Ala Gln Thr Asn Ser Met Val Thr Leu
130 135 140
Gly Cys Leu Val Lys Gly Tyr Phe Pro Glu Pro Val Thr Val Thr Trp
145 150 155 160
Asn Ser Gly Ser Leu Ser Ser Gly Val His Thr Phe Pro Ala Val Leu

				165				170					175			
Gln	Ser	Asp	Leu	Tyr	Thr	Leu	Ser	Ser	Ser	Val	Thr	Val	Pro	Ser	Ser	
			180					185					190			
Thr	Trp	Pro	Ser	Gln	Thr	Val	Thr	Cys	Asn	Val	Ala	His	Pro	Ala	Ser	
		195					200					205				
Ser	Thr	Lys	Val	Asp	Lys	Lys	Ile	Val	Pro	Arg	Asp	Cys	Gly	Cys	Lys	
	210				215						220					
Pro	Cys	Ile	Cys	Thr	Val	Pro	Glu	Val	Ser	Ser	Val	Phe	Ile	Phe	Pro	
225				230					235						240	
Pro	Lys	Pro	Lys	Asp	Val	Leu	Thr	Ile	Thr	Leu	Thr	Pro	Lys	Val	Thr	
			245					250						255		
Cys	Val	Val	Val	Asp	Ile	Ser	Lys	Asp	Asp	Pro	Glu	Val	Gln	Phe	Ser	
		260						265					270			
Trp	Phe	Val	Asp	Asp	Val	Glu	Val	His	Thr	Ala	Gln	Thr	Lys	Pro	Arg	
	275						280					285				
Glu	Glu	Gln	Ile	Asn	Ser	Thr	Phe	Arg	Ser	Val	Ser	Glu	Leu	Pro	Ile	
	290					295					300					
Met	His	Gln	Asp	Trp	Leu	Asn	Gly	Lys	Glu	Phe	Lys	Cys	Arg	Val	Asn	
305				310						315					320	
Ser	Ala	Ala	Phe	Pro	Ala	Pro	Ile	Glu	Lys	Thr	Ile	Ser	Lys	Thr	Lys	
			325					330						335		
Gly	Arg	Pro	Lys	Ala	Pro	Gln	Val	Tyr	Thr	Ile	Pro	Pro	Pro	Lys	Glu	
		340					345						350			
Gln	Met	Ala	Lys	Asp	Lys	Val	Ser	Leu	Thr	Cys	Met	Ile	Thr	Asn	Phe	
	355						360					365				
Phe	Pro	Glu	Asp	Ile	Thr	Val	Glu	Trp	Gln	Trp	Asn	Gly	Gln	Pro	Ala	
	370					375					380					
Glu	Asn	Tyr	Lys	Asn	Thr	Gln	Pro	Ile	Met	Asp	Thr	Asp	Gly	Ser	Tyr	
385					390					395					400	
Phe	Val	Tyr	Ser	Lys	Leu	Asn	Val	Gln	Lys	Ser	Asn	Trp	Glu	Ala	Gly	
			405					410						415		
Asn	Thr	Phe	Thr	Cys	Ser	Val	Leu	His	Glu	Gly	Leu	His	Asn	His	His	
		420						425					430			
Thr	Glu	Lys	Ser	Leu	Ser	His	Ser	Pro	Gly	Lys						
	435						440									

<210> 117

<211> 214

<212> PRT

<213> Artificial Sequence

<220>

<223> Light chain (clone 16)

<400> 117

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

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

<210> 118

<211> 1332

<212> DNA

<213> Artificial Sequence

<220>

<223> Heavy chain (clone 16)

<400> 118

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caggctccagc tacagcagtc tggacctgag ctggtgaagc ctggggccttc agtgaagata 60
tcctgcaagg cttctggcta caccttcact gacttctata taaactgggt gaagcagagg 120
cctggacagg gacttgagtg gattggatgg atttttccta gaagtggtag tacttactac 180
aatgagaagt tcaagggcaa ggccacactt agtgtagaca aatcttccat cacagcctac 240
atgttgctca gcagcctgac ctctgaggac tctgcggtct atttctgtgc aaggggggat 300
ggttactctg gagctatgga ctactggggg caaggaacct cagtcaccgt ctctcagacc 360
aaaacgacac ccccatctgt ctatccactg gccctggat ctgctgcca aactaactcc 420
atggtgaccc tgggatgcct ggtcaagggc tatttccctg agccagtgac agtgacctgg 480
aactctggat ccctgtccag cggtgtgcac accttcccag ctgtcctgca gtctgacctc 540
tacactctga gcagctcagt gactgtcccc tccagcacct ggcccagcca gaccgtcacc 600
tgcaacgttg cccacccggc cagcagcacc aaggtggaca agaaaattgt gcccagggat 660
tgtggttgta agccttgcat atgtacagtc ccagaagtat catctgtctt catcttcccc 720
ccaaagcca aggatgtgct caccattact ctgactccta aggtcacgtg tgttggtgta 780
gacatcagca aggatgatcc cgaggtccag ttcagctggt ttgtagatga tgtggagggtg 840
cacacagctc agacgaaacc ccgggaggag cagatcaaca gcactttccg ttcagtcagt 900
gaacttcca tcatgcacca ggactggctc aatggcaagg agttcaaagt cagggtcaac 960
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ctgacctgca tgataacaaa cttcttccct gaagacatta ctgtggagtg gcagtggaa 1140
gggcagccag cggagaacta caagaacact cagcccatca tggacacaga tggctcttac 1200
ttcgtctaca gcaagctcaa tgtgcagaag agcaactggg aggcaggaaa tactttcacc 1260
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cctggtaa at ga 1332

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<210> 119
<211> 645
<212> DNA
<213> Artificial Sequence

<220>
<223> Light chain (clone 16)

<400> 119
gatatccaga tgacacagac tacatcctcc ctgtctgcct ctctgggaga cagagtcacc 60
atcagttgca gtgcaagtca gggcattaga aattatttaa actggtatca gcagaaacca 120
gatggaaactg ttaaaactcct gatctattac acatcaaatt tacactcagg agtcccatca 180
aggttcagtg gcagtgggtc tgggacagat tattctctca ccatcagcaa cctggaacct 240
gaagatattg ccacttacta ttgtcagcag tataataacc ttcctcggac gttcgggtgga 300
ggcaccaagc tggaaatcaa acgggctgat gctgcaccaa ctgtatccat cttccacca 360
tccagtgagc agttaacatc tggagggtgcc tcagtcgtgt gcttcttgaa caacttctac 420
cccaaagaca tcaatgtcaa gtggaagatt gatggcagtg aacgacaaaa tggcgtcctg 480
aacagttgga ctgatcagga cagcaaagac agcacctaca gcatgagcag caccctcacg 540
ttgaccaagg acgagtatga acgacataac agctatacct gtgaggccac tcacaagaca 600
tcaacttcac ccattgtcaa gagcttcaac aggaatgagt gttag 645

<210> 120
<211> 357
<212> DNA
<213> Artificial Sequence

<220>
<223> VH (clone 16)

<400> 120
caggtccagc tacagcagtc tggacctgag ctggtgaagc ctggggcctc agtgaagata 60
tcctgcaagg cttctggcta caccttcact gacttctata taaactgggt gaagcagagg 120
cctggacagg gacttgagtg gattggatgg atttttccta gaagtggtag tacttactac 180
aatgagaagt tcaagggcaa ggccacactt agtgtagaca aatcttccat cacagcctac 240
atgttgctca gcagcctgac ctctgaggac tctgcggtct atttctgtgc aaggggggat 300
ggttactctg gagctatgga ctactgggggt caaggaacct cagtcaccgt ctcctca 357

<210> 121
<211> 321
<212> DNA
<213> Artificial Sequence

<220>
<223> VL (clone 16)

<400> 121
gatatccaga tgacacagac tacatcctcc ctgtctgcct ctctgggaga cagagtcacc 60
atcagttgca gtgcaagtca gggcattaga aattatttaa actggtatca gcagaaacca 120
gatggaaactg ttaaaactcct gatctattac acatcaaatt tacactcagg agtcccatca 180
aggttcagtg gcagtgggtc tgggacagat tattctctca ccatcagcaa cctggaacct 240
gaagatattg ccacttacta ttgtcagcag tataataacc ttcctcggac gttcgggtgga 300
ggcaccaagc tggaaatcaa a 321

<210> 122
<211> 19
<212> PRT
<213> Artificial Sequence

<220>
<223> Leader sequence; heavy chain (clone 16)

<400> 122
Met Gly Trp Ser Trp Ile Phe Leu Phe Leu Leu Ser Gly Thr Ala Gly
1 5 10 15
Val His Cys

<210> 123
<211> 57
<212> DNA
<213> Artificial Sequence

<220>
<223> Leader sequence; heavy chain (clone 16)

<400> 123
atgggatgga gctggatctt tctcttcctc ctgtcaggaa ctgcaggtgt ccattgc 57

<210> 124
<211> 19
<212> PRT
<213> Artificial Sequence

<220>
<223> Leader sequence; light chain (clone 16)

<400> 124
Met Ser Ser Ala Gln Phe Leu Gly Leu Leu Leu Leu Cys Phe Gln Gly
1 5 10 15
Thr Arg Cys

<210> 125
<211> 57
<212> DNA
<213> Artificial Sequence

<220>
<223> Leader sequence; light chain (clone 16)

<400> 125
atgtcctctg ctcaattcct tggctctcctg ttgctctgtt ttcaaggtac cagatgt 57

<210> 126
<211> 21

<212> PRT
<213> Artificial Sequence

<220>
<223> T2A peptide

<400> 126
Gly Ser Gly Glu Gly Arg Gly Ser Leu Leu Thr Cys Gly Asp Val Glu
1 5 10 15
Glu Asn Pro Gly Pro
20

<210> 127
<211> 24
<212> PRT
<213> Artificial Sequence

<220>
<223> T2A peptide

<400> 127
Leu Glu Gly Gly Gly Glu Gly Arg Gly Ser Leu Leu Thr Cys Gly Asp
1 5 10 15
Val Glu Glu Asn Pro Gly Pro Arg
20

<210> 128
<211> 19
<212> PRT
<213> Artificial Sequence

<220>
<223> P2A peptide

<400> 128
Ala Thr Asn Phe Ser Leu Leu Lys Gln Ala Gly Asp Val Glu Glu Asn
1 5 10 15
Pro Gly Pro

<210> 129
<211> 22
<212> PRT
<213> Artificial Sequence

<220>
<223> P2A peptide

<400> 129
Gly Ser Gly Ala Thr Asn Phe Ser Leu Leu Lys Gln Ala Gly Asp Val
1 5 10 15

Glu Glu Asn Pro Gly Pro
20

<210> 130
<211> 20
<212> PRT
<213> Artificial Sequence

<220>
<223> E2A peptide

<400> 130
Gln Cys Thr Asn Tyr Ala Leu Leu Lys Leu Ala Gly Asp Val Glu Ser
1 5 10 15
Asn Pro Gly Pro
20

<210> 131
<211> 23
<212> PRT
<213> Artificial Sequence

<220>
<223> E2A peptide

<400> 131
Gly Ser Gly Gln Cys Thr Asn Tyr Ala Leu Leu Lys Leu Ala Gly Asp
1 5 10 15
Val Glu Ser Asn Pro Gly Pro
20

<210> 132
<211> 22
<212> PRT
<213> Artificial Sequence

<220>
<223> F2A peptide

<400> 132
Val Lys Gln Thr Leu Asn Phe Asp Leu Leu Lys Leu Ala Gly Asp Val
1 5 10 15
Glu Ser Asn Pro Gly Pro
20

<210> 133
<211> 25
<212> PRT
<213> Artificial Sequence

$\langle 220 \rangle$

<223> F2A peptide

<400> 133

Gly Ser Gly Val Lys Gln Thr Leu Asn Phe Asp Leu Leu Lys Leu Ala
1 5 10 15

Gly Asp Val Glu Ser Asn Pro Gly Pro
20 25

<210> 134

<211> 18

<212> PRT

<213> Artificial Sequence

 $\langle 220 \rangle$

<223> T2A peptide

<400> 134

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

Gly Pro