

10624-294-228_SEQLIST

SEQUENCE LISTING

<110> Celgene Corporation

<120> PD-1 BINDING PROTEINS AND
METHODS OF USE THEREOF

<130> 10624-294-228

<140> TBA

<141> On even date herewith

<150> 62/234,535

<151> 2015-09-29

<160> 44

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> VL CDR1 of Antibodies PD1AB-1, PD1AB-3 and PD1AB-6

<400> 1

Lys Ser Gly Gln Ser Val Leu Tyr Ser Ser Asn Gln Lys Asn Phe Leu

1

5

10

15

Ala

<210> 2

<211> 7

<212> PRT

<213> Artificial Sequence

<220>

<223> VL CDR2 of Antibodies PD1AB-1, PD1AB-2, PD1AB-3, PD1AB-4,
PD1AB-5 and PD1AB-6

<400> 2

Trp Ala Ser Thr Arg Glu Ser

1

5

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<210> 3

<211> 8

<212> PRT

<213> Artificial Sequence

<220>

<223> VL CDR3 of Antibodies PD1AB-1, PD1AB-2, PD1AB-3, PD1AB-4,
PD1AB-5 and PD1AB-6

<400> 3

His Gln Tyr Leu Tyr Ser Trp Thr
1 5

<210> 4

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> VH CDR1 of Antibodies PD1AB-1, PD1AB-2, PD1AB-3, PD1AB-4,
PD1AB-5 and PD1AB-6

<400> 4

Gly Phe Asn Ile Lys Asp Thr Tyr Met His
1 5 10

<210> 5

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> VH CDR2 of Antibodies PD1AB-1, PD1AB-2, PD1AB-3, PD1AB-4,
PD1AB-5 and PD1AB-6

<400> 5

Arg Ile Asp Pro Ala Asn Gly Asp Arg Lys
1 5 10

<210> 6

<211> 15

<212> PRT

<213> Artificial Sequence

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<220>

<223> VH CDR3 of Antibodies PD1AB-1, PD1AB-2, PD1AB-3, PD1AB-4, PD1AB-5 and PD1AB-6

<400> 6

Ser	Gly	Pro	Val	Tyr	Tyr	Tyr	Gly	Ser	Ser	Tyr	Val	Met	Asp	Tyr
1				5				10					15	

<210> 7

<211> 17

<212> PRT

<213> Artificial Sequence

<220>

<223> VL CDR1 of Antibodies PD1AB-2, PD1AB-4, and PD1AB-5

<400> 7

Lys	Ser	Ser	Gln	Ser	Val	Leu	Tyr	Ser	Ser	Asn	Asn	Lys	Asn	Tyr	Leu
1				5				10					15		
Ala															

<210> 8

<211> 113

<212> PRT

<213> Artificial Sequence

<220>

<223> VL domain of Antibodies PD1AB-1 and PD1AB-6

<400> 8

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

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Arg

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

<220>
 <223> VL domain of Antibodies PD1AB-2, PD1AB-4 and PD1AB-5

<400> 9
 Asp Ile Val Met Thr Gln Ser Pro Asp Ser Leu Ala Val Ser Leu Gly
 1 5 10 15
 Glu Arg Ala Thr Ile Asn Cys Lys Ser Ser Gln Ser Val Leu Tyr Ser
 20 25 30
 Ser Asn Asn Lys Asn Tyr Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln
 35 40 45
 Pro Pro Lys Leu Leu Ile Tyr Trp Ala Ser Thr Arg Glu Ser Gly Val
 50 55 60
 Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr
 65 70 75 80
 Ile Ser Ser Leu Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys His Gln
 85 90 95
 Tyr Leu Tyr Ser Trp Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys
 100 105 110

Arg

<210> 10
 <211> 113
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> VL domain of Antibody PD1AB-3

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

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Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr
65 70 75 80
Ile Ser Asn Leu Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys His Gln
85 90 95
Tyr Leu Tyr Ser Trp Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys
100 105 110
Arg

<210> 11
<211> 124
<212> PRT
<213> Artificial Sequence

<220>
<223> VH domain of Antibodies PD1AB-1 and PD1AB-2

<400> 11
Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
1 5 10 15
Thr Val Lys Ile Ser Cys Lys Val Ser Gly Phe Asn Ile Lys Asp Thr
20 25 30
Tyr Met His Trp Val Gln Gln Ala Pro Gly Lys Gly Leu Glu Trp Met
35 40 45
Gly Arg Ile Asp Pro Ala Asn Gly Asp Arg Lys Tyr Asp Pro Lys Phe
50 55 60
Gln Gly Arg Val Thr Ile Thr Ala Asp Thr Ser Thr Asp Thr Ala Tyr
65 70 75 80
Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys
85 90 95
Ala Arg Ser Gly Pro Val Tyr Tyr Tyr Gly Ser Ser Tyr Val Met Asp
100 105 110
Tyr Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser
115 120

<210> 12
<211> 124
<212> PRT
<213> Artificial Sequence

<220>
<223> VH domain of Antibodies PD1AB-3 and PD1AB-4

<400> 12
Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
1 5 10 15

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

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<210> 13

<211> 124

<212> PRT

<213> Artificial Sequence

<220>

<223> VH domain of Antibodies PD1AB-5 and PD1AB-6

<400> 13

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

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<210> 14

<211> 23

<212> PRT

<213> Artificial Sequence

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<220>

<223> VL FR1 of Antibodies PD1AB-1, PD1AB-2, PD1AB-3, PD1AB-4, PD1AB-5 and PD1AB-6

<400> 14

Asp	Ile	Val	Met	Thr	Gln	Ser	Pro	Asp	Ser	Leu	Ala	Val	Ser	Leu	Gly
1				5				10					15		
Glu	Arg	Ala	Thr	Ile	Asn	Cys									
			20												

<210> 15

<211> 15

<212> PRT

<213> Artificial Sequence

<220>

<223> VL FR2 of Antibodies PD1AB-1, PD1AB-2, PD1AB-3, PD1AB-4, PD1AB-5 and PD1AB-6

<400> 15

Trp	Tyr	Gln	Gln	Lys	Pro	Gly	Gln	Pro	Pro	Lys	Leu	Leu	Ile	Tyr
1				5				10					15	

<210> 16

<211> 32

<212> PRT

<213> Artificial Sequence

<220>

<223> VL FR3 of Antibodies PD1AB-1, PD1AB-2, PD1AB-4, PD1AB-5 and PD1AB-6

<400> 16

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

<210> 17

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> VL FR4 of Antibodies PD1AB-1, PD1AB-2, PD1AB-3, PD1AB-4,

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PD1AB-5 and PD1AB-6

<400> 17

Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys Arg
1 5 10

<210> 18

<211> 32

<212> PRT

<213> Artificial Sequence

<220>

<223> VL FR3 of Antibody PD1AB-3

<400> 18

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

<210> 19

<211> 25

<212> PRT

<213> Artificial Sequence

<220>

<223> VH FR1 of Antibodies PD1AB-1, PD1AB-2, PD1AB-3 and PD1AB-4

<400> 19

Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
1 5 10 15
Thr Val Lys Ile Ser Cys Lys Val Ser
20 25

<210> 20

<211> 14

<212> PRT

<213> Artificial Sequence

<220>

<223> VH FR2 of Antibodies PD1AB-1, PD1AB-2, PD1AB-3, PD1AB-4,
PD1AB-5 and PD1AB-6

<400> 20

Trp Val Gln Gln Ala Pro Gly Lys Gly Leu Glu Trp Met Gly

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1 5 10

<210> 21

<211> 39

<212> PRT

<213> Artificial Sequence

<220>

<223> VH FR3 of Antibodies PD1AB-1, PD1AB-2, PD1AB-5 and PD1AB-6

<400> 21

Tyr Asp Pro Lys Phe Gln Gly Arg Val Thr Ile Thr Ala Asp Thr Ser
 1 5 10 15
 Thr Asp Thr Ala Tyr Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr
 20 25 30
 Ala Val Tyr Tyr Cys Ala Arg
 35

<210> 22

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> VH FR4 of Antibodies PD1AB-1, PD1AB-2, PD1AB-3, PD1AB-4,
 PD1AB-5 and PD1AB-6

<400> 22

Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser
 1 5 10

<210> 23

<211> 39

<212> PRT

<213> Artificial Sequence

<220>

<223> VH FR3 of Antibodies PD1AB-3 and PD1AB-4

<400> 23

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

35

<210> 24
 <211> 25
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> VH FR1 of Antibodies PD1AB-5 and PD1AB-6

<400> 24
 Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
 1 5 10 15
 Thr Val Lys Ile Ser Cys Lys Ala Ser
 20 25

<210> 25
 <211> 341
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> VL of Antibodies PD1AB-1 and PD1AB-6

<400> 25
 gacatcgtga tgaccagtc tccagactcc ctggctgtgt ctctgggcga gagggccacc 60
 atcaactgca agtccggtca aagtgtttta tacagttcaa atcagaagaa cttcttggcc 120
 tggtagcagc agaaaccagg acagcctcct aagctgctca tttactgggc atccactagg 180
 gaatctggggg tccctgaccg attcagtggc agcgggtctg ggacagattt cactctcacc 240
 atcagcagcc tgcaagctga agatgtggca gtttattact gtcacataa cctctactcg 300
 tggacgtttg gccaggggac caagctggag atcaaacgga c 341

<210> 26
 <211> 341
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> VL of Antibodies PD1AB-2, PD1AB-4 and PD1AB-5

<400> 26
 gacatcgtga tgaccagtc tccagactcc ctggctgtgt ctctgggcga gagggccacc 60
 atcaactgca agtccagcca gagtggtttta tacagctcca acaataagaa ctacttagct 120
 tggtagcagc agaaaccagg acagcctcct aagctgctca tttactgggc atctaccg 180
 gaatccggggg tccctgaccg attcagtggc agcgggtctg ggacagattt cactctcacc 240
 atcagcagcc tgcaagctga agatgtggca gtttattact gtcacataa cctctactcg 300

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tggacgtttg gccaggggac caagctggag atcaaacgga c 341

<210> 27

<211> 341

<212> DNA

<213> Artificial Sequence

<220>

<223> VL of Antibody PD1AB-3

<400> 27

gacatcgtga tgacccagtc tccagactcc ctggctgtgt ctctgggcga gagggccacc 60
atcaactgca agtccgggtca aagtgtttta tacagttcaa atcagaagaa cttcttggcc 120
tggtagcagc agaaaccagg acagcctcct aagctgctca tttactgggc atccactagg 180
gaatctgggg tccctgaccg attcagtggc agcgggtctg ggacagattt cactctcacc 240
atcagcaacc tgcaagctga agatgtggca gtttattact gtcataata cctctactcg 300
tggacgtttg gccaggggac caagctggag atcaaacgga c 341

<210> 28

<211> 372

<212> DNA

<213> Artificial Sequence

<220>

<223> VH of Antibodies PD1AB-1 and PD1AB-2

<400> 28

gaggtccagc tggtagcgtc tggggctgag gtgaagaagc ctggggctac agtgaaaatc 60
tcctgcaagg tttctggatt caacattaaa gacacgtata tgcactgggt gcaacaggcc 120
cctggaaaag ggcttgagtg gatgggaagg attgatcctg cgaatggtga taggaaatat 180
gacccgaagt tccagggcag agtcaccata accgcggaca cgtctacaga cacagcctac 240
atggagctga gcagcctgag atctgaggac acggccgtgt attactgtgc tagatcaggc 300
cctgtttatt actacggtag tagctacgtt atggactact ggggtcaagg aaccacagtc 360
accgtctcct ca 372

<210> 29

<211> 372

<212> DNA

<213> Artificial Sequence

<220>

<223> VH of Antibodies PD1AB-3 and PD1AB-4

<400> 29

gaggtccagc tggtagcgtc tggggctgag gtgaagaagc ctggggctac agtgaaaatc 60
tcctgcaagg tttctggatt caacattaaa gacacgtata tgcactgggt gcaacaggcc 120
cctggaaaag ggcttgagtg gatgggaagg attgatcctg cgaatggtga taggaaatat 180
gacccgaagt tccagggcag agtcaccata accgcggaca cgtctacaaa cacagcctac 240

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atggagctga gcagcctgag atctgaggac acggccgtgt attactgtgc tagatcaggc 300
cctgtttatt actacggtag tagctacgtt atggactact ggggtcaagg aaccacagtc 360
accgtctcct ca 372
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<210> 30
 <211> 372
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> VH of Antibodies PD1AB-5 and PD1AB-6

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<400> 30
gaggtccagc tgggtacagtc tggggctgag gtgaagaagc ctggggctac agtgaaaatc 60
tcctgcaagg cttctggatt caacattaaa gacacgtata tgcactgggt gcaacaggcc 120
cctggaaaag ggcttgagtg gatgggaagg attgatcctg cgaatgggta taggaaatat 180
gacccgaagt tccagggcag agtcaccata accgcggaca cgtctacaga cacagcctac 240
atggagctga gcagcctgag atctgaggac acggccgtgt attactgtgc tagatcaggc 300
cctgtttatt actacggtag tagctacgtt atggactact ggggtcaagg aaccacagtc 360
accgtctcct ca 372
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<210> 31
 <211> 219
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> light chain of Antibody PD1AB-6-IgG1

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<400> 31
Asp Ile Val Met Thr Gln Ser Pro Asp Ser Leu Ala Val Ser Leu Gly
 1           5           10           15
Glu Arg Ala Thr Ile Asn Cys Lys Ser Gly Gln Ser Val Leu Tyr Ser
 20           25           30
Ser Asn Gln Lys Asn Phe Leu Ala Trp Tyr Gln Gln Lys Pro Gly Gln
 35           40           45
Pro Pro Lys Leu Leu Ile Tyr Trp Ala Ser Thr Arg Glu Ser Gly Val
 50           55           60
Pro Asp Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr
 65           70           75           80
Ile Ser Ser Leu Gln Ala Glu Asp Val Ala Val Tyr Tyr Cys His Gln
 85           90           95
Tyr Leu Tyr Ser Trp Thr Phe Gly Gln Gly Thr Lys Leu Glu Ile Lys
100          105          110
Arg Thr Val Ala Ala Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu
115          120          125
Gln Leu Lys Ser Gly Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe
130          135          140
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Tyr	Pro	Arg	Glu	Ala	Lys	Val	Gln	Trp	Lys	Val	Asp	Asn	Ala	Leu	Gln
145					150					155					160
Ser	Gly	Asn	Ser	Gln	Glu	Ser	Val	Thr	Glu	Gln	Asp	Ser	Lys	Asp	Ser
				165					170						175
Thr	Tyr	Ser	Leu	Ser	Ser	Thr	Leu	Thr	Leu	Ser	Lys	Ala	Asp	Tyr	Glu
			180					185						190	
Lys	His	Lys	Val	Tyr	Ala	Cys	Glu	Val	Thr	His	Gln	Gly	Leu	Ser	Ser
	195						200					205			
Pro	Val	Thr	Lys	Ser	Phe	Asn	Arg	Gly	Glu	Cys					
	210					215									

<210> 32

<211> 454

<212> PRT

<213> Artificial Sequence

<220>

<223> heavy chain of Antibody PD1AB-6-IgG1

<400> 32

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

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      210                215                220
Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu
225                230                235                240
Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp
      245                250                255
Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp
      260                265                270
Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly
      275                280                285
Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn
      290                295                300
Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp
305                310                315                320
Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro
      325                330                335
Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu
      340                345                350
Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn
      355                360                365
Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile
      370                375                380
Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr
385                390                395                400
Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys
      405                410                415
Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys
      420                425                430
Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu
      435                440                445
Ser Leu Ser Pro Gly Lys
450

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<210> 33
 <211> 454
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> heavy chain of Antibody PD1AB-6-K3

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<400> 33
Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
 1                5                10                15
Thr Val Lys Ile Ser Cys Lys Ala Ser Gly Phe Asn Ile Lys Asp Thr
      20                25                30
Tyr Met His Trp Val Gln Gln Ala Pro Gly Lys Gly Leu Glu Trp Met
      35                40                45

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Gly	Arg	Ile	Asp	Pro	Ala	Asn	Gly	Asp	Arg	Lys	Tyr	Asp	Pro	Lys	Phe
50						55					60				
Gln	Gly	Arg	Val	Thr	Ile	Thr	Ala	Asp	Thr	Ser	Thr	Asp	Thr	Ala	Tyr
65					70					75					80
Met	Glu	Leu	Ser	Ser	Leu	Arg	Ser	Glu	Asp	Thr	Ala	Val	Tyr	Tyr	Cys
			85						90					95	
Ala	Arg	Ser	Gly	Pro	Val	Tyr	Tyr	Tyr	Gly	Ser	Ser	Tyr	Val	Met	Asp
			100					105					110		
Tyr	Trp	Gly	Gln	Gly	Thr	Thr	Val	Thr	Val	Ser	Ser	Ala	Ser	Thr	Lys
		115					120					125			
Gly	Pro	Ser	Val	Phe	Pro	Leu	Ala	Pro	Ser	Ser	Lys	Ser	Thr	Ser	Gly
						135					140				
Gly	Thr	Ala	Ala	Leu	Gly	Cys	Leu	Val	Lys	Asp	Tyr	Phe	Pro	Glu	Pro
145					150					155					160
Val	Thr	Val	Ser	Trp	Asn	Ser	Gly	Ala	Leu	Thr	Ser	Gly	Val	His	Thr
			165						170					175	
Phe	Pro	Ala	Val	Leu	Gln	Ser	Ser	Gly	Leu	Tyr	Ser	Leu	Ser	Ser	Val
			180					185					190		
Val	Thr	Val	Pro	Ser	Ser	Ser	Leu	Gly	Thr	Gln	Thr	Tyr	Ile	Cys	Asn
		195					200					205			
Val	Asn	His	Lys	Pro	Ser	Asn	Thr	Lys	Val	Asp	Lys	Lys	Val	Glu	Pro
	210					215					220				
Lys	Ser	Cys	Asp	Lys	Thr	His	Thr	Cys	Pro	Pro	Cys	Pro	Ala	Pro	Glu
225					230					235					240
Leu	Leu	Gly	Gly	Pro	Ser	Val	Phe	Leu	Phe	Pro	Pro	Lys	Pro	Lys	Asp
			245						250					255	
Thr	Leu	Met	Ile	Ser	Arg	Thr	Pro	Glu	Val	Thr	Cys	Val	Val	Val	Asp
			260					265					270		
Val	Ser	His	Glu	Asp	Pro	Glu	Val	Lys	Phe	Asn	Trp	Tyr	Val	Asp	Gly
		275					280					285			
Val	Glu	Val	His	Asn	Ala	Lys	Thr	Lys	Pro	Arg	Glu	Glu	Gln	Tyr	Asn
		290				295					300				
Ser	Thr	Tyr	Arg	Val	Val	Ser	Val	Leu	Thr	Val	Leu	His	Gln	Asp	Trp
305					310					315					320
Leu	Asn	Gly	Lys	Glu	Tyr	Lys	Cys	Ala	Val	Ser	Asn	Lys	Ala	Leu	Pro
			325						330					335	
Ala	Pro	Ile	Glu	Lys	Thr	Ile	Ser	Lys	Ala	Lys	Gly	Gln	Pro	Arg	Glu
			340					345					350		
Pro	Gln	Val	Tyr	Thr	Leu	Pro	Pro	Ser	Arg	Asp	Glu	Leu	Thr	Lys	Asn
		355					360					365			
Gln	Val	Ser	Leu	Thr	Cys	Leu	Val	Lys	Gly	Phe	Tyr	Pro	Ser	Asp	Ile
		370				375					380				
Ala	Val	Glu	Trp	Glu	Ser	Asn	Gly	Gln	Pro	Glu	Asn	Asn	Tyr	Lys	Thr
385					390					395					400
Thr	Pro	Pro	Val	Leu	Asp	Ser	Asp	Gly	Ser	Phe	Phe	Leu	Tyr	Ser	Lys
			405						410					415	
Leu	Thr	Val	Asp	Lys	Ser	Arg	Trp	Gln	Gln	Gly	Asn	Val	Phe	Ser	Cys
			420					425					430		

10624-294-228_SEQLIST

Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu
 435 440 445
 Ser Leu Ser Pro Gly Lys
 450

<210> 34
 <211> 451
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> heavy chain of Antibody PD1AB-6-4P

<400> 34
 Glu Val Gln Leu Val Gln Ser Gly Ala Glu Val Lys Lys Pro Gly Ala
 1 5 10 15
 Thr Val Lys Ile Ser Cys Lys Ala Ser Gly Phe Asn Ile Lys Asp Thr
 20 25 30
 Tyr Met His Trp Val Gln Gln Ala Pro Gly Lys Gly Leu Glu Trp Met
 35 40 45
 Gly Arg Ile Asp Pro Ala Asn Gly Asp Arg Lys Tyr Asp Pro Lys Phe
 50 55 60
 Gln Gly Arg Val Thr Ile Thr Ala Asp Thr Ser Thr Asp Thr Ala Tyr
 65 70 75 80
 Met Glu Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys
 85 90 95
 Ala Arg Ser Gly Pro Val Tyr Tyr Tyr Gly Ser Ser Tyr Val Met Asp
 100 105 110
 Tyr Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser Ala Ser Thr Lys
 115 120 125
 Gly Pro Ser Val Phe Pro Leu Ala Pro Cys Ser Arg Ser Thr Ser Glu
 130 135 140
 Ser Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro
 145 150 155 160
 Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr
 165 170 175
 Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val
 180 185 190
 Val Thr Val Pro Ser Ser Ser Leu Gly Thr Lys Thr Tyr Thr Cys Asn
 195 200 205
 Val Asp His Lys Pro Ser Asn Thr Lys Val Asp Lys Arg Val Glu Ser
 210 215 220
 Lys Tyr Gly Pro Pro Cys Pro Pro Cys Pro Ala Pro Glu Phe Leu Gly
 225 230 235 240
 Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met
 245 250 255
 Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser Gln

10624-294-228_SEQLIST

```

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

```

<210> 35

<211> 451

<212> PRT

<213> Artificial Sequence

<220>

<223> heavy chain of Antibody PD1AB-6-4PE

<400> 35

```

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

```

10624-294-228_SEQLIST

Ala	Arg	Ser	Gly	Pro	Val	Tyr	Tyr	Tyr	Gly	Ser	Ser	Tyr	Val	Met	Asp
			100					105					110		
Tyr	Trp	Gly	Gln	Gly	Thr	Thr	Val	Thr	Val	Ser	Ser	Ala	Ser	Thr	Lys
		115					120						125		
Gly	Pro	Ser	Val	Phe	Pro	Leu	Ala	Pro	Cys	Ser	Arg	Ser	Thr	Ser	Glu
		130				135					140				
Ser	Thr	Ala	Ala	Leu	Gly	Cys	Leu	Val	Lys	Asp	Tyr	Phe	Pro	Glu	Pro
145					150					155					160
Val	Thr	Val	Ser	Trp	Asn	Ser	Gly	Ala	Leu	Thr	Ser	Gly	Val	His	Thr
			165						170					175	
Phe	Pro	Ala	Val	Leu	Gln	Ser	Ser	Gly	Leu	Tyr	Ser	Leu	Ser	Ser	Val
			180					185					190		
Val	Thr	Val	Pro	Ser	Ser	Ser	Leu	Gly	Thr	Lys	Thr	Tyr	Thr	Cys	Asn
		195					200					205			
Val	Asp	His	Lys	Pro	Ser	Asn	Thr	Lys	Val	Asp	Lys	Arg	Val	Glu	Ser
	210					215				220					
Lys	Tyr	Gly	Pro	Pro	Cys	Pro	Pro	Cys	Pro	Ala	Pro	Glu	Phe	Glu	Gly
225					230					235					240
Gly	Pro	Ser	Val	Phe	Leu	Phe	Pro	Pro	Lys	Pro	Lys	Asp	Thr	Leu	Met
			245						250					255	
Ile	Ser	Arg	Thr	Pro	Glu	Val	Thr	Cys	Val	Val	Val	Asp	Val	Ser	Gln
		260						265					270		
Glu	Asp	Pro	Glu	Val	Gln	Phe	Asn	Trp	Tyr	Val	Asp	Gly	Val	Glu	Val
		275					280					285			
His	Asn	Ala	Lys	Thr	Lys	Pro	Arg	Glu	Glu	Gln	Phe	Asn	Ser	Thr	Tyr
	290					295					300				
Arg	Val	Val	Ser	Val	Leu	Thr	Val	Leu	His	Gln	Asp	Trp	Leu	Asn	Gly
305					310					315					320
Lys	Glu	Tyr	Lys	Cys	Lys	Val	Ser	Asn	Lys	Gly	Leu	Pro	Ser	Ser	Ile
			325						330					335	
Glu	Lys	Thr	Ile	Ser	Lys	Ala	Lys	Gly	Gln	Pro	Arg	Glu	Pro	Gln	Val
			340					345					350		
Tyr	Thr	Leu	Pro	Pro	Ser	Gln	Glu	Glu	Met	Thr	Lys	Asn	Gln	Val	Ser
		355					360						365		
Leu	Thr	Cys	Leu	Val	Lys	Gly	Phe	Tyr	Pro	Ser	Asp	Ile	Ala	Val	Glu
	370					375					380				
Trp	Glu	Ser	Asn	Gly	Gln	Pro	Glu	Asn	Asn	Tyr	Lys	Thr	Thr	Pro	Pro
385					390					395					400
Val	Leu	Asp	Ser	Asp	Gly	Ser	Phe	Phe	Leu	Tyr	Ser	Arg	Leu	Thr	Val
			405						410					415	
Asp	Lys	Ser	Arg	Trp	Gln	Glu	Gly	Asn	Val	Phe	Ser	Cys	Ser	Val	Met
			420					425					430		
His	Glu	Ala	Leu	His	Asn	His	Tyr	Thr	Gln	Lys	Ser	Leu	Ser	Leu	Ser
	435						440								
Pro	Gly	Lys													
	450														

10624-294-228_SEQLIST

<210> 36

<211> 330

<212> PRT

<213> Homo sapiens

<220>

<223> Fc region of a human IgG1

<400> 36

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> 37
<211> 330
<212> PRT
<213> Artificial Sequence
```

<220>
<223> Fc region of a human IgG1 with K322A substitution, also named as IgG1-K322A Fc region

<400> 37															
Ala 1	Ser	Thr	Lys	Gly 5	Pro	Ser	Val	Phe	Pro 10	Leu	Ala	Pro	Ser	Ser	Lys
Ser	Thr	Ser	Gly 20	Gly	Thr	Ala	Ala	Leu 25	Gly	Cys	Leu	Val	Lys 30	Asp	Tyr
Phe	Pro	Glu 35	Pro	Val	Thr	Val	Ser 40	Trp	Asn	Ser	Gly	Ala 45	Leu	Thr	Ser
Gly	Val	His	Thr	Phe	Pro	Ala	Val 55	Leu	Gln	Ser	Ser	Gly 60	Leu	Tyr	Ser
Leu 65	Ser	Ser	Val	Val	Thr	Val	Pro	Ser	Ser	Ser	Leu	Gly	Thr	Gln	Thr 80
Tyr	Ile	Cys	Asn	Val	Asn	His	Lys	Pro	Ser	Asn	Thr	Lys	Val	Asp	Lys 95
Lys	Val	Glu	Pro	Lys	Ser	Cys	Asp	Lys	Thr	His	Thr	Cys	Pro	Pro	Cys 110
Pro	Ala	Pro	Glu	Leu	Leu	Gly	Gly	Pro	Ser	Val	Phe	Leu	Phe	Pro	Pro 125
Lys	Pro	Lys	Asp	Thr	Leu	Met	Ile	Ser	Arg	Thr	Pro	Glu	Val	Thr	Cys 140
Val 145	Val	Val	Asp	Val	Ser	His	Glu	Asp	Pro	Glu	Val	Lys	Phe	Asn	Trp 160
Tyr	Val	Asp	Gly	Val	Glu	Val	His	Asn	Ala	Lys	Thr	Lys	Pro	Arg	Glu 175
Glu	Gln	Tyr	Asn	Ser	Thr	Tyr	Arg	Val	Val	Ser	Val	Leu	Thr	Val	Leu 190
His	Gln	Asp	Trp	Leu	Asn	Gly	Lys	Glu	Tyr	Lys	Cys	Ala	Val	Ser	Asn 205
Lys	Ala	Leu	Pro	Ala	Pro	Ile	Glu	Lys	Thr	Ile	Ser	Lys	Ala	Lys	Gly 220
Gln 225	Pro	Arg	Glu	Pro	Gln	Val	Tyr	Thr	Leu	Pro	Pro	Ser	Arg	Asp	Glu 240
Leu	Thr	Lys	Asn	Gln	Val	Ser	Leu	Thr	Cys	Leu	Val	Lys	Gly	Phe	Tyr 255
Pro	Ser	Asp	Ile	Ala	Val	Glu	Trp	Glu	Ser	Asn	Gly	Gln	Pro	Glu	Asn

10624-294-228_SEQLIST

			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> 38

<211> 327

<212> PRT

<213> Homo sapiens

<220>

<223> Fc region of a human IgG4

<400> 38

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			

10624-294-228_SEQLIST

```

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 Pro Gly Lys
                325

```

<210> 39

<211> 327

<212> PRT

<213> Artificial Sequence

<220>

<223> Fc region of a human IgG4 with S228P substitution, also named as IgG4P Fc region

<400> 39

```

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 Pro 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

```

10624-294-228_SEQLIST

```

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 Pro Gly Lys
    325

```

<210> 40

<211> 327

<212> PRT

<213> Artificial Sequence

<220>

<223> Fc region of a human IgG4 with S228P and L235E
substitutions, also named as IgG4PE Fc region

<400> 40

```

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 Pro Cys Pro Ala Pro
    100                      105                      110
Glu Phe Glu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys
    115                      120                      125

```

10624-294-228_SEQLIST

```

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 Pro Gly Lys
          325

```

<210> 41

<211> 106

<212> PRT

<213> Artificial Sequence

<220>

<223> constant region of the light chain of Antibody PD1AB-6-IgG1

<400> 41

```

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

```

10624-294-228_SEQLIST

Val Thr Lys Ser Phe Asn Arg Gly Glu Cys
 85 90 95
 100 105

<210> 42
 <211> 198
 <212> PRT
 <213> Homo sapiens

<220>
 <223> human PD-1

<400> 42
 Met Gln Ile Pro Gln Ala Pro Trp Pro Val Val Trp Ala Val Leu Gln
 1 5 10 15
 Leu Gly Trp Arg Pro Gly Trp Phe Leu Asp Ser Pro Asp Arg Pro Trp
 20 25 30
 Asn Pro Pro Thr Phe Ser Pro Ala Leu Leu Val Val Thr Glu Gly Asp
 35 40 45
 Asn Ala Thr Phe Thr Cys Ser Phe Ser Asn Thr Ser Glu Ser Phe Val
 50 55 60
 Leu Asn Trp Tyr Arg Met Ser Pro Ser Asn Gln Thr Asp Lys Leu Ala
 65 70 75 80
 Ala Phe Pro Glu Asp Arg Ser Gln Pro Gly Gln Asp Cys Arg Phe Arg
 85 90 95
 Val Thr Gln Leu Pro Asn Gly Arg Asp Phe His Met Ser Val Val Arg
 100 105 110
 Ala Arg Arg Asn Asp Ser Gly Thr Tyr Leu Cys Gly Ala Ile Ser Leu
 115 120 125
 Ala Pro Lys Ala Gln Ile Lys Glu Ser Leu Arg Ala Glu Leu Arg Val
 130 135 140
 Thr Glu Arg Arg Ala Glu Val Pro Thr Ala His Pro Ser Pro Ser Pro
 145 150 155 160
 Arg Pro Ala Gly Gln Phe Gln Thr Leu Val Val Gly Val Val Gly Gly
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