

SEQUENCE LISTING

<110> Celgene Corporation
Signal Pharmaceuticals, LLC

<120> FORMULATIONS COMPRISING PD-1 BINDING PROTEINS AND
METHODS OF MAKING THEREOF

<130> 10624-386-228

<140> TBA

<141> 2018-03-28

<150> US 62/478,524

<151> 2017-03-29

<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		

<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

<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		

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
 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
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

<210> 13
<211> 124
<212> PRT
<213> Artificial Sequence

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

<400> 13
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

<210> 14
<211> 23
<212> PRT
<213> Artificial Sequence

<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, 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
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 agtccgggtca aagtgtttta tacagttcaa atcagaagaa cttcttggtcc 120
tggtaccagc agaaaccagg acagcctcct aagctgctca ttactgggc atccactagg 180
gaatctgggg tccctgaccg attcagtggc agcgggtctg ggacagattt cactctcacc 240

atcagcagcc tgcaagctga agatgtggca gtttattact gtcacatcaata cctctactcg 300
tggaacgtttg 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 tgacccagtc tccagactcc ctggctgtgt ctctgggcca gagggccacc 60
atcaactgca agtccagcca gagtggttta tacagctcca acaataagaa ctacttagct 120
tggtaccagc agaaaccagg acagcctcct aagctgctca ttactgggc atctaccgg 180
gaatccgggg tccctgaccg attcagtggc agcgggtctg ggacagattt cactctcacc 240
atcagcagcc tgcaagctga agatgtggca gtttattact gtcacatcaata cctctactcg 300
tggaacgtttg 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 ctctgggcca gagggccacc 60
atcaactgca agtccgggtca aagtgtttta tacagttcaa atcagaagaa cttcttgagg 120
tggtaccagc agaaaccagg acagcctcct aagctgctca ttactgggc atccactagg 180
gaatctgggg tccctgaccg attcagtggc agcgggtctg ggacagattt cactctcacc 240
atcagcaacc tgcaagctga agatgtggca gtttattact gtcacatcaata cctctactcg 300
tggaacgtttg 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 tggtacagtc tggggctgag gtgaagaagc ctggggctac agtgaaaatc 60
tcctgcaagg tttctggatt caacattaaa gacacgtata tgcactgggt gcaacaggcc 120
cctggaaaag ggcttgagtg gatgggaagg attgacctg cgaatgggtga 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

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gaggtccagc tggtagacgtc tggggctgag gtgaagaagc ctgggggctac agtgaaaatc 60
tcctgcaagg tttctggatt caacattaaa gacacgtata tgcactgggt gcaacaggcc 120
cctggaaaag ggcttgagtg gatgggaagg attgacacctg cgaatgggtga taggaaatat 180
gacccgaagt tccagggcag agtcaccata accgcggaca cgtctacaaa cacagcctac 240
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

<400> 30

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tcctgcaagg cttctggatt caacattaaa gacacgtata tgcactgggt gcaacaggcc 120
cctggaaaag ggcttgagtg gatgggaagg attgacacctg cgaatgggtga 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

<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				
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	
	130					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	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															

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

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

<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				
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	
	130					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
				245					250				Lys
Thr	Leu	Met	Ile	Ser	Arg	Thr	Pro	Glu	Val	Thr	Cys	Val	Val
			260					265				270	Asp
Val	Ser	His	Glu	Asp	Pro	Glu	Val	Lys	Phe	Asn	Trp	Tyr	Val
		275					280				285	Asp	Gly
Val	Glu	Val	His	Asn	Ala	Lys	Thr	Lys	Pro	Arg	Glu	Glu	Gln
	290					295				300		Tyr	Asn
Ser	Thr	Tyr	Arg	Val	Val	Ser	Val	Leu	Thr	Val	Leu	His	Gln
305					310					315		Asp	Trp
Leu	Asn	Gly	Lys	Glu	Tyr	Lys	Cys	Ala	Val	Ser	Asn	Lys	Ala
			325						330				Leu
Ala	Pro	Ile	Glu	Lys	Thr	Ile	Ser	Lys	Ala	Lys	Gly	Gln	Pro
		340						345				350	Arg
Pro	Gln	Val	Tyr	Thr	Leu	Pro	Pro	Ser	Arg	Asp	Glu	Leu	Thr
	355					360						365	Lys
Gln	Val	Ser	Leu	Thr	Cys	Leu	Val	Lys	Gly	Phe	Tyr	Pro	Ser
370					375					380		Asp	Ile
Ala	Val	Glu	Trp	Glu	Ser	Asn	Gly	Gln	Pro	Glu	Asn	Asn	Tyr
385					390				395			Lys	Thr
Thr	Pro	Pro	Val	Leu	Asp	Ser	Asp	Gly	Ser	Phe	Phe	Leu	Tyr
			405					410				415	Ser
Leu	Thr	Val	Asp	Lys	Ser	Arg	Trp	Gln	Gln	Gly	Asn	Val	Phe
		420					425				430	Ser	Cys
Ser	Val	Met	His	Glu	Ala	Leu	His	Asn	His	Tyr	Thr	Gln	Lys
	435					440					445	Ser	Leu
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
1			5						10				15
Thr	Val	Lys	Ile	Ser	Cys	Lys	Ala	Ser	Gly	Phe	Asn	Ile	Lys
		20					25					30	Asp
Tyr	Met	His	Trp	Val	Gln	Gln	Ala	Pro	Gly	Lys	Gly	Leu	Glu
	35					40					45	Trp	Met
Gly	Arg	Ile	Asp	Pro	Ala	Asn	Gly	Asp	Arg	Lys	Tyr	Asp	Pro
	50					55				60		Lys	Phe
Gln	Gly	Arg	Val	Thr	Ile	Thr	Ala	Asp	Thr	Ser	Thr	Asp	Thr
65					70				75			80	Tyr
Met	Glu	Leu	Ser	Ser	Leu	Arg	Ser	Glu	Asp	Thr	Ala	Val	Tyr
			85					90				95	Cys
Ala	Arg	Ser	Gly	Pro	Val	Tyr	Tyr	Tyr	Gly	Ser	Ser	Tyr	Val
		100					105					110	Met
Tyr	Trp	Gly	Gln	Gly	Thr	Thr	Val	Thr	Val	Ser	Ser	Ala	Ser
	115					120					125	Thr	Lys
Gly	Pro	Ser	Val	Phe	Pro	Leu	Ala	Pro	Cys	Ser	Arg	Ser	Thr
	130				135						140		Glu

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	
			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
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	445
Pro Gly Lys					
450					

<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	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	Ala	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> 38
 <211> 327
 <212> PRT
 <213> Homo sapiens

<220>
 <223> Fc region of a human IgG4

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

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

<210> 43
<211> 10
<212> PRT
<213> Artificial Sequence

<220>
<223> amino acid 100-109 of human PD-1 encoding an epitope
for anti-PD-1 antibody binding

<400> 43
Leu Pro Asn Gly Arg Asp Phe His Met Ser
1 5 10

<210> 44
<211> 6
<212> PRT
<213> Artificial Sequence

<220>
<223> amino acid 100-105 of human PD-1 encoding an epitope
for anti-PD-1 antibody binding

<400> 44

Leu Pro Asn Gly Arg Asp
1 5