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SEQUENCE LISTING

<110> Mitsubishi Tanabe Pharma Corporation
Osaka University
National University Corporation Chiba University

<120> RGMa binding protein and its use

<130> A16005-16140

<150> JP2015-091095

<151> 2015-04-28

<160> 46

<170> PatentIn version 3.5

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 Tyr Tyr Thr Ser Arg Leu His Ser Gly Val Pro Ser Arg Phe Ser Gly
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	Val	Tyr	Leu	Gln	Met	Asn	Asn	Leu	Arg	Ala	Glu	Asp	Thr	Gly	Ile	Tyr		
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	Tyr	Cys	Thr	Arg	Arg	Asp	Gly	Ala	Tyr	Trp	Gly	Gln	Gly	Thr	Leu	Val		
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145					150						155					160		
	Ala	Leu	Thr	Ser	Gly	Val	His	Thr	Phe	Pro	Ala	Val	Leu	Gln	Ser	Ser		
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	Gly	Leu	Tyr	Ser	Leu	Ser	Ser	Val	Val	Thr	Val	Pro	Ser	Ser	Ser	Leu		
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	Gly	Thr	Gln	Thr	Tyr	Ile	Cys	Asn	Val	Asn	His	Lys	Pro	Ser	Asn	Thr		
			195					200						205				
	Lys	Val	Asp	Lys	Lys	Val	Glu	Pro	Lys	Ser	Cys	Asp	Lys	Thr	His	Thr		
			210				215					220						
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225					230						235					240		
	Leu	Phe	Pro	Pro	Lys	Pro	Lys	Asp	Thr	Leu	Met	Ile	Ser	Arg	Thr	Pro		
				245						250					255			
	Glu	Val	Thr	Cys	Val	Val	Val	Asp	Val	Ser	His	Glu	Asp	Pro	Glu	Val		
				260					265					270				
	Lys	Phe	Asn	Trp	Tyr	Val	Asp	Gly	Val	Glu	Val	His	Asn	Ala	Lys	Thr		
			275					280					285					
	Lys	Pro	Arg	Glu	Glu	Gln	Tyr	Asn	Ser	Thr	Tyr	Arg	Val	Val	Ser	Val		
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	Leu	Thr	Val	Leu	His	Gln	Asp	Trp	Leu	Asn	Gly	Lys	Glu	Tyr	Lys	Cys		
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	Lys	Ala	Lys	Gly	Gln	Pro	Arg	Glu	Pro	Gln	Val	Tyr	Thr	Leu	Pro	Pro		
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	Ser	Arg	Asp	Glu	Leu	Thr	Lys	Asn	Gln	Val	Ser	Leu	Thr	Cys	Leu	Val		
			355					360					365					
	Lys	Gly	Phe	Tyr	Pro	Ser	Asp	Ile	Ala	Val	Glu	Trp	Glu	Ser	Asn	Gly		
			370				375					380						
	Gln	Pro	Glu	Asn	Asn	Tyr	Lys	Thr	Thr	Pro	Pro	Val	Leu	Asp	Ser	Asp		
385					390						395					400		
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				405						410					415			
	Gln	Gln	Gly	Asn	Val	Phe	Ser	Cys	Ser	Val	Met	His	Glu	Ala	Leu	His		
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 <212> PRT
 <213> Homo sapiens

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 20 25 30
 Ala Ala Arg Ser Gly Ser Ala Pro Gln Ser Pro Gly Ala Ser Ile Arg

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Val	Arg	Gly	Ser	Ser	Val	Ile	Leu	Asn	Cys	Ser	Ala	Tyr	Ser	Glu	Pro
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Ser	Pro	Lys	Ile	Glu	Trp	Lys	Lys	Asp	Gly	Thr	Phe	Leu	Asn	Leu	Val
				85					90					95	
Ser	Asp	Asp	Arg	Arg	Gln	Leu	Leu	Pro	Asp	Gly	Ser	Leu	Phe	Ile	Ser
			100					105					110		
Asn	Val	Val	His	Ser	Lys	His	Asn	Lys	Pro	Asp	Glu	Gly	Tyr	Tyr	Gln
		115					120					125			
Cys	Val	Ala	Thr	Val	Glu	Ser	Leu	Gly	Thr	Ile	Ile	Ser	Arg	Thr	Ala
	130					135					140				
Lys	Leu	Ile	Val	Ala	Gly	Leu	Pro	Arg	Phe	Thr	Ser	Gln	Pro	Glu	Pro
145					150					155					160
Ser	Ser	Val	Tyr	Ala	Gly	Asn	Asn	Ala	Ile	Leu	Asn	Cys	Glu	Val	Asn
				165					170					175	
Ala	Asp	Leu	Val	Pro	Phe	Val	Arg	Trp	Glu	Gln	Asn	Arg	Gln	Pro	Leu
			180					185					190		
Leu	Leu	Asp	Arg	Val	Ile	Lys	Leu	Pro	Ser	Gly	Met	Leu	Val	Ile	
		195				200					205				
Ser	Asn	Ala	Thr	Glu	Gly	Asp	Gly	Gly	Leu	Tyr	Arg	Cys	Val	Val	Glu
	210					215					220				
Ser	Gly	Gly	Pro	Pro	Lys	Tyr	Ser	Asp	Glu	Val	Glu	Leu	Lys	Val	Leu
225					230					235					240
Pro	Asp	Pro	Glu	Val	Ile	Ser	Asp	Leu	Val	Phe	Leu	Lys	Gln	Pro	Ser
				245					250					255	
Pro	Leu	Val	Arg	Val	Ile	Gly	Gln	Asp	Val	Val	Leu	Pro	Cys	Val	Ala
			260					265					270		
Ser	Gly	Leu	Pro	Thr	Pro	Thr	Ile	Lys	Trp	Met	Lys	Asn	Glu	Glu	Ala
		275					280					285			
Leu	Asp	Thr	Glu	Ser	Ser	Glu	Arg	Leu	Val	Leu	Leu	Ala	Gly	Gly	Ser
	290					295					300				
Leu	Glu	Ile	Ser	Asp	Val	Thr	Glu	Asp	Asp	Ala	Gly	Thr	Tyr	Phe	Cys
305					310					315					320
Ile	Ala	Asp	Asn	Gly	Asn	Glu	Thr	Ile	Glu	Ala	Gln	Ala	Glu	Leu	Thr
				325					330					335	
Val	Gln	Ala	Gln	Pro	Glu	Phe	Leu	Lys	Gln	Pro	Thr	Asn	Ile	Tyr	Ala
			340					345					350		
His	Glu	Ser	Met	Asp	Ile	Val	Phe	Glu	Cys	Glu	Val	Thr	Gly	Lys	Pro
		355					360					365			
Thr	Pro	Thr	Val	Lys	Trp	Val	Lys	Asn	Gly	Asp	Met	Val	Ile	Pro	Ser
					375						380				
Asp	Tyr	Phe	Lys	Ile	Val	Lys	Glu	His	Asn	Leu	Gln	Val	Leu	Gly	Leu
385					390					395					400
Val	Lys	Ser	Asp	Glu	Gly	Phe	Tyr	Gln	Cys	Ile	Ala	Glu	Asn	Asp	Val
				405					410					415	
Gly	Asn	Ala	Gln	Ala	Gly	Ala	Gln	Leu	Ile	Ile	Leu	Glu	His	Ala	Pro
			420					425					430		
Ala	Thr	Thr	Gly	Pro	Leu	Pro	Ser	Ala	Pro	Arg	Asp	Val	Val	Ala	Ser
		435					440					445			
Leu	Val	Ser	Thr	Arg	Phe	Ile	Lys	Leu	Thr	Trp	Arg	Thr	Pro	Ala	Ser
	450					455					460				
Asp	Pro	His	Gly	Asp	Asn	Leu	Thr	Tyr	Ser	Val	Phe	Tyr	Thr	Lys	Glu
465					470					475					480
Gly	Ile	Ala	Arg	Glu	Arg	Val	Glu	Asn	Thr	Ser	His	Pro	Gly	Glu	Met
				485					490					495	
Gln	Val	Thr	Ile	Gln	Asn	Leu	Met	Pro	Ala	Thr	Val	Tyr	Ile	Phe	Arg
			500					505					510		
Val	Met	Ala	Gln	Asn	Lys	His	Gly	Ser	Gly	Glu	Ser	Ser	Ala	Pro	Leu
		515					520					525			
Arg	Val	Glu	Thr	Gln	Pro	Glu	Val	Gln	Leu	Pro	Gly	Pro	Ala	Pro	Asn
	530					535					540				
Leu	Arg	Ala	Tyr	Ala	Ala	Ser	Pro	Thr	Ser	Ile	Thr	Val	Thr	Trp	Glu
545					550					555					560
Thr	Pro	Val	Ser	Gly	Asn	Gly	Glu	Ile	Gln	Asn	Tyr	Lys	Leu	Tyr	Tyr
				565					570					575	
Met	Glu	Lys	Gly	Thr	Asp	Lys	Glu	Gln	Asp	Val	Asp	Val	Ser	Ser	His

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			580					585					590		
Ser	Tyr	Thr	Ile	Asn	Gly	Leu	Lys	Lys	Tyr	Thr	Glu	Tyr	Ser	Phe	Arg
		595					600					605			
Val	Val	Ala	Tyr	Asn	Lys	His	Gly	Pro	Gly	Val	Ser	Thr	Pro	Asp	Val
		610				615					620				
Ala	Val	Arg	Thr	Leu	Ser	Asp	Val	Pro	Ser	Ala	Ala	Pro	Gln	Asn	Leu
625					630					635				640	
Ser	Leu	Glu	Val	Arg	Asn	Ser	Lys	Ser	Ile	Met	Ile	His	Trp	Gln	Pro
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Pro	Ala	Pro	Ala	Thr	Gln	Asn	Gly	Gln	Ile	Thr	Gly	Tyr	Lys	Ile	Arg
			660					665					670		
Tyr	Arg	Lys	Ala	Ser	Arg	Lys	Ser	Asp	Val	Thr	Glu	Thr	Leu	Val	Ser
		675					680					685			
Gly	Thr	Gln	Leu	Ser	Gln	Leu	Ile	Glu	Gly	Leu	Asp	Arg	Gly	Thr	Glu
		690				695					700				
Tyr	Asn	Phe	Arg	Val	Ala	Ala	Leu	Thr	Ile	Asn	Gly	Thr	Gly	Pro	Ala
705					710					715					720
Thr	Asp	Trp	Leu	Ser	Ala	Glu	Thr	Phe	Glu	Ser	Asp	Leu	Asp	Glu	Thr
				725					730					735	
Arg	Val	Pro	Glu	Val	Pro	Ser	Ser	Leu	His	Val	Arg	Pro	Leu	Val	Thr
			740					745					750		
Ser	Ile	Val	Val	Ser	Trp	Thr	Pro	Pro	Glu	Asn	Gln	Asn	Ile	Val	Val
		755					760					765			
Arg	Gly	Tyr	Ala	Ile	Gly	Tyr	Gly	Ile	Gly	Ser	Pro	His	Ala	Gln	Thr
		770				775					780				
Ile	Lys	Val	Asp	Tyr	Lys	Gln	Arg	Tyr	Tyr	Thr	Ile	Glu	Asn	Leu	Asp
785					790					795					800
Pro	Ser	Ser	His	Tyr	Val	Ile	Thr	Leu	Lys	Ala	Phe	Asn	Asn	Val	Gly
				805					810					815	
Glu	Gly	Ile	Pro	Leu	Tyr	Glu	Ser	Ala	Val	Thr	Arg	Pro	His	Thr	Asp
			820					825					830		
Thr	Ser	Glu	Val	Asp	Leu	Phe	Val	Ile	Asn	Ala	Pro	Tyr	Thr	Pro	Val
		835					840					845			
Pro	Asp	Pro	Thr	Pro	Met	Met	Pro	Pro	Val	Gly	Val	Gln	Ala	Ser	Ile
		850				855					860				
Leu	Ser	His	Asp	Thr	Ile	Arg	Ile	Thr	Trp	Ala	Asp	Asn	Ser	Leu	Pro
865					870					875					880
Lys	His	Gln	Lys	Ile	Thr	Asp	Ser	Arg	Tyr	Tyr	Thr	Val	Arg	Trp	Lys
				885					890					895	
Thr	Asn	Ile	Pro	Ala	Asn	Thr	Lys	Tyr	Lys	Asn	Ala	Asn	Ala	Thr	Thr
			900					905					910		
Leu	Ser	Tyr	Leu	Val	Thr	Gly	Leu	Lys	Pro	Asn	Thr	Leu	Tyr	Glu	Phe
		915					920					925			
Ser	Val	Met	Val	Thr	Lys	Gly	Arg	Arg	Ser	Ser	Thr	Trp	Ser	Met	Thr
		930				93									

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1145	Lys	Pro	Pro	Asp	Leu	Trp	1150	Ile	His	His	Glu	Arg	1155	Leu	Glu
1160	Pro	Ile	Asp	Lys	Ser	Pro	1165	Asp	Pro	Asn	Pro	Ile	1170	Met	Thr
1175	Pro	Ile	Pro	Arg	Asn	Ser	1180	Gln	Asp	Ile	Thr	Pro	1185	Val	Asp
1190	Met	Asp	Ser	Asn	Ile	His	1195	Gln	Arg	Arg	Asn	Ser	1200	Tyr	Arg
1205	Glu	Ser	Glu	Asp	Ser	Met	1210	Ser	Thr	Leu	Ala	Gly	1215	Arg	Gly
1220	Arg	Pro	Lys	Met	Met	Met	1225	Pro	Phe	Asp	Ser	Gln	1230	Pro	Pro
1235	Val	Ile	Ser	Ala	His	Pro	1240	Ile	His	Ser	Leu	Asp	1245	Asn	Pro
1250	His	Phe	His	Ser	Ser	Ser	1255	Leu	Ala	Ser	Pro	Ala	1260	Arg	Ser
1265	Tyr	His	Pro	Gly	Ser	Pro	1270	Trp	Pro	Ile	Gly	Thr	1275	Ser	Met
1280	Ser	Asp	Arg	Ala	Asn	Ser	1285	Thr	Glu	Ser	Val	Arg	1290	Asn	Thr
1295	Thr	Asp	Thr	Met	Pro	Ala	1300	Ser	Ser	Ser	Gln	Thr	1305	Cys	Cys
1310	His	Gln	Asp	Pro	Glu	Gly	1315	Ala	Thr	Ser	Ser	Ser	1320	Tyr	Leu
1325	Ser	Gln	Glu	Glu	Asp	Ser	1330	Gly	Gln	Ser	Leu	Pro	1335	Thr	Ala
1340	Arg	Pro	Ser	His	Pro	Leu	1345	Lys	Ser	Phe	Ala	Val	1350	Pro	Ala
1355	Pro	Pro	Gly	Pro	Pro	Thr	1360	Tyr	Asp	Pro	Ala	Leu	1365	Pro	Ser
1370	Leu	Leu	Ser	Gln	Gln	Ala	1375	Leu	Asn	His	His	Ile	1380	His	Ser
1385	Thr	Ala	Ser	Ile	Gly	Thr	1390	Leu	Gly	Arg	Ser	Arg	1395	Pro	Pro
1400	Val	Val	Val	Pro	Ser	Ala	1405	Pro	Glu	Val	Gln	Glu	1410	Thr	Thr
1415	Leu	Glu	Asp	Ser	Glu	Ser	1420	Ser	Tyr	Glu	Pro	Asp	1425	Glu	Leu
1430	Glu	Met	Ala	His	Leu	Glu	1435	Gly	Leu	Met	Lys	Asp	1440	Leu	Asn
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1460															

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 <212> PRT
 <213> Artificial Sequence

<220>
 <223> humanized antibody heavy chain HA

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

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Ala	Tyr	Leu	Gln	Met	Asn	Ser	Leu	Lys	Thr	Glu	Asp	Thr	Ala	Leu	Tyr
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			100					105					110		
Thr	Val	Ser	Ser	Ala	Ser	Thr	Lys	Gly	Pro	Ser	Val	Phe	Pro	Leu	Ala
		115					120					125			
Pro	Ser	Ser	Lys	Ser	Thr	Ser	Gly	Gly	Thr	Ala	Ala	Leu	Gly	Cys	Leu
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Val	Lys	Asp	Tyr	Phe	Pro	Glu	Pro	Val	Thr	Val	Ser	Trp	Asn	Ser	Gly
145					150					155					160
Ala	Leu	Thr	Ser	Gly	Val	His	Thr	Phe	Pro	Ala	Val	Leu	Gln	Ser	Ser
				165					170					175	
Gly	Leu	Tyr	Ser	Leu	Ser	Ser	Val	Val	Thr	Val	Pro	Ser	Ser	Ser	Leu
			180					185					190		
Gly	Thr	Gln	Thr	Tyr	Ile	Cys	Asn	Val	Asn	His	Lys	Pro	Ser	Asn	Thr
		195					200					205			
Lys	Val	Asp	Lys	Lys	Val	Glu	Pro	Lys	Ser	Cys	Asp	Lys	Thr	His	Thr
	210					215					220				
Cys	Pro	Pro	Cys	Pro	Ala	Pro	Glu	Leu	Leu	Gly	Gly	Pro	Ser	Val	Phe
225					230					235					240
Leu	Phe	Pro	Pro	Lys	Pro	Lys	Asp	Thr	Leu	Met	Ile	Ser	Arg	Thr	Pro
				245					250					255	
Glu	Val	Thr	Cys	Val	Val	Val	Asp	Val	Ser	His	Glu	Asp	Pro	Glu	Val
			260					265					270		
Lys	Phe	Asn	Trp	Tyr	Val	Asp	Gly	Val	Glu	Val	His	Asn	Ala	Lys	Thr
		275					280					285			
Lys	Pro	Arg	Glu	Glu	Gln	Tyr	Asn	Ser	Thr	Tyr	Arg	Val	Val	Ser	Val
	290					295					300				
Leu	Thr	Val	Leu	His	Gln	Asp	Trp	Leu	Asn	Gly	Lys	Glu	Tyr	Lys	Cys
305					310					315					320
Lys	Val	Ser	Asn	Lys	Ala	Leu	Pro	Ala	Pro	Ile	Glu	Lys	Thr	Ile	Ser
				325					330					335	
Lys	Ala	Lys	Gly	Gln	Pro	Arg	Glu	Pro	Gln	Val	Tyr	Thr	Leu	Pro	Pro
			340					345					350		
Ser	Arg	Asp	Glu	Leu	Thr	Lys	Asn	Gln	Val	Ser	Leu	Thr	Cys	Leu	Val
		355					360					365			
Lys	Gly	Phe	Tyr	Pro	Ser	Asp	Ile	Ala	Val	Glu	Trp	Glu	Ser	Asn	Gly
	370					375				380					
Gln	Pro	Glu	Asn	Asn	Tyr	Lys	Thr	Thr	Pro	Pro	Val	Leu	Asp	Ser	Asp
385					390					395					400
Gly	Ser	Phe	Phe	Leu	Tyr	Ser	Lys	Leu	Thr	Val	Asp	Lys	Ser	Arg	Trp
				405					410					415	
Gln	Gln	Gly	Asn	Val	Phe	Ser	Cys	Ser	Val	Met	His	Glu	Ala	Leu	His
			420					425					430		
Asn	His	Tyr	Thr	Gln	Lys	Ser	Leu	Ser	Leu	Ser	Pro	Gly	Lys		
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 <212> PRT
 <213> Artificial Sequence

<220>
 <223> humanized antibody heavy chain HB

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

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				85				90					95		
Tyr	Cys	Thr	Arg	100	Asp	Gly	Ala	105	Trp	Gly	Lys	Gly	110	Thr	Val
Thr	Val	Ser	Ser	115	Ala	Ser	Thr	120	Lys	Gly	Pro	Ser	125	Phe	Pro
Pro	Ser	Ser	Lys	130	Ser	Thr	Ser	135	Gly	Gly	Thr	Ala	140	Leu	Gly
Val	Lys	Asp	Tyr	145	Phe	Pro	Glu	150	Val	Thr	Val	Ser	155	Trp	Asn
Ala	Leu	Thr	Ser	160	Gly	Val	His	165	Thr	Phe	Pro	Ala	170	Val	Gln
Gly	Leu	Tyr	Ser	175	Leu	Ser	Ser	180	Val	Val	Thr	Val	185	Pro	Ser
Gly	Thr	Gln	Thr	190	Tyr	Ile	Cys	195	Val	Asn	His	Lys	200	Pro	Ser
Lys	Val	Asp	Lys	205	Lys	Val	Glu	210	Pro	Lys	Ser	Cys	215	Asp	Lys
Cys	Pro	Pro	Cys	220	Pro	Ala	Pro	225	Glu	Leu	Leu	Gly	230	Gly	Pro
Leu	Phe	Pro	Pro	235	Lys	Pro	Lys	240	Asp	Thr	Leu	Met	245	Ile	Ser
Glu	Val	Thr	Cys	250	Val	Val	Val	255	Asp	Val	Ser	His	260	Glu	Asp
Lys	Phe	Asn	Trp	265	Tyr	Val	Asp	270	Gly	Val	Glu	Val	275	His	Asn
Lys	Pro	Arg	Glu	280	Glu	Gln	Tyr	285	Asn	Ser	Thr	Tyr	290	Val	Arg
Leu	Thr	Val	Leu	295	His	Gln	Asp	300	Trp	Leu	Asn	Gly	305	Lys	Glu
Lys	Val	Ser	Asn	310	Lys	Ala	Leu	315	Pro	Ala	Pro	Ile	320	Glu	Lys
Lys	Ala	Lys	Gly	325	Gln	Pro	Arg	330	Gln	Val	Tyr	Thr	335	Leu	Thr
Ser	Arg	Asp	Glu	340	Leu	Thr	Lys	345	Asn	Gln	Val	Ser	350	Leu	Thr
Lys	Gly	Phe	Tyr	355	Pro	Ser	Asp	360	Ile	Ala	Val	Glu	365	Glu	Ser
Gln	Pro	Glu	Asn	370	Asn	Tyr	Lys	375	Thr	Thr	Pro	Pro	380	Val	Leu
Gly	Ser	Phe	Phe	385	Leu	Tyr	Ser	390	Lys	Leu	Thr	Val	395	Asp	Lys
Gln	Gln	Gly	Asn	400	Val	Phe	Ser	405	Cys	Ser	Val	Met	410	His	Glu
Asn	His	Tyr	Thr	415	Gln	Lys	Ser	420	Leu	Ser	Leu	Ser	425	Pro	Gly
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 <212> PRT
 <213> Artificial Sequence

<220>
 <223> humanized antibody heavy chain HC

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															30
Trp	Met	Asp	Trp	35	Phe	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Leu	Glu	Trp
															45
Ala	Glu	Ile	Arg	50	Ser	Lys	Ala	Asn	Asn	His	Ala	Thr	Tyr	Tyr	Ala
															60
Ser	Val	Lys	Gly	65	Arg	Phe	Thr	Ile	Ser	Arg	Asp	Asp	Ser	Lys	Ser
															80
Val	Tyr	Leu	Gln	85	Met	Asn	Ser	Leu	Lys	Thr	Glu	Asp	Thr	Ala	Leu
															95

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Tyr	Cys	Thr	Arg	Arg	Asp	Gly	Ala	Tyr	Trp	Gly	Lys	Gly	Thr	Thr	Val
			100					105					110		
Thr	Val	Ser	Ser	Ala	Ser	Thr	Lys	Gly	Pro	Ser	Val	Phe	Pro	Leu	Ala
		115					120					125			
Pro	Ser	Ser	Lys	Ser	Thr	Ser	Gly	Gly	Thr	Ala	Ala	Leu	Gly	Cys	Leu
	130					135					140				
Val	Lys	Asp	Tyr	Phe	Pro	Glu	Pro	Val	Thr	Val	Ser	Trp	Asn	Ser	Gly
145					150					155					160
Ala	Leu	Thr	Ser	Gly	Val	His	Thr	Phe	Pro	Ala	Val	Leu	Gln	Ser	Ser
				165					170					175	
Gly	Leu	Tyr	Ser	Leu	Ser	Ser	Val	Val	Thr	Val	Pro	Ser	Ser	Ser	Leu
			180					185					190		
Gly	Thr	Gln	Thr	Tyr	Ile	Cys	Asn	Val	Asn	His	Lys	Pro	Ser	Asn	Thr
		195					200					205			
Lys	Val	Asp	Lys	Lys	Val	Glu	Pro	Lys	Ser	Cys	Asp	Lys	Thr	His	Thr
	210					215					220				
Cys	Pro	Pro	Cys	Pro	Ala	Pro	Glu	Leu	Leu	Gly	Gly	Pro	Ser	Val	Phe
225					230					235					240
Leu	Phe	Pro	Pro	Lys	Pro	Lys	Asp	Thr	Leu	Met	Ile	Ser	Arg	Thr	Pro
				245					250					255	
Glu	Val	Thr	Cys	Val	Val	Val	Asp	Val	Ser	His	Glu	Asp	Pro	Glu	Val
			260					265					270		
Lys	Phe	Asn	Trp	Tyr	Val	Asp	Gly	Val	Glu	Val	His	Asn	Ala	Lys	Thr
		275					280					285			
Lys	Pro	Arg	Glu	Glu	Gln	Tyr	Asn	Ser	Thr	Tyr	Arg	Val	Val	Ser	Val
	290					295					300				
Leu	Thr	Val	Leu	His	Gln	Asp	Trp	Leu	Asn	Gly	Lys	Glu	Tyr	Lys	Cys
305					310					315					320
Lys	Val	Ser	Asn	Lys	Ala	Leu	Pro	Ala	Pro	Ile	Glu	Lys	Thr	Ile	Ser
				325					330					335	
Lys	Ala	Lys	Gly	Gln	Pro	Arg	Glu	Pro	Gln	Val	Tyr	Thr	Leu	Pro	Pro
			340					345					350		
Ser	Arg	Asp	Glu	Leu	Thr	Lys	Asn	Gln	Val	Ser	Leu	Thr	Cys	Leu	Val
		355					360					365			
Lys	Gly	Phe	Tyr	Pro	Ser	Asp	Ile	Ala	Val	Glu	Trp	Glu	Ser	Asn	Gly
	370					375					380				
Gln	Pro	Glu	Asn	Asn	Tyr	Lys	Thr	Thr	Pro	Pro	Val	Leu	Asp	Ser	Asp
385					390					395					400
Gly	Ser	Phe	Phe	Leu	Tyr	Ser	Lys	Leu	Thr	Val	Asp	Lys	Ser	Arg	Trp
				405					410					415	
Gln	Gln	Gly	Asn	Val	Phe	Ser	Cys	Ser	Val	Met	His	Glu	Ala	Leu	His
			420					425					430		
Asn	His	Tyr	Thr	Gln	Lys	Ser	Leu	Ser	Leu	Ser	Pro	Gly	Lys		
		435					440					445			

<210> 14
 <211> 446
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> humanized antibody heavy chain HD

<400>	14														
Glu	Val	Gln	Leu	Val	Glu	Ser	Gly	Gly	Gly	Leu	Val	Gln	Pro	Gly	Arg
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Ser	Leu	Arg	Leu	Ser	Cys	Thr	Ala	Ser	Gly	Phe	Thr	Phe	Ser	Asp	Ala
		20						25					30		
Trp	Met	Asp	Trp	Phe	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Leu	Glu	Trp	Val
		35					40					45			
Ala	Glu	Ile	Arg	Ser	Lys	Ala	Asn	Asn	His	Ala	Thr	Tyr	Tyr	Ala	Glu
	50					55					60				
Ser	Val	Lys	Gly	Arg	Phe	Thr	Ile	Ser	Arg	Asp	Asp	Ser	Lys	Ser	Ile
65					70					75					80
Ala	Tyr	Leu	Gln	Met	Asn	Ser	Leu	Arg	Thr	Glu	Asp	Thr	Ala	Leu	Tyr
				85					90					95	
Tyr	Cys	Thr	Arg	Arg	Asp	Gly	Ala	Tyr	Trp	Gly	Lys	Gly	Thr	Thr	Val

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Thr	Val	Ser	100 Ser	Ala	Ser	Thr	Lys	105 Gly	Pro	Ser	Val	Phe	110 Pro	Leu	Ala
Pro	Ser	115 Ser	Lys	Ser	Thr	Ser	120 Gly	Gly	Thr	Ala	Ala	125 Leu	Gly	Cys	Leu
Val	130 Lys	Asp	Tyr	Phe	Pro	135 Glu	Pro	Val	Thr	Val	140 Ser	Trp	Asn	Ser	Gly
Ala	Leu	Thr	Ser	165 Gly	Val	His	Thr	Phe	Pro	155 Ala	Val	Leu	Gln	Ser	160 Ser
Gly	Leu	Tyr	Ser	180 Leu	Ser	Ser	Val	185 Val	Thr	Val	Pro	Ser	Ser	175 Ser	Leu
Gly	Thr	Gln	Thr	Tyr	Ile	Cys	Asn	200 Val	Asn	His	Lys	Pro	Ser	Asn	Thr
Lys	Val	Asp	Lys	Lys	Val	Glu	Pro	Lys	Ser	Cys	Asp	Lys	Thr	His	Thr
Cys	Pro	Pro	Cys	Pro	Ala	Pro	Glu	Leu	Leu	Gly	Gly	Pro	Ser	Val	Phe
Leu	Phe	Pro	Pro	Lys	230 Pro	Lys	Asp	Thr	Leu	Met	Ile	Ser	Arg	Thr	240 Pro
Glu	Val	Thr	Cys	Val	Val	Val	Asp	Val	Ser	His	Glu	Asp	Pro	Glu	Val
Lys	Phe	Asn	Trp	Tyr	Val	Asp	Gly	Val	Glu	Val	His	Asn	Ala	Lys	Thr
Lys	Pro	Arg	Glu	Glu	Gln	Tyr	Asn	Ser	Thr	Tyr	Arg	Val	Val	Ser	Val
Leu	Thr	Val	Leu	His	Gln	Asp	Trp	Leu	Asn	Gly	Lys	Glu	Tyr	Lys	Cys
Lys	Val	Ser	Asn	Lys	Ala	Leu	Pro	Ala	Pro	Ile	Glu	Lys	Thr	Ile	Ser
Lys	Ala	Lys	Gly	Gln	Pro	Arg	Glu	Pro	Gln	Val	Tyr	Thr	Leu	Pro	Pro
Ser	Arg	Asp	Glu	Leu	Thr	Lys	Asn	Gln	Val	Ser	Leu	Thr	Cys	Leu	Val
Lys	Gly	Phe	Tyr	Pro	Ser	Asp	Ile	Ala	Val	Glu	Trp	Glu	Ser	Asn	Gly
Gln	Pro	Glu	Asn	Asn	Tyr	Lys	Thr	Thr	Pro	Pro	Val	Leu	Asp	Ser	Asp
Gly	Ser	Phe	Phe	Leu	Tyr	Ser	Lys	Leu	Thr	Val	Asp	Lys	Ser	Arg	Trp
Gln	Gln	Gly	Asn	Val	Phe	Ser	Cys	Ser	Val	Met	His	Glu	Ala	Leu	His
Asn	His	Tyr	Thr	Gln	Lys	Ser	Leu	Ser	Leu	Ser	Pro	Gly	Lys		

<210>	15
<211>	446
<212>	PRT
<213>	Artificial Sequence

<220>
<223> humanized antibody heavy chain HE

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

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Thr	Val	Ser	Ser	Ala	Ser	Thr	Lys	Gly	Pro	Ser	Val	Phe	Pro	Leu	Ala
		115					120					125			
Pro	Ser	Ser	Lys	Ser	Thr	Ser	Gly	Gly	Thr	Ala	Ala	Leu	Gly	Cys	Leu
	130					135					140				
Val	Lys	Asp	Tyr	Phe	Pro	Glu	Pro	Val	Thr	Val	Ser	Trp	Asn	Ser	Gly
145					150					155					160
Ala	Leu	Thr	Ser	Gly	Val	His	Thr	Phe	Pro	Ala	Val	Leu	Gln	Ser	Ser
				165					170					175	
Gly	Leu	Tyr	Ser	Leu	Ser	Ser	Val	Val	Thr	Val	Pro	Ser	Ser	Ser	Leu
			180					185					190		
Gly	Thr	Gln	Thr	Tyr	Ile	Cys	Asn	Val	Asn	His	Lys	Pro	Ser	Asn	Thr
		195					200					205			
Lys	Val	Asp	Lys	Lys	Val	Glu	Pro	Lys	Ser	Cys	Asp	Lys	Thr	His	Thr
	210					215					220				
Cys	Pro	Pro	Cys	Pro	Ala	Pro	Glu	Leu	Leu	Gly	Gly	Pro	Ser	Val	Phe
225					230					235					240
Leu	Phe	Pro	Pro	Lys	Pro	Lys	Asp	Thr	Leu	Met	Ile	Ser	Arg	Thr	Pro
				245					250					255	
Glu	Val	Thr	Cys	Val	Val	Val	Asp	Val	Ser	His	Glu	Asp	Pro	Glu	Val
			260					265					270		
Lys	Phe	Asn	Trp	Tyr	Val	Asp	Gly	Val	Glu	Val	His	Asn	Ala	Lys	Thr
		275					280					285			
Lys	Pro	Arg	Glu	Glu	Gln	Tyr	Asn	Ser	Thr	Tyr	Arg	Val	Val	Ser	Val
	290					295					300				
Leu	Thr	Val	Leu	His	Gln	Asp	Trp	Leu	Asn	Gly	Lys	Glu	Tyr	Lys	Cys
305					310					315					320
Lys	Val	Ser	Asn	Lys	Ala	Leu	Pro	Ala	Pro	Ile	Glu	Lys	Thr	Ile	Ser
				325					330					335	
Lys	Ala	Lys	Gly	Gln	Pro	Arg	Glu	Pro	Gln	Val	Tyr	Thr	Leu	Pro	Pro
			340					345					350		
Ser	Arg	Asp	Glu	Leu	Thr	Lys	Asn	Gln	Val	Ser	Leu	Thr	Cys	Leu	Val
		355					360					365			
Lys	Gly	Phe	Tyr	Pro	Ser	Asp	Ile	Ala	Val	Glu	Trp	Glu	Ser	Asn	Gly
	370					375					380				
Gln	Pro	Glu	Asn	Asn	Tyr	Lys	Thr	Thr	Pro	Pro	Val	Leu	Asp	Ser	Asp
385					390					395					400
Gly	Ser	Phe	Phe	Leu	Tyr	Ser	Lys	Leu	Thr	Val	Asp	Lys	Ser	Arg	Trp
				405					410					415	
Gln	Gln	Gly	Asn	Val	Phe	Ser	Cys	Ser	Val	Met	His	Glu	Ala	Leu	His
			420					425					430		
Asn	His	Tyr	Thr	Gln	Lys	Ser	Leu	Ser	Leu	Ser	Pro	Gly	Lys		
		435					440					445			

<210> 16

<211> 446

<212> PRT

<213> Artificial Sequence

<220>

<223> humanized antibody heavy chain HF

<400> 16

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

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Pro	Ser	115	Lys	Ser	Thr	Ser	120	Gly	Gly	Thr	Ala	Ala	125	Leu	Gly	Cys	Leu
Val	130	Lys	Asp	Tyr	Phe	Pro	135	Glu	Pro	Val	Thr	Val	140	Ser	Trp	Asn	Ser
145	Ala	Leu	Thr	Ser	Gly	150	Val	His	Thr	Phe	Pro	155	Ala	Val	Leu	Gln	Ser
Gly	Leu	Tyr	Ser	165	Leu	Ser	Ser	Val	Val	170	Thr	Val	Pro	Ser	Ser	175	Leu
Gly	Thr	Gln	Thr	Tyr	Ile	Cys	Asn	185	Val	Asn	His	Lys	Pro	Ser	Asn	Thr	
Lys	Val	195	Asp	Lys	Lys	Val	Glu	200	Pro	Lys	Ser	Cys	Asp	Lys	Thr	His	Thr
Cys	210	Pro	Pro	Cys	Pro	Ala	215	Pro	Glu	Leu	Leu	Gly	220	Gly	Pro	Ser	Val
225	Leu	Phe	Pro	Pro	Lys	230	Pro	Lys	Asp	Thr	Leu	Met	Ile	Ser	Arg	Thr	Pro
Glu	Val	Thr	Cys	Val	Val	Val	Asp	Val	250	Ser	His	Glu	Asp	Pro	Glu	Val	
Lys	Phe	Asn	Trp	Tyr	Val	Asp	Gly	265	Val	Glu	Val	His	Asn	Ala	Lys	Thr	
Lys	Pro	Arg	Glu	Glu	Gln	Tyr	Asn	280	Ser	Thr	Tyr	Arg	Val	Val	Ser	Val	
Leu	Thr	Val	Leu	His	Gln	Asp	Trp	Leu	Asn	Gly	Lys	Glu	Tyr	Lys	Cys		
305	Lys	Val	Ser	Asn	Lys	Ala	Leu	Pro	Ala	Pro	Ile	Glu	Lys	Thr	Ile	Ser	
Lys	Ala	Lys	Gly	Gln	Pro	Arg	Glu	Pro	Gln	Val	Tyr	Thr	Leu	Pro	Pro		
Ser	Arg	Asp	Glu	Leu	Thr	Lys	Asn	345	Gln	Val	Ser	Leu	Thr	Cys	Leu	Val	
Lys	Gly	Phe	Tyr	Pro	Ser	Asp	Ile	Ala	Val	Glu	Trp	Glu	Ser	Asn	Gly		
Gln	Pro	Glu	Asn	Asn	Tyr	Lys	Thr	Thr	Pro	Pro	Val	Leu	Asp	Ser	Asp		
385	Gly	Ser	Phe	Phe	Leu	Tyr	Ser	Lys	Leu	Thr	Val	Asp	Lys	Ser	Arg	Trp	
Gln	Gln	Gly	Asn	Val	Phe	Ser	Cys	Ser	Val	Met	His	Glu	Ala	Leu	His		
Asn	His	Tyr	Thr	Gln	Lys	Ser	Leu	Ser	Leu	Ser	Pro	Gly	Lys				
		435					440					445					

<210> 17
 <211> 446
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> humanized antibody heavy chain HG

<400>	17	Glu	Val	Gln	Leu	Val	Glu	Ser	Gly	Gly	Gly	Leu	Val	Gln	Pro	Gly	Arg
1		Ser	Leu	Arg	Leu	5	Ser	Cys	Thr	Ala	Ser	10	Gly	Phe	Thr	Phe	Ser
		Trp	Met	Asp	Trp	20	Val	Arg	Gln	Ala	Pro	25	Gly	Lys	Gly	Leu	Glu
		Ala	Glu	Ile	Arg	35	Ser	Lys	Ala	Asn	Asn	40	His	Ala	Thr	Tyr	Tyr
		Ser	Val	Lys	Gly	50	Arg	Phe	Thr	Ile	Ser	60	Arg	Asp	Ser	Lys	Ser
		Ala	Tyr	Leu	Gln	65	Met	Asn	Ser	Leu	Lys	75	Thr	Glu	Asp	Thr	Ala
		Tyr	Cys	Thr	Arg	85	Arg	Asp	Gly	Ala	Tyr	90	Trp	Gly	Lys	Gly	Thr
		Thr	Val	Ser	Ser	100	Ala	Ser	Thr	Lys	Gly	105	Pro	Ser	Val	Phe	Pro
						115						120					125

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Pro	Ser	Ser	Lys	Ser	Thr	Ser	Gly	Gly	Thr	Ala	Ala	Leu	Gly	Cys	Leu
Val	130	Lys	Asp	Tyr	Phe	Pro	Glu	Pro	Val	Thr	Val	Ser	Trp	Asn	Ser
145						150				155					Gly
Ala	Leu	Thr	Ser	Gly	Val	His	Thr	Phe	Pro	Ala	Val	Leu	Gln	Ser	Ser
				165					170					175	
Gly	Leu	Tyr	Ser	Leu	Ser	Ser	Val	Val	Thr	Val	Pro	Ser	Ser	Ser	Leu
			180					185					190		
Gly	Thr	Gln	Thr	Tyr	Ile	Cys	Asn	Val	Asn	His	Lys	Pro	Ser	Asn	Thr
		195					200					205			
Lys	Val	Asp	Lys	Lys	Val	Glu	Pro	Lys	Ser	Cys	Asp	Lys	Thr	His	Thr
	210					215					220				
Cys	Pro	Pro	Cys	Pro	Ala	Pro	Glu	Leu	Leu	Gly	Gly	Pro	Ser	Val	Phe
225					230					235					240
Leu	Phe	Pro	Pro	Lys	Pro	Lys	Asp	Thr	Leu	Met	Ile	Ser	Arg	Thr	Pro
				245					250					255	
Glu	Val	Thr	Cys	Val	Val	Val	Asp	Val	Ser	His	Glu	Asp	Pro	Glu	Val
			260					265					270		
Lys	Phe	Asn	Trp	Tyr	Val	Asp	Gly	Val	Glu	Val	His	Asn	Ala	Lys	Thr
		275					280					285			
Lys	Pro	Arg	Glu	Glu	Gln	Tyr	Asn	Ser	Thr	Tyr	Arg	Val	Val	Ser	Val
	290					295					300				
Leu	Thr	Val	Leu	His	Gln	Asp	Trp	Leu	Asn	Gly	Lys	Glu	Tyr	Lys	Cys
305					310					315					320
Lys	Val	Ser	Asn	Lys	Ala	Leu	Pro	Ala	Pro	Ile	Glu	Lys	Thr	Ile	Ser
				325					330					335	
Lys	Ala	Lys	Gly	Gln	Pro	Arg	Glu	Pro	Gln	Val	Tyr	Thr	Leu	Pro	Pro
			340					345					350		
Ser	Arg	Asp	Glu	Leu	Thr	Lys	Asn	Gln	Val	Ser	Leu	Thr	Cys	Leu	Val
		355					360					365			
Lys	Gly	Phe	Tyr	Pro	Ser	Asp	Ile	Ala	Val	Glu	Trp	Glu	Ser	Asn	Gly
	370					375					380				
Gln	Pro	Glu	Asn	Asn	Tyr	Lys	Thr	Thr	Pro	Pro	Val	Leu	Asp	Ser	Asp
385					390					395					400
Gly	Ser	Phe	Phe	Leu	Tyr	Ser	Lys	Leu	Thr	Val	Asp	Lys	Ser	Arg	Trp
				405					410					415	
Gln	Gln	Gly	Asn	Val	Phe	Ser	Cys	Ser	Val	Met	His	Glu	Ala	Leu	His
			420					425					430		
Asn	His	Tyr	Thr	Gln	Lys	Ser	Leu	Ser	Leu	Ser	Pro	Gly	Lys		
		435					440					445			

<210> 18
 <211> 446
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> humanized antibody heavy chain HH

<400>	18														
Glu	Val	Gln	Leu	Val	Glu	Ser	Gly	Gly	Gly	Leu	Val	Gln	Pro	Gly	Arg
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Ser	Leu	Arg	Leu	Ser	Cys	Thr	Ala	Ser	Gly	Phe	Thr	Phe	Ser	Asp	Ala
			20					25					30		
Trp	Met	Asp	Trp	Val	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Leu	Glu	Trp	Val
		35					40					45			
Ala	Glu	Ile	Arg	Ser	Lys	Ala	Asn	Asn	His	Ala	Thr	Tyr	Tyr	Ala	Glu
	50					55				60					
Ser	Val	Lys	Gly	Arg	Phe	Thr	Ile	Ser	Arg	Asp	Ser	Lys	Ser	Ile	
65					70					75				80	
Ala	Tyr	Leu	Gln	Met	Asn	Ser	Leu	Lys	Thr	Glu	Asp	Thr	Ala	Val	Tyr
				85					90				95		
Tyr	Cys	Thr	Arg	Arg	Asp	Gly	Ala	Tyr	Trp	Gly	Lys	Gly	Thr	Thr	Val
			100					105					110		
Thr	Val	Ser	Ser	Ala	Ser	Thr	Lys	Gly	Pro	Ser	Val	Phe	Pro	Leu	Ala
			115				120					125			
Pro	Ser	Ser	Lys	Ser	Thr	Ser	Gly	Gly	Thr	Ala	Ala	Leu	Gly	Cys	Leu

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Val	130	Lys	Asp	Tyr	Phe	Pro	135	Glu	Pro	Val	Thr	Val	140	Ser	Trp	Asn	Ser	Gly
145	Ala	Leu	Thr	Ser	Gly	150	Val	His	Thr	Phe	Pro	155	Ala	Val	Leu	Gln	Ser	Ser
				165	Leu	Ser	Ser	Val	Val	170	Thr	Val	Pro	Ser	Ser	175	Ser	Leu
Gly	Thr	Gln	180	Thr	Tyr	Ile	Cys	Asn	185	Val	Asn	His	Lys	Pro	190	Ser	Asn	Thr
	195	Val	Asp	Lys	Lys	Val	Glu	Pro	Lys	Ser	Cys	Asp	Lys	Thr	His	Thr		
Lys	210	Pro	Pro	Cys	Pro	Ala	Pro	Glu	Leu	Leu	Gly	Gly	Pro	Ser	Val	Phe		
Cys	225	Phe	Pro	Pro	Lys	230	Pro	Lys	Asp	Thr	Leu	Met	Ile	Ser	Arg	Thr	Pro	
				245	Val	Val	Val	Asp	Val	Ser	His	Glu	Asp	Pro	Glu	Val		
Glu	Val	Thr	Cys	260	Tyr	Val	Asp	Gly	Val	Glu	Val	His	Asn	Ala	Lys	Thr		
Lys	Phe	Asn	275	Trp	Glu	Gln	Tyr	280	Asn	Ser	Thr	Tyr	Arg	Val	Val	Ser	Val	
	290	Pro	Arg	Glu	Gln	Gln	295	Asp	Trp	Leu	Asn	Gly	Lys	Glu	Tyr	Lys	Cys	
Leu	305	Thr	Val	Leu	His	Gln	310	Asp	Trp	Leu	Asn	Gly	Lys	Glu	Tyr	Lys	Cys	
Lys	Val	Ser	Asn	Lys	Ala	Leu	Pro	Ala	Pro	330	Ile	Glu	Lys	Thr	Ile	Ser		
				325	Pro	Arg	Glu	Pro	335	Gln	Val	Tyr	Thr	Leu	Pro	Pro		
Lys	Ala	Lys	Gly	340	Gln	Pro	Arg	Glu	Pro	345	Gln	Val	Tyr	Thr	Leu	Pro	Pro	
Ser	Arg	Asp	Glu	Leu	Thr	Lys	Asn	Gln	Val	Ser	Leu	Thr	Cys	Leu	Val			
		355					360											
Lys	Gly	Phe	Tyr	Pro	Ser	Asp	Ile	Ala	Val	Glu	Trp	Glu	Ser	Asn	Gly			
	370					375					380							
Gln	Pro	Glu	Asn	Asn	Tyr	Lys	Thr	Thr	Pro	Pro	Val	Leu	Asp	Ser	Asp			
385					390					395								
Gly	Ser	Phe	Phe	Leu	Tyr	Ser	Lys	Leu	Thr	Val	Asp	Lys	Ser	Arg	Trp			
				405						410								
Gln	Gln	Gly	Asn	Val	Phe	Ser	Cys	Ser	Val	Met	His	Glu	Ala	Leu	His			
			420					425										
Asn	His	Tyr	Thr	Gln	Lys	Ser	Leu	Ser	Leu	Ser	Pro	Gly	Lys					
	435						440					445						

<210> 19
 <211> 214
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> humanized antibody light chain KA

<400>	19	Asp	Ile	Gln	Met	Thr	Gln	Ser	Pro	Ser	Ser	Val	Ser	Ala	Ser	Val	Gly
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Asp	Arg	Val	Thr	Ile	Thr	Cys	Arg	Ala	Ser	Gln	Asp	Ile	Ser	Ser	Tyr		
		20						25					30				
Leu	Asn	Trp	Tyr	Gln	Gln	Lys	Pro	Gly	Lys	Ala	Pro	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	Phe	Thr	Leu	Thr	Ile	Ser	Ser	Leu	Gln	Pro		
65					70					75					80		
Glu	Asp	Phe	Ala	Ser	Tyr	Phe	Cys	Gln	Gln	Leu	Asn	Thr	Leu	Pro	Trp		
				85					90					95			
Thr	Phe	Gly	Gly	Gly	Thr	Lys	Val	Glu	Met	Glu	Arg	Thr	Val	Ala	Ala		
		100						105					110				
Pro	Ser	Val	Phe	Ile	Phe	Pro	Pro	Ser	Asp	Glu	Gln	Leu	Lys	Ser	Gly		
	115						120					125					
Thr	Ala	Ser	Val	Val	Cys	Leu	Leu	Asn	Asn	Phe	Tyr	Pro	Arg	Glu	Ala		
	130					135					140						

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Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser Gln
 145 150 155 160
 Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Thr Tyr Ser Leu Ser
 165 170 175
 Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys His Lys Val Tyr
 180 185 190
 Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser Pro Val Thr Lys Ser
 195 200 205
 Phe Asn Arg Gly Glu Cys
 210

<210> 20
 <211> 214
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> humanized antibody light chain KB

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

<210> 21
 <211> 214
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> humanized antibody light chain KC

<400> 21
 Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Val Ser Ala Ser Val Gly
 1 5 10 15
 Asp Arg Val Thr Ile Thr Cys Arg Ala Ser Gln Asp Ile Ser Ser Tyr
 20 25 30
 Leu Asn Trp Tyr Gln Gln Lys Pro Gly Lys Ala 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

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

<210> 22
<211> 214
<212> PRT
<213> Artificial Sequence

<220>
<223> humanized antibody light chain KD

<400> 22
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Val Ser Ala Ser Val Gly
1 5 10 15
Asp Arg Val Thr Ile Thr Cys Arg Ala Ser Gln Asp Ile Ser Ser Tyr
20 25 30
Leu Asn Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro 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 Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80
Glu Asp Phe Ala Thr Tyr Phe Cys Gln Gln Leu Asn Thr Leu Pro Trp
85 90 95
Thr Phe Gly Gly Gly Thr Lys Val Glu Met Glu Arg Thr Val Ala Ala
100 105 110
Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys Ser Gly
115 120 125
Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu Ala
130 135 140
Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser Gln
145 150 155 160
Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser Leu Ser
165 170 175
Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys His Lys Val Tyr
180 185 190
Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser Pro Val Thr Lys Ser
195 200 205
Phe Asn Arg Gly Glu Cys
210

<210> 23
<211> 214
<212> PRT
<213> Artificial Sequence

<220>
<223> humanized antibody light chain KE

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<400> 23
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Val Ser Ala Ser Val Gly
1 5 10 15
Asp Arg Val Thr Ile Thr Cys Arg Ala Ser Gln Asp Ile Ser Ser Tyr
20 25 30
Leu Asn Trp Tyr Gln Gln Lys Pro Gly Lys Ala 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 Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80
Glu Asp Phe Ala Ser Tyr Phe Cys Gln Gln Leu Asn Thr Leu Pro Trp
85 90 95
Thr Phe Gly Gly Gly Thr Lys Val Glu Met Glu Arg Thr Val Ala Ala
100 105 110
Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys Ser Gly
115 120 125
Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu Ala
130 135 140
Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser Gln
145 150 155 160
Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser Leu Ser
165 170 175
Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys His Lys Val Tyr
180 185 190
Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser Pro Val Thr Lys Ser
195 200 205
Phe Asn Arg Gly Glu Cys
210

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<210> 24
<211> 214
<212> PRT
<213> Artificial Sequence

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<220>
<223> humanized antibody light chain KF

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<400> 24
Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Val Ser Ala Ser Val Gly
1 5 10 15
Asp Arg Val Thr Ile Thr Cys Arg Ala Ser Gln Asp Ile Ser Ser Tyr
20 25 30
Leu Asn Trp Tyr Gln Gln Lys Pro Gly Lys Ala 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 Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80
Glu Asp Phe Ala Thr Tyr Phe Cys Gln Gln Leu Asn Thr Leu Pro Trp
85 90 95
Thr Phe Gly Gly Gly Thr Lys Val Glu Met Glu Arg Thr Val Ala Ala
100 105 110
Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys Ser Gly
115 120 125
Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu Ala
130 135 140
Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser Gln
145 150 155 160
Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser Leu Ser
165 170 175
Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys His Lys Val Tyr
180 185 190
Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser Pro Val Thr Lys Ser
195 200 205
Phe Asn Arg Gly Glu Cys

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210

<210> 25
 <211> 214
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> humanized antibody light chain KG

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

<210> 26
 <211> 14
 <212> PRT
 <213> Mus musculus

<400> 26

Glu Glu Val Val Asn Ala Val Glu Asp Trp Asp Ser Gln Gly
 1 5 10

<210> 27
 <211> 14
 <212> PRT
 <213> Mus musculus

<400> 27

Asn Gln Gln Ile Asp Phe Gln Ala Phe His Thr Asn Ala Glu
 1 5 10

<210> 28
 <211> 11
 <212> PRT
 <213> Mus musculus

<400> 28

Pro	Thr	Ala	Pro	Glu	Thr	Phe	Pro	Tyr	Glu	Thr
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<210> 29

<211> 11

<212> PRT

<213> Mus musculus

<400> 29

Lys	Leu	Pro	Val	Glu	Asp	Leu	Tyr	Tyr	Gln	Ala
1				5					10	

<210> 30

<211> 11

<212> PRT

<213> Mus musculus

<400> 30

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

<210> 31

<211> 7

<212> PRT

<213> Mus musculus

<400> 31

Tyr	Thr	Ser	Arg	Leu	His	Ser
1				5		

<210> 32

<211> 7

<212> PRT

<213> Mus musculus

<400> 32

Gln	Gln	Leu	Asn	Thr	Leu	Pro
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<210> 33

<211> 5

<212> PRT

<213> Mus musculus

<400> 33

Asp	Ala	Trp	Met	Asp
1				5

<210> 34

<211> 19

<212> PRT

<213> Mus musculus

<400> 34

Glu Ile Arg Ser Lys Ala Asn Asn His Ala Thr Tyr Tyr Ala Glu Ser
1 5 10 15

Val Lys Gly

<210> 35
<211> 5
<212> PRT
<213> Mus musculus

<400> 35

Arg Asp Gly Ala Tyr
1 5

<210> 36
<211> 16
<212> PRT
<213> Mus musculus

<400> 36

Arg Ser Ser Gln Ser Leu Val His Ser Asn Gly Asn Thr Tyr Leu His
1 5 10 15

<210> 37
<211> 7
<212> PRT
<213> Mus musculus

<400> 37

Lys Val Ser Asn Arg Phe Ser
1 5

<210> 38
<211> 7
<212> PRT
<213> Mus musculus

<400> 38

Ser Gln Ser Thr His Val Pro
1 5

<210> 39
<211> 6
<212> PRT
<213> Mus musculus

<400> 39

Thr Ser Tyr Tyr Trp Asn
1 5

<210> 40
<211> 16
<212> PRT
<213> Mus musculus

<400> 40

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

<210> 41

<211> 116

<212> PRT

<213> Artificial Sequence

<220>

<223> humanized antibody heavy chain

<400> 41

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

<210> 42

<211> 107

<212> PRT

<213> Artificial Sequence

<220>

<223> humanized antibody light chain

<400> 42

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

<210> 43

<211> 348

<212> DNA

<213> Artificial Sequence

<220>

<223> a gene encoding humanized antibody heavy chain

<400> 43

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cctggcaagg	gcctggaatg	ggtggccgag	atccgggtcca	aggccaacaa	ccacgccacc	180
tactacgccg	agtctgtgaa	gggccgggtc	accatctccc	gggacgactc	caagtccatc	240
gtgtacctgc	agatgaactc	cctgcggacc	gaggacaccg	ccctgtacta	ctgcaccaga	300
agggacggcg	cctactgggg	caagggcacc	acagtgcag	tgtcctcc		348

<210> 44
 <211> 321
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> a gene encoding humanized antibody light chain

<400> 44						
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ggcaaggccc	ccaagctgct	gatctactac	acctcccggc	tgcactccgg	cgtgccctct	180
agattttccg	gctctggctc	cggcaccgac	tttaccctga	ccatctccag	cctgcagccc	240
gaggacttcg	cctcctactt	ctgtcagcag	ctgaacaccc	tgccctggac	ctttggcgga	300
ggcaccaagg	tggaatgga	a				321

<210> 45
 <211> 13
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> PLP139-151

<400> 45	
His Ser Leu Gly Lys Trp Leu Gly His Pro Asp Lys Phe	
1 5 10	

<210> 46
 <211> 4
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> spacer

<400> 46	
Ser Gly Ser Gly	
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