

170222_16PP026WO_Sequence_protocol_JX-2.txt

SEQUENCE LISTING

<110> EUROIMMUN Medizinische Labordiagnostika AG

<120> An immunoassay for the diagnosis of viral infections

<130> 16PP026WO2

<160> 27

<170> BiSSAP 1.3

<210> 1

<211> 352

<212> PRT

<213> Artificial Sequence

<220>

<223> SEQ ID NO1: Zika virus NS1 antigen

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

Trp Pro Lys Ser His Thr Leu Trp Thr Asp Gly Val Glu Glu Ser Asp
 225 230 235 240
 Leu Ile Ile Pro Lys Ser Leu Ala Gly Pro Leu Ser His His Asn Thr
 245 250 255
 Arg Glu Gly Tyr Arg Thr Gln Val Lys Gly Pro Trp His Ser Glu Glu
 260 265 270
 Leu Glu Ile Arg Phe Glu Glu Cys Pro Gly Thr Lys Val His Val Glu
 275 280 285
 Glu Thr Cys Gly Thr Arg Gly Pro Ser Leu Arg Ser Thr Thr Ala Ser
 290 295 300
 Gly Arg Val Ile Glu Glu Trp Cys Cys Arg Glu Cys Thr Met Pro Pro
 305 310 315 320
 Leu Ser Phe Arg Ala Lys Asp Gly Cys Trp Tyr Gly Met Glu Ile Arg
 325 330 335
 Pro Arg Lys Glu Pro Glu Ser Asn Leu Val Arg Ser Met Val Thr Ala
 340 345 350

<210> 2

<211> 352

<212> PRT

<213> Artificial Sequence

<220>

<223> SEQ ID NO2: dengue virus 1 NS1 antigen

<400> 2

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

Gln Met Cys Asp His Arg Leu Met Ser Ala Ala Ile Lys Asp Ser Lys
 180 185 190
 Ala Val His Ala Asp Met Gly Tyr Trp Ile Glu Ser Glu Lys Asn Glu
 195 200 205
 Thr Trp Lys Leu Ala Arg Ala Ser Phe Ile Glu Val Lys Thr Cys Ile
 210 215 220
 Trp Pro Lys Ser His Thr Leu Trp Ser Asn Gly Val Leu Glu Ser Glu
 225 230 235 240
 Met Ile Ile Pro Lys Ile Tyr Gly Gly Pro Ile Ser Gln His Asn Tyr
 245 250 255
 Arg Pro Gly Tyr Phe Thr Gln Thr Ala Gly Pro Trp His Leu Gly Lys
 260 265 270
 Leu Glu Leu Asp Phe Asp Leu Cys Glu Gly Thr Thr Val Ile Val Asp
 275 280 285
 Glu His Cys Gly Asn Arg Gly Pro Ser Leu Arg Thr Thr Thr Val Thr
 290 295 300
 Gly Lys Ile Ile His Glu Trp Cys Cys Arg Ser Cys Thr Leu Pro Pro
 305 310 315 320
 Leu Arg Phe Arg Gly Glu Asp Gly Cys Trp Tyr Gly Met Glu Ile Arg
 325 330 335
 Pro Val Lys Glu Lys Glu Glu Asn Leu Val Lys Ser Met Val Ser Ala
 340 345 350

<210> 3

<211> 352

<212> PRT

<213> Artificial Sequence

<220>

<223> SEQ ID NO3: dengue virus 2 NS1 antigen

<400> 3

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

His Asn Gln Thr Phe Leu Ile Asp Gly Pro Glu Thr Ala Glu Cys Pro
 130 135 140
 Asn Thr Asn Arg Ala Trp Asn Ser Leu Glu Val Glu Asp Tyr Gly Phe
 145 150 155 160
 Gly Val Phe Thr Thr Asn Ile Trp Leu Lys Leu Lys Glu Lys Gln Asp
 165 170 175
 Ala Phe Cys Asp Ser Lys Leu Met Ser Ala Ala Ile Lys Asp Asn Arg
 180 185 190
 Ala Val His Ala Asp Met Gly Tyr Trp Ile Glu Ser Ala Leu Asn Asp
 195 200 205
 Thr Trp Lys Ile Glu Lys Ala Ser Phe Ile Glu Val Lys Asn Cys His
 210 215 220
 Trp Pro Lys Ser His Thr Leu Trp Ser Asn Gly Val Leu Glu Ser Glu
 225 230 235 240
 Met Ile Ile Pro Lys Asn Leu Ala Gly Pro Val Ser Gln His Asn Tyr
 245 250 255
 Arg Pro Gly Tyr His Thr Gln Ile Ala Gly Pro Trp His Leu Gly Lys
 260 265 270
 Leu Glu Met Asp Phe Asp Phe Cys Asp Gly Thr Thr Val Val Val Thr
 275 280 285
 Glu Asp Cys Gly Asn Arg Gly Pro Ser Leu Arg Thr Thr Thr Ala Ser
 290 295 300
 Gly Lys Leu Ile Thr Glu Trp Cys Cys Arg Ser Cys Thr Leu Pro Pro
 305 310 315 320
 Leu Arg Tyr Arg Gly Glu Asp Gly Cys Trp Tyr Gly Met Glu Ile Arg
 325 330 335
 Pro Leu Lys Glu Lys Glu Glu Asn Leu Val Asn Ser Leu Val Thr Ala
 340 345 350

<210> 4

<211> 352

<212> PRT

<213> Artificial Sequence

<220>

<223> SEQ ID NO4: dengue virus 3 NS1 antigen

<400> 4

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

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

<210> 5

<211> 352

<212> PRT

<213> Artificial Sequence

<220>

<223> SEQ ID NO5: dengue virus 4 NS1 antigen

<400> 5

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

<400> 6

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

<210> 7

<211> 352

<212> PRT

<213> Artificial Sequence

<220>

<223> SEQ ID NO7: Tick-borne encephalitis virus NS1 antigen

<400> 7

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

<210> 8

<211> 352

<212> PRT

<213> Artificial Sequence

<220>

<223> SEQ ID NO8: Japanese encephalitis virus NS1 antigen

<400> 8

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

Glu	Asp	Cys	Gly	Lys	Arg	Gly	Pro	Ser	Ile	Arg	Thr	Thr	Thr	Asp	Ser
290						295					300				
Gly	Lys	Leu	Ile	Thr	Asp	Trp	Cys	Cys	Arg	Ser	Cys	Ser	Leu	Pro	Pro
305					310					315				320	
Leu	Arg	Phe	Arg	Thr	Glu	Asn	Gly	Cys	Trp	Tyr	Gly	Met	Glu	Ile	Arg
				325					330					335	
Pro	Val	Arg	His	Asp	Glu	Thr	Thr	Leu	Val	Arg	Ser	Gln	Val	Asp	Ala
			340					345					350		

<210> 9

<211> 352

<212> PRT

<213> Artificial Sequence

<220>

<223> SEQ ID NO9: Yellow fever virus NS1 antigen

<400> 9

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

Met	Phe	Met	Pro	Arg	Ser	Ile	Gly	Gly	Pro	Val	Ser	Ser	His	Asn	His
				245					250					255	
Ile	Pro	Gly	Tyr	Lys	Val	Gln	Thr	Asn	Gly	Pro	Trp	Met	Gln	Val	Pro
			260					265					270		
Leu	Glu	Val	Lys	Arg	Glu	Ala	Cys	Pro	Gly	Thr	Ser	Val	Ile	Ile	Asp
		275					280					285			
Gly	Asn	Cys	Asp	Gly	Arg	Gly	Lys	Ser	Thr	Arg	Ser	Thr	Thr	Asp	Ser
	290					295				300					
Gly	Lys	Ile	Ile	Pro	Glu	Trp	Cys	Cys	Arg	Ser	Cys	Thr	Met	Pro	Pro
305				310					315					320	
Val	Ser	Phe	His	Gly	Ser	Asp	Gly	Cys	Trp	Tyr	Pro	Met	Glu	Ile	Arg
			325					330					335		
Pro	Arg	Lys	Thr	His	Glu	Ser	His	Leu	Val	Arg	Ser	Trp	Val	Thr	Ala
		340						345					350		

<210> 10

<211> 362

<212> PRT

<213> Artificial Sequence

<220>

<223> SEQ ID NO10: Zika virus NS1 antigen with C-terminal His tag

<400> 10

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

Ala	Ala	His	Ser	Asp	Leu	Gly	Tyr	Trp	Ile	Glu	Ser	Glu	Lys	Asn	Asp
	195						200					205			
Thr	Trp	Arg	Leu	Lys	Arg	Ala	His	Leu	Ile	Glu	Met	Lys	Thr	Cys	Glu
	210					215					220				
Trp	Pro	Lys	Ser	His	Thr	Leu	Trp	Thr	Asp	Gly	Val	Glu	Glu	Ser	Asp
225					230					235				240	
Leu	Ile	Ile	Pro	Lys	Ser	Leu	Ala	Gly	Pro	Leu	Ser	His	His	Asn	Thr
			245					250						255	
Arg	Glu	Gly	Tyr	Arg	Thr	Gln	Val	Lys	Gly	Pro	Trp	His	Ser	Glu	Glu
	260							265					270		
Leu	Glu	Ile	Arg	Phe	Glu	Glu	Cys	Pro	Gly	Thr	Lys	Val	His	Val	Glu
	275						280					285			
Glu	Thr	Cys	Gly	Thr	Arg	Gly	Pro	Ser	Leu	Arg	Ser	Thr	Thr	Ala	Ser
290						295				300					
Gly	Arg	Val	Ile	Glu	Glu	Trp	Cys	Cys	Arg	Glu	Cys	Thr	Met	Pro	Pro
305					310					315				320	
Leu	Ser	Phe	Arg	Ala	Lys	Asp	Gly	Cys	Trp	Tyr	Gly	Met	Glu	Ile	Arg
			325					330					335		
Pro	Arg	Lys	Glu	Pro	Glu	Ser	Asn	Leu	Val	Arg	Ser	Met	Val	Thr	Ala
		340						345					350		
Leu	Glu	His	His	His	His	His	His	His							
	355					360									

<210> 11

<211> 500

<212> PRT

<213> Artificial Sequence

<220>

<223> SEQ ID NO 11: Zika virus envelope glycoprotein

<400> 11

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

Gly	Ser	Gln	His	Ser	Gly	Met	Ile	Gly	Tyr	Glu	Thr	Asp	Glu	Asp	Arg	145	150	155	160
Ala	Lys	Val	Glu	Val	Thr	Pro	Asn	Ser	Pro	Arg	Ala	Glu	Ala	Thr	Leu	165	170	175	
Gly	Gly	Phe	Gly	Ser	Leu	Gly	Leu	Asp	Cys	Glu	Pro	Arg	Thr	Gly	Leu	180	185	190	
Asp	Phe	Ser	Asp	Leu	Tyr	Tyr	Leu	Thr	Met	Asn	Asn	Lys	His	Trp	Leu	195	200	205	
Val	His	Lys	Glu	Trp	Phe	His	Asp	Ile	Pro	Leu	Pro	Trp	His	Ala	Gly	210	215	220	
Ala	Asp	Thr	Gly	Thr	Pro	His	Trp	Asn	Asn	Lys	Glu	Ala	Leu	Val	Glu	225	230	235	240
Phe	Lys	Asp	Ala	His	Ala	Lys	Arg	Gln	Thr	Val	Val	Val	Leu	Gly	Ser	245	250	255	
Gln	Glu	Gly	Ala	Val	His	Thr	Ala	Leu	Ala	Gly	Ala	Leu	Glu	Ala	Glu	260	265	270	
Met	Asp	Gly	Ala	Lys	Gly	Arg	Leu	Phe	Ser	Gly	His	Leu	Lys	Cys	Arg	275	280	285	
Leu	Lys	Met	Asp	Lys	Leu	Arg	Leu	Lys	Gly	Val	Ser	Tyr	Ser	Leu	Cys	290	295	300	
Thr	Ala	Ala	Phe	Thr	Phe	Thr	Lys	Val	Pro	Ala	Glu	Thr	Leu	His	Gly	305	310	315	320
Thr	Val	Thr	Val	Glu	Val	Gln	Tyr	Ala	Gly	Thr	Asp	Gly	Pro	Cys	Lys	325	330	335	
Ile	Pro	Val	Gln	Met	Ala	Val	Asp	Met	Gln	Thr	Leu	Thr	Pro	Val	Gly	340	345	350	
Arg	Leu	Ile	Thr	Ala	Asn	Pro	Val	Ile	Thr	Glu	Ser	Thr	Glu	Asn	Ser	355	360	365	
Lys	Met	Met	Leu	Glu	Leu	Asp	Pro	Pro	Phe	Gly	Asp	Ser	Tyr	Ile	Val	370	375	380	
Ile	Gly	Val	Gly	Asp	Lys	Lys	Ile	Thr	His	His	Trp	His	Arg	Ser	Gly	385	390	395	400
Ser	Thr	Ile	Gly	Lys	Ala	Phe	Glu	Ala	Thr	Val	Arg	Gly	Ala	Lys	Arg	405	410	415	
Met	Ala	Val	Leu	Gly	Asp	Thr	Ala	Trp	Asp	Phe	Gly	Ser	Val	Gly	Gly	420	425	430	
Val	Phe	Asn	Ser	Leu	Gly	Lys	Gly	Ile	His	Gln	Ile	Phe	Gly	Ala	Ala	435	440	445	
Phe	Lys	Ser	Leu	Phe	Gly	Gly	Met	Ser	Trp	Phe	Ser	Gln	Ile	Leu	Ile	450	455	460	
Gly	Thr	Leu	Leu	Val	Trp	Leu	Gly	Leu	Asn	Thr	Lys	Asn	Gly	Ser	Ile	465	470	475	480
Ser	Leu	Thr	Cys	Leu	Ala	Leu	Gly	Gly	Val	Met	Ile	Phe	Leu	Ser	Thr	485	490	495	
Ala	Val	Ser	Ala													500			

<210> 12
 <211> 494
 <212> PRT

<213> Artificial Sequence

<220>

<223> SEQ ID NO12: dengue virus 1 envelope glycoprotein

<400> 12

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Met Arg Cys Val Gly Ile Gly Ser Arg Asp Phe Val Glu Gly Leu Ser
1      5      10      15
Gly Ala Thr Trp Val Asp Val Val Leu Glu His Gly Ser Cys Val Thr
      20      25      30
Thr Met Ala Lys Asp Lys Pro Thr Leu Asp Ile Glu Leu Leu Lys Thr
      35      40      45
Glu Val Thr Asn Pro Ala Val Leu Arg Lys Leu Cys Ile Glu Ala Lys
      50      55      60
Ile Ser Asn Thr Thr Thr Asp Ser Arg Cys Pro Thr Gln Gly Glu Ala
      65      70      75      80
Thr Leu Val Glu Glu Gln Asp Ala Asn Phe Val Cys Arg Arg Thr Phe
      85      90      95
Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
      100      105      110
Leu Leu Thr Cys Ala Lys Phe Lys Cys Val Thr Lys Leu Glu Gly Lys
      115      120      125
Ile Val Gln Tyr Glu Asn Leu Lys Tyr Ser Val Ile Val Thr Val His
      130      135      140
Thr Gly Asp Gln His Gln Val Gly Asn Glu Thr Thr Glu His Gly Thr
      145      150      155      160
Ile Ala Thr Ile Thr Pro Gln Ala Pro Thr Ser Glu Ile Gln Leu Thr
      165      170      175
Asp Tyr Gly Ala Leu Thr Leu Asp Cys Ser Pro Arg Thr Gly Leu Asp
      180      185      190
Phe Asn Glu Met Val Leu Leu Thr Met Lys Glu Lys Ser Trp Leu Val
      195      200      205
His Lys Gln Trp Phe Leu Asp Leu Pro Leu Pro Trp Thr Ser Gly Ala
      210      215      220
Ser Thr Ser Gln Glu Thr Trp Asn Arg Gln Asp Leu Leu Val Thr Phe
      225      230      235      240
Lys Thr Ala His Ala Lys Lys Gln Glu Val Val Val Leu Gly Ser Gln
      245      250      255
Glu Gly Ala Met His Thr Ala Leu Thr Gly Ala Thr Glu Ile Gln Thr
      260      265      270
Ser Gly Thr Thr Thr Ile Phe Ala Gly His Leu Lys Cys Arg Leu Lys
      275      280      285
Met Asp Lys Leu Thr Leu Lys Gly Met Ser Tyr Val Met Cys Thr Gly
      290      295      300
Ser Phe Lys Leu Glu Lys Glu Val Ala Glu Thr Gln His Gly Thr Val
      305      310      315      320
Leu Val Gln Val Lys Tyr Glu Gly Thr Asp Ala Pro Cys Lys Ile Pro
      325      330      335
Phe Ser Thr Gln Asp Glu Lys Gly Val Thr Gln Asn Arg Leu Ile Thr
      340      345      350
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Ala Asn Pro Ile Val Thr Asp Lys Glu Lys Pro Val Asn Ile Glu Thr
355 360 365
Glu Pro Pro Phe Gly Glu Ser Tyr Ile Val Val Gly Ala Gly Glu Lys
370 375 380
Ala Leu Lys Gln Cys Trp Phe Lys Lys Gly Ser Ser Ile Gly Lys Met
385 390 395 400
Phe Glu Ala Thr Ala Arg Gly Ala Arg Arg Met Ala Ile Leu Gly Asp
405 410 415
Thr Ala Trp Asp Phe Gly Ser Ile Gly Gly Val Phe Thr Ser Val Gly
420 425 430
Lys Leu Val His Gln Val Phe Gly Thr Ala Tyr Gly Val Leu Phe Ser
435 440 445
Gly Val Ser Trp Thr Met Lys Ile Gly Ile Gly Ile Leu Leu Thr Trp
450 455 460
Leu Gly Leu Asn Ser Arg Ser Thr Ser Leu Ser Met Thr Cys Ile Ala
465 470 475 480
Val Gly Met Val Thr Leu Tyr Leu Gly Val Met Val Gln Ala
485 490

<210> 13

<211> 495

<212> PRT

<213> Artificial Sequence

<220>

<223> SEQ ID NO13: dengue virus 2 envelope glycoprotein

<400> 13

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

Gly Tyr Gly Thr Val Thr Met Glu Cys Ser Pro Arg Thr Gly Leu Asp
 180 185 190
 Phe Asn Glu Met Val Leu Leu Gln Met Glu Asn Lys Ala Trp Leu Val
 195 200 205
 His Arg Gln Trp Phe Leu Asp Leu Pro Leu Pro Trp Leu Pro Gly Ala
 210 215 220
 Asp Thr Gln Gly Ser Asn Trp Ile Gln Lys Glu Thr Leu Val Thr Phe
 225 230 235 240
 Lys Asn Pro His Ala Lys Lys Gln Asp Val Val Val Leu Gly Ser Gln
 245 250 255
 Glu Gly Ala Met His Thr Ala Leu Thr Gly Ala Thr Glu Ile Gln Met
 260 265 270
 Ser Ser Gly Asn Leu Leu Phe Thr Gly His Leu Lys Cys Arg Leu Arg
 275 280 285
 Met Asp Lys Leu Gln Leu Lys Gly Met Ser Tyr Ser Met Cys Thr Gly
 290 295 300
 Lys Phe Lys Val Val Lys Glu Ile Ala Glu Thr Gln His Gly Thr Ile
 305 310 315 320
 Val Ile Arg Val Gln Tyr Glu Gly Asp Gly Ser Pro Cys Lys Ile Pro
 325 330 335
 Phe Glu Ile Met Asp Leu Glu Lys Arg His Val Leu Gly Arg Leu Ile
 340 345 350
 Thr Val Asn Pro Ile Val Thr Glu Lys Asp Ser Pro Val Asn Ile Glu
 355 360 365
 Ala Glu Pro Pro Phe Gly Asp Ser Tyr Ile Ile Ile Gly Val Glu Pro
 370 375 380
 Gly Gln Leu Lys Leu Asn Trp Phe Lys Lys Gly Ser Ser Ile Gly Gln
 385 390 395 400
 Met Ile Glu Thr Thr Met Arg Gly Ala Lys Arg Met Ala Ile Leu Gly
 405 410 415
 Asp Thr Ala Trp Asp Phe Gly Ser Leu Gly Gly Val Phe Thr Ser Ile
 420 425 430
 Gly Lys Ala Leu His Gln Val Phe Gly Ala Ile Tyr Gly Ala Ala Phe
 435 440 445
 Ser Gly Val Ser Trp Ile Met Lys Ile Leu Ile Gly Val Ile Ile Thr
 450 455 460
 Trp Ile Gly Met Asn Ser Arg Ser Thr Ser Leu Ser Val Ser Leu Val
 465 470 475 480
 Leu Val Gly Val Val Thr Leu Tyr Leu Gly Val Met Val Gln Ala
 485 490 495

<210> 14

<211> 493

<212> PRT

<213> Artificial Sequence

<220>

<223> SEQ ID NO14: dengue virus 3 envelope glycoprotein

<400> 14

Met	Arg	Cys	Val	Gly	Val	Gly	Asn	Arg	Asp	Phe	Val	Glu	Gly	Leu	Ser	1	5	10	15
Gly	Ala	Thr	Trp	Val	Asp	Val	Val	Leu	Glu	His	Gly	Gly	Cys	Val	Thr	20	25	30	
Thr	Met	Ala	Lys	Asn	Lys	Pro	Thr	Leu	Asp	Ile	Glu	Leu	Gln	Lys	Thr	35	40	45	
Glu	Ala	Thr	Gln	Leu	Ala	Thr	Leu	Arg	Lys	Leu	Cys	Ile	Glu	Gly	Lys	50	55	60	
Ile	Thr	Asn	Ile	Thr	Thr	Asp	Ser	Arg	Cys	Pro	Thr	Gln	Gly	Glu	Ala	65	70	75	80
Ile	Leu	Pro	Glu	Glu	Gln	Asp	Gln	Asn	Tyr	Val	Cys	Lys	His	Thr	Tyr	85	90	95	
Val	Asp	Arg	Gly	Trp	Gly	Asn	Gly	Cys	Gly	Leu	Phe	Gly	Lys	Gly	Ser	100	105	110	
Leu	Val	Thr	Cys	Ala	Lys	Phe	Gln	Cys	Leu	Glu	Ser	Ile	Glu	Gly	Lys	115	120	125	
Val	Val	Gln	His	Glu	Asn	Leu	Lys	Tyr	Thr	Val	Ile	Ile	Thr	Val	His	130	135	140	
Thr	Gly	Asp	Gln	His	Gln	Val	Gly	Asn	Glu	Thr	Gln	Gly	Val	Thr	Ala	145	150	155	160
Glu	Ile	Thr	Ser	Gln	Ala	Ser	Thr	Ala	Glu	Ala	Ile	Leu	Pro	Glu	Tyr	165	170	175	
Gly	Thr	Leu	Gly	Leu	Glu	Cys	Ser	Pro	Arg	Thr	Gly	Leu	Asp	Phe	Asn	180	185	190	
Glu	Met	Ile	Leu	Leu	Thr	Met	Lys	Asn	Lys	Ala	Trp	Met	Val	His	Arg	195	200	205	
Gln	Trp	Phe	Phe	Asp	Leu	Pro	Leu	Pro	Trp	Thr	Ser	Gly	Ala	Thr	Thr	210	215	220	
Lys	Thr	Pro	Thr	Trp	Asn	Arg	Lys	Glu	Leu	Leu	Val	Thr	Phe	Lys	Asn	225	230	235	240
Ala	His	Ala	Lys	Lys	Gln	Glu	Val	Val	Val	Leu	Gly	Ser	Gln	Glu	Gly	245	250	255	
Ala	Met	His	Thr	Ala	Leu	Thr	Gly	Ala	Thr	Glu	Ile	Gln	Thr	Ser	Gly	260	265	270	
Gly	Thr	Ser	Ile	Phe	Ala	Gly	His	Leu	Lys	Cys	Arg	Leu	Lys	Met	Asp	275	280	285	
Lys	Leu	Lys	Leu	Lys	Gly	Met	Ser	Tyr	Ala	Met	Cys	Leu	Asn	Thr	Phe	290	295	300	
Val	Leu	Lys	Lys	Glu	Val	Ser	Glu	Thr	Gln	His	Gly	Thr	Ile	Leu	Ile	305	310	315	320
Lys	Val	Glu	Tyr	Lys	Gly	Glu	Asp	Ala	Pro	Cys	Lys	Ile	Pro	Phe	Ser	325	330	335	
Thr	Glu	Asp	Gly	Gln	Gly	Lys	Ala	His	Asn	Gly	Arg	Leu	Ile	Thr	Ala	340	345	350	
Asn	Pro	Val	Thr	Lys	Lys	Glu	Glu	Pro	Val	Asn	Ile	Glu	Ala	Glu	355	360	365		
Pro	Pro	Phe	Gly	Glu	Ser	Asn	Ile	Val	Ile	Gly	Ile	Gly	Asp	Lys	Ala	370	375	380	
Leu	Lys	Ile	Asn	Trp	Tyr	Arg	Lys	Gly	Ser	Ser	Ile	Gly	Lys	Met	Phe	385	390	395	400

Glu Ala Thr Ala Arg Gly Ala Arg Arg Met Ala Ile Leu Gly Asp Thr
 405 410 415
 Ala Trp Asp Phe Gly Ser Val Gly Gly Val Leu Asn Ser Leu Gly Lys
 420 425 430
 Met Val His Gln Ile Phe Gly Ser Ala Tyr Thr Ala Leu Phe Ser Gly
 435 440 445
 Val Ser Trp Ile Met Lys Ile Gly Ile Gly Val Leu Leu Thr Trp Ile
 450 455 460
 Gly Leu Asn Ser Lys Asn Thr Ser Met Ser Phe Ser Cys Ile Ala Ile
 465 470 475 480
 Gly Ile Ile Thr Leu Tyr Leu Gly Val Val Val Gln Ala
 485 490

<210> 15

<211> 495

<212> PRT

<213> Artificial Sequence

<220>

<223> SEQ ID NO15: dengue virus 4 envelope glycoprotein

<400> 15

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

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Asp Thr Ser Glu Val His Trp Asn Tyr Lys Glu Arg Met Val Thr Phe
225                230                235                240
Lys Val Pro His Ala Lys Arg Gln Asp Val Thr Val Leu Gly Ser Gln
                245                250                255
Glu Gly Ala Met His Ser Ala Leu Ala Gly Ala Thr Glu Val Asp Ser
                260                265                270
Gly Asp Gly Asn His Met Phe Ala Gly His Leu Lys Cys Lys Val Arg
                275                280                285
Met Glu Lys Leu Arg Ile Lys Gly Met Ser Tyr Thr Met Cys Ser Gly
290                295                300
Lys Phe Ser Ile Asp Lys Glu Met Ala Glu Thr Gln His Gly Thr Thr
305                310                315                320
Val Val Lys Val Lys Tyr Glu Gly Ala Gly Ala Pro Cys Lys Val Pro
                325                330                335
Ile Glu Ile Arg Asp Val Asn Lys Glu Lys Val Val Gly Arg Ile Ile
                340                345                350
Ser Ser Thr Pro Leu Ala Glu Asn Thr Asn Ser Val Thr Asn Ile Glu
                355                360                365
Leu Glu Pro Pro Phe Gly Asp Ser Tyr Ile Val Ile Gly Val Gly Asn
370                375                380
Ser Ala Leu Thr Leu His Trp Phe Arg Lys Gly Ser Ser Ile Gly Lys
385                390                395                400
Met Phe Glu Ser Thr Tyr Arg Gly Ala Lys Arg Met Ala Ile Leu Gly
                405                410                415
Glu Thr Ala Trp Asp Phe Gly Ser Val Gly Gly Leu Phe Thr Ser Leu
                420                425                430
Gly Lys Ala Val His Gln Val Phe Gly Ser Val Tyr Thr Thr Met Phe
                435                440                445
Gly Gly Val Ser Trp Met Ile Arg Ile Leu Ile Gly Phe Leu Val Leu
450                455                460
Trp Ile Gly Thr Asn Ser Arg Asn Thr Ser Met Ala Met Thr Cys Ile
465                470                475                480
Ala Val Gly Gly Ile Thr Leu Phe Leu Gly Phe Thr Val Gln Ala
                485                490                495

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<210> 16

<211> 497

<212> PRT

<213> Artificial Sequence

<220>

<223> SEQ ID NO16: West Nile virus envelope glycoprotein

<400> 16

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

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Glu Ala Ala Asn Leu Ala Asp Val Arg Ser Tyr Cys Tyr Leu Ala Ser
 50 55 60
 Val Ser Asp Leu Ser Thr Arg Ala Ala Cys Pro Thr Met Gly Glu Ala
 65 70 75 80
 His Asn Glu Lys Arg Ala Asp Pro Ala Phe Val Cys Lys Gln Gly Val
 85 90 95
 Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
 100 105 110
 Ile Asp Thr Cys Ala Lys Phe Ala Cys Thr Thr Lys Ala Thr Gly Trp
 115 120 125
 Ile Ile Gln Lys Glu Asn Ile Lys Tyr Glu Val Ala Ile Phe Val His
 130 135 140
 Gly Pro Thr Thr Val Glu Ser His Gly Lys Ile Gly Ala Thr Gln Ala
 145 150 155 160
 Gly Arg Phe Ser Ile Thr Pro Ser Ala Pro Ser Tyr Thr Leu Lys Leu
 165 170 175
 Gly Glu Tyr Gly Glu Val Thr Val Asp Cys Glu Pro Arg Ser Gly Ile
 180 185 190
 Asp Thr Ser Ala Tyr Tyr Val Met Ser Val Gly Glu Lys Ser Phe Leu
 195 200 205
 Val His Arg Glu Trp Phe Met Asp Leu Asn Leu Pro Trp Ser Ser Ala
 210 215 220
 Gly Ser Thr Thr Trp Arg Asn Arg Glu Thr Leu Met Glu Phe Glu Glu
 225 230 235 240
 Pro His Ala Thr Lys Gln Ser Val Val Ala Leu Gly Ser Gln Glu Gly
 245 250 255
 Ala Leu His Gln Ala Leu Ala Gly Ala Ile Pro Val Glu Phe Ser Ser
 260 265 270
 Asn Thr Val Lys Leu Thr Ser Gly His Leu Lys Cys Arg Val Lys Met
 275 280 285
 Glu Lys Leu Gln Leu Lys Gly Thr Thr Tyr Gly Val Cys Ser Lys Ala
 290 295 300
 Phe Lys Phe Ala Arg Thr Pro Ala Asp Thr Gly His Gly Thr Val Val
 305 310 315 320
 Leu Glu Leu Gln Tyr Thr Gly Thr Asp Gly Pro Cys Lys Val Pro Ile
 325 330 335
 Ser Ser Val Ala Ser Leu Asn Asp Leu Thr Pro Val Gly Arg Leu Val
 340 345 350
 Thr Val Asn Pro Phe Val Ser Val Ala Thr Ala Asn Ser Lys Val Leu
 355 360 365
 Ile Glu Leu Glu Pro Pro Phe Gly Asp Ser Tyr Ile Val Val Gly Arg
 370 375 380
 Gly Glu Gln Gln Ile Asn His His Trp His Lys Ser Gly Ser Ser Ile
 385 390 395 400
 Gly Lys Ala Phe Thr Thr Thr Leu Arg Gly Ala Gln Arg Leu Ala Ala
 405 410 415
 Leu Gly Asp Thr Ala Trp Asp Phe Gly Ser Val Gly Gly Val Phe Thr
 420 425 430
 Ser Val Gly Lys Ala Ile His Gln Val Phe Gly Gly Ala Phe Arg Ser
 435 440 445

Leu Phe Gly Gly Met Ser Trp Ile Thr Gln Gly Leu Leu Gly Ala Leu
 450 455 460
 Leu Leu Trp Met Gly Ile Asn Ala Arg Asp Arg Ser Ile Ala Met Thr
 465 470 475 480
 Phe Leu Ala Val Gly Gly Val Leu Leu Phe Leu Ser Val Asn Val His
 485 490 495
 Ala

<210> 17

<211> 496

<212> PRT

<213> Artificial Sequence

<220>

<223> SEQ ID NO17: Tick-borne encephalitis virus envelope glycoprotein

<400> 17

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

50		55		60
Val Thr Asp Ile Ser Thr	Val Ala Arg Cys Pro Thr Thr Gly Glu Ala			
65	70	75	80	
His Asn Glu Lys Arg Ala Asp Ser Ser Tyr Val Cys Lys Gln Gly Phe				
85	90	95		
Thr Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser				
100	105	110		
Ile Asp Thr Cys Ala Lys Phe Ser Cys Thr Ser Lys Ala Ile Gly Arg				
115	120	125		
Thr Ile Gln Pro Glu Asn Ile Lys Tyr Glu Val Gly Ile Phe Val His				
130	135	140		
Gly Thr Thr Thr Ser Glu Asn His Gly Asn Tyr Ser Ala Gln Val Gly				
145	150	155	160	
Ala Ser Gln Ala Ala Lys Phe Thr Val Thr Pro Asn Ala Pro Ser Ile				
165	170	175		
Thr Leu Lys Leu Gly Asp Tyr Gly Glu Val Thr Leu Asp Cys Glu Pro				
180	185	190		
Arg Ser Gly Leu Asn Thr Glu Ala Phe Tyr Val Met Thr Val Gly Ser				
195	200	205		
Lys Ser Phe Leu Val His Arg Glu Trp Phe His Asp Leu Ala Leu Pro				
210	215	220		
Trp Thr Ser Pro Ser Ser Thr Ala Trp Arg Asn Arg Glu Leu Leu Met				
225	230	235	240	
Glu Phe Glu Glu Ala His Ala Thr Lys Gln Ser Val Val Ala Leu Gly				
245	250	255		
Ser Gln Glu Gly Gly Leu His Gln Ala Leu Ala Gly Ala Ile Val Val				
260	265	270		
Glu Tyr Ser Ser Ser Val Lys Leu Thr Ser Gly His Leu Lys Cys Arg				
275	280	285		
Leu Lys Met Asp Lys Leu Ala Leu Lys Gly Thr Thr Tyr Gly Met Cys				
290	295	300		
Thr Glu Lys Phe Ser Phe Ala Lys Asn Pro Ala Asp Thr Gly His Gly				
305	310	315	320	
Thr Val Val Ile Glu Leu Ser Tyr Ser Gly Ser Asp Gly Pro Cys Lys				
325	330	335		
Ile Pro Ile Val Ser Val Ala Ser Leu Asn Asp Met Thr Pro Val Gly				
340	345	350		
Arg Leu Val Thr Val Asn Pro Phe Val Ala Thr Ser Ser Ala Asn Ser				
355	360	365		
Lys Val Leu Val Glu Met Glu Pro Pro Phe Gly Asp Ser Tyr Ile Val				
370	375	380		
Val Gly Arg Gly Asp Lys Gln Ile Asn His His Trp His Lys Ala Gly				
385	390	395	400	
Ser Thr Leu Gly Lys Ala Phe Ser Thr Thr Leu Lys Gly Ala Gln Arg				
405	410	415		
Leu Ala Ala Leu Gly Asp Thr Ala Trp Asp Phe Gly Ser Ile Gly Gly				
420	425	430		
Val Phe Asn Ser Ile Gly Lys Ala Val His Gln Val Phe Gly Gly Ala				
435	440	445		
Phe Arg Thr Leu Phe Gly Gly Met Ser Trp Ile Thr Gln Gly Leu Met				

450 455 460
 Gly Ala Leu Leu Leu Trp Met Gly Val Asn Ala Arg Asp Arg Ser Ile
 465 470 475 480
 Ala Leu Ala Phe Leu Ala Thr Gly Gly Val Leu Val Phe Leu Ala Thr
 485 490 495
 Asn Val His Ala
 500

<210> 19
 <211> 353
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> SEQ ID NO19: Powassan virus NS1 antigen

<400> 19
 Asp Tyr Gly Cys Ala Ile Asp Pro Glu Arg Met Glu Ile Arg Cys Gly
 1 5 10 15
 Glu Gly Leu Val Val Trp Lys Glu Val Ser Glu Trp Tyr Asp Gly Tyr
 20 25 30
 Ala Tyr His Pro Glu Ser Pro Asp Thr Leu Ala Gln Ala Leu Arg Glu
 35 40 45
 Ala Phe Glu Arg Gly Val Cys Gly Val Val Pro Gln Asn Arg Leu Glu
 50 55 60
 Met Ala Met Trp Arg Ser Thr Ala Pro Glu Leu Asn Leu Val Leu Ser
 65 70 75 80
 Glu Gly Glu Ala Asn Leu Thr Ile Val Val Asp Lys Thr Asp Pro Ala
 85 90 95
 Asp Tyr Arg Gly Gly Thr Pro Met Val Leu Lys Lys Thr Gly Lys Glu
 100 105 110
 Ser Lys Val Ser Trp Lys Ser Trp Gly Lys Ser Ile Leu Trp Ser Val
 115 120 125
 Pro Asp Ser Pro Arg Arg Met Met Met Gly Val Asp Gly Val Gly Glu
 130 135 140
 Cys Pro Leu Tyr Arg Arg Ala Thr Gly Val Phe Thr Val Ala Glu Phe
 145 150 155 160
 Gly Val Gly Leu Arg Thr Lys Val Phe Leu Asp Leu Arg Gly Glu Ala
 165 170 175
 Ser Lys Glu Cys Asp Thr Gly Val Met Gly Ala Ala Val Lys Asn Gly
 180 185 190
 Lys Ala Ile His Thr Asp Gln Ser Met Trp Met Ser Ser Phe Arg Asn
 195 200 205
 Asp Thr Gly Thr Tyr Ile His Glu Leu Ile Leu Thr Asp Leu Arg Asn
 210 215 220
 Cys Thr Trp Pro Ala Ser His Thr Ile Asp Asn Asp Gly Val Leu Asp
 225 230 235 240
 Ser His Leu Phe Leu Pro Val Thr Leu Ala Gly Pro Arg Ser Lys Tyr
 245 250 255
 Asn Arg Ile Pro Gly Tyr Ser Glu Gln Val Arg Gly Pro Trp Asp Gln

260	265	270
Thr Pro Leu Arg Val Val Arg Asp His Cys Pro Gly Thr Ser Val Arg		
275	280	285
Ile Asp Ser His Cys Asp Lys Arg Gly Ala Ser Val Arg Ser Thr Thr		
290	295	300
Glu Ser Gly Lys Ile Ile Pro Glu Trp Cys Cys Arg Ala Cys Glu Leu		
305	310	315
Pro Pro Val Thr Phe Arg Ser Gly Thr Asp Cys Trp Tyr Ala Met Glu		
325	330	335
Ile Arg Pro Val His Ser Gln Gly Gly Leu Val Arg Ser Met Val Val		
340	345	350
Ala		

<210> 20

<211> 384

<212> PRT

<213> Artificial Sequence

<220>

<223> SEQ ID NO20: Zika virus NS1 antigen with C-terminal His tag and additional fused peptide

<400> 20

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

195	200	205
Ala Val Lys Gly Lys Glu	Ala Ala His Ser Asp	Leu Gly Tyr Trp Ile
210	215	220
Glu Ser Glu Lys Asn Asp Thr Trp Arg Leu Lys Arg	Ala His Leu Ile	
225	230	235 240
Glu Met Lys Thr Cys Glu Trp Pro Lys Ser His Thr Leu Trp Thr Asp		
245	250	255
Gly Val Glu Glu Ser Asp Leu Ile Ile Pro Lys Ser Leu Ala Gly Pro		
260	265	270
Leu Ser His His Asn Thr Arg Glu Gly Tyr Arg Thr Gln Val Lys Gly		
275	280	285
Pro Trp His Ser Glu Glu Leu Glu Ile Arg Phe Glu Glu Cys Pro Gly		
290	295	300
Thr Lys Val His Val Glu Glu Thr Cys Gly Thr Arg Gly Pro Ser Leu		
305	310	315 320
Arg Ser Thr Thr Ala Ser Gly Arg Val Ile Glu Glu Trp Cys Cys Arg		
325	330	335
Glu Cys Thr Met Pro Pro Leu Ser Phe Arg Ala Lys Asp Gly Cys Trp		
340	345	350
Tyr Gly Met Glu Ile Arg Pro Arg Lys Glu Pro Glu Ser Asn Leu Val		
355	360	365
Arg Ser Met Val Thr Ala Leu Glu His His His His His His His His		
370	375	380

<210> 21

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> SEQ ID NO21: Zika virus NS1 epitope

<400> 21

Arg Met Glu Asn Ile Met Trp Lys Ser Val Glu Gly

1 5 10

<210> 22

<211> 9

<212> PRT

<213> Artificial Sequence

<220>

<223> SEQ ID NO22: Zika virus NS1 epitope

<400> 22

Gln Arg Leu Pro Val Pro Val Asn Glu

1 5

<210> 23
<211> 9
<212> PRT
<213> Artificial Sequence

<220>
<223> SEQ ID NO23: Zika virus NS1 epitope

<400> 23
Ser Tyr Phe Val Arg Ala Ala Lys Thr
1 5

<210> 24
<211> 4
<212> PRT
<213> Artificial Sequence

<220>
<223> SEQ ID NO24: Zika virus NS1 epitope

<400> 24
Asp Thr Leu Lys
1

<210> 25
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> SEQ ID NO25: Zika virus NS1 epitope

<400> 25
Asp Tyr Ser Leu Glu
1 5

<210> 26
<211> 5
<212> PRT
<213> Artificial Sequence

<220>
<223> SEQ ID NO26: Zika virus NS1 epitope

<400> 26
Ser Phe Arg Ala Lys
1 5

<210> 27
<211> 493

<212> PRT

<213> Artificial Sequence

<220>

<223> SEQ ID NO27: Yellow fever virus envelope glycoprotein

<400> 27

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Ala His Cys Ile Gly Ile Thr Asp Arg Asp Phe Ile Glu Gly Val His
1      5      10      15
Gly Gly Thr Trp Val Ser Ala Thr Leu Glu Gln Asp Lys Cys Val Thr
20      25      30
Val Met Ala Pro Asp Lys Pro Ser Leu Asp Ile Ser Leu Glu Thr Val
35      40      45
Ala Ile Asp Gly Pro Ala Glu Ala Arg Lys Val Cys Tyr Asn Ala Val
50      55      60
Leu Thr His Val Lys Ile Asn Asp Lys Cys Pro Ser Thr Gly Glu Ala
65      70      75      80
His Leu Ala Glu Glu Asn Glu Gly Asp Asn Ala Cys Lys Arg Thr Tyr
85      90      95
Ser Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys Gly Ser
100     105     110
Ile Val Ala Cys Ala Lys Phe Thr Cys Ala Lys Ser Met Ser Leu Phe
115     120     125
Glu Val Asp Gln Thr Lys Ile Gln Tyr Val Ile Arg Ala Gln Leu His
130     135     140
Val Gly Ala Lys Gln Glu Asn Trp Asn Thr Asp Ile Lys Thr Leu Lys
145     150     155     160
Phe Asp Ala Leu Ser Gly Ser Gln Glu Ala Glu Phe Thr Gly Tyr Gly
165     170     175
Lys Ala Thr Leu Glu Cys Gln Val Gln Thr Ala Val Asp Phe Gly Asn
180     185     190
Ser Tyr Ile Ala Glu Met Glu Lys Glu Ser Trp Ile Val Asp Arg Gln
195     200     205
Trp Ala Gln Asp Leu Thr Leu Pro Trp Gln Ser Gly Ser Gly Gly Val
210     215     220
Trp Arg Glu Met His His Leu Val Glu Phe Glu Pro Pro His Ala Ala
225     230     235     240
Thr Ile Arg Val Leu Ala Leu Gly Asn Gln Glu Gly Ser Leu Lys Thr
245     250     255
Ala Leu Thr Gly Ala Met Arg Val Thr Lys Asp Thr Asn Asp Asn Asn
260     265     270
Leu Tyr Lys Leu His Gly Gly His Val Ser Cys Arg Val Lys Leu Ser
275     280     285
Ala Leu Thr Leu Lys Gly Thr Ser Tyr Lys Met Cys Thr Asp Lys Met
290     295     300
Ser Phe Val Lys Asn Pro Thr Asp Thr Gly His Gly Thr Val Val Met
305     310     315     320
Gln Val Lys Val Pro Lys Gly Ala Pro Cys Lys Ile Pro Val Ile Val
325     330     335
Ala Asp Asp Leu Thr Ala Ala Ile Asn Lys Gly Ile Leu Val Thr Val
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340	345	350
Asn Pro Ile Ala Ser Thr Asn Asp Asp Glu Val Leu Ile Glu Val Asn		
355	360	365
Pro Pro Phe Gly Asp Ser Tyr Ile Ile Val Gly Thr Gly Asp Ser Arg		
370	375	380
Leu Thr Tyr Gln Trp His Lys Glu Gly Ser Ser Ile Gly Lys Leu Phe		
385	390	395
Thr Gln Thr Met Lys Gly Ala Glu Arg Leu Ala Val Met Gly Asp Ala		
405	410	415
Ala Trp Asp Phe Ser Ser Ala Gly Gly Phe Phe Thr Ser Val Gly Lys		
420	425	430
Gly Ile His Thr Val Phe Gly Ser Ala Phe Gln Gly Leu Phe Gly Gly		
435	440	445
Leu Asn Trp Ile Thr Lys Val Ile Met Gly Ala Val Leu Ile Trp Val		
450	455	460
Gly Ile Asn Thr Arg Asn Met Thr Met Ser Met Ser Met Ile Leu Val		
465	470	475
Gly Val Ile Met Met Phe Leu Ser Leu Gly Val Gly Ala		
485	490	