

1420378_442W02_Sequence_Listing_ST25
SEQUENCE LISTING

<110> The United States of America, as Represented by the
Secretary of the Department of Health and Human Services
Whitehead, Stephen S Ph.D.

<120> LIVE ATTENUATE ZIKA VIRUS VACCINE

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<150> US 62/307,170

<151> 2016-03-11

<160> 25

<170> PatentIn version 3.5

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 <211> 3423
 <212> PRT
 <213> Zika virus polyprotein

<400> 3

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Leu	Pro	Ala	Gly	Leu	Leu	Leu	Gly	His	Gly	Pro	Ile	Arg	Met	Val	Leu
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Leu	Ile	Asn	Arg	Trp	Gly	Ser	Val	Gly	Lys	Lys	Glu	Ala	Met	Glu	Ile
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Ile	Lys	Lys	Phe	Lys	Lys	Asp	Leu	Ala	Ala	Met	Leu	Arg	Ile	Ile	Asn
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Val Gly Leu Leu Leu Thr Thr Ala Met Ala Ala Glu Val Thr Arg Arg
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Ile Ser Phe Pro Thr Thr Leu Gly Met Asn Lys Cys Tyr Ile Gln Ile
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Met Asp Leu Gly His Met Cys Asp Ala Thr Met Ser Tyr Glu Cys Pro
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Met Leu Asp Glu Gly Val Glu Pro Asp Asp Val Asp Cys Trp Cys Asn
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Thr Thr Ser Thr Trp Val Val Tyr Gly Thr Cys His His Lys Lys Gly
195 200 205

Glu Ala Arg Arg Ser Arg Arg Ala Val Thr Leu Pro Ser His Ser Thr
210 215 220

Arg Lys Leu Gln Thr Arg Ser Gln Thr Trp Leu Glu Ser Arg Glu Tyr
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Thr Lys His Leu Ile Arg Val Glu Asn Trp Ile Phe Arg Asn Pro Gly
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Phe Ala Leu Ala Ala Ala Ala Ile Ala Trp Leu Leu Gly Ser Ser Thr
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Ser Gln Lys Val Ile Tyr Leu Val Met Ile Leu Leu Ile Ala Pro Ala
275 280 285

Tyr Ser Ile Arg Cys Ile Gly Val Ser Asn Arg Asp Phe Val Glu Gly
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Val Thr Val Met Ala Gln Asp Lys Pro Thr Val Asp Ile Glu Leu Val
325 330 335

Thr Thr Thr Val Ser Asn Met Ala Glu Val Arg Ser Tyr Cys Tyr Glu
340 345 350

Ala Ser Ile Ser Asp Met Ala Ser Asp Ser Arg Cys Pro Thr Gln Gly
355 360 365

Glu Ala Tyr Leu Asp Lys Gln Ser Asp Thr Gln Tyr Val Cys Lys Arg
370 375 380

Thr Leu Val Asp Arg Gly Trp Gly Asn Gly Cys Gly Leu Phe Gly Lys
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Gly Ser Leu Val Thr Cys Ala Lys Phe Ala Cys Ser Lys Lys Met Thr
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Gly Lys Ser Ile Gln Pro Glu Asn Leu Glu Tyr Arg Ile Met Leu Ser
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Val His Gly Ser Gln His Ser Gly Met Ile Val Asn Asp Thr Gly His
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Glu Thr Asp Glu Asn Arg Ala Lys Val Glu Ile Thr Pro Asn Ser Pro
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Arg Ala Glu Ala Thr Leu Gly Gly Phe Gly Ser Leu Gly Leu Asp Cys
465 470 475 480

Glu Pro Arg Thr Gly Leu Asp Phe Ser Asp Leu Tyr Tyr Leu Thr Met
485 490 495

Asn Asn Lys His Trp Leu Val His Lys Glu Trp Phe His Asp Ile Pro
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530 535 540

Val Val Val Leu Gly Ser Gln Glu Gly Ala Val His Thr Ala Leu Ala
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Gly Ala Leu Glu Ala Glu Met Asp Gly Ala Lys Gly Arg Leu Ser Ser
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Gly His Leu Lys Cys Arg Leu Lys Met Asp Lys Leu Arg Leu Lys Gly
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Val Ser Tyr Ser Leu Cys Thr Ala Ala Phe Thr Phe Thr Lys Ile Pro
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Ala Glu Thr Leu His Gly Thr Val Thr Val Glu Val Gln Tyr Ala Gly
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Thr Asp Gly Pro Cys Lys Val Pro Ala Gln Met Ala Val Asp Met Gln
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Glu Ser Thr Glu Asn Ser Lys Met Met Leu Glu Leu Asp Pro Pro Phe
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Gly Asp Ser Tyr Ile Val Ile Gly Val Gly Glu Lys Lys Ile Thr His
675 680 685

His Trp His Arg Ser Gly Ser Thr Ile Gly Lys Ala Phe Glu Ala Thr
690 695 700

Val Arg Gly Ala Lys Arg Met Ala Val Leu Gly Asp Thr Ala Trp Asp
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Leu Ile Phe Leu Ser Thr Ala Val Ser Ala Asp Val Gly Cys Ser Val
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Asp Phe Ser Lys Lys Glu Thr Arg Cys Gly Thr Gly Val Phe Val Tyr
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820 825 830

Pro Arg Arg Leu Ala Ala Ala Val Lys Gln Ala Trp Glu Asp Gly Ile
835 840 845

Cys Gly Ile Ser Ser Val Ser Arg Met Glu Asn Ile Met Trp Arg Ser
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Val Glu Gly Glu Leu Asn Ala Ile Leu Glu Glu Asn Gly Val Gln Leu
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Thr Val Val Val Gly Ser Val Lys Asn Pro Met Trp Arg Gly Pro Gln
885 890 895

Arg Leu Pro Val Pro Val Asn Glu Leu Pro His Gly Trp Lys Ala Trp
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Gly Lys Ser Tyr Phe Val Arg Ala Ala Lys Thr Asn Asn Ser Phe Val
915 920 925

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Asn Ser Phe Leu Val Glu Asp His Gly Phe Gly Val Phe His Thr Ser
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Val Trp Leu Lys Val Arg Glu Asp Tyr Ser Leu Glu Cys Asp Pro Ala
965 970 975

Val Ile Gly Thr Ala Val Lys Gly Lys Glu Ala Val His Ser Asp Leu
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995 1000 1005

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1160						1165					1170			
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Ala	Met	Ile	Leu	Gly	Gly	Phe	Ser	Met	Ser	Asp	Leu	Ala	Lys	Leu
1190						1195					1200			
Ala	Ile	Leu	Met	Gly	Ala	Thr	Phe	Ala	Glu	Met	Asn	Thr	Gly	Gly
1205						1210					1215			
Asp	Val	Ala	His	Leu	Ala	Leu	Ile	Ala	Ala	Phe	Lys	Val	Arg	Pro
1220						1225					1230			
Ala	Leu	Leu	Val	Ser	Phe	Ile	Phe	Arg	Ala	Asn	Trp	Thr	Pro	Arg
1235						1240					1245			
Glu	Ser	Met	Leu	Leu	Ala	Leu	Ala	Ser	Cys	Leu	Leu	Gln	Thr	Ala
1250						1255					1260			
Ile	Ser	Ala	Leu	Glu	Gly	Asp	Leu	Met	Val	Leu	Ile	Asn	Gly	Phe
1265						1270					1275			
Ala	Leu	Ala	Trp	Leu	Ala	Ile	Arg	Ala	Met	Val	Val	Pro	Arg	Thr
1280						1285					1290			
Asp	Asn	Ile	Thr	Leu	Ala	Ile	Leu	Ala	Ala	Leu	Thr	Pro	Leu	Ala
1295						1300					1305			
Arg	Gly	Thr	Leu	Leu	Val	Ala	Trp	Arg	Ala	Gly	Leu	Ala	Thr	Cys
1310						1315					1320			

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Gly Gly Phe Met Leu Leu Ser Leu Lys Gly Lys Gly Ser Val Lys
1325 1330 1335

Lys Asn Leu Pro Phe Val Met Ala Leu Gly Leu Thr Ala Val Arg
1340 1345 1350

Leu Val Asp Pro Ile Asn Val Val Gly Leu Leu Leu Leu Thr Arg
1355 1360 1365

Ser Gly Lys Arg Ser Trp Pro Pro Ser Glu Val Leu Thr Ala Val
1370 1375 1380

Gly Leu Ile Cys Ala Leu Ala Gly Gly Phe Ala Lys Ala Asp Ile
1385 1390 1395

Glu Met Ala Gly Pro Met Ala Ala Val Gly Leu Leu Ile Val Ser
1400 1405 1410

Tyr Val Val Ser Gly Lys Ser Val Asp Met Tyr Ile Glu Arg Ala
1415 1420 1425

Gly Asp Ile Thr Trp Glu Lys Asp Ala Glu Val Thr Gly Asn Ser
1430 1435 1440

Pro Arg Leu Asp Val Ala Leu Asp Glu Ser Gly Asp Phe Ser Leu
1445 1450 1455

Val Glu Asp Asp Gly Pro Pro Met Arg Glu Ile Ile Leu Lys Val
1460 1465 1470

Val Leu Met Thr Ile Cys Gly Met Asn Pro Ile Ala Ile Pro Phe
1475 1480 1485

Ala Ala Gly Ala Trp Tyr Val Tyr Val Lys Thr Gly Lys Arg Ser
1490 1495 1500

Gly Ala Leu Trp Asp Val Pro Ala Pro Lys Glu Val Lys Lys Gly
1505 1510 1515

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Glu Thr Thr Asp Gly Val Tyr Arg Val Met Thr Arg Arg Leu Leu
1520 1525 1530

Gly Ser Thr Gln Val Gly Val Gly Val Met Gln Glu Gly Val Phe
1535 1540 1545

His Thr Met Trp His Val Thr Lys Gly Ser Ala Leu Arg Ser Gly
1550 1555 1560

Glu Gly Arg Leu Asp Pro Tyr Trp Gly Asp Val Lys Gln Asp Leu
1565 1570 1575

Val Ser Tyr Cys Gly Pro Trp Lys Leu Asp Ala Ala Trp Asp Gly
1580 1585 1590

His Ser Glu Val Gln Leu Leu Ala Val Pro Pro Gly Glu Arg Ala
1595 1600 1605

Arg Asn Ile Gln Thr Leu Pro Gly Ile Phe Lys Thr Lys Asp Gly
1610 1615 1620

Asp Ile Gly Ala Val Ala Leu Asp Tyr Pro Ala Gly Thr Ser Gly
1625 1630 1635

Ser Pro Ile Leu Asp Lys Cys Gly Arg Val Ile Gly Leu Tyr Gly
1640 1645 1650

Asn Gly Val Val Ile Lys Asn Gly Ser Tyr Val Ser Ala Ile Thr
1655 1660 1665

Gln Gly Arg Arg Glu Glu Glu Thr Pro Val Glu Cys Phe Glu Pro
1670 1675 1680

Ser Met Leu Lys Lys Lys Gln Leu Thr Val Leu Asp Leu His Pro
1685 1690 1695

Gly Ala Gly Lys Thr Arg Arg Val Leu Pro Glu Ile Val Arg Glu
1700 1705 1710

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Ala Ile Lys Thr Arg Leu Arg Thr Val Ile Leu Ala Pro Thr Arg
1715 1720 1725

Val Val Ala Ala Glu Met Glu Glu Ala Leu Arg Gly Leu Pro Val
1730 1735 1740

Arg Tyr Met Thr Thr Ala Val Asn Val Thr His Ser Gly Thr Glu
1745 1750 1755

Ile Val Asp Leu Met Cys His Ala Thr Phe Thr Ser Arg Leu Leu
1760 1765 1770

Gln Pro Ile Arg Val Pro Asn Tyr Asn Leu Tyr Ile Met Asp Glu
1775 1780 1785

Ala His Phe Thr Asp Pro Ser Ser Ile Ala Ala Arg Gly Tyr Ile
1790 1795 1800

Ser Thr Arg Val Glu Met Gly Glu Ala Ala Ala Ile Phe Met Thr
1805 1810 1815

Ala Thr Pro Pro Gly Thr Arg Asp Ala Phe Pro Asp Ser Asn Ser
1820 1825 1830

Pro Ile Met Asp Thr Glu Val Glu Val Pro Glu Arg Ala Trp Ser
1835 1840 1845

Ser Gly Phe Asp Trp Val Thr Asp His Ser Gly Lys Thr Val Trp
1850 1855 1860

Phe Val Pro Ser Val Arg Asn Gly Asn Glu Ile Ala Ala Cys Leu
1865 1870 1875

Thr Lys Ala Gly Lys Arg Val Ile Gln Leu Ser Arg Lys Thr Phe
1880 1885 1890

Glu Thr Glu Phe Gln Lys Thr Lys His Gln Glu Trp Asp Phe Val
1895 1900 1905

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Val	Thr	Thr	Asp	Ile	Ser	Glu	Met	Gly	Ala	Asn	Phe	Lys	Ala	Asp
1910						1915					1920			
Arg	Val	Ile	Asp	Ser	Arg	Arg	Cys	Leu	Lys	Pro	Val	Ile	Leu	Asp
1925						1930					1935			
Gly	Glu	Arg	Val	Ile	Leu	Ala	Gly	Pro	Met	Pro	Val	Thr	His	Ala
1940						1945					1950			
Ser	Ala	Ala	Gln	Arg	Arg	Gly	Arg	Ile	Gly	Arg	Asn	Pro	Asn	Lys
1955						1960					1965			
Pro	Gly	Asp	Glu	Tyr	Leu	Tyr	Gly	Gly	Gly	Cys	Ala	Glu	Thr	Asp
1970						1975					1980			
Glu	Asp	His	Ala	His	Trp	Leu	Glu	Ala	Arg	Met	Leu	Leu	Asp	Asn
1985						1990					1995			
Ile	Tyr	Leu	Gln	Asp	Gly	Leu	Ile	Ala	Ser	Leu	Tyr	Arg	Pro	Glu
2000						2005					2010			
Ala	Asp	Lys	Val	Ala	Ala	Ile	Glu	Gly	Glu	Phe	Lys	Leu	Arg	Thr
2015						2020					2025			
Glu	Gln	Arg	Lys	Thr	Phe	Val	Glu	Leu	Met	Lys	Arg	Gly	Asp	Leu
2030						2035					2040			
Pro	Val	Trp	Leu	Ala	Tyr	Gln	Val	Ala	Ser	Ala	Gly	Ile	Thr	Tyr
2045						2050					2055			
Thr	Asp	Arg	Arg	Trp	Cys	Phe	Asp	Gly	Thr	Thr	Asn	Asn	Thr	Ile
2060						2065					2070			
Met	Glu	Asp	Ser	Val	Pro	Ala	Glu	Val	Trp	Thr	Arg	His	Gly	Glu
2075						2080					2085			
Lys	Arg	Val	Leu	Lys	Pro	Arg	Trp	Met	Asp	Ala	Arg	Val	Cys	Ser
2090						2095					2100			

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Asp	His	Ala	Ala	Leu	Lys	Ser	Phe	Lys	Glu	Phe	Ala	Ala	Gly	Lys
2105						2110					2115			
Arg	Gly	Ala	Ala	Phe	Gly	Val	Met	Glu	Ala	Leu	Gly	Thr	Leu	Pro
2120						2125					2130			
Gly	His	Met	Thr	Glu	Arg	Phe	Gln	Glu	Ala	Ile	Asp	Asn	Leu	Ala
2135						2140					2145			
Val	Leu	Met	Arg	Ala	Glu	Thr	Gly	Ser	Arg	Pro	Tyr	Lys	Ala	Ala
2150						2155					2160			
Ala	Ala	Gln	Leu	Pro	Glu	Thr	Leu	Glu	Thr	Ile	Met	Leu	Leu	Gly
2165						2170					2175			
Leu	Leu	Gly	Thr	Val	Ser	Leu	Gly	Ile	Phe	Phe	Val	Leu	Met	Arg
2180						2185					2190			
Asn	Lys	Gly	Ile	Gly	Lys	Met	Gly	Phe	Gly	Met	Val	Thr	Leu	Gly
2195						2200					2205			
Ala	Ser	Ala	Trp	Leu	Met	Trp	Leu	Ser	Glu	Ile	Glu	Pro	Ala	Arg
2210						2215					2220			
Ile	Ala	Cys	Val	Leu	Ile	Val	Val	Phe	Leu	Leu	Leu	Val	Val	Leu
2225						2230					2235			
Ile	Pro	Glu	Pro	Glu	Lys	Gln	Arg	Ser	Pro	Gln	Asp	Asn	Gln	Met
2240						2245					2250			
Ala	Ile	Ile	Ile	Met	Val	Ala	Val	Gly	Leu	Leu	Gly	Leu	Ile	Thr
2255						2260					2265			
Ala	Asn	Glu	Leu	Gly	Trp	Leu	Glu	Arg	Thr	Lys	Ser	Asp	Leu	Ser
2270						2275					2280			
His	Leu	Met	Gly	Arg	Arg	Glu	Glu	Gly	Ala	Thr	Ile	Gly	Phe	Ser
2285						2290					2295			

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Met Asp Ile Asp Leu Arg Pro Ala Ser Ala Trp Ala Ile Tyr Ala
2300 2305 2310

Ala Leu Thr Thr Phe Ile Thr Pro Ala Val Gln His Ala Val Thr
2315 2320 2325

Thr Ser Tyr Asn Asn Tyr Ser Leu Met Ala Met Ala Thr Gln Ala
2330 2335 2340

Gly Val Leu Phe Gly Met Gly Lys Gly Met Pro Phe Tyr Ala Trp
2345 2350 2355

Asp Phe Gly Val Pro Leu Leu Met Ile Gly Cys Tyr Ser Gln Leu
2360 2365 2370

Thr Pro Leu Thr Leu Ile Val Ala Ile Ile Leu Leu Val Ala His
2375 2380 2385

Tyr Met Tyr Leu Ile Pro Gly Leu Gln Ala Ala Ala Ala Arg Ala
2390 2395 2400

Ala Gln Lys Arg Thr Ala Ala Gly Ile Met Lys Asn Pro Val Val
2405 2410 2415

Asp Gly Ile Val Val Thr Asp Ile Asp Thr Met Thr Ile Asp Pro
2420 2425 2430

Gln Val Glu Lys Lys Met Gly Gln Val Leu Leu Ile Ala Val Ala
2435 2440 2445

Val Ser Ser Ala Ile Leu Ser Arg Thr Ala Trp Gly Trp Gly Glu
2450 2455 2460

Ala Gly Ala Leu Ile Thr Ala Ala Thr Ser Thr Leu Trp Glu Gly
2465 2470 2475

Ser Pro Asn Lys Tyr Trp Asn Ser Ser Thr Ala Thr Ser Leu Cys
2480 2485 2490

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Asn Ile Phe Arg Gly Ser Tyr Leu Ala Gly Ala Ser Leu Ile Tyr
2495 2500 2505

Thr Val Thr Arg Asn Ala Gly Leu Val Lys Arg Arg Gly Gly Gly
2510 2515 2520

Thr Gly Glu Thr Leu Gly Glu Lys Trp Lys Ala Arg Leu Asn Gln
2525 2530 2535

Met Ser Ala Leu Glu Phe Tyr Ser Tyr Lys Lys Ser Gly Ile Thr
2540 2545 2550

Glu Val Cys Arg Glu Glu Ala Arg Arg Ala Leu Lys Asp Gly Val
2555 2560 2565

Ala Thr Gly Gly His Ala Val Ser Arg Gly Ser Ala Lys Leu Arg
2570 2575 2580

Trp Leu Val Glu Arg Gly Tyr Leu Gln Pro Tyr Gly Lys Val Ile
2585 2590 2595

Asp Leu Gly Cys Gly Arg Gly Gly Trp Ser Tyr Tyr Ala Ala Thr
2600 2605 2610

Ile Arg Lys Val Gln Glu Val Lys Gly Tyr Thr Lys Gly Gly Pro
2615 2620 2625

Gly His Glu Glu Pro Val Leu Val Gln Ser Tyr Gly Trp Asn Ile
2630 2635 2640

Val Arg Leu Lys Ser Gly Val Asp Val Phe His Met Ala Ala Glu
2645 2650 2655

Pro Cys Asp Thr Leu Leu Cys Asp Ile Gly Glu Ser Ser Ser Ser
2660 2665 2670

Pro Glu Val Glu Glu Ala Arg Thr Leu Arg Val Leu Ser Met Val
2675 2680 2685

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Gly Asp Trp Leu Glu Lys Arg Pro Gly Ala Phe Cys Ile Lys Val
2690 2695 2700

Leu Cys Pro Tyr Thr Ser Thr Met Met Glu Thr Leu Glu Arg Leu
2705 2710 2715

Gln Arg Arg Tyr Gly Gly Gly Leu Val Arg Val Pro Leu Ser Arg
2720 2725 2730

Asn Ser Thr His Glu Met Tyr Trp Val Ser Gly Ala Lys Ser Asn
2735 2740 2745

Thr Ile Lys Ser Val Ser Thr Thr Ser Gln Leu Leu Leu Gly Arg
2750 2755 2760

Met Asp Gly Pro Arg Arg Pro Val Lys Tyr Glu Glu Asp Val Asn
2765 2770 2775

Leu Gly Ser Gly Thr Arg Ala Val Val Ser Cys Ala Glu Ala Pro
2780 2785 2790

Asn Met Lys Ile Ile Gly Asn Arg Ile Glu Arg Ile Arg Ser Glu
2795 2800 2805

His Ala Glu Thr Trp Phe Phe Asp Glu Asn His Pro Tyr Arg Thr
2810 2815 2820

Trp Ala Tyr His Gly Ser Tyr Glu Ala Pro Thr Gln Gly Ser Ala
2825 2830 2835

Ser Ser Leu Ile Asn Gly Val Val Arg Leu Leu Ser Lys Pro Trp
2840 2845 2850

Asp Val Val Thr Gly Val Thr Gly Ile Ala Met Thr Asp Thr Thr
2855 2860 2865

Pro Tyr Gly Gln Gln Arg Val Phe Lys Glu Lys Val Asp Thr Arg
2870 2875 2880

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Val	Pro	Asp	Pro	Gln	Glu	Gly	Thr	Arg	Gln	Val	Met	Ser	Met	Val
2885						2890					2895			
Ser	Ser	Trp	Leu	Trp	Lys	Glu	Leu	Gly	Lys	His	Lys	Arg	Pro	Arg
2900						2905					2910			
Val	Cys	Thr	Lys	Glu	Glu	Phe	Ile	Asn	Lys	Val	Arg	Ser	Asn	Ala
2915						2920					2925			
Ala	Leu	Gly	Ala	Ile	Phe	Glu	Glu	Glu	Lys	Glu	Trp	Lys	Thr	Ala
2930						2935					2940			
Val	Glu	Ala	Val	Asn	Asp	Pro	Arg	Phe	Trp	Ala	Leu	Val	Asp	Lys
2945						2950					2955			
Glu	Arg	Glu	His	His	Leu	Arg	Gly	Glu	Cys	Gln	Ser	Cys	Val	Tyr
2960						2965					2970			
Asn	Met	Met	Gly	Lys	Arg	Glu	Lys	Lys	Gln	Gly	Glu	Phe	Gly	Lys
2975						2980					2985			
Ala	Lys	Gly	Ser	Arg	Ala	Ile	Trp	Tyr	Met	Trp	Leu	Gly	Ala	Arg
2990						2995					3000			
Phe	Leu	Glu	Phe	Glu	Ala	Leu	Gly	Phe	Leu	Asn	Glu	Asp	His	Trp
3005						3010					3015			
Met	Gly	Arg	Glu	Asn	Ser	Gly	Gly	Gly	Val	Glu	Gly	Leu	Gly	Leu
3020						3025					3030			
Gln	Arg	Leu	Gly	Tyr	Val	Leu	Glu	Glu	Met	Ser	Arg	Ile	Pro	Gly
3035						3040					3045			
Gly	Arg	Met	Tyr	Ala	Asp	Asp	Thr	Ala	Gly	Trp	Asp	Thr	Arg	Ile
3050						3055					3060			
Ser	Arg	Phe	Asp	Leu	Glu	Asn	Glu	Ala	Leu	Ile	Thr	Asn	Gln	Met
3065						3070					3075			

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Glu	Lys	Gly	His	Arg	Ala	Leu	Ala	Leu	Ala	Ile	Ile	Lys	Tyr	Thr
3080						3085					3090			
Tyr	Gln	Asn	Lys	Val	Val	Lys	Val	Leu	Arg	Pro	Ala	Glu	Lys	Gly
3095						3100					3105			
Lys	Thr	Val	Met	Asp	Ile	Ile	Ser	Arg	Gln	Asp	Gln	Arg	Gly	Ser
3110						3115					3120			
Gly	Gln	Val	Val	Thr	Tyr	Ala	Leu	Asn	Thr	Phe	Thr	Asn	Leu	Val
3125						3130					3135			
Val	Gln	Leu	Ile	Arg	Asn	Met	Glu	Ala	Glu	Glu	Val	Leu	Glu	Met
3140						3145					3150			
Gln	Asp	Leu	Trp	Leu	Leu	Arg	Arg	Ser	Glu	Lys	Val	Thr	Asn	Trp
3155						3160					3165			
Leu	Gln	Ser	Asn	Gly	Trp	Asp	Arg	Leu	Lys	Arg	Met	Ala	Val	Ser
3170						3175					3180			
Gly	Asp	Asp	Cys	Val	Val	Lys	Pro	Ile	Asp	Asp	Arg	Phe	Ala	His
3185						3190					3195			
Ala	Leu	Arg	Phe	Leu	Asn	Asp	Met	Gly	Lys	Val	Arg	Lys	Asp	Thr
3200						3205					3210			
Gln	Glu	Trp	Lys	Pro	Ser	Thr	Gly	Trp	Asp	Asn	Trp	Glu	Glu	Val
3215						3220					3225			
Pro	Phe	Cys	Ser	His	His	Phe	Asn	Lys	Leu	His	Leu	Lys	Asp	Gly
3230						3235					3240			
Arg	Ser	Ile	Val	Val	Pro	Cys	Arg	His	Gln	Asp	Glu	Leu	Ile	Gly
3245						3250					3255			
Arg	Ala	Arg	Val	Ser	Pro	Gly	Ala	Gly	Trp	Ser	Ile	Arg	Glu	Thr
3260						3265					3270			

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Ala Cys Leu Ala Lys Ser Tyr Ala Gln Met Trp Gln Leu Leu Tyr
3275 3280 3285

Phe His Arg Arg Asp Leu Arg Leu Met Ala Asn Ala Ile Cys Ser
3290 3295 3300

Ser Val Pro Val Asp Trp Val Pro Thr Gly Arg Thr Thr Trp Ser
3305 3310 3315

Ile His Gly Lys Gly Glu Trp Met Thr Thr Glu Asp Met Leu Val
3320 3325 3330

Val Trp Asn Arg Val Trp Ile Glu Glu Asn Asp His Met Glu Asp
3335 3340 3345

Lys Thr Pro Val Thr Lys Trp Thr Asp Ile Pro Tyr Leu Gly Lys
3350 3355 3360

Arg Glu Asp Leu Trp Cys Gly Ser Leu Ile Gly His Arg Pro Arg
3365 3370 3375

Thr Thr Trp Ala Glu Asn Ile Lys Asn Thr Val Asn Met Val Arg
3380 3385 3390

Arg Ile Ile Gly Asp Glu Glu Lys Tyr Met Asp Tyr Leu Ser Thr
3395 3400 3405

Gln Val Arg Tyr Leu Gly Glu Glu Gly Ser Thr Pro Gly Val Leu
3410 3415 3420

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<211> 10649
<212> DNA
<213> Dengue virus type 4 strain 814669 genome

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ttctaacagt ttgtttgaat agagagcaga tctctggaaa aatgaaccaa cgaaaaaagg 120
tggttagacc acctttcaat atgctgaaac gcgagagaaa cgcgtatca acccctcaag 180

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tagcattcat cacgtttttg cgagtccttt ccatcccacc aacagcaggg attctgaaga	300
gatggggaca gttgaagaaa aataaggcca tcaagatact gattggattc aggaaggaga	360
taggccgcat gctgaacatc ttgaacggga gaaaaaggtc aacgataaca ttgctgtgct	420
tgattcccac cgtaatggcg ttttccttgt caacaagaga tggcgaaccc ctcatgatag	480
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ccctactggt caataccgaa cctgaagaca ttgattgctg gtgcaacctc acgtctacct	660
gggtcatgta tgggacatgc acccagagcg gagaacggag acgagagaag cgctcagtag	720
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aacagtacat ttgccggaga gatgtggtag acagaggggtg gggcaatggc tgtggcttgt	1260
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ttgggcgtat catctcatcc acccctttgg ctgagaatac caacagtgt accaacatag	2040
aattagaacc cccctttggg gacagctaca tagtgatagg tgttggaac agcgcattaa	2100
cactccattg gttcaggaag gggagttcca ttggcaagat gtttgagtcc acatacagag	2160
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<210> 14
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 <212> RNA
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<400> 14
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 <211> 251
 <212> RNA
 <213> Artificial Sequence

<220>
 <223> Dengue virus construct

<400> 15
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<211> 276
<212> RNA
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<211> 245

<212> RNA

<213> Artificial Sequence

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<223> Dengue virus construct

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<223> Dengue virus construct

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<210> 21

<211> 190

<212> RNA

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<400> 24

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<210> 25

<211> 195

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gauccaacag guucu 195