

What is claimed is:

1. A chimeric dengue virus E glycoprotein comprising a dengue virus E glycoprotein backbone that comprises amino acid substitutions that introduce a protein domain from a dengue virus serotype that is different from the dengue virus serotype of the dengue virus E glycoprotein backbone, wherein the dengue virus E glycoprotein backbone is from dengue virus serotype 4 and the protein domain is from dengue virus serotype 2, wherein the glycoprotein comprises the amino acid sequence:

MRCVGVGNRDFVEGVSGGAWVDLVLEHGGCVTTMAQGKPTLDFELTKTTAKEVALLR
TYCIEASISNITTATRCPTQGEPYLKKEEQDQQYICRRDVVDRGWGNGCGLFGKGGVVTC
AKFSCSGKITGNLVQIENLEYTVVTVHNGDTHAVGNDTSNHGVTATITPRSPSVEVKLP
DYGELTLDCEPRSGIDFNEMILMKMKKKTWL VHKQWFLDLPLPWTAGADTSEVHWN
KERMVTFKVPFAKRQDVTVLGSQEGAMHSALAGATEVDSGDGNHMFAGHLKCKV
EKLRIKMSYTMCSGKFSIDKEMAETQHGTTVVKVKEYEGAGAPCKVPIEIRDVNKEKV
VGRVISSTPLAENTNSVTNIELEPPFGDSYIVIGVGNSALTLHWFRKGSSIGKMFESTYRG
AKRMAILGETAWDFGSGGLFTSLGKAVHQVFGSVYTTMFGGVSWMIRILIGFLVLWIG
TNSRNTSMAMTCIAVGGITLFLGFTVQA (SEQ ID NO:1),

wherein said amino acid sequence comprises the following amino acid substitutions:

T300S, S303T, S307K, D309V, M312I, T320I, V322I, K323R, K325Q, A329D, A331S, V335I, I337F, R340T, V342L, N343E, E345R, K346H, V348L, V351L, S353T, S354V, T355N, L357I, A358V, E359T, N360E, T361K, N362D, V364P, T365V, L369A, V379I, G383E, N384P, S385G, A386Q, T388K, H390N, and R393K.

2. A chimeric dengue virus E glycoprotein comprising a dengue virus E glycoprotein backbone that comprises amino acid substitutions that introduce a protein domain from a dengue virus serotype that is different from the dengue virus serotype of the dengue virus E glycoprotein backbone, wherein the dengue virus E glycoprotein backbone is from dengue virus serotype 4 and the protein domain is from dengue virus serotype 2, wherein the glycoprotein comprises the amino acid sequence:

MRCVGVGNRDFVEGVSGGAWVDLVLEHGGCVTTMAQGKPTLDFELTKTTAKEVALLR
TYCIEASISNITTATRCPTQGEPYLKKEEQDQQYICRRDVVDRGWGNGCGLFGKGGVVTC
AKFSCSGKITGNLVQIENLEYTVVTVHNGDTHAVGNDTSNHGVTATITPRSPSVEVKLP
DYGELTLDCEPRSGIDFNEMILMKMKKKTWL VHKQWFLDLPLPWTAGADTSEVHWN
KERMVTFKVPFAKRQDVTVLGSQEGAMHSALAGATEVDSGDGNHMFAGHLKCKV
EKLRLKGMSYSMCTGKFKIVKEIAETQHGTIVIRVQYEGDGSPCKIPFEITDLEKRHLVGR
LITVNPVITEKDSPVNIEAEPFGDSYIIIGVEPGQLKLNWFKKGSSIGKMFESTYRGA

MAILGETAWDFGSVGGLFTSLGKAVHQVFGSVYTTMFGGVSWMIRILIGFLVLWIGTNS
RNTSMAMTCIAVGGITLFLGFTVQA (SEQ ID NO:5).

3. A flavivirus particle or virus like particle (VLP) comprising the E glycoprotein of claim 1.
4. A population of flavivirus particles comprising the flavivirus particle of claim 3.
5. A composition comprising the E glycoprotein of claim 1 in a pharmaceutically acceptable carrier.
6. A composition comprising the population of claim 4 in a pharmaceutically acceptable carrier.
7. A composition comprising the flavivirus particle and/or VLP of claim 3 in a pharmaceutically acceptable carrier.
8. Use of the E glycoprotein of claim 1 in the manufacture of a medicament for producing an immune response to a dengue virus in a subject, wherein the medicament comprising an effective amount of the E glycoprotein is to be administered to the subject.
9. A flavivirus particle or virus like particle (VLP) comprising the E glycoprotein of claim 2.
10. A population of flavivirus particles comprising the flavivirus particle of claim 9.
11. A composition comprising the E glycoprotein of claim 2 in a pharmaceutically acceptable carrier.
12. A composition comprising the population of claim 10 in a pharmaceutically acceptable carrier.

13. A composition comprising the flavivirus particle and/or VLP of claim 9 in a pharmaceutically acceptable carrier.

14. Use of the E glycoprotein of claim 2 in the manufacture of a medicament for producing an immune response to a dengue virus in a subject, wherein the medicament comprising an effective amount of the E glycoprotein is to be administered to the subject.