CLAIMS

What is claimed is:

1. A plasmid expressing a mutant dengue virus E protein for use in neutralizing and protecting against one or more dengue virus serotypes infection, and/or for neutralizing a dengue virus, reducing, alleviating antibody dependent enhancement of dengue virus infection, and/or for increasing survival rate of a subject with dengue virus infection; wherein the mutant dengue virus E protein comprises an amino acid sequence that is at least 80% identical to SEQ ID NO: 1, and further wherein the mutant dengue virus E protein has one or more amino acid residue substitutions at position corresponding to Asn8, Arg9, Val12, and/or Glu13 of SEQ ID NO: 1.

2. The plasmid expressing a mutant dengue virus E protein of claim 1, wherein the mutant dengue virus E protein has one amino acid residue substitution at the Asn8 with Arg.

3. The plasmid expressing a mutant dengue virus E protein of claim 1, wherein the plasmid is in a form of gold-coated plasmid DNA-complex.

4. Use of a plasmid expressing a mutant dengue virus E protein in the manufacture of a medicament for neutralizing and protecting against one or more dengue virus serotypes infection, and/or for neutralizing a dengue virus, reducing, alleviating antibody dependent enhancement of dengue virus infection, and/or for increasing survival rate of a subject with dengue virus infection; wherein the mutant dengue virus E protein comprises an amino acid sequence that is at least 80% identical to SEQ ID NO: 1, and further wherein the mutant dengue virus E protein has one amino acid residue substitution at a position corresponding to Asn8 of SEQ ID NO: 1.

5. The use of claim 4, wherein the mutant dengue virus E protein has one amino acid residue substitution at the Asn8 with Arg.

6. The use of claim 4, wherein the plasmid is in a form of gold-coated plasmid DNA-complex.

7. Immunized sera for use in neutralizing and protecting against one or more dengue virus serotypes infection, and/or for neutralizing a dengue virus, reducing, alleviating antibody dependent enhancement of dengue virus infection, and/or for increasing survival rate of a subject with dengue virus infection; wherein the immunize sera comprise neutralizing antibodies elicited by a plasmid expressing a mutant dengue virus E protein comprising an amino acid sequence that is at least 80% identical to SEQ ID NO: 1; and further wherein the dengue virus E protein has one or more amino acid residue substitutions at position corresponding to Asn8, Arg9, Val12, and/or Glu13 of SEQ ID NO: 1.

8. The immunized sera of claim 7, wherein the mutant dengue virus E protein has one amino acid residue substitution at the Asn8 with Arg.

9. The immunized sera of claim 7, wherein the immunized sear are free of antibody dependent enhancement of the dengue virus infection.

10. The immunized sera of claim 7, wherein the immunized sear are human immunized sera.

11. Use of immunized sera in the manufacture of a medicament for neutralizing and protecting against one or more dengue virus serotypes infection, and/or for neutralizing a dengue virus, reducing, alleviating antibody dependent enhancement of dengue virus infection, and/or for increasing survival rate of a subject with dengue virus infection; wherein the immunize sera comprise neutralizing elicited by a plasmid expressing a mutant dengue virus E protein comprising an amino acid sequence that is at least 80% identical to SEQ ID NO: 1; and further wherein the dengue virus E protein has one amino acid residue substitution at a position corresponding to Asn8 of SEQ ID NO: 1.

12. The use of claim 11, wherein the mutant dengue virus E protein has one amino acid residue substitution at the Asn8 with Arg.

13. The use of claim 11, wherein the immunized sear are free of antibody dependent enhancement of the dengue virus infection.

14. The use of claim 11, wherein the immunized sear are human immunized sera.

15. A DNA vaccine for use in neutralizing and protecting against one or more dengue virus serotypes infection, and/or for neutralizing a dengue virus, reducing, alleviating antibody dependent enhancement of dengue virus infection, and/or for increasing survival rate of a subject with dengue virus infection; wherein the DNA vaccine comprises a plasmid expressing a mutant dengue virus E protein, the mutant dengue virus E protein comprising an amino acid sequence that is at least 80% identical to SEQ ID NO: 1; and further wherein the mutant dengue virus E protein has one or more amino acid residue substitutions at position corresponding to Asn8, Arg9, Val12, and/or Glu13 of SEQ ID NO: 1.

16. The DNA vaccine for use of claim 15, wherein the mutant dengue virus E protein has one amino acid residue substitution at the Asn8 with Arg.

17. The DNA vaccine for use of claim 15, wherein the plasmid is in a form of gold-coated plasmid DNA-complex.

18. Use of a DNA vaccine in the manufacture of a medicament for neutralizing and protecting against one or more dengue virus serotypes infection, and/or for neutralizing a dengue virus, reducing, alleviating antibody dependent enhancement of dengue virus infection, and/or for increasing survival rate of a subject with dengue virus infection; wherein the DNA vaccine comprises a plasmid expressing a mutant dengue virus E protein, the mutant dengue virus E protein comprising an amino acid sequence that is at least 80% identical to SEQ ID NO: 1; and

further wherein the mutant dengue virus E protein has one amino acid residue substitution at a position corresponding to Asn8 of SEQ ID NO: 1.

19. The use of claim 18, wherein the mutant dengue virus E protein has one amino acid residue substitution at the Asn8 with Arg.

20. The use of claim 18, wherein the plasmid is in a form of gold-coated plasmid DNA-complex.