a. (i) a heavy chain with three CDRs comprising the amino acid sequences GYSTH (SEQ ID NO:421), WDNPSSGDTTYAENFRG (SEQ ID NO:522), and GGDDYSFDH (SEQ ID NO:623) respectively;

b. (ii) a light chain with three CDRs comprising the amino acid sequences RGDSLRSYYAS (SEQ ID NO:724), GENNRPS (SEQ ID NO:825), and NSRDSSDHLLL (SEQ ID NO:826) respectively; and

c. (iii) a modified Fc region having a leucine to alanine substitution at amino acid positions 234 and 235 such that the Fc region does not bind to the an Fcγ receptor,

wherein positions 234 and 235 correspond to positions 240 and 241 of SEQ ID NO:20, respectively and wherein the antibody binds a flavivirus.

~~**[0009b]** In a further aspect, the present disclosure provides an isolated humanized monoclonal antibody comprising a V_H amino acid sequence having SEQ ID NO: 1, a V_L amino acid sequence having SEQ ID NO: 3, and a modified Fc region such that the Fc region does not bind to the Fcγ receptor, and wherein the antibody binds a flavivirus.~~

~~**[0009c]** In another aspect, the present disclosure provides an isolated humanized monoclonal antibody comprising a V_H nucleotide sequence having SEQ ID NO: 2, a V_L nucleotide sequence having SEQ ID NO: 4, and a modified Fc region such that the Fc region does not bind to the Fcγ receptor, and wherein the antibody binds a flavivirus.~~

[0010] The present disclosure further provides an isolated humanized monoclonal antibody that neutralizes a flavivirus.

[0011] The present disclosure also provides antibodies with a modified Fc region such that the Fc region does not bind to the Fcγ receptor. The modified Fc region contains mutations at amino acid positions 234 and 235. In one embodiment, the mutations are L234A and L235A. In one embodiment, the modified Fc region comprises a CH2 region wherein the amino acids at positions 4 and 5 of the CH2 region are mutated. For example, the leucine amino acids at positions 4 and 5 are mutated to a different amino acid, preferably, an alanine. In other embodiments, the modified Fc region comprises an Fc region where the amino acids at positions 108 and 109 are mutated. For example, the leucines at positions 108 and 109 of the Fc region are mutated to a different amino acid, preferably, an alanine. In another embodiment, the modified Fc region comprises the amino acid sequence of SEQ ID NO: 7. The modified Fc region binds to the neonatal Fc receptor (FcRn).

[0012] According to the present disclosure, the antibody does not contribute to an antibody-dependent enhancement of a flavivirus infection.

[0013] According to the present disclosure, the antibody is linked to a therapeutic agent. The therapeutic agent is a toxin, a radiolabel, a siRNA, a small molecule, or a cytokine. For example, the cytokine is TGF-beta.

[0014] The present disclosure further provides a cell producing a huFV antibody. The cell may be a mammalian cell (*i.e.*, a mouse, rabbit, goat, or sheep), or a plant cell (*i.e.* tobacco plant).

[0014a] In one aspect, the present disclosure provides an isolated cell ~~producing~~ ~~an~~that produces the antibody disclosed herein.

[0014b] In another aspect, the present disclosure provides a use of an antibody disclosed herein in the manufacture of a medicament for ~~preventing~~ reducing antibody-dependent enhancement of a flavivirus infection in a subject.

[0014c] In a further aspect, the present disclosure provides a use of an antibody disclosed herein and a flavivirus vaccine in the manufacture of a medicament for increasing flavivirus vaccine efficiency in a subject.

[0014d] In another aspect, the present disclosure provides a use of an antibody disclosed herein in the manufacture of a medicament for preventing, treating or alleviating a symptom of a flavivirus infection in a subject.

anti-viral agent are administered sequentially or concurrently. The anti-viral agent is an antibody, an antibody linked to a therapeutic agent, or a small molecule.

[0018] The flavivirus is West Nile virus, Dengue virus (serotypes 1-4), St. Louis encephalitis virus, yellow fever virus, Japanese encephalitis virus, and Murray Valley encephalitis virus.

[0019] In one aspect, the present disclosure provides a nucleic acid sequence containing a nucleic acid sequence of SEQ ID NO: 2, 4 and 8.

[0020] The present disclosure further provides a nucleic acid sequence encoding a polypeptide of SEQ ID NO: 1 and 3. The present disclosure further provides a polypeptide containing the amino acid sequence of SEQ ID NO: 1, 3 and 7.

~~**[0020a]** In one aspect, the present disclosure provides a nucleic acid sequence encoding a polypeptide comprising SEQ ID NO: 1, 3 and 7 or 13.~~

~~**[0020b]** In another aspect, the present disclosure provides a polypeptide comprising the amino acid sequence comprising SEQ ID NO: 1, 3 and 7 or 13.~~

[0021] The present disclosure further provides a vector containing the nucleic acid sequence containing SEQ ID NO: 2, 4 and 8, or encoding a polypeptide of SEQ ID NO: 1, 3 and 7.

~~**[0021a]** In one aspect, the present disclosure provides a vector comprising a nucleic acid disclosed herein.~~

[0022] Additionally, the present disclosure provides a cell containing a vector containing the nucleic acid sequence containing SEQ ID NO: 2, 4 and 8, or encoding a polypeptide of SEQ ID NO: 1, 3 and 7.

~~**[0022a]** In one aspect, the present disclosure provides a cell comprising a vector disclosed herein.~~

[0023] Other features and advantages of the present disclosure will be apparent from and are encompassed by the following detailed description and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] **Figure 1** shows a schematic of an expression vector containing wild-type mAb-11.

[0025] **Figure 2** shows a schematic of an expression vector containing engineered mAb-11-LALA.

What is claimed is:

1. An isolated humanized monoclonal antibody comprising:

~~a.~~ (i) a heavy chain with three CDRs comprising the amino acid sequences GYSTH (SEQ ID NO:~~4~~21), WDNPSSGDTTYAENFRG (SEQ ID NO:~~5~~22), and GGDDYSFDH (SEQ ID NO:~~6~~23) respectively;

~~b.~~ (ii) a light chain with three CDRs comprising the amino acid sequences RGDSLRSYYAS (SEQ ID NO:~~7~~24), GENNRPS (SEQ ID NO:~~8~~25), and NSRDSSDHLLL (SEQ ID NO:~~8~~26) respectively; and

~~c.~~ (iii) a modified Fc region having a leucine to alanine substitution at amino acid positions 234 and 235 such that the Fc region does not bind to ~~the~~ an Fcγ receptor,

wherein positions 234 and 235 correspond to positions 240 and 241 of SEQ ID NO:20, respectively and wherein the antibody binds a flavivirus.

~~2. An isolated humanized monoclonal antibody comprising a V_H amino acid sequence having SEQ ID NO: 1, a V_L amino acid sequence having SEQ ID NO: 3, and a modified Fc region such that the Fc region does not bind to the Fcγ receptor, and wherein the antibody binds a flavivirus.~~

~~3. An isolated humanized monoclonal antibody comprising a V_H nucleotide sequence having SEQ ID NO: 2, a V_L nucleotide sequence having SEQ ID NO: 4, and a modified Fc region such that the Fc region does not bind to the Fcγ receptor, and wherein the antibody binds a flavivirus.~~

4~~2~~. The antibody of ~~any of the preceding claims~~claim 1, wherein said antibody does not contribute to an antibody-dependent enhancement of a flavivirus infection.

5~~3~~. The antibody of ~~any of the preceding claims~~claim 1, wherein said antibody neutralizes a flavivirus.

~~6. The antibody of any of the preceding claims, wherein the Fc region contains mutations at amino acid positions 234 and 235.~~

~~7. The antibody of claim 6, wherein the mutations are L234A and L235A.~~

84. The antibody of claim 61, wherein the Fc region comprises the amino acid sequence of SEQ ID NO: 7 or SEQ ID NO: 13.

95. The antibody of ~~any of the preceding claims~~claim 1, wherein the modified Fc region binds to the neonatal Fc receptor.

106. The antibody of ~~any of the preceding claims~~claim 1, wherein the flavivirus is West Nile virus, Dengue virus (serotypes 1-4), St. Louis encephalitis virus, yellow fever virus, Japanese encephalitis virus, ~~and~~ or Murray Valley encephalitis virus.

117. The antibody of ~~any of the preceding claims~~claim 1, wherein said humanized monoclonal antibody is produced in a plant.

128. The antibody ~~according to any one of the previous claims~~of claim 1, linked to a therapeutic agent.

139. The antibody of claim 128, wherein said therapeutic agent is a toxin, a radiolabel, a siRNA, a small molecule, or a cytokine.

1410. The antibody of claim 139, wherein said cytokine is TGF-beta.

1511. An isolated cell ~~producing~~ that produces the antibody of ~~the previous claims~~claim 1.

1612. Use of an antibody of any one of claims 1-~~14~~10 in the manufacture of a medicament for ~~preventing~~ reducing antibody-dependent enhancement of a flavivirus infection in a subject.

1713. The use of claim 1612, wherein said antibody is to be administered to said subject after a first infection by a flavivirus.

1814. Use of an antibody of any one of claims 1 to ~~14~~10 and a flavivirus vaccine in the manufacture of a medicament for increasing flavivirus vaccine efficiency in a subject.

1915. The use of claim 1814, wherein said antibody and said vaccine are to be administered to said subject sequentially or concurrently.

~~20~~16. The use of claim 1814, wherein said vaccine is a viral vaccine.

~~21~~17. Use of an antibody according to any one of claims 1-~~14~~10 in the manufacture of a medicament for preventing, treating or alleviating a symptom of a flavivirus infection in a subject.

~~22~~18. Use of an antibody according to any one of claims 1-~~14~~10 in the manufacture of a medicament for delaying the onset of one or more symptoms of a flavivirus infection in a subject.

~~23~~19. The use of claim ~~21~~17 or ~~22~~18, wherein an anti-viral agent is to be further administered to said subject.

~~24~~20. The use of claim ~~23~~19, wherein the anti-viral agent is an antibody, an antibody linked to a therapeutic agent, or a small molecule.

~~25~~21. The use of claim ~~23~~19, wherein said antibody and the anti-viral agent are to be administered sequentially or concurrently.

~~26~~22. The use of any one of claims ~~21~~17-~~25~~21, wherein said one or more symptom comprises weight loss, paralysis, fever, headache, nausea, vomiting, skin rash, and body aches.

~~27~~23. The use of any one of claims ~~1~~17-~~26~~22, wherein said flavivirus is West Nile virus, Dengue virus (serotypes 1-4), St. Louis encephalitis virus, yellow fever virus, Japanese encephalitis virus, or Murray Valley encephalitis virus.

~~28. A nucleic acid sequence comprising a nucleic acid sequence of SEQ ID NO: 2, 4 and 8.~~

~~29. A nucleic acid sequence encoding a polypeptide comprising SEQ ID NO: 1, 3 and 7 or 13.~~

~~30. A polypeptide comprising the amino acid sequence comprising SEQ ID NO: 1, 3 and 7 or 13.~~

~~31. A vector comprising the nucleic acid claims 28 and 29.~~

~~32. A cell comprising the vector of claim 31.~~

~~33~~24. The isolated cell of claim ~~15~~11 ~~or 32~~, wherein said isolated cell is a plant cell.