CLAIMS

1. An isolated antibody, or an antigen binding fragment thereof, that specifically binds to a Zika virus epitope and neutralizes Zika virus infection, wherein the antibody, or the antigen binding fragment thereof, comprises CDRH1, CDRH2, and CDRH3 amino acid sequences and CDRL1, CDRL2, and CDRL3 amino acid sequences (i) according to SEQ ID NOs: 1 - 5 and 7; (ii) according to SEQ ID NOs: 1 – 4 and 6 – 7; (iii) according to SEQ ID NOs: 19 – 23 and 25; (iv) according to SEQ ID NOs: 19 – 22 and 24 – 25; (v) according to SEQ ID NOs: 37 – 41 and 43; (vi) according to SEQ ID NOs: 37 – 40 and 42 – 43; (vii) according to SEQ ID NOs: 73 – 77 and 79; or (viii) according to SEQ ID NOs: 73 – 76 and 78 – 79.

2. The antibody, or the antigen binding fragment thereof, according to claim 1, characterized in that the concentration of the antibody, or antigen binding fragment thereof, required for 50% neutralization of Zika virus (IC_{50}) is up to about 1 µg/ml, preferably up to about 500 ng/ml, more preferably up to about 250 ng/ml, even more preferably up to about 100 ng/ml and most preferably up to about 50 ng/ml.

3. The antibody, or the antigen binding fragment thereof, according to claim 1 or 2, characterized in that the antibody, or antigen binding fragment thereof, does not bind to Dengue virus-like particles and/or to Dengue envelope protein.

4. The antibody, or the antigen binding fragment thereof, according to any of claims 1 – 3, characterized in that the antibody, or antigen binding fragment thereof, is a human antibody.

5. The antibody, or the antigen binding fragment thereof, according to any of claims 1 – 4, characterized in that the antibody, or antigen binding fragment thereof, is a monoclonal antibody, preferably a human monoclonal antibody, more preferably a recombinant human monoclonal antibody.

6. The antibody, or the antigen binding fragment thereof, according to any of claims 1 – 5, characterized in that the antibody, or antigen binding fragment thereof, is of the IgG type, preferably of the IgG1 type.

7. The antibody, or the antigen binding fragment thereof, according to any of claims 1 6, characterized in that the antibody, or antigen binding fragment thereof, comprises an Fc moiety.

8. The antibody, or the antigen binding fragment thereof, according to claim 7, characterized in that the antibody, or antigen binding fragment thereof, comprises a mutation in the Fc moiety, said mutation reducing binding of the antibody to an Fc receptor.

9. The antibody, or the antigen binding fragment thereof, according to claim 7 or 8, characterized in that the antibody, or antigen binding fragment thereof, comprises a CH2 L4A mutation, a CH2 L5A mutation, or both.

10. The antibody, or the antigen binding fragment thereof, according to any of claims 1 – 9, characterized in that the antibody, or antigen binding fragment thereof, binds to domain III of Zika virus envelope protein.

11. The antibody, or the antigen binding fragment thereof, according to any of claims 1 – 10, characterized in that the antibody, or antigen binding fragment thereof, can inhibit a post-attachment step of ZIKV.

12. The antibody, or the antigen binding fragment thereof, according to claim 11, characterized in that the antibody, or antigen binding fragment thereof, can prevent membrane fusion.

13. The antibody, or the antigen binding fragment thereof, according to any of claims 1 – 12, characterized in that the antibody, or the antigen binding fragment thereof, comprises (i) a heavy chain variable region (VH) amino acid sequence according to SEQ ID NO: 8 ~~or a functional sequence variant thereof~~and a light chain variable region (VL) amino acid sequence according to SEQ ID NO: 9; (ii) a heavy chain variable region (VH) amino acid sequence according to SEQ ID NO: 26 and a light chain variable region (VL) amino acid sequence according to SEQ ID NO: 27; (iii) a heavy chain variable region (VH) amino acid sequence according to SEQ ID NO: 44 and a light chain variable region (VL) amino acid sequence according to SEQ ID NO: 45; or (iv) a heavy chain variable region (VH) amino acid sequence according to SEQ ID

NO: 80 and a light chain variable region (VL) amino acid sequence according to SEQ ID NO: 81; or

functional sequence variants of said heavy and light chain variable regions having at least 70%, at least 75%, at least 80%, at least 85%, at least 88%, at least 90%, at least 92%, at least 95%, at least 96%, at least 97%, at least 98% or at least 99% sequence identity ~~and/or a light chain variable region (VL) amino acid sequence according to SEQ ID NO: 9 or a functional sequence variant thereof having at least 70%, at least 75%, at least 80%, at least 85%, at least 88%, at least 90%, at least 92%, at least 95%, at least 96%, at least 97%, at least 98% or at least 99% sequence identity; (ii) a heavy chain variable region (VH) amino acid sequence according to SEQ ID NO: 26 or a functional sequence variant thereof having at least 70%, at least 75%, at least 80%, at least 85%, at least 88%, at least 90%, at least 92%, at least 95%, at least 96%, at least 97%, at least 98% or at least 99% sequence identity and/or a light chain variable region (VL) amino acid sequence according to SEQ ID NO: 27 or a functional sequence variant thereof having at least 70%, at least 75%, at least 80%, at least 85%, at least 88%, at least 90%, at least 92%, at least 95%, at least 96%, at least 97%, at least 98% or at least 99% sequence identity; (iii) a heavy chain variable region (VH) amino acid sequence according to SEQ ID NO: 44 or a functional sequence variant thereof having at least 70%, at least 75%, at least 80%, at least 85%, at least 88%, at least 90%, at least 92%, at least 95%, at least 96%, at least 97%, at least 98% or at least 99% sequence identity and/or a light chain variable region (VL) amino acid sequence according to SEQ ID NO: 45 or a functional sequence variant thereof having at least 70%, at least 75%, at least 80%, at least 85%, at least 88%, at least 90%, at least 92%, at least 95%, at least 96%, at least 97%, at least 98% or at least 99% sequence identity; or (iv) a heavy chain variable region (VH) amino acid sequence according to SEQ ID NO: 80 or a functional sequence variant thereof having at least 70%, at least 75%, at least 80%, at least 85%, at least 88%, at least 90%, at least 92%, at least 95%, at least 96%, at least 97%, at least 98% or at least 99% sequence identity and/or a light chain variable region (VL) amino acid sequence according to SEQ ID NO: 81 or a functional sequence variant thereof having at least 70%, at least 75%, at least 80%, at least 85%, at least 88%, at least 90%, at least 92%, at least 95%, at least 96%, at least 97%, at least 98% or at least 99% sequence identity.~~.

14. The antibody, or the antigen binding fragment thereof, according to any of the previous claims, characterized in that the antibody, or the antigen binding fragment thereof, is a purified antibody, a single chain antibody, Fab, Fab', F(ab')2, Fv or scFv.

15. Use of the antibody, or the antigen binding fragment thereof, according to any of the previous claims, in the manufacture of a medicament for prevention or treatment of Zika virus ~~infention~~infection.

16. A nucleic acid molecule comprising a polynucleotide encoding the antibody, or the antigen binding fragment thereof, according to any of the previous claims.

17. The nucleic acid molecule according to claim –16, wherein the polynucleotide sequence comprises~~ or consists of~~ a nucleic acid sequence according to any one of SEQ ID NOs: 10 – 18, 28 – 36, 46 – 54, 64 – 72, and 82 – 90; or a functional sequence variant thereof having at least 70%, at least 75%, at least 80%, at least 85%, at least 88%, at least 90%, at least 92%, at least 95%, at least 96%, at least 97%, at least 98% or at least 99% sequence identity.

18. A vector comprising the nucleic acid molecule according to claim 16 or 17.

19. A cell expressing the antibody, or the antigen binding fragment thereof, according to any of claims 1 to 14; or comprising the vector according to claim 18.

20. A pharmaceutical composition comprising the antibody, or the antigen binding fragment thereof, according to any of claims 1 to 14, the nucleic acid according to claims 16 – 17, the vector according to claim 18 and/or the cell according to claim 19.

21. The pharmaceutical composition according to claim 20 further comprising a pharmaceutically acceptable excipient, diluent or carrier.

22. The pharmaceutical composition according to claim 20 or 21, which is provided as a single-dose product.

23. The pharmaceutical composition according to any of claims -20 – 22, wherein the amount of the antibody, or the antigen binding fragment thereof~~, according to any of claims 1 to 20~~, does not exceed 500 mg, preferably does not exceed 200 mg, more

preferably does not exceed 100 mg, and even more preferably does not exceed 50 mg.

24. Use of the antibody, or the antigen binding fragment thereof, according to any of claims 1 to 15, the nucleic acid according to any of claims ~~-~~16 – 17, the vector according to claim 18, the cell according to claim 19, or the pharmaceutical composition according to any of claims 20 – ~~24~~23 in the manufacture of a medicament for the prevention or treatment of Zika virus infection.

25. The use according to claim 24 in the prevention or treatment of Zika virus infection in subjects showing symptoms of Zika infection.

26. The use according to claim 24 in the prevention or treatment of Zika virus infection in asymptomatic subjects.

27. The use according to ~~claim~~any one of claims 24 to 26 in the prevention or treatment of Zika virus infection in pregnant subjects.

~~.~~28. The use according to ~~claim~~any one of claims 24 to 27 wherein the antibody, or the antigen binding fragment thereof, the nucleic acid, the vector, the cell, or the pharmaceutical composition is to be administered up to seven days after ~~(~~a ~~possible)~~ Zika virus infection, preferably up to five days after ~~(~~a ~~possible)~~ Zika virus infection, more preferably up to four days after ~~(~~a ~~possible)~~ Zika virus infection, even more preferably up to three days after ~~(~~a ~~possible)~~ Zika virus infection, and most preferably up to one day after ~~(~~a ~~possible)~~ Zika virus infection.

29. The use according to ~~claim~~any one of claims 24 to 28, wherein the antibody, or the antigen binding fragment thereof, the nucleic acid, the vector, the cell, or the pharmaceutical composition is to be administered in combination with a checkpoint inhibitor.

30. The use according to ~~claim 28~~any one of claims 24 to 29 wherein the antibody, or the antigen binding fragment thereof, the nucleic acid, the vector, the cell, or the pharmaceutical composition is to be administered at a (single) dose of 0.005 to 100 mg/kg, preferably at a (single) dose of 0.0075 to 50 mg/kg, more preferably at a

(single) dose of 0.01 to 10 mg/kg, even more preferably at a (single) dose of 0.05 to 5 mg/kg, and particularly preferably at a (single) dose of 0.1 to 1 mg/kg.

31. Use of the antibody, or the antigen binding fragment thereof, according to any of claims 1 to 14 for monitoring the quality of an anti-Zika vaccine by checking that the antigen of said vaccine contains the specific epitope in the correct conformation.

32. Use of the antibody, or the antigen binding fragment thereof, according to any of claims 1 to ~~15~~14 in *in-vitro* diagnosis of Zika virus infection.

33. A kit of parts comprising at least one antibody, or the antigen binding fragment thereof, according to any of claims 1 to ~~15~~14, at least one nucleic acid according to any of claims 16 – 17~~ – 18~~, at least one vector according to claim ~~19~~18, at least one cell according to claim ~~20~~19, or at least one pharmaceutical composition according to any of claims ~~21 – 24~~20 – 23.