CLAIMS:

1. A human monoclonal antibody capable of specifically binding to an envelope (E) protein of at least one dengue virus serotype, wherein the antibody comprises a light chain variable domain sequence comprising the first, second, and third complementarity determining region (CDR) sequences of clone 11E1 defined as CDR1: QSVSNW, CDR2: KAS and CDR3: QQSGT.

2. A serotype-specific human monoclonal antibody derived from a plasmablast capable of specifically binding to an E protein of one or two dengue virus serotypes with higher affinity compared to E proteins of other dengue virus serotypes, wherein the antibody comprises all CDR sequences from the following heavy and light chain variable domain peptide sequences: SEQ ID NO: 109 and SEQ ID NO: 110.

3. The monoclonal antibody of any one of claims 1 to 2, wherein the antibody comprises the full heavy and light chain variable domain sequences of SEQ ID NO: 109 and SEQ ID NO: 110.

4. A bi-specific antibody comprising a variable domain of a first monoclonal antibody as defined in claim 1 linked to a variable domain of a second monoclonal antibody, wherein first and second antibodies are a combination as defined in Table 6.

5. A pharmaceutical composition or kit comprising the antibody of any one of claims 1 to 4.

6. An isolated polynucleotide encoding first, second, and third complementarity determining region (CDR) sequences in the heavy chain variable domain of the 11E1 clone defined as CDR1: GFTFSTYP, CDR2: IFNGGSST and CDR3: AKFAAPPSGWCDY.

7. An isolated polynucleotide encoding first, second, and third complementarity determining region (CDR) sequences in the light chain and heavy chain variable domain of the 11E1 clone.

8. An isolated polynucleotide encoding an antibody according to any one of claims 1 to 4.

9. Use of the antibody according to any one of claims 1 to 4 in the manufacture of a medicament for prevention or treatment of dengue virus infection.

10. The use according to claim 9, wherein the antibody comprises:

all CDR sequences from the following pair of heavy and light chain variable domain peptide sequences SEQ ID NOs: 109 and 110.

11. An antibody according to any one of claims 1 to 4 for use in the prevention or treatment of dengue virus infection.

12. The antibody according to claim 11, wherein the antibody comprises:

all CDR sequences from the following pair of heavy and light chain variable domain peptide sequences SEQ ID NOs: 109 and 110.

13. The use according to any one of claims 9 to 10, or the antibody according to claim 11 or claim 12, wherein said antibody comprises the full heavy and light chain variable domain sequences.

14. An *in vitro* method for detecting immunity to dengue virus in a subject, comprising:

coating at least one insoluble support with a dengue virus E protein,

contacting the E protein coated to the support with a first antibody comprising:

an antibody according to any one of claims 1 to 4; and

the biological sample of the subject;

and detecting a presence or absence of competitive binding to the E protein between the first antibody and an antibody specific to the E protein that may be present in the sample,

wherein detection of said competitive binding indicates pre-existing immunity to dengue virus in the subject.

15. The method according to claim 14, comprising:

coating four of said insoluble supports with E protein, wherein each said support is coated with E protein from a distinct dengue virus serotype, and each said support is isolated from all other said supports;

contacting the E protein coated to each said isolated insoluble support with said first antibody and said biological sample; and

determining the amount of first antibody bound to the E protein coated on each said isolated insoluble support;

wherein detection of less first antibody bound to the E protein coated on one of said supports when compared to at least one other of said supports indicates pre-existing immunity to dengue virus in the subject,

and wherein said pre-existing immunity is specific to the dengue serotype of the E protein to which less first antibody is bound.

16. The method according to claim 15, comprising:

coating four of said insoluble supports with E protein, wherein each said support is coated with E protein from the same dengue virus serotype, and each said support is isolated from all other said supports;

contacting the E protein coated to each said isolated insoluble support with said first antibody, said biological sample and soluble E protein of a specific dengue virus serotype,

wherein each said isolated insoluble support is contacted with soluble E protein from a different dengue virus serotype; and

determining the amount of first antibody bound to the E protein of each said isolated insoluble support;

wherein detection of less first antibody bound to the E protein coated on one of said supports when compared to at least one other of said supports indicates pre-existing immunity to dengue virus in the subject,

and wherein said pre-existing immunity is specific to the dengue serotype of the soluble E protein contacted with the E protein to which less first antibody is bound.

17. An *in vitro* method for detecting immunity to dengue virus in a subject, comprising:

coating four insoluble supports with E protein, wherein each said support is coated with E protein from a distinct dengue virus serotype, and each said support is isolated from all other said supports;

contacting the E protein coated on each said isolated support with a biological sample from the subject, and, a first antibody according to any one of claims 1 to 4;

wherein the first antibody contacted with the E protein coated on each said isolated insoluble support binds specifically to that said E protein, and cannot bind to an E protein coated to any other of said supports;

determining the amount of first antibody bound to the E protein of each said isolated insoluble support;

wherein detection of less first antibody bound to the E protein coated on one of said supports when compared to at least one other of said supports indicates pre-existing immunity to dengue virus in the subject,

and wherein said pre-existing immunity is specific to the dengue serotype of the E protein to which less first antibody is bound.

18. The method according to claim 17, wherein said first antibody is an antibody according to claim 2.

19. The method according to any one of claims 14 to 18, wherein any one or more of said insoluble supports is a bead or a well in culture plate.

20. The method according to any one of claims 14 to 19, wherein the first antibody is labelled with a detectable marker.

21. An *in vitro* method for detecting immunity to dengue virus in a subject, comprising:

coating at least one insoluble support with a first antibody comprising all heavy and light chain variable domain CDR sequences from an antibody according to any one of claims 1 to 4;

contacting the first antibody coated on the support with dengue virus particles to thereby allow said virus particles to bind to said first antibody;

contacting the virus particles with a biological sample from the subject to thereby allow any dengue virus-specific antibodies that may be present in said sample to bind to said virus particles; and

detecting whether said virus particles are bound by any said dengue virus-specific antibodies to thereby determine whether immunity to dengue virus exists in the subject.

22. The method according to claim 21, wherein the first antibody is only capable of binding to an E protein from one dengue virus serotype.

23. The method according to any one of claims 14 to 20, or claim 22, wherein the E protein is E domain III (EDIII) protein.

CLAIMS:

1. A human monoclonal antibody capable of specifically binding to an envelope (E) protein of at least one dengue virus serotype, wherein the antibody comprises a light chain variable domain sequence comprising the first, second, and third complementarity determining region (CDR) sequences of clone 11E1 defined in Figure 20 or 22.

2. A serotype-specific human monoclonal antibody derived from a plasmablast capable of specifically binding to an E protein of one or two dengue virus serotypes with higher affinity compared to E proteins of other dengue virus serotypes, wherein the antibody comprises all CDR sequences from the following heavy and light chain variable domain peptide sequences: SEQ ID NO: 109 and SEQ ID NO: 110.

3. The monoclonal antibody of any one of claims 1 to 2, wherein the antibody comprises full heavy and light chain variable domain sequences from said pair.

4. A bi-specific antibody comprising a variable domain of a first monoclonal antibody as defined in claim 1 linked to a variable domain of a second monoclonal antibody, wherein the first and second antibody each comprise all CDR sequences from one pair of heavy and light chain variable domain peptide sequences according to any one of claims 1 to 3.

5. A bi-specific antibody comprising a variable domain of a first monoclonal antibody as defined in claim 1 linked to a variable domain of a second monoclonal antibody, wherein first and second antibodies are a combination as defined in Table 5 or Table 6.

6. A pharmaceutical composition or kit comprising the antibody of any one of claims 1 to5.

7. An isolated polynucleotide encoding first, second, and third complementarity determining region (CDR) sequences in the heavy chain variable domain of the clone defined in claim 1.

8. An isolated polynucleotide encoding first, second, and third complementarity determining region (CDR) sequences in the light chain heavy chain variable domain of the clone defined in claim 1.

9. An isolated polynucleotide encoding an antibody according to any one of claims 1 to 5.

10. Use of the antibody according to any one of claims 1 to 5 in the manufacture of a medicament for prevention or treatment of dengue virus infection.

11. The use according to claim 10, wherein the antibody comprises:

all CDR sequences from the following pair of heavy and light chain variable domain peptide sequences SEQ ID NOs: 109 and 110.

12. An antibody according to any one of claims 1 to 5 for use in the prevention or treatment of dengue virus infection.

13. The antibody according to claim 12, wherein the antibody comprises:

all CDR sequences from the following pair of heavy and light chain variable domain peptide sequences SEQ ID NOs: 109 and 110.

14. The use according to any one of claims 10 to 11, or the antibody according to claim 12 or claim 13, wherein said antibody comprises full heavy and light chain variable domain sequences from said pair.

15. An *in vitro* method for detecting immunity to dengue virus in a subject, comprising:

coating at least one insoluble support with a dengue virus E protein,

contacting the E protein coated to the support with a first antibody comprising:

an antibody according to any one of claims 1 to 5; and

the biological sample of the subject;

and detecting a presence or absence of competitive binding to the E protein between the first antibody and an antibody specific to the E protein that may be present in the sample,

wherein detection of said competitive binding indicates pre-existing immunity to dengue virus in the subject.

16. The method according to claim 15, comprising:

coating four of said insoluble supports with E protein, wherein each said support is coated with E protein from a distinct dengue virus serotype, and each said support is isolated from all other said supports;

contacting the E protein coated to each said isolated insoluble support with said first antibody and said biological sample; and

determining the amount of first antibody bound to the E protein coated on each said isolated insoluble support;

wherein detection of less first antibody bound to the E protein coated on one of said supports when compared to at least one other of said supports indicates pre-existing immunity to dengue virus in the subject,

and wherein said pre-existing immunity is specific to the dengue serotype of the E protein to which less first antibody is bound.

17. The method according to claim 16, comprising:

coating four of said insoluble supports with E protein, wherein each said support is coated with E protein from the same dengue virus serotype, and each said support is isolated from all other said supports;

contacting the E protein coated to each said isolated insoluble support with said first antibody, said biological sample and soluble E protein of a specific dengue virus serotype,

wherein each said isolated insoluble support is contacted with soluble E protein from a different dengue virus serotype; and

determining the amount of first antibody bound to the E protein of each said isolated insoluble support;

wherein detection of less first antibody bound to the E protein coated on one of said supports when compared to at least one other of said supports indicates pre-existing immunity to dengue virus in the subject,

and wherein said pre-existing immunity is specific to the dengue serotype of the soluble E protein contacted with the E protein to which less first antibody is bound.

18. An *in vitro* method for detecting immunity to dengue virus in a subject, comprising:

coating four insoluble supports with E protein, wherein each said support is coated with E protein from a distinct dengue virus serotype, and each said support is isolated from all other said supports;

contacting the E protein coated on each said isolated support with a biological sample from the subject, and, a first antibody according to any one of claims 1 to 5;

wherein the first antibody contacted with the E protein coated on each said isolated insoluble support binds specifically to that said E protein, and cannot bind to an E protein coated to any other of said supports;

determining the amount of first antibody bound to the E protein of each said isolated insoluble support;

wherein detection of less first antibody bound to the E protein coated on one of said supports when compared to at least one other of said supports indicates pre-existing immunity to dengue virus in the subject,

and wherein said pre-existing immunity is specific to the dengue serotype of the E protein to which less first antibody is bound.

19. The method according to claim 18, wherein said first antibody is an antibody according to claim 4.

20. The method according to any one of claims 15 to 19, wherein any one or more of said insoluble supports is a bead or a well in culture plate.

21. The method according to any one of claims 15 to 20, wherein the first antibody is labelled with a detectable marker.

22. An *in vitro* method for detecting immunity to dengue virus in a subject, comprising:

coating at least one insoluble support with a first antibody comprising all heavy and light chain variable domain CDR sequences from an antibody according to any one of claims 1 to 5;

contacting the first antibody coated on the support with dengue virus particles to thereby allow said virus particles to bind to said first antibody;

contacting the virus particles with a biological sample from the subject to thereby allow any dengue virus-specific antibodies that may be present in said sample to bind to said virus particles; and

detecting whether said virus particles are bound by any said dengue virus-specific antibodies to thereby determine whether immunity to dengue virus exists in the subject.

23. The method according to claim 22, wherein the first antibody is only capable of binding to an E protein from one dengue virus serotype.

24. The method according to any one of claims 15 to 21, or claim 23, wherein the E protein is E domain III (EDIII) protein.