CLAIMS

1. A chimeric polyepitope having less than 600 amino acid residues comprising or consisting of the following fragments of (a), (b) and (c) assembled in a fusion polypeptide wherein the fragments of (a), (b) and (c) are directly or indirectly fused in this order:

(a) two fragments of the non-structural (NS) NS3 protein of the dengue virus (DENV) serotype 1 (DENV1) comprising or consisting of two regions, wherein the first region has an amino acid sequence as defined in SEQ ID NO: 6, and the second region has an amino acid sequence as defined in SEQ ID NO: 9,

(b) a fragment of the NS4b protein of DENV1 having an amino acid sequence as defined in SEQ ID NO: 12,

(c) a fragment of the NS5 protein of DENV1 having an amino acid sequence as defined in SEQ ID NO: 15,

or a polyepitope variant thereof, which (i) comprises or consists of the assembly in a fusion polypeptide, of DENV NS fragments, the sequences of which are obtained by alignment of the NS3 DENV1, NS4b DENV1, NS5 DENV1 fragments recited in (a), (b) and (c) with the respective NS3, NS4b and NS5 sequences of the NS proteins of a virus of the DENV2, DENV3 or DENV4 serotype or (ii) consists of a chimeric polyepitope having an amino acid sequence which has more than 75 % identity, in particular more than 80% identity with the sequence of the fusion polypeptide consisting of fused fragments (a), (b) and (c) from which it derives by mutation of amino acid residues, over its whole length.

2. The chimeric polyepitope according to claim 1, which has an amino acid sequence selected from the group consisting of SEQ ID NO: 3, SEQ ID NOs: 146, SEQ ID NO: 147 and SEQ ID NO: 148.

3. The chimeric polyepitope according to claim 1 or 2, which elicits a human leukocyte antigen (HLA)-restricted $CD8^+$ and/or $CD4^+$ T cell response against DENV1, DENV2, DENV3 and DENV4.

4. An isolated or purified polynucleotide encoding the chimeric polyepitope according to any one of claims 1 to 3.

5. The polynucleotide according to claim 4, which has a nucleotide sequence selected from the group consisting of SEQ ID NOs: 1 or SEQ ID NOs: 2.

6. A vector, which is a plasmid comprising the polynucleotide according to claim 4 or 5.

7. A recombinant measles virus (MV) genome vector, which is a plasmid comprising (i) a cDNA encoding the full-length RNA genome of a MV virus and (ii) the polynucleotide according to claim 4 or 5, said polynucleotide being located as an insert between the P and M genes of the MV genome or between the H and L genes of the MV genome, optionally in an Additional Transcription Unit (ATU), wherein the sequences of (i) and (ii) when recombined in the plasmid together comply with the rule of six.

8. A recombinant MV genome vector, which is a plasmid comprising (a) a cDNA encoding the full-length RNA genome of a MV virus and (b) a polynucleotide encoding DENV antigens composed of the fusion of the envelope domain III (EDIII) polypeptides of the four DENV serotypes, fused to the ectodomain of the membrane protein (ectoM) of DENV1, in particular DENV antigens having the sequence of SEQ ID No.: 145 and (c) the polynucleotide according to claim 4 or 5, wherein:

- the polynucleotide (b) is located as an insert between the P and M genes of the MV genome and the polynucleotide (c) is located as an insert between the H and L genes of the MV genome, or

- the polynucleotide (b) is located as an insert between the P and M genes of the MV genome and the polynucleotide (c) is located as an insert between the P and M genes of the MV genome, or

- the polynucleotide (b) is located as an insert between the H and L genes of the MV genome and the polynucleotide (c) is located as an insert between the P and M genes of the MV genome and

wherein the sequences of (a), (b) and (c) when recombined in the plasmid together comply with the rule of six.

9. The recombinant MV genome vector according to claim 7 or 8, which comprises the cDNA encoding the full-length RNA genome of a live-attenuated Schwarz or Moraten virus.

10. A host cell genetically transformed with the polynucleotide according to claim 4 or 5, the vector according to claim 6, or the recombinant MV genome vector according to any one of claims 7 to 9.

11. The cell according to claim 10, which is HEK-293-T7-MV cell line.

12. Recombinant measles virus (MV) particles, which are rescued from a helper cell line expressing the T7 RNA polymerase and the N, P and L proteins of MV, and which further expresses a nucleic acid encoding a vector according to claim 6 or a nucleic acid encoding a recombinant MV genome vector according to any one of claims 7 to 9.

13. An immunogenic composition comprising (a) DENV antigens composed of the fusion of the EDIII polypeptides of the four DENV serotypes, fused to ectoM of DENV1, in particular DENV antigens having the sequence of SEQ ID NO: 145 and (b) the chimeric polyepitope according to any one of claims 1 to 3, which optionally does not comprise an accessory adjuvant.

14. An immunogenic composition comprising recombinant MV particles according to claim 12, which optionally does not comprise an accessory adjuvant.

15. The immunogenic composition according to claim 13 or 14, wherein said composition is formulated for an administration through parenteral route such as subcutaneous (s.c.), intradermal (i.d.), intramuscular (i.m.), intraperitoneal (i.p.) or intravenous (i.v.) injection.

16. The immunogenic composition according to any one of claims 13 to 15, wherein said composition is administered in one or multiple administration dose(s), in particular in a prime-boost administration regime.

17. The use of the recombinant MV particles according to claim 12 or the immunogenic composition according to claim 13, in the manufacture of a medicament for the prevention and/or treatment of a dengue virus infection in a human subject.

18. A method to produce recombinant MV particles for the preparation of an anti-dengue virus vaccine, comprising or consisting of:

a) transfecting a recombinant MV genome vector according to any one of claims 7 to 9, in a helper cell line which expresses the T7 RNA polymerase and the N, P and L proteins of MV;

b) transferring said helper cell line onto cells competent to sustain the replication and production of recombinant MV particles expressing a chimeric polyepitope according to any one of claims 1 to 3 and optionally a polypeptide comprising a tetravalent DENV antigen composed of the fusion of the EDIII polypeptides of the four serotypes, fused to ectoM of DENV1, in particular DENV antigens having the sequence of SEQ ID NO: 145 and;

c) recovering the recombinant MV particles produced in step b).

19. The method according to claim 18, wherein said competent cells in step b) are Vero (African green monkey kidney) cells, CEF (chick embryo fibroblast) cells or MRC5 cells.