

Claims

1. An immunogenic composition comprising at least one infectious virus particle, wherein the infectious virus particle comprises a measles virus scaffold and a Zika virus
5 E-protein, wherein the infectious virus particle comprises as its genome at least two nucleic acid sequences, wherein the first nucleic acid sequence is a sequence that encodes an E-protein of a Zika virus, and wherein the first nucleic acid sequence is operably linked to a second nucleic acid sequence encoding the measles virus scaffold vector backbone, wherein the immunogenic composition optionally comprises at least
10 one pharmaceutically and/or veterinarily acceptable carrier and/or excipient, and

wherein the genome of the at least one infectious virus particle comprising the first and the second nucleic acid sequence is selected from SEQ ID NOs: 57 and 58.

2. The immunogenic composition according to claim 1,

(a) wherein the at least one first nucleic acid sequence does not comprise a
15 sequence encoding a stem-anchor region of an E-protein of a Zika virus and wherein the nucleic acid sequence does not comprise a sequence encoding non-structural proteins of a Zika virus; or

(b) wherein the at least one first nucleic acid sequence encodes at least one E-protein of a Zika virus having a mutation L107D in comparison to the sequence of SEQ ID
20 NOs:40 to 52 or 130 to 150.

3. The immunogenic composition according to any one of claims 1 or 2, wherein the vector backbone is from an attenuated virus measles virus strain of the Schwarz strain.

4. A nucleic acid molecule comprising a nucleic acid sequence, encoding at least one E-protein of a Zika virus, and a nucleic acid sequence encoding at least one E-protein
25 signal sequence for a Zika virus E-protein and comprising a nucleic acid sequence encoding at least one pre-membrane protein of a Zika virus and further comprising a nucleic acid sequence encoding at least one pre-membrane protein signal sequence for a Zika virus prM protein, wherein the nucleic acid molecule has a sequence selected from SEQ ID NOs: 57 or 58.

5. A recombinant chimeric virus encoded by a nucleic acid sequence selected from the group consisting of SEQ ID NOs 57 or 58.

6. A method for producing a recombinant chimeric virus according to claim 5, or for producing an immunogenic composition according to any one of claims 1 to 3, the method comprising the following steps:

(i) providing a nucleic acid molecule according to claim 4 to obtain a recombinant chimeric virus as defined in claim 5;

(ii) infecting at least one host cell with at least one recombinant chimeric virus obtained in step (i), or with a recombinant chimeric virus as defined in claim 5, to obtain a virus sample;

(iii) clarifying the virus sample of step (ii);

(iv) purifying the clarified virus sample of step (iii);

(v) optionally: formulating the at least one recombinant chimeric virus with at least one pharmaceutically and/or veterinarily acceptable carrier and/or excipient;

(vi) obtaining a recombinant chimeric virus, or an immunogenic composition.

7. The method of claim 6, comprising a purification step (iv), wherein the purification step comprises purification by means of chromatography.

8. The method of claims 6 or 7, wherein the at least one host cell is selected from the group consisting of Vero cells, chicken embryo fibroblast cells, HEK293 cells, HeLa cells, fetal rhesus lung cells or MRC5 cells.

9. The method of any one of claims 6 to 8, wherein the method comprises a further step, comprising

(vii) separating recombinant subviral particles from infectious particles.

10. An immunogenic composition, preferably a vaccine composition, comprising an immunogenic composition according to any one of claims 1 to 3 for use in a method of preventing or treating a Zika virus disease in a subject.

11. The immunogenic composition or the vaccine composition for use in a method of preventing or treating a Zika virus disease according to claim 10, wherein the composition is characterized by a content of contaminating host cell DNA of less than 100 pg/dosis, preferably of less than 75 pg/dosis, more preferably of less than 50 pg/dosis, even more preferably less than 25 pg/dosis and most preferably of less than 10 pg/dosis, wherein one dose represents one dose comprising the immunogenic or the vaccine composition to be administered to a subject in need thereof as a single dose.