

CLAIMS

What is claimed is:

1. Use of a virus protein in the construction of a recombinant oncolytic virus, the protein being selected from:

- 5 (a) SEQ ID NO: 1;
 (b) SEQ ID NO: 2; or
 (c) an amino acid sequence having at least 80% homology to (a) or (b).

2. The use according to claim 1, wherein the virus protein is derived from wild-type vesicular stomatitis viruses.

- 10 3. The use according to any one of claims 1 to 2, wherein the virus protein comprises an amino acid sequence having at least 90%, at least 95%, at least 98%, or at least 99% homology to (a) or (b).

4. The use according to any one of claims 1 to 3, wherein the recombinant oncolytic virus carries no heterologous gene.

- 15 5. The use according to any one of claims 1 to 4, wherein each gene coding sequence of a genome of the recombinant oncolytic virus is selected from wild-type vesicular stomatitis viruses.

6. The use according to any one of claims 1 to 5, wherein the virus protein has a ZDOCK score of a binding force to a cell receptor not lower than 1,800.

- 20 7. The use according to claim 6, wherein the cell receptor comprises at least one selected from CHRNA5, SSTR5, KISS1R, HTR1D, or CCR8.

8. The use according to any one of claims 1 to 7, wherein the recombinant oncolytic virus further expresses at least one of nuclear protein, phosphate protein, matrix protein, and RNA-dependent RNA polymerase.

- 25 9. The use according to any one of claims 1 to 8, wherein the genome of the recombinant oncolytic virus carries: a nucleic acid molecule encoding the nuclear protein, a nucleic acid molecule encoding the phosphate protein, a nucleic acid molecule encoding the matrix protein, and a nucleic acid molecule encoding the RNA-dependent RNA polymerase.

- 30 10. The use according to any one of claims 8 to 9, wherein at least one of the nucleic acid molecule encoding the nuclear protein, the nucleic acid molecule encoding the phosphate protein, the nucleic acid molecule encoding the matrix protein,

and the nucleic acid molecule encoding the RNA-dependent RNA polymerase that are carried by the genome of the recombinant oncolytic virus is derived from a Mudd summer subtype virus strain of the vesicular stomatitis virus.

11. A method for constructing a recombinant oncolytic virus, comprising:
5 allowing an initial vesicular stomatitis virus to express a G protein, the G protein comprising the following amino acid sequence:

(a) SEQ ID NO: 1;

(b) SEQ ID NO: 2; or

(c) an amino acid sequence having at least 80% homology to (a) or (b),

10 optionally, the G protein is derived from wild-type vesicular stomatitis viruses, and optionally, the amino acid sequence of the G protein has a capture sequence number of GENE ID: DQ408670.1 or GENE ID: X03633.1; and

optionally, the amino acid sequence of the G protein has at least 90%, at least 95%, at least 98%, or at least 99% homology to (a) or (b).

12. The method according to claim 11, wherein the initial vesicular stomatitis virus further expresses at least one selected from a nuclear protein, a phosphate protein, a matrix protein, and an RNA-dependent RNA polymerase.

13. The method according to 12, wherein the initial vesicular oncolytic virus carries: a nucleic acid molecule encoding the nuclear protein, a nucleic acid molecule
20 encoding the phosphate protein, and a nucleic acid molecule encoding the matrix protein; and

optionally, at least one of the nucleic acid molecule encoding the nuclear protein, the nucleic acid molecule encoding the phosphate protein, the nucleic acid molecule encoding the matrix protein, and a nucleic acid molecule encoding the
25 RNA-dependent RNA polymerase is derived from a Mudd summer subtype virus strain of the vesicular stomatitis virus.

14. A recombinant oncolytic virus, being constructed by the method according to any one of claims 11 to 13.

15. A method for improving a binding force of an oncolytic virus to a target cell,
30 the method comprising:

allowing the oncolytic virus to express a G protein having a strong binding force to the target cell, the G protein including the following amino acid sequence:

(a) SEQ ID NO: 1;

(b) SEQ ID NO: 2; or

(c) an amino acid sequence having at least 80% homology to (a) or (b),

optionally, the G protein is derived from wild-type vesicular stomatitis viruses, and optionally, the amino acid sequence of the G protein has a capture sequence

5 number of GENE ID: DQ408670.1 or GENE ID: X03633.1; and

optionally, the G protein comprises an amino acid sequence having at least 90%, at least 95%, at least 98%, or at least 99% homology to (a) or (b).

16. A recombinant oncolytic virus obtained by the method according to claim 15.

17. A recombinant oncolytic virus having a high affinity for a tumor cell,

10 wherein the recombinant oncolytic virus expresses a virus protein having a high affinity for a cell receptor, the virus protein being selected from:

(a) SEQ ID NO: 1;

(b) SEQ ID NO: 2; or

(c) an amino acid sequence having at least 80% homology to (a) or (b).

15 18. The recombinant oncolytic virus according to claim 17, wherein the virus protein is derived from wild-type vesicular stomatitis viruses.

19. The recombinant oncolytic virus according to claim 18, wherein the virus protein comprises an amino acid sequence having at least 90%, at least 95%, at least 98%, or at least 99% homology to (a) or (b).

20 20. The recombinant oncolytic virus according to any one of claims 17 to 19, wherein the recombinant oncolytic virus carries no heterologous gene.

21. The recombinant oncolytic virus according to any one of claims 17 to 20, wherein each gene coding sequence of a genome of the recombinant oncolytic virus is selected from wild-type vesicular stomatitis viruses.

25 22. The recombinant oncolytic virus according to any one of claims 17 to 21, wherein the virus protein has a ZDOCK score of a binding force to a cell receptor not lower than 1,800.

23. The recombinant oncolytic viruses according to any one of claims 17 to 22, wherein the cell receptor comprises at least one selected from CHRNA5, SSTR5, KISS1R, HTR1D, CCR8.

30 24. The recombinant oncolytic virus according to any one of claims 17 to 23, wherein the recombinant oncolytic virus further expresses at least one selected from a nuclear protein, a phosphate protein, a matrix protein, and an RNA-dependent RNA

polymerase.

25. The recombinant oncolytic virus according to any one of claims 17 to 23, wherein the genome of the recombinant oncolytic virus carries: a nucleic acid molecule encoding the nuclear protein, a nucleic acid molecule encoding the phosphate protein, a nucleic acid molecule encoding the matrix protein, and a nucleic acid molecule encoding the RNA-dependent RNA polymerase.

26. The recombinant oncolytic virus according to any one of claims 17 to 24, wherein at least one of the nucleic acid molecule encoding the nuclear protein, the nucleic acid molecule encoding the phosphate protein, the nucleic acid molecule encoding the matrix protein, and the nucleic acid molecule encoding the RNA-dependent RNA polymerase that are carried by the genome of the recombinant oncolytic virus is derived from a Mudd summer subtype virus strain of the vesicular stomatitis virus.

~~27. Use of the oncolytic virus according to any one of claims 14, and 16 to 26 in the prevention or treatment of a disease.~~

~~28. The use according to claim 27, wherein the disease is selected from a cancer or a tumor.~~

~~29. The use according to claim 27 or 28, wherein the disease is selected from at least one of lung cancer, gastric cancer, liver cancer, intestinal cancer, esophageal cancer, breast cancer, cervical cancer, malignant lymphoma, nasopharyngeal cancer, or leukemia.~~

~~30~~27. A pharmaceutical composition, comprising:

the recombinant oncolytic virus according to any one of claims 14, and 16 to 26.

~~31~~28. The pharmaceutical composition according to claim ~~30~~27, wherein the pharmaceutical composition is in a form suitable for inhalation or injection administration.

~~32~~29. The use of the pharmaceutical composition according to claim ~~30~~27 or ~~31~~28 in the preparation of a medicament for the treatment or prevention of a cancer or tumor.

~~33~~30. The use according to claim ~~32~~29, wherein the cancer comprises at least one of lung cancer, gastric cancer, liver cancer, intestinal cancer, esophageal cancer, breast cancer, cervical cancer, malignant lymphoma, nasopharyngeal cancer, or leukemia.

~~34. A method for preventing or treating a tumor, comprising:—~~

administering, to a subject, at least one of the oncolytic virus according to any one of claims 14, and 16 to 26 and the pharmaceutical composition according to any one of claims 30 to 31.

5 35. The method according to claim 34, wherein the tumor comprises at least one of lung cancer, gastric cancer, liver cancer, intestinal cancer, esophageal cancer, breast cancer, cervical cancer, malignant lymphoma, nasopharyngeal cancer, or leukemia.