Claims

1. A chimeric influenza virus hemagglutinin (HA) polypeptide, comprising one or more stem domain sequence, each having at least 60% homology with a stem domain consensus sequence of H1 subtype HA (H1 HA) and/or H5 subtype HA (H5 HA), fused with one or more globular head domain sequence, each having at least 60% homology with a globular head domain consensus sequence of H1 subtype HA (H1 HA) or H5 subtype HA (H5 HA).

2. The polypeptide of claim 1, wherein the HA is an influenza A HA, an influenza B HA, or an influenza C HA.

3. The polypeptide of claim 1, wherein the homology is at least 65%, 70%, 75%, 80%, 85%, 90%, 95%, 96%, 97%, 98%, 99% or 100%.

4. The polypeptide of claim 1, wherein the stem domain sequence is an N-terminal stem segment of H1 HA or a C-terminal stem segment of H1 HA; an N-terminal stem segment of H1 HA or a C-terminal stem segment of H1+H5 HA sequences; or an N-terminal stem segment of H5 HA or a C-terminal stem segment of H1+H5 HA sequences.

5. The polypeptide of claim 1, wherein the stem domain consensus sequence of H1 HA comprises an amino acid sequence of SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO: 5, SEQ ID NO: 6, SEQ ID NO: 9, or SEQ ID NO: 10.

6. The polypeptide of claim 1, wherein the globular head domain consensus sequence of H5 HA comprises an amino acid sequence of SEQ ID NO: 3, SEQ ID NO: 7, or SEQ ID NO: 11.

7. The polypeptide of claim 1, which comprises an amino acid sequence of SEQ ID NO: 4, SEQ ID NO: 8, or SEQ ID NO: 12.

8. The polypeptide of claim 1, wherein one or more glycosites on HA are monoglycosylated, wherein the monoglycosylated HA has only N-Acetylglucosamine (GlcNAc) on each glycosite.

9. The polypeptide of claim 1, wherein the chimeric influenza virus HA polypeptide is used as an immunogen.

10. An immunogenic composition comprising the chimeric influenza virus HA polypeptide of any of claims 1 to 9 and an adjuvant.

11. The immunogenic composition of claim 10, wherein the adjuvant is a glycolipid adjuvant.

12. Use of the chimeric influenza virus hemagglutinin (HA) polypeptide according to any of claims 1 to 9 or the immunogenic composition of claim 10 in the manufacture of a medicament for immunizing a subject against influenza virus or preventing an influenza virus disease.

13. The use according to claim 12, wherein the medicament is for eliciting $CD4^+$ and $CD8^+$ T-cell immune responses.

14. The use according to claim 12, wherein the medicament is for inducing stem-specific antibodies, with higher antibody-dependent cellular cytotoxicity (ADCC), better neutralizing and stronger cross-protection activities against H1, H3, H5 and H7 strains and subtypes.

15. The use according to claim 12, wherein the medicament is for enhancing the vaccine efficacy with more IFN-γ, IL-4 and $CD8^+$ memory T cells produced.

16. A recombinant polynucleotide comprising a nucleic acid sequence encoding the polypeptide of any of claims 1 to 9 and optionally a nucleic acid sequence encoding a signal peptide.

17. The recombinant polynucleotide of claim 16, wherein the signal peptide comprises a sequence of SEQ ID NO: 13 or SEQ ID NO: 14.

18. A vector comprising the recombinant polynucleotide of claim 17.

19. A host cell comprising the vector of claim 18.