CLAIMS:

1. A haemagglutinin protein of influenza virus subtype 5 (H5 protein) comprising an amino acid sequence of SEQ ID NO: 1, ~~of influenza virus,~~ wherein the H5 protein has ~~having~~ the amino acid 223N and the modification 328K+, ~~wherein numbering of the amino acid positions of the H5 protein refers to the amino acid position as exemplarily given in SEQ ID NO:1 and~~ wherein the modification 328K+ means that at amino acid position 328 of H5 protein a second Lysine (K+) is inserted.

2. The H5 protein according to claim 1, wherein such H5 protein ~~having~~ has the amino acid 94N.

3. The H5 protein according to claim 1 or 2, wherein such H5 protein ~~having~~ has the amino acid 120N.

4. The H5 protein according to any one of claims 1 to 3, wherein such H5 protein has ~~having~~ the amino acid 155N.

5. The H5 protein according to any one of claims 1 to 4, wherein such H5 protein has ~~having~~ one or more of the following amino acid clusters selected from the group consisting of:

   a. aa 93 - 95: GNF
   b. aa 123 – 125: SDH
   c. aa 128 – 130: SSG
   d. aa 138 - 140: GSS
   e. aa 226 - 228: MDF
   f. aa 270 – 272: EVE
   g. aa 309 – 311: NKL.

6. The H5 protein according to any one of claims 1 to 5, wherein such H5 protein comprises a peptide that comprises:

   i. the amino acid sequences of SEQ ID NO:4; SEQ ID NO:5 or SEQ ID NO:6; or

ii. any peptide that has at least 85% sequence homology to the polypeptide of i) and that comprises hemagglutinin inhibition in a standard hemagglutinin inhibition assay; or

iii. any part of the polypeptides of i) or ii) comprising at least 8 contiguous amino acids of any of such peptides of i) or ii) and wherein any of such peptide comprises hemagglutinin inhibition in a standard hemagglutinin inhibition assay; or

iv. any peptide of i), ii) or iii) having one of the amino acids 36T, 36K, 83A, 83T, 83D, 86A, 86V, 120S, 155S, 156A, 156T, 189R, 189K, 212K, 212R, 212E, 263A or 263T; or

v. any peptide of i), ii), iii) or iv) having one or more of the following amino acid clusters selected from the group consisting of:

a. aa 93 - 95: GNF
b. aa 123 – 125: SDH
c. aa 128 – 130: SSG
d. aa 138 - 140: GSS
e. aa 226 - 228: MDF
f. aa 270 – 272: EVE
g. aa 309 – 311: NKL.

7. The H5 protein according to any one of claims 1 to 6, wherein such H5 protein is originated from an avian influenza virus.

8. The H5 protein according to anyone of claims 1 to 7, wherein such H5 protein comprises the amino acid sequence of SEQ ID NO:4.

9. An nucleic acid molecule, wherein such nucleic acid molecule codes for the H5 protein according to any one of claims 1 to 8.

10. An vector comprising the nucleic acid molecule according to claim 9.

~~11. A vaccine comprises~~

~~a. the H5 protein according to any one of claims 1 to 8, the nucleic acid molecule according to claim 9, or the vector according to claim 10, and~~

~~b. a pharmaceutical acceptable carrier and/or excipient.~~

~~12. The vaccine according to claim 11, wherein the excipient is one or more adjuvants.~~

~~13. The vaccine according to claim 12, wherein the adjuvants is an Emulsigen-based adjuvants.~~

~~14. The vaccine according to any one of claims 11 to 13, wherein the vaccine comprises one or more antigens.~~

~~15. The vaccine according to claim 14, wherein the further antigen is an antigen of a poultry or mammalian pathogen.~~

~~16. The vaccine according to claim 15, wherein the further antigen is H3, H7, or H9 of influenza virus.~~

~~17.~~11. A method for producing the H5 protein of anyone of claims 1 to 8, wherein said method comprises the steps:

a. isolating or amplifying the nucleic acid that codes for such H5 protein;
b. cloning the H5 encoding nucleic acid in an expression vector;
c. expressing the H5 protein

~~18.~~12. The method according to claim ~~17~~11, wherein the expression vector is a recombinant baculovirus.

~~19.~~13. The method according to claim ~~17~~ 11 or ~~18~~12, wherein the H5 protein is expressed in insect cells.

~~20. A method for producing the vaccine comprising a H5 protein according to any one of claims 1 to 8, wherein said method comprises the steps:~~

~~a. obtaining a H5 protein according to any one of claims 1 to 9;~~

~~b. admixing the H5 protein of step a) with a pharmaceutical acceptable carrier and/or excipient.~~

~~21. A method for producing the vaccine comprising a H5 nucleic acid according to claim 9 or a vector according to claim 10, wherein said method comprises the steps:~~

~~a. obtaining the H5 nucleic acid molecule according to claim 9 or the vector according to claim 10;~~

~~b. admixing the H5 nucleic acid molecule or vector of step a) with a pharmaceutical acceptable carrier and/or excipient.~~

~~22.~~14. The ~~use of the~~ H5 protein according to any one of claims 1 to 8 for use as a medicine.

~~23.~~15. The ~~use of the~~ nucleic acid molecule according to claim 9 for use as a medicine.

~~24.~~16. The ~~use of the~~ vector according to claim 10 for use as a medicine.

~~25. The use of the vaccine according to any one of claims 11 to 16 as a medicine.~~

~~26.~~17. The use of the H5 protein according to any one of claims 1 to 8 for the preparation of a pharmaceutical composition for the prophylaxis or treatment of infections caused by viral influenza.

~~27.~~18. The use of the nucleic acid molecule according to claim 9 for the preparation of a pharmaceutical composition for the prophylaxis or treatment of infections caused by viral influenza.

~~28.~~19. The use of the vector according to claim 10 for the preparation of a pharmaceutical composition for the prophylaxis or treatment of infections caused by viral influenza.

~~29.~~20. The use according to any one of claims ~~26~~ 17 to ~~28~~19, wherein the viral influenza infection is caused by avian, swine or human influenza virus or any combination or hybrid thereof.

~~30. A method for the treatment or prophylaxis of influenza virus infections, wherein the method comprising administration of a therapeutically effective amount of the H5 protein according to claim 1 to 8 to a subject in need of such a treatment.~~

~~31. A method for the treatment or prophylaxis of influenza virus infections, wherein the method comprising administration of a therapeutically effective amount of the H5 nucleic acid according to claim 9 or the vector according to claim 10 to a subject in need of such a treatment.~~

~~32. A method for the treatment or prophylaxis of influenza virus infections, wherein the method comprising administration of a therapeutically effective amount of the vaccine according to any one of claims H5 protein according to claim 11 to 16 to a subject in need of such a treatment.~~

~~33. The method according to any one of claims 30 to 32, wherein the influenza infection is caused by avian, swine or human influenza virus or any combination or hybrid thereof.~~

~~34.~~21. A kit of parts, that comprises

a. the H5 protein according to any one of claims 1 to 8, the nucleic acid molecule according to claim 9, or the vector according to claim 10~~, or the vaccine according to any one of claims 11 to 16~~; and

b. a package leaflet indicating the use of such H5 protein, nucleic acid molecule, or vector ~~or vaccine~~ of a) for the treatment or prophylaxis of infections caused by influenza virus.

~~35.~~22. The kit according to claims ~~34~~21, wherein such kit comprises at least one further antigen of poultry or mammalian pathogen.