CLAIMS

1. An mRNA encoding a rabies virus antigen, wherein the rabies virus antigen is a G protein and comprises an amino acid sequence having at least 80%, at least 85%, at least 90%, at least 95%, at least 98%, or 100% identity to the amino acid sequence of SEQ ID NO. 4.

2. The mRNA according to claim 1, wherein the mRNA comprises a 5' UTR, a 3' UTR, and 3'-polyadenylic acid.

3. The mRNA according to claim 2, wherein the 3'-polyadenylic acid comprises the nucleotide sequence of SEQ ID NO. 7.

4. The mRNA according to any one of claims 2-3, wherein the 5' UTR comprises the nucleotide sequence of SEQ ID NO. 6.

5. The mRNA according to any one of claims 2-3, wherein the 3' UTR comprises the nucleotide sequence of SEQ ID NO. 8 or SEQ ID NO. 9.

6. The mRNA according to any one of claims 1-5, comprising a nucleotide sequence having at least 80%, at least 85%, at least 90%, at least 95%, at least 98%, or 100% identity to the nucleotide sequence of any one of SEQ ID NOs. 1-3.

7. The mRNA according to any one of claims 1-6, wherein the mRNA further comprises a 5' guanosine cap selected from: m7Gppp(2'OMeA)pG, m7GpppApA, m7GpppApC, m7GpppApG, m7GpppApU, m7GpppCpA, m7GpppCpC, m7GpppCpG, m7GpppCpU, m7GpppGpA, m7GpppGpC, m7GpppGpG, m7GpppGpU, m7GpppUpA, m7GpppUpC, m7GpppUpG, m7GpppUpU, m7Gpppm6ApG, m7G3'OmepppApA, m7G3'OmepppApC, m7G3'OmepppApU, m7G3'OmepppApG, m7G3'OmepppCpA, m7G3'OmepppCpC, m7G3'OmepppCpG, m7G3'OmepppCpU, m7G3'OmepppUpA, m7G3'OmepppUpC, m7G3'OmepppUpG, m7G3'OmepppUpU, m7G3'OmepppA2'OmepG, m7G3'OmepppA2'OmepC, m7G3'OmepppA2'OmepU, m7G3'OmepppA2'OmepA, m7G3'OmepppC2'OmepA, m7G3'OmepppC2'OmepU, m7G3'OmepppC2'OmepG, m7G3'OmepppC2'OmepC, m7G3'OmepppG2'OmepA, m7G3'OmepppG2'OmepU, m7G3'OmepppG2'OmepG, m7G3'OmepppG2'OmepC, m7G3'OmepppU2'OmepA, m7G3'OmepppU2'OmepU, m7G3'OmepppU2'OmepG, and m7G3'OmepppU2'OmepC.

8. The mRNA according to any one of claims 1-7, wherein the mRNA comprises a chemically modified base or analog thereof selected from 5-methoxymethyl uridine, 5-methylthio uridine,

1-methoxymethyl pseudouridine, 5-methyl cytidine, 5-methoxy cytidine, 1-methyl-pseudouridine (N1-methyl-pseudo-UTP), and pseudouridine.

9. A composition comprising a lipid nanoparticle and the mRNA according to any one of claims 1-8.

10. The composition according to claim 9, comprising an ionizable cationic lipid, a structural lipid, a helper lipid, and a surfactant.

11. The composition according to claim 10, wherein the lipid nanoparticle comprises, by molar percentage (mol%), 20-60 mol% ionizable cationic lipid, 25-55 mol% structural lipid, 5-25 mol% helper lipid, and 0.5-15 mol% surfactant.

12. The composition according to claim 10, wherein:

(a) the structural lipid is selected from cholesterol and cholesterol derivatives;

(b) the cationic lipid is selected from: SM-102, ALC-0315, ALC-0519, Dlin-MC3-DMA, DODMA, DLin-KC2-DMA, and DlinDMA;

(c) the helper lipid is selected from DSPC, DOPE, DOPC, DOPG, and DOPS; and

(d) the surfactant is selected from PEG2000-DMG, PEG-DSPE, DTDA-PEG2000, and TPGS.

13. The composition according to claim 10, wherein the lipid nanoparticle comprises, by molar percentage (mol%), 50 mol% SM-102, 10 mol% DSPC, 38.5 mol% cholesterol, and 1.5 mol% PEG2000-DMG.

14. Use of the mRNA according to any one of claims 1-8 or the composition according to any one of claims 9-13 in the preparation of a nucleic acid vaccine against rabies virus.

15. The use according to claim 14, wherein the vaccine is a combination vaccine and a multivalent vaccine.

16. The use according to any one of claims 14-15, wherein the vaccine is an anti-rabies virus mRNA vaccine.

17. The use according to claim 16, wherein the rabies virus is selected from a Pasteur strain (PAS), a Flury strain, a SAD strain, an aG strain, a CTN strain, SC16 (CSC1016D), GD1 (GDZAQ45), NM3 (CNM1103C), QH2 (CQH1202D), LY (CNX8601), YN3 (CYN1009D), XZ17 (CXZ1704H), and derivative strains thereof.

18. A pharmaceutical composition comprising an mRNA which comprises the sequence set forth in SEQ ID NO. 1, a lipid nanoparticle composition, 20 mmol/L tromethamine, 10.7

mmol/L sodium acetate, and 8.7% sucrose, with a pH of 7.0-8.0, wherein the lipid nanoparticle comprises 50 mol% SM-102, 10 mol% DSPC, 38.5 mol% cholesterol, and 1.5 mol% PEG2000-DMG, and wherein the nitrogen-to-phosphorus ratio (N:P) is 6.

19. A nucleic acid molecule comprising the sequence set forth in SEQ ID NO. 10.

20. A biomaterial comprising the nucleic acid molecule according to claim 19, wherein the biomaterial is an expression cassette, a recombinant vector, a recombinant plasmid, or a transgenic cell line comprising the nucleic acid molecule; wherein the recombinant vector is preferably a pVAX.1 vector or a pcDNA3.1 vector.