CLAIMS

WHAT IS CLAIMED IS:

1. A mesenchymal stem cell (MSC) that is genetically modified to overexpress an angiopoeitin-1 (ANGPT1) polypeptide and an IFN-induced transmembrane (IFITM) polypeptide.

2. The MSC of claim 1, wherein the MSC expresses a recombinant ANGPT1 polypeptide.

3. The MSC of claim 2, wherein the recombinant ANGPT1 polypeptide comprises an amino acid sequence that is at least 70% identical to the amino acid sequence of residues 16 to 498 of SEQ ID NO:9.

4. The MSC of claim 3, wherein the recombinant ANGPT1 polypeptide comprises an amino acid sequence that is at least 90% identical to the amino acid sequence of residues 16 to 498 of SEQ ID NO:9.

5. The MSC of claim 4, wherein the recombinant ANGPT1 polypeptide comprises the amino acid sequence of residues 16 to 498 of SEQ ID NO:9.

6. The MSC of any one of claims 1 to 5, wherein the MSC comprises a first exogenous nucleic acid comprising an ANGPT1 polypeptide-encoding region operably linked to a promoter or promoter/enhancer combination.

7. The MSC of claim 6, wherein the promoter is a cytomegalovirus (CMV) promoter.

8. The MSC of claim 6, wherein the promoter/enhancer combination is a CMV promoter/enhancer combination.

9. The MSC of any one of claims 6 to 8, wherein the ANGPT1 polypeptide-encoding region comprises a nucleotide sequence having at least 70% identity with the nucleotide sequence of SEQ ID NO: 7 or 8.

10. The MSC of claim 9, wherein the ANGPT1 polypeptide-encoding region comprises the nucleotide sequence of SEQ ID NO: 7 or 8.

11. The MSC of any one of claims 1 to 10, wherein the MSC expresses a recombinant IFITM polypeptide.

12. The MSC of claim 11, wherein the recombinant IFITM polypeptide is a recombinant IFITM1 or IFITM3 polypeptide.

13. The MSC of claim 12, wherein the recombinant IFITM polypeptide comprises an amino acid sequence that is at least 70% identical to the amino acid sequences of SEQ ID NO: 3 or 6.

14. The MSC of claim 13, wherein the recombinant IFITM polypeptide comprises an amino acid sequence that is at least 90% identical to the amino acid sequences of SEQ ID NO: 3 or 6.

15. The MSC of claim 14, wherein the recombinant IFITM polypeptide comprises the amino acid sequences of SEQ ID NO: 3 or 6.

16. The MSC of any one of claims 11 to 15, wherein the MSC comprises a second exogenous nucleic acid comprising an IFITM polypeptide-encoding region operably linked to a second promoter or promoter/enhancer combination.

17. The MSC of claim 16, wherein the second promoter is a CMV promoter.

18. The MSC of claim 16, wherein the second promoter/enhancer combination is a CMV promoter/enhancer combination.

19. The MSC of any one of claims 16 to 18, wherein the IFITM polypeptide-encoding region comprises a nucleotide sequence having at least 70% identity with the sequence of SEQ ID NO:1, 2, 4 or 5.

20. The MSC of claim 19, wherein the IFITM polypeptide-encoding region comprises a nucleotide sequence having at least 90% identity with the sequence of SEQ ID NO:1, 2, 4 or 5.

21. The MSC of claim 20, wherein the IFITM polypeptide-encoding region comprises a nucleotide sequence of SEQ ID NO:1, 2, 4 or 5.

22. The MSC of any one of claims 6 to 21, wherein the first and/or second exogenous nucleic acid(s) is/are comprised in a vector or plasmid.

23. The MSC of claim 22, wherein the first and second exogenous nucleic acids are comprised in the same vector or plasmid.

24. A pharmaceutical composition comprising the MSC of any one of claims 1 to 23 and a pharmaceutically acceptable excipient.

25. The MSC of any one of claims 1 to 23 or the pharmaceutical composition of claim 24, for use as a medicament.

26. The MSC or pharmaceutical composition for use of claim 25, wherein said medicament is for the prevention or treatment of a viral disease in a subject.

27. The MSC or pharmaceutical composition for use of claim 26, wherein the viral disease is COVID-19 or influenza.

28. The MSC or pharmaceutical composition for use of claim 26 or 27, wherein the subject is human.

29. The MSC or pharmaceutical composition for use of any one of claims 26-28, wherein the MSC are allogenic with respect to the subject.

30. The MSC or pharmaceutical composition for use of any one of claims 26-28, wherein the MSC are autologous with respect to the subject.

31. The MSC or pharmaceutical composition for use of any one of claims 26-30, wherein the MSC are for administration into the lungs.

~~32. A method for preventing or treating a viral disease in a subject, comprising administering to the subject an effective amount of the MSC of any one of claims 1 to 23 or pharmaceutical composition of claim 24.~~

~~33. The method of claim 32, wherein the viral disease is COVID-19 or influenza.~~

~~34. The method of claim 32 or 33, wherein the subject is human.~~

~~35. The method of any one of claims 32-34, wherein the MSC are allogenic with respect to the subject.~~

~~36. The method of any one of claims 32-34, wherein the MSC are autologous with respect to the subject.~~

~~37. The method of any one of claims 32-36, wherein the MSC are administered into the lungs of the subject.~~

~~38. Use of the MSC of any one of claims 1 to 23 or the pharmaceutical composition of claim 24 for the manufacture of a medicament for the prevention or treatment of a viral disease in a subject.~~

~~39. Use of the MSC of any one of claims 1 to 23 or the pharmaceutical composition of claim 24 for the prevention or treatment of a viral disease in a subject.~~

~~40. The use of claim 38 or 39, wherein the viral disease is COVID-19 or influenza.~~

~~41. The use of any one of claims 38-40, wherein the subject is human.~~

~~42. The use of any one of claims 38-41, wherein the MSC are allogenic with respect to the subject.~~

~~43. The use of any one of claims 38-41, wherein the MSC are autologous with respect to the subject.~~

~~44. The use of any one of claims 38-43, wherein the MSC are for administration into the lungs.~~