CLAIMS:

1. A method of treating or preventing hyperinflammation in a human subject in need thereof, the method comprising administering to the subject a composition comprising mesenchymal lineage precursor or stem cells (MLPSCs).

2. The method of claim 1, wherein the hyperinflammation is caused by a viral infection.

3. The method of claim 2 wherein the viral infection is caused by a rhinovirus, an influenza virus, a respiratory syncytial virus (RSV) or a coronavirus.

4. The method of claim 3 wherein the viral infection is caused by a coronavirus.

5. The method of claim 4 wherein the coronavirus is Severe Acute Respiratory Syndrome coronavirus (SARS-CoV), Middle East Respiratory Syndrome coronavirus (MERS-CoV) or COVID-19.

6. The method according to any one of claims 1 to 5, wherein the subject also has Acute Respiratory Distress Syndrome (ARDS).

7. The method of any one of claims 1 to 5, wherein the MLPSCs have been cryopreserved and thawed.

8. The method of any one of claims 1 to 7, wherein the MLPSCs are culture expanded from an intermediate cryopreserved MLPSCs population.

9. The method according to any one of claims 1 to 8, wherein the MLPSCs are culture expanded for at least about 5 passages.

10. The method of any one of claims 1 to 9, wherein the MLPSCs express at least 13 pg TNFR1 per million MLPSCs.

11. The method of any one of claims 1 to 10, wherein the MLPSCs express about 13 pg to about 44 pg TNFR1 per million MLPSCs.

12. The method of any one of claims 9 to 11, wherein said culture expansion comprises at least 20 or 30 population doublings.

13. The method of any one of claims 1 to 12, wherein the subject has MIS.

14. The method according to any one of claims 1 to 13, wherein the subject has viral myocarditis.

15. The method according to any one of claims 1 to 14, wherein the MLPSCs are mesenchymal stem cells (MSCs).

16. The method according to any one of claims 1 to 15, wherein the MLPSCs are allogeneic.

17. The method according to any one of claims 1 to 16, wherein the MLPSCs are modified to carry or express an anti-viral drug or thrombolytic agent.

18. The method according to any one of claims 1 to 17 which comprises administering between 1 x 10^7 and 2 x 10^8 cells per dose.

19. The method according to any one of claims 1 to 18 which comprises administering about 1 x 10^8 cells per dose.

20. The method according to claim 19, wherein the subject receives two doses.

21. The method according to any one of claims 1 to 20, wherein the subjects circulating CRP levels decrease after treatment.

22. The method according to any one of claims 1 to 21, wherein subjects white blood cell count decreases after treatment.

23. The method according to any one of claims 1 to 22, wherein the subjects FiO2 levels decrease after treatment and/or the subjects P/F ratio increases after treatment.

24. The method according to any one of claims 1 to 24, wherein the subjects D-dimer level is reduced after treatment.

25. The method of claim 24, wherein the subjects D-dimer level is reduced to below 5 µg/ml.

26. The method according to any one of claims 1 to 25, wherein the subjects BNP level is reduced after treatment.

27. The method according to any one of claims 1 to 26, wherein the subjects LVEF% is increased after treatment.

28. The method according to any one of claims 1 to 27, wherein the composition further comprises Plasma-Lyte A, dimethyl sulfoxide (DMSO), human serum albumin (HSA).

29. The method according to any one of claims 1 to 28, wherein the composition further comprises Plasma-Lyte A (70%), DMSO (10%), HSA (25%) solution, the HSA solution comprising 5% HSA and 15% buffer.

30. The method according to any one of claims 1 to 29, wherein the composition comprises greater than $6.68x10^6$ viable cells/mL.

31. A method of treating or preventing multi-system inflammatory syndrome (MIS) in a human subject in need thereof, the method comprising administering to the subject a composition comprising mesenchymal lineage precursor or stem cells (MLPSCs).

32. The method of claim 31, wherein the subject is a child.

33. A method of treating or preventing a disease associated with elevated D-dimer levels in a human subject in need thereof, the method comprising administering to the subject a composition comprising mesenchymal lineage precursor or stem cells (MLPSCs).

34. The method of claim 33, wherein the disease is thrombosis or pulmonary embolism.

35. The method of claim 33 or 34, wherein treatment reduces the subjects D-dimer level below 15 µg/ml.

36. The method of claim 33 or 34, wherein treatment reduces the subjects D-dimer level below 5 µg/ml.

37. The method of claim 34, wherein the thrombosis is arterial thrombosis.

CLAIMS

1. Use of a composition comprising a population of culture expanded, cryopreserved and thawed mesenchymal lineage precursor or stem cells (MLPSCs) in the manufacture of a medicament for treating or preventing hyperinflammation in a human subject in need thereof.

2. Use according to Claim 1, in which the hyperinflammation is caused by a viral infection.

3. Use according to Claim 2 in which the viral infection is caused by COVID-19.

4. Use of a composition comprising mesenchymal lineage precursor or stem cells (MLPSCs) in the manufacture of a medicament for treating or preventing a disease associated with elevated D-dimer levels in a human subject in need thereof.

5. Use according to Claim 4, in which the disease is thrombosis or pulmonary embolism.

6. Use according to Claim 5, in which the thrombosis is arterial thrombosis.

7. Use according to any preceding claim, in which the subject also has Acute Respiratory Distress Syndrome (ARDS).

8. Use according to any preceding claim, in which the MLPSCs are culture expanded from an intermediate cryopreserved MLPSCs population.

9. Use according to any preceding claim, in which the MLPSCs are culture expanded for at least about 5 passages.

10. Use according to any preceding claim, in which the subject has MIS.

11. Use according to any preceding claim, in which the subject has viral myocarditis.

12. Use according to any preceding claim, in which the MLPSCs are mesenchymal stem cells (MSCs).

13. Use according to any preceding claim, in which the MLPSCs are modified to carry or express an anti-viral drug or thrombolytic agent.

14. Use according to any preceding claim, in which the medicament comprises a dose of between 1×10^7 and 2×10^8 cells.

15. Use according to any of Claims 1 to 13, in which the medicament comprises a dose of about 1 x 10^8 cells.

16. Use according to Claim 14 or 15, in which the medicament comprises two doses.

17. Use according to any preceding claim, in which the subject's circulating CRP levels decrease after administration of the medicament.

18. Use according to any preceding claim, in which the subject's white blood cell count decreases after administration of the medicament.

19. Use according to any preceding claim, in which the subject's FiO2 levels decrease after administration of the medicament and/or the subject's P/F ratio increases after administration of the medicament.

20. Use according to any preceding claim, in which, after administration of the medicament, the subject's:

D-dimer level is reduced;

BNP level is reduced; and/or

LVEF% is increased.

21. Use according to Claim 20, in which the subject's D-dimer level is reduced to below 15 μg/ml after administration of the medicament.

22. Use according to any preceding claim, in which the composition further comprises Plasma-Lyte A (70%), DMSO (10%), HSA (25%) solution, the HSA solution comprising 5% HSA and 15% buffer.

23. Use according to any preceding claim, in which the composition comprises greater than 6.68x10^6 viable cells/mL.

24. Use according to Claim 10, in which the subject is a child.

25. Use according to Claim 20, in which treatment reduces the subject's D-dimer level below 5 μg/ml.