Claims

1. An isolated human breast milk exosome, wherein Hypoxia up-regulated protein 1 (HYOU1), Apolipoprotein A-IV (APOA4) and Procollagen-lysine,2-oxoglutarate 5-dioxygenase 1 (PLOD1) are not detected by liquid chromatography – mass spectrometry in the exosome.

2. The exosome of claim 1, wherein C4a anaphylatoxin (CFA), Hypoxia up-regulated protein 1 (HYOU1), Apolipoprotein A-IV (APOA4), Procollagen-lysine,2-oxoglutarate 5-dioxygenase 1 (PLOD1), Threonine—tRNA ligase 1, cytoplasmic (TARS1), and Cytosolic non-specific dipeptidase (CNDP2) are not detected by liquid chromatography – mass spectrometry in the exosome.

3. The exosome of claim 1 or claim 2, wherein the exosome comprises lactotransferrin (LTF), annexin A2 (ANXA2) and lactadherin (MFGE8), MUC1 and tetraspanins CD9, CD81 and CD63.

4. The exosome of any one of claims 1 to 3, wherein the exosome comprises one or more miRNAs selected from miR-148a-3p, miR-22-3p, miR-125b-5b and miR-6126.

5. The exosome of any preceding claim, wherein the exosome comprises one or more lipids selected from cholesterol esters, ceramides, triacylglycerides, diacylglycerides, lyso-phospholipids, total phospholipids, alkanyl phospholipids, and alkenyl phospholipids.

6. The exosome of any preceding claim, wherein the exosome comprises one or more phospholipids selected from sphingomyelins, phosphatidylcholine, phosphatidylethanolamine, phosphatidylinositol, and phosphatidylserine.

7. The exosome of any preceding claim, wherein the exosome has a diameter of 50 to 100nm.

8. The exosome of claim 7, wherein the exosome has a diameter size of 65 to 75nm.

9. The exosome of any preceding claim, wherein the exosome has the same function as exosomes derived from natural human breast milk.

10. The exosome of any preceding claim, wherein the exosome has the same structure as exosomes derived from natural human breast milk.

11. A population of exosomes, wherein the population comprises exosomes of any preceding claim.

12. A composition comprising exosomes or a population of exosomes according to any preceding claim.

13. An *in vitro* method for producing an exosome according to any one of claims 1 to 10 or population or exosomes according to claim 11, the method comprising:

A) Culturing mammary epithelial cells in a culture medium to generate lactocyte mammary-like gland organoids; and

B) Secreting a mammalian milk like product from said lactocytes, and

C) Purifying the exosomes from the mammalian milk like product to remove impurities, optionally by chromatography or filtration or ultracentrifugation, in order to isolate the exosomes.

14. The method of claim 13, wherein the time duration of step A) is no longer than 14 days, optionally is 14 days.

15. The method of claim 13 or 14, wherein Step A) is conducted in 3D suspension culture conditions.

16. The method of claims 13 to 15, wherein step C) further comprises formulating the isolated exosomes into a powder form, optionally by spray drying or freeze drying, or liquid form.

17. The method of claims 13 to 16, wherein step C) further comprises sterilising the isolated exosomes.

18. The method of claims 13 to 17, wherein step C) further comprises storing the isolated exosomes at below freezing, optionally at -80°C.

19. The method of claims 13 to 18, further comprising formulating the isolated exosomes with supplementary nutritional ingredients.

20. The method of claims 13 to 19, wherein the isolated exosomes are dispensed into a container for consumption.

21. A human breast milk exosome product which is obtainable according to the method of any one of claims 13 to 20.

22. A method of producing a human milk fortifier, comprising conducting the method of any one of claims 13 to 20

23. The exosome according to any one of claims 1 to 10, the population of exosomes according to claim 11, the composition according to claim 12, or the exosome product according to claim 21, for use in therapy.

24. The exosome according to any one of claims 1 to 10, the population of exosomes according to claim 11, the composition according to claim 12, or the exosome product according to claim 21, for use in preventing, treating, or ameliorating symptoms associated with inflammation.

25. The exosome according to any one of claims 1 to 10, the population of exosomes according to claim 11, the composition according to claim 12, or the exosome product according to claim 21, for use according to claim 23, wherein inflammation is intestinal inflammation.

26. The exosome according to any one of claims 1 to 10, the population of exosomes according to claim 11, the composition according to claim 12, or the exosome product according to claim 21, for use according to claim 23, wherein inflammation is bronchial inflammation.

27. The exosome according to any one of claims 1 to 10, the population of exosomes according to claim 11, the composition according to claim 12, or the exosome product

according to claim 21, for use according to claim 23, wherein inflammation is respiratory inflammation.