Claims

1. An aerosolizable composition comprising exosomes from mesenchymal stem cells (MSCs) having a surface coating of the hydrophilic polymer polyethylene glycol (PEG), the vesicles carrying a luminal cargo comprising a microRNA (miR), an anti-miR, mRNA, a long non-coding RNA, a circular RNA, a small interfering RNA, a short hairpin RNA, a piwi-interacting RNA, a CRISPR RNA sequence or artificially designed nucleic acid sequences, protein, cytokine or lipid, wherein the PEG has a molecular weight of less than 5kDa, the surface coating is a dense coating that covers at least 65% of the exosome surface and neutralises the surface charge of the exosomes to 0mV to -8mV.

2. A composition according to claim 1, wherein the hydrophilic polymer comprises DSPE-PEG.

3. A composition according to any preceding claim, wherein the surface coating polymer has a molecular weight of <3kDa.

4. A composition according to any preceding claim, wherein the exosomes have a cargo comprising a microRNA (miR).

5. A composition according to claim 4, wherein the miR, is selected from miR-125b-5p, miR-125b-1-3p, miR-513a-5p and miR-17.

6. A composition according to any preceding claim wherein the exosomes have a cargo comprising an mRNA or its translated protein.

7. A composition according to claim 6, wherein the mRNA is a modified CFTR mRNA.

8. A composition according to any preceding claim, comprising an aqueous suspension or colloid of the exosomes.

9. A composition according to any preceding claim, for use in therapy.

10. A composition for use according to claim 9, for use in therapy of lung disease.

11. A composition for use according to claim 9 or 10, for use in cancer therapy.

12. An exosome colloid or suspension for use in therapy, wherein the exosomes have a therapeutic luminal cargo comprising a microRNA (miR), an anti-miR, mRNA, a long non-coding RNA, a circular RNA, a small interfering RNA, a short hairpin RNA, a piwi-interacting RNA, a CRISPR RNA sequence or artificially designed nucleic acid sequences, protein, cytokine or lipid, and a surface coating of the hydrophilic polymer polyethylene glycol (PEG), wherein the PEG has a molecular weight of less than 5kDa, and the surface coating is a dense coating that covers at least 65% of the exosome surface and neutralises the surface charge of the exosomes to 0mV to -8mV.

13. An exosome colloid or suspension for use according to claim 12, wherein the therapy is for treatment of cystic fibrosis, COPD, lung cancer or another lung condition.

14. An exosome colloid or suspension for use according to claim 12 or claim 13, wherein the exosomes comprise a therapeutic cargo which comprises at least one exogenous mRNA (e.g. in vitro transcribed mRNA), protein, miR or antimiR.

15. An exosome colloid or suspension for use according to any one of claims 12 – 14, wherein the exosomes are derived from mesenchymal stem cells genetically modified to overexpress specific miRs, antimiRs, mRNAs or other nucleic acid and mature protein therapeutic cargoes.

16. An exosome colloid or suspension for use according to any one of claims 12 - 15, wherein the treatment includes aerosolization of the colloid or suspension.

17. Use of
a composition according to any of claims 1 to 8 in the manufacture of a medicament for the treatment of lung disease, wherein the medicament is to be administered by forming an aerosol of vesicles of the composition.

18. The use according to claim 17, wherein the medicament is to be administered by forming the aerosol using a nebuliser.

19. The use according to claim 18, wherein the medicament is to be administered by forming the aerosol using a vibrating mesh nebuliser.