[015] Disclosed is a method of treating a disease or condition in a subject in need thereof, the method comprising:

(a) providing an enriched population of chorionic placenta-derived mesenchymal stem cells (CH-MSCs); and

(b) administering to the subject a pharmaceutical composition comprising a therapeutically effecting amount of at least one of:

i. the CH-MSC population;
ii. extracellular vesicles derived from the CH-MSC population;
iii. conditioned media from the CH-MSC population; and
iv. extracellular matrix secreted by the CH-MSC population;

thereby treating the disease or condition.

[015a] According to one example, there is provided use of a pharmaceutical composition comprising a therapeutically effecting amount of at least one of:

i. an enriched population of chorionic placenta-derived mesenchymal stem cells (CH-MSCs);
ii. extracellular vesicles derived from said CH-MSC population;
iii. conditioned media from said CH-MSC population; and
iv. extracellular matrix secreted by said CH-MSC population;

in the manufacture of a medicament for treating a disease or condition in a subject in need thereof.

[016] According to another example, there is provided a method of selecting a mesenchymal stem cell (MSC) subpopulation, the method comprising:

(a) providing MSCs; and

(b) selecting at least one MSC expressing of at least one surface marker on the at least one MSC's surface, wherein expression of at least one of CD184, CD193, CD235a, CD318, CD255, CD268, fMLP, ITGA2, ITGA4, and CD326 indicates an MSC is an umbilical cord-derived MSC, expression of at least one of TCR alpha-beta, CD55, LIFR, ST6GALNACS, and MIC A/B indicates an MSC is a chorionic placenta-derived MSC, expression of at least one of CD24, CD48, CD66b, CD338, CD120b, CD268, FGFLR1, ITGA5, NES, and PDGFRAA indicates an MSC is a bone marrow-derived MSC, expression of at least one of CD84, PDGFRBB, and TNFRSF11B indicates an MSC is an adipose-derived MSC, and expression of CD157 indicates an MSC is an amniotic placenta-derived MSC;

thereby selecting an MSC subpopulation.

[017] In one aspect, the present disclosure refers to use of a pharmaceutical composition in the manufacture of a medicament for treating a disease or condition, the pharmaceutical composition comprising a pharmaceutically acceptable adjuvant, excipient or carrier and at least one of:

(a) an isolated and enriched population of chorionic placenta-derived mesenchymal stem cells (CH-MSCs) with confirmed expression of a surface marker selected from: TCR alpha-beta, CD55, LIFR, and ST6GALNACS; and

(b) extracellular vesicles derived from the CH-MSC population.

[018] According to another example, there is provided a method of maintaining stem cells and primary cells in culture, the method comprising,

(a) providing stem cells, primary cells or both;

(b) growing the stem cells, primary cells or both in culture medium comprising extracellular vesicles derived from MSCs,

thereby maintaining stem cells, primary cells or both in culture.

[019] According to some examples, the disease or condition is selected from a neurological disease, a muscular disease, an autoimmune disease, an inflammatory disease, a digestive disease, an energy homeostasis disease, a fibrotic disease, aging, radiation induced injury, cell transplant rejection and a proliferative disease.

[020] According to some examples, the neurological disease is selected from brain cancer, cancer metastasis to the brain, multiple sclerosis (MS), amyotrophic lateral sclerosis (ALS), Alzheimer's disease, Parkinson's disease, neurological injury, radiation induced injury to the brain, hypoxic injury to the brain and Rett syndrome.

[021] According to some examples, the brain cancer is any one of an astrocytic tumor, a glioma, a medulloblastoma, a neuroblastoma and a meningioma. According to some examples the glioma is glioblastoma.

[022] According to some examples, the muscular disease is selected from MS, a muscular dystrophy, muscle injury, muscle inflammation, cachexia and sarcopenia. According to some examples, the muscular dystrophy is Duchenne's muscular dystrophy (DMD), or Baker muscular dystrophy. According to some examples, the disease is a muscle disease and wherein the extracellular vesicles, conditioned media, extracellular matrix or a combination thereof comprise at least one of miR-29a, miR-29b, miR-29c and miR-656.

[023] According to some examples, the autoimmune disease is selected from MS, diabetes, colitis, and Chron's disease.

[024] According to some examples, the energy homeostasis disease is diabetes.

[025] According to some examples, the digestive disease is selected from irritable bowel syndrome (IBD), Chron's disease, and colitis.

[026] According to some examples, aging comprises at least one of skin aging, muscle aging, and brain aging.

[027] According to some examples, the proliferative disease is cancer. According to some examples, the cancer is any one of brain cancer, metastasis to the brain, lung cancer, breast cancer, colon cancer, pancreatic cancer, prostate cancer, and head and neck cancer. According to some examples, the brain cancer is selected from glioma, medulloblastoma, neuroblastoma and meningioma. According to some examples, the glioma is glioblastoma. According to some examples, the MSC population, extracellular vesicles, conditioned media, extracellular matrix or a combination thereof comprise at least one of miR-145 and miR-656. According to some examples, the methods of the disclosure further comprise irradiating the subject.

[028] According to some examples, the enriched population of CH-MSCs is substantially devoid of amniotic placenta-derived MSCs (AM-MSCs).

[029] According to some examples, the providing comprises, selecting CH-MSCs from a mix of cells or placental tissue. According to some examples, the selecting comprises selecting at least one cell expressing at least one surface marker selected from TCR alpha-beta, CD55, LIFR, ST6GALNACS, and MIC A/B.

[030] According to some examples, the administering comprises at least one of intravenous administration, intramuscular administration, intranasal administration, intrathecal administration, intrastriatal administration, intracranial administration, intraarterial administration, and subcutaneous administration.

[031] According to some examples, the CH-MSC population is allogenic to the subject. According to some examples, the CH-MSC population is autologous to the subject.

[032] According to some examples, the methods of the disclosure further comprise confirming expression of the at least one surface marker on the surface of the selected CH-MSC.

[033] According to some examples, the methods of the disclosure further comprise culturing the MSC in MSC growth media.

[034] According to some examples, the providing comprises providing tissue or a cell mixture and isolating MSCs from the tissue or cell mixture.

[035] According to some examples, the isolating MSCs comprises isolation of cells expressing a plurality of surface marker selected from CD9, CD10, CD13, CD26, CD29, CD44, CD36, CD46, CD47, CD49a, CD49b, CD49c, CD49d, CD49e, CD50, CD51/61, CD54, CD55, CD58, CD59, CD61, CD63, CD71, CD73, CD81, CD83, CD87, CD90, CD91, CD95, CD97, CD98, CD99, CD105, CD108, CD109, CD140b, CD142, CD146, CD147, CD151, CD164, CD165, CD166, CD273, β2-microglobulin, HLA-A,B,C, HLA-A2, and STRO1.

[036] According to some examples, the tissue is selected from placenta, umbilical cord, adipose tissue and bone marrow.

[037] According to some examples, the methods of the disclosure further comprise confirming expression of the at least one surface marker on the surface of the selected MSC.

[038] According to some examples, the culture medium comprises conditioned media from the MSC. According to some examples, the culture medium comprises extracellular matrix from the MSC.

[039] According to some examples, the growing comprises coculture of the stem cells, primary cells or both with the MSC.

[040] According to some examples, the methods of the disclosure further comprise growing the stem cells, primary cells or both in primary cell growth media.

[041] According to some examples, the maintaining comprises extending survival of the stem cells, primary cells or both beyond survival of the cells in culture medium substantially devoid of extracellular vesicles from the MSC. According to some examples, the maintaining comprises culturing the stem cells, primary cells or both in vitro for at least 10 passages. According to some examples, the maintaining comprises the stem cells, primary cells or both retaining the ability to undergo both symmetric and asymmetric divisions.

[042] According to some examples, the MSCs are umbilical cord-derived MSCs (UC-MSCs), CH-MSCs or a combination thereof. According to some examples, the MSCs are CH-MSCs.

[043] According to some examples, the stem cell are cancer stem cells and the MSCs are bone marrow-derived MSCs, (BM-MSCs), adipose-derived MSCs (AD-MSCs), AM-MSCs, or a combination thereof.

[044] According to another example, there is provided a pharmaceutical composition comprising at least one of: a mesenchymal stem cell (MSC) population, extracellular vesicles secreted from the MSC population, conditioned media from the MSC population and a combination thereof; the MSC population is characterized by an expression profile selected from any one of Tables 1-5.

[045] According to some examples, the pharmaceutical compositions of the disclosure further comprise a pharmaceutically acceptable carrier.

[046] Further examples and the full scope of applicability of the present disclosure will become apparent from the detailed description given hereinafter. However, it should be understood that the detailed description and specific examples, while indicating preferred examples of the disclosure, are given by way of illustration only, since various changes and modifications within the spirit and scope of the disclosure will become apparent to those skilled in the art from this detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

[047] **Figures 1A-C. Different MSC populations and their exosomes have opposite effects on glioma stem cells. (1A)** A bar chart of self-renewal of glioblastoma cells after incubation with MSC subtypes. Self-renewal is represented as a percentage of the self-renewal when cells were incubated with control. **(1B)** A bar chart of self-renewal of glioblastoma cells after incubation with exosomes from various MSC subtypes. Self-renewal is represented as a percentage of the self-renewal when cells were incubated with control. **(1C)** A bar chart of **r**elative mRNA expression levels of five mesenchymal and stemness markers in five MSC subtypes. Control expression was standardized to 1. The populations for each gene are presented in the following order: Control, UC, CH, AM, BM, AD.

[048] **Figures 2A-H. MSC Population and their exosomes inhibit glioblastoma and prolong survival.** (**2A**) A bar chart, showing survival, as measured in days, of mice receiving four different MSC subtypes or control cells. **(2B)** A bar chart, showing survival, as measured in days, of mice

CLAIMS

1. Use of a pharmaceutical composition in the manufacture of a medicament for treating a disease or condition, the pharmaceutical composition comprising a pharmaceutically acceptable adjuvant, excipient or carrier and at least one of:

   (a) an isolated and enriched population of chorionic placenta-derived mesenchymal stem cells (CH-MSCs) with confirmed expression of a surface marker selected from: TCR alpha-beta, CD55, LIFR, and ST6GALNACS; and

   (b) extracellular vesicles derived from said CH-MSC population.

2. The use of claim 1, wherein said disease or condition is selected from a neurological disease, a muscular disease, an autoimmune disease, an inflammatory disease, a digestive disease, an energy homeostasis disease, aging, radiation induced injury, cell transplant rejection and a proliferative disease.

3. The use of claim 2, wherein said neurological disease is selected from brain cancer, cancer metastasis to the brain, multiple sclerosis (MS), amyotrophic lateral sclerosis (ALS), Alzheimer's disease, Parkinson's disease, neurological injury, radiation induced injury to the brain and Rett syndrome.

4. The use of claim 3, wherein said brain cancer is any one of a glioma, an astrocytic tumor, a medulloblastoma, neuroblastoma, and a meningioma.

5. The use of claim 4, wherein said glioma is glioblastoma.

6. The use of claim 2, wherein said muscular disease is selected from MS, a muscular dystrophy, muscle injury, muscle inflammation, cachexia and sarcopenia.

7. The use of claim 6, wherein said muscular dystrophy is Duchenne's muscular dystrophy (DMD).

8. The use of any one of claims 2, 6 or 7, wherein said disease is a muscle disease and wherein said extracellular vesicles, conditioned media or both comprise at least one of miR-29a, miR-29b, miR-29c and miR-656.

9. The use of claim 2, wherein said autoimmune disease is selected from MS, diabetes and Crohn's disease.

10. The use of claim 2, wherein said energy homeostasis disease is diabetes.

11. The use of claim 2, wherein said digestive disease is selected from irritable bowel syndrome (IBD), Crohn's disease, and colitis.

12. The use of claim 2, wherein aging comprises skin aging.

13. The use of claim 2, wherein said proliferative disease is cancer.

14. The use of claim 13, wherein said cancer is any one of brain cancer, metastasis to the brain, lung cancer, breast cancer, colon cancer, pancreatic cancer, prostate cancer, and head and neck cancer.

15. The use of claim 14, wherein said brain cancer is selected from glioma, astrocytic tumors, medulloblastoma, neuroblastoma or meningioma.

16. The use of claim 15, wherein said glioma is glioblastoma.

17. The use of any one of claims 13 to 16, wherein the disease or condition is in a subject that is to be irradiated.

18. The use of any one of claims 13 to 16, wherein said MSC population, extracellular vesicles, conditioned media or a combination thereof comprise at least one of miR-145 and miR-656.

19. The use of any one of claims 1 to 18, wherein said substantially pure population of CH-MSCs is substantially devoid of amniotic placenta-derived MSCs (AM-MSCs).

20. The use of any one of claims 1 to 19, wherein the pharmaceutical composition is formulated to be administered via at least one of intravenous administration, intramuscular administration, intranasal administration, intrathecal administration, intrastriatal administration, intracranial administration, intraarterial administration, and subcutaneous administration.

21. The use of any one of claims 1 to 20, wherein said disease or condition is in a subject and said CH-MSC population is allogenic to said subject.

22. The use of any one of claims 1 to 20, wherein said disease or condition is in a subject and said CH-MSC population is autologous to said subject.