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SUMMARY

[0008]

An object of the present disclosure is to provide a cell product for treatment of spinal cord injury.

[0009]

The present inventors have found that human Muse cells that are administered to a rat model of spinal cord injury via a blood vessel or the like, or directly to a target site of spinal cord injury and its surroundings, migrate, accumulate, and engraft to a spinal cord injury site, and reconstruct spinal cord tissues, thereby improving or restoring motor functions, and thus that the Muse cells can be used in treatment of spinal cord injury, thereby completed the present disclosure.

[0010]

Accordingly, the present disclosure provides the following items [1] to [7].

[1] A cell product for treatment of spinal cord injury, comprising a SSEA-3-positive pluripotent stem cell derived from a mesenchymal tissue in a living body or a cultured mesenchymal cell.

[1a] Use of a SSEA-3 (Stage-Specific Embryonic Antigen-3)-positive pluripotent stem cell derived from a mesenchymal tissue in a living body or a cultured mesenchymal cell in the manufacture of a cell product for treatment of spinal cord injury.

[2] The cell product of item [1], wherein the spinal cord injury is complete spinal cord injury.

[3] The cell product of item [1], wherein the spinal cord injury is incomplete spinal cord injury.

[4] The cell product of any one of items [1] to [3], wherein said pluripotent stem cell is one having all of the following characteristics:

(i) having low or no telomerase activity;

(ii) capable of differentiating into any of tridermic cells;

(iii) showing no neoplastic proliferation; and

(iv) having self-renewal capacities.

[5] The cell product of any one of items [1] to [3], wherein said pluripotent stem cell is one having all of the following characteristics:

(i) SSEA-3-positive;

(ii) CD105-positive;

(iii) having low or no telomerase activity;

(iv) capable of differentiating into any of tridermic cells;

(v) showing no neoplastic proliferation; and

(vi) having self-renewal capacities.

[6] A SSEA-3-positive pluripotent stem cell derived from a mesenchymal tissue in a living body or a cultured mesenchymal cell, for use in production of a cell product for treatment of spinal cord injury.

[7] A method of treating spinal cord injury, comprising administering to a patient with spinal cord injury in need thereof a therapeutically effective amount of a cell product comprising SSEA-3-positive pluripotent stem cells derived from a mesenchymal tissue in a living body or a cultured mesenchymal cell.

[0011]

According to the present disclosure, Muse cells can be administered to a patient with spinal cord injury via a blood vessel or the like, or directly to a target site of spinal cord injury and its surroundings, which allows the cells to migrate,

accumulate, and engraft to the spinal cord injury site, and to reconstruct spinal cord tissues, thereby improving or restoring motor functions. Thus, the cell product of the present disclosure can be used for treatment of spinal cord injury.

[0012]

Since Muse cells can efficiently migrate, accumulate, and engraft to a site of spinal cord injury, reconstructing spinal cord tissues at the engraftment site, they do not require differentiation induction into cells to be treated prior to transplantation (administration). In addition, Muse cells are non-tumorigenic and excellent in safety. Furthermore, since Muse cells do not induce any immune rejection, treatment with allogenic preparations produced from donors is also possible. Therefore, Muse cells having the excellent characteristics as described above can provide readily feasible means for treatment of patients with spinal cord injury.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013]

Fig. 1 is a graph showing the results of evaluation of hindlimb motor function in a rat model of spinal cord injury treated with a vehicle (HBSS) or a Muse cell (CL2020) (Example 1-4). *P<0.05, **P<0.01 vs. HBSS

Fig. 2 is a graph showing the results of evaluation of hindlimb motor function in a rat model of spinal cord injury treated with a vehicle or a Muse cell (Example 2-1). *P<0.05, **P<0.01 vs. HBSS (Control)

Fig. 3 is a graph showing the results of evaluation of hindlimb motor function in a rat model of spinal cord injury treated with a vehicle or a Muse cell (Example 3-1). *P<0.05 vs. HBSS (Control)

DETAILED DESCRIPTION OF THE INVENTION

[0014]

The present invention relates to a cell product for treatment of spinal cord injury, comprising a SSEA-3-positive pluripotent stem cell (Muse cell). The

CLAIMS

1. Use of a SSEA-3 (Stage-Specific Embryonic Antigen-3)-positive pluripotent stem cell derived from a mesenchymal tissue in a living body or a cultured mesenchymal cell in the manufacture of a cell product for treatment of spinal cord injury.

2. The use according to claim 1, wherein the spinal cord injury is complete spinal cord injury.

3. The use according to claim 1, wherein the spinal cord injury is incomplete spinal cord injury.

4. The use according to any one of claims 1 to 3, wherein said pluripotent stem cell is one having all of the following characteristics:

(i) having low or no telomerase activity;

(ii) capable of differentiating into any of tridermic cells;

(iii) showing no neoplastic proliferation; and

(iv) having self-renewal capacities.

5. The use according to any one of claims 1 to 3, wherein said pluripotent stem cell is one having all of the following characteristics:

(i) SSEA-3-positive;

(ii) CD105-positive;

(iii) having low or no telomerase activity;

(iv) capable of differentiating into any of tridermic cells;

(v) showing no neoplastic proliferation; and

(vi) having self-renewal capacities.