## SUMMARY

**[0007a]**

In one aspect, provided herein is the use of a cell preparation comprising pluripotent stem cells positive for SSEA-3 isolated from mesenchymal tissue of a body or cultured mesenchymal cells in the manufacture of a medicament for the alleviation and/or treatment of ischemia reperfusion-induced lung injury.

[TECHNICAL PROBLEM]

**[0008]**

It is an object of the present disclosure is to provide a novel medical use for pluripotent stem cells (i.e., Muse cells) in regenerative medicine. More specifically, it is an object of the present disclosure is to provide a cell preparation and pharmaceutical composition that include Muse cells and are effective for treatment of ischemia reperfusion-induced lung injury, and a novel treatment method.

[SOLUTION TO PROBLEM]

**[0009]**

The present inventors have found that preparing a rat model of ischemia reperfusion-induced lung injury, and administering Muse cells by pulmonary artery injection, alleviates ischemia reperfusion-induced lung injury, and the present disclosure has been completed.

**[0010]**

Specifically, the present disclosure provides as follows.

[1] A cell preparation for alleviation and/or treatment of ischemia reperfusion-induced lung injury, comprising pluripotent stem cells positive for SSEA-3 isolated from mesenchymal tissue of a body or cultured mesenchymal cells.

[2] The cell preparation according to [1] above, comprising a cell fraction wherein the pluripotent stem cells positive for SSEA-3 have been concentrated by external stress treatment.

[3] The cell preparation according to [1] or [2] above, wherein the pluripotent stem cells are CD105-positive.

[4] The cell preparation according to any one of [1] to [3] above, wherein the pluripotent stem cells are CD117-negative and CD146-negative.

[5] The cell preparation according to any one of [1] to [4] above, wherein the pluripotent stem cells are CD117-negative, CD146-negative, NG2-negative, CD34-negative, vWF-negative, and CD271-negative.

[6] The cell preparation according to any one of [1] to [5] above, wherein the pluripotent stem cells are CD34-negative, CD117-negative, CD146-negative, CD271-negative, NG2-

negative, vWF-negative, Sox10-negative, Snai1-negative, Slug-negative, Tyrp1-negative, and Dct negative.

[7] The cell preparation according to any one of [1] to [6] above, wherein the pluripotent stem cells have all of the following properties:

(i) low or non-existent telomerase activity;

(ii) having the ability to differentiate into any of three germ layers;

(iii) exhibiting no neoplastic proliferation; and

(iv) having self-renewal ability.

[8] The cell preparation described in any one of [1] to [7] above, wherein the ischemia reperfusion-induced lung injury is lung injury occurring at reinitiation of blood flow after having organ transplantation, after having artificial cardiopulmonary circulation during heart surgery, after having thoracic surgery of lung cancer or the like accompanying forming of blood vessels or blocking of blood flow, and/or after dissolving blood clots or removing blood clots in pulmonary thromboembolism.

[9] The cell preparation according to any one of [1] to [8] above, wherein the pluripotent stem cells have the ability to engraft into lung tissue.

## [ADVANTAGEOUS EFFECTS OF DISCLOSURE]

**[0011]**

According to the present disclosure, by administering Muse cells to a subject suffering from ischemia reperfusion-induced lung injury, Muse cells are selectively integrated in the disease part of lung tissues and cytokines or tissue protecting factors, or the like are continuously secreted in the tissues by Muse cells, and thus normal lung tissues can be constructed.

## BRIEF DESCRIPTION OF DRAWINGS

**[0012]**

FIG. 1 illustrates the result of functional evaluation of lung (P/F ratio) by using Muse cells in rat model of ischemia reperfusion-induced lung injury.

FIG. 2 illustrates the result of functional evaluation of lung (A-a$DO_2$) by using Muse cells in rat model of ischemia reperfusion-induced lung injury.

FIG. 3 illustrates the result of functional evaluation of lung (left lung compliance) by using Muse cells in rat model of ischemia reperfusion-induced lung injury.

FIG. 4 illustrates the result of histological evaluation of lung (pathological evaluation after hematoxylin · eosin staining) by using Muse cells in rat model of ischemia reperfusion-induced lung injury.

FIG. 5 illustrates the result of histological evaluation of lung (the number of TUNEL positive cells) by using Muse cells in rat model of ischemia reperfusion-induced lung injury.

FIG. 6 illustrates the result of counting the number of human golgi positive cells in lung tissue section of a rat model of ischemia reperfusion-induced lung injury.

FIG. 7A illustrates the expression amount of mRNA of various cytokines in lung tissues of a rat model of ischemia reperfusion-induced lung injury.

FIG. 7B illustrates the expression amount of mRNA of various cytokines in lung tissues

CLAIMS

1. Use of a cell preparation comprising pluripotent stem cells positive for SSEA-3 isolated from mesenchymal tissue of a body or cultured mesenchymal cells in the manufacture of a medicament for the alleviation and/or treatment of ischemia reperfusion-induced lung injury.

2. The use according to claim 1, comprising a cell fraction wherein the pluripotent stem cells positive for SSEA-3 have been concentrated by external stress treatment.

3. The use according to claim 1 or 2, wherein the pluripotent stem cells are CD105-positive.

4. The use according to any one of claims 1 to 3, wherein the pluripotent stem cells are CD117-negative and CD146-negative.

5. The use according to any one of claims 1 to 4, wherein the pluripotent stem cells are CD117-negative, CD146-negative, NG2-negative, CD34-negative, vWF-negative, and CD271-negative.

6. The use according to any one of claims 1 to 5, wherein the pluripotent stem cells are CD34-negative, CD117-negative, CD146-negative, CD271-negative, NG2-negative, vWF-negative, Sox10-negative, Snai1-negative, Slug-negative, Tyrp1-negative, and Dct negative.

7. The use according to any one of claims 1 to 6, wherein the pluripotent stem cells have all of the following properties:

(i) low or non-existent telomerase activity;

(ii) having the ability to differentiate into any of three germ layers;

(iii) exhibiting no neoplastic proliferation; and

(iv) having self-renewal ability.

8. The use according to any one of claims 1 to 7 above, wherein the ischemia reperfusion-induced lung injury is lung injury occurring at reinitiation of blood flow after having organ transplantation, after having artificial cardiopulmonary circulation during heart surgery, after having thoracic surgery of lung cancer or the like accompanying forming of blood vessels or blocking of blood flow, and/or after dissolving blood clots or removing blood clots in pulmonary thromboembolism.

9. The use according to any one of claims 1 to 8, wherein the pluripotent stem cells have the ability to engraft into lung tissue.