motor and sensory areas. Furthermore, they have demonstrated that administration of MSCs in a vascular dementia model rat improves the cognitive function. In one aspect, the present disclosure refers to the use of CD24-negative mesenchymal stem cells derived from human bone marrow or blood in the manufacture of a medicament for treating dysfunction of higher function in a disease selected from the group consisting of dementia, a chronic phase of cerebral infarction, and a chronic phase of spinal cord injury, by synapse formation. In another aspect, the present disclosure refers to the use of CD24-negative mesenchymal stem cells derived from human bone marrow or blood in the manufacture of a medicament for treating dysfunction of higher function in a disease selected from the group consisting of dementia, a chronic phase of cerebral infarction, and a chronic phase of spinal cord injury, by promoting brain plasticity.

[0010]

Accordingly, the present disclosure relates to the following (1) to (14).

(1) A synapse formation agent comprising CD24-negative mesenchymal stem cells derived from human bone marrow or blood.

(2) The synapse formation agent according to (1) above, wherein the cells are positive for at least one or more

transplantation therapy is a therapy already used on the clinical site and its safety is confirmed. Moreover, stem cells derived from bone marrow are highly migratory and not only by the transplant to the local site but also by intravenous administration, they can be delivered to lesional tissue and the therapeutic effect can be expected there.

[0019]

The cells may be cells obtained by inducing differentiation of ES cells or induced pluripotent stem cells (iPS cells or the like), an established cell line, or cells isolated from the living body and proliferated. The cells may be derived from allogeneic cells or autologous cells, but they are preferably mesenchymal stem cells derived from autologous cells (derived from patient's own cells).

[0020]

The mesenchymal stem cells used in the present invention are cells that are negative for CD24, a differentiation marker, and maintained in an undifferentiated state. Therefore, the cells have properties of having high proliferation and survival rates after the introduction into the living body. The inventors have developed a method for obtaining such undifferentiated mesenchymal stem cells, details of which are described in WO2009/034708.

[0021]

Claims

[Claim 1]

Use of CD24-negative mesenchymal stem cells derived from human bone marrow or blood in the manufacture of a medicament for treating dysfunction of higher function in a disease selected from the group consisting of dementia, a chronic phase of cerebral infarction, and a chronic phase of spinal cord injury, by synapse formation.

[Claim 2]

The use according to claim 1, wherein the cells are positive for at least one or more selected from CD73, CD90, CD105, and CD200 and/or negative for at least one or more selected from CD19, CD34, CD45, CD74, CD79α, and HLA-DR.

[Claim 3]

The use according to claim 1 or 2, wherein the human bone marrow or blood is bone marrow or blood of a patient receiving administration of the medicament.

[Claim 4]

The use according to any one of claims 1 to 3, wherein the cells have been proliferated and enriched in a medium containing human serum.

[Claim 5]

The use according to claim 4, wherein the human serum is autologous serum of a patient receiving the medicament.

[Claim 6]

The use according to any one of claims 1 to 5, wherein the medicament is a formation for intravenous administration, a formulation for lumber puncture administration, a formulation for intracerebral administration, a formulation for intracerebroventricular administration, a formulation for local administration, or a formulation for intraarterial administration.

[Claim 7]

The use according to any one of claims 1 to 5, wherein the medicament is a formulation for intravenous administration.

[Claim 8]

The use according to any one of claims 1 to 7, wherein the cells have been proliferated and enriched in a medium containing no anticoagulant or an anticoagulant at less than 0.02 U/mL.

[Claim 9]

The use according to claim 8, wherein the anticoagulant is heparin, a heparin derivative, or a salt thereof.

[Claim 10]

The use according to claim 6 or 9, wherein the human bone marrow or blood has been prepared such that an amount of the anticoagulant added at the time of collection is less than 0.2 U/mL based on the volume of the bone marrow or blood.

[Claim 11]

Use of CD24-negative mesenchymal stem cells derived from human bone marrow or blood in the manufacture of a medicament for treating dysfunction of higher function in a disease selected from the group consisting of dementia, a chronic phase of cerebral infarction, and a chronic phase of spinal cord injury, by promoting brain plasticity.

[Claim 12]

The use according to claim 11, wherein the cells have been proliferated and enriched in a medium containing human serum.

[Claim 13]

The use according to claim 11 or 12, wherein the human bone marrow or blood is bone marrow or blood of a patient receiving administration of the medicament, and the human serum is autologous serum of a patient receiving the medicament.

[Claim 14]

The use according to any one of claims 11 to 13, wherein the medicament is a formulation for intravenous administration.

[Claim 15]

The use according to any one of claims 11 to 14, wherein the cells have been proliferated and enriched in a medium containing no anticoagulant or an anticoagulant at less than 0.02 U/mL.

[Claim 16]

The use according to claim 15, wherein the anticoagulant is heparin, a heparin derivative, or a salt thereof.

[Claim 17]

The use according to claim 15 or 16, wherein the human bone marrow or blood has been prepared such that an amount of the anticoagulant added at the time of collection is less than 0.2 U/mL based on the volume of the bone marrow or blood.