Non Patent Literature 3: Scientific Reports, 5, 9563 (2015)

Non Patent Literature 4: Transplantation, 74, 1414-9 (2002)

Summary of Invention

[0005a] In one aspect, provided herein is a preservation method for retinal tissue, comprising preserving retinal tissue in a preservation solution having a potassium ion concentration of more than 0 mM and less than 115 mM at a preservation temperature of 12°C to 22°C, and wherein the retinal tissue has a continuous epithelium structure, and has a cell layer comprising a photoreceptor precursor cell, and a cell layer comprising a neural retinal precursor cell.

[0005b] In another aspect, provided herein is a transport method for retinal tissue, comprising transporting retinal tissue in a preservation solution having a potassium ion concentration of more than 0 mM and less than 115 mM at a preservation temperature of 12°C to 22°C, wherein the retinal tissue has a continuous epithelium structure, and has a cell layer comprising a photoreceptor precursor cell, and a cell layer comprising a neural retinal precursor cell.

Technical Problem

[0006] An object of the present invention is to provide a preservation method for neural tissue for several hours to several weeks without freezing, a preservation solution therefor, a transport method for neural tissue in accordance with the method and using the preservation solution, and a composition for transplantation.

Solution to Problem

[0007] The present inventors conducted intensive studies with a view to attaining the above object. As a result, they found that neural tissue can be preserved while maintaining a function thereof for several days in a preservation solution having a potassium ion concentration of less than 115 mM at a preservation temperature of 8°C to 30°C, and arrived at the present invention.

[0008] More specifically, the present invention relates to the following items.

[1] A preservation method for neural tissue, comprising preserving neural tissue in a preservation solution having a potassium ion concentration of more than 0 mM and less than 115 mM at a preservation temperature of 8°C to 30°C.

[2] The preservation method according to [1], wherein the preservation temperature is 12°C to 22°C.

CLAIMS

[Claim 1]

A preservation method for retinal~~neural~~ tissue, comprising preserving retinal~~neural~~ tissue in a preservation solution having a potassium ion concentration of more than 0 mM and less than 115 mM at a preservation temperature of ~~8~~12°C to ~~30~~22°C, and wherein the retinal tissue has a continuous epithelium structure, and has a cell layer comprising a photoreceptor precursor cell, and a cell layer comprising a neural retinal precursor cell.

[Claim 2]

The preservation method according to claim 1, wherein the preservation temperature is ~~12~~17°C ~~to 22°C~~.

[Claim 3]

The preservation method according to claim 1 or 2, wherein the retinal~~neural~~ tissue is derived from a human.

[Claim 4]

The preservation method according to any one of claims 1 to 3, wherein the retinal~~neural~~ tissue is a tissue derived from pluripotent stem cells.

[Claim 5]

The preservation method according to any one of claims 1 to 4, wherein the retinal~~neural~~ tissue is a tissue to be subjected to transplantation.

[Claim 6]

The preservation method according to any one of claims 1 to 5, wherein the photoreceptor precursor cell is Crx-positive cell, and the neural retinal precursor cell is Chx10-positive cell~~neural tissue is a cell aggregate having a layer structure~~.

[Claim 7]

The preservation method according to any one of claims 1 to 6, wherein the potassium ion concentration is more than 0 mM and less than 60 mM~~neural tissue is~~

~~a cell aggregate having a neuroepithelial structure~~.

[Claim 8]

The preservation method according to claim 7, wherein the potassium ion concentration is 0.1 mM to 10 mM.~~neuroepithelial structure is a continuous epithelium structure present on a surface of the cell aggregate and/or a rosette structure present on a surface of or inside the cell aggregate.~~

[Claim 9]

The preservation method according to any one of claims 1 to 8, wherein the preservation is performed for a period of 48 hours or more~~neural tissue includes one or more neural tissues selected from the group consisting of forebrain tissue, midbrain tissue and retinal tissue~~.

[Claim 10]

The preservation method according to any one of claims 1 to 9, wherein the~~for~~ preservation is performed for a period of 14 days or less.

[Claim 11]

The preservation method according to any one of claims 1 to 9, for preservation for a period of 5 days or less.

[Claim 12]

The preservation method according to any one of claims 1 to 11, wherein the preservation solution is an aqueous solution containing a buffering agent and having a buffering action to control pH within the range of 6.0 to 8.6.

[Claim 13]

The preservation method according to any one of claims 1 to 12, wherein the preservation solution is the aqueous solution further containing a glycosaminoglycan.

[Claim 14]

The preservation method according to claim 13, wherein the concentration of

the glycosaminoglycan is 0.1% (w/v) or more and 10% (w/v) or less.

[Claim 15]

The preservation method according to claim 13 or 14, wherein the glycosaminoglycan includes one or more glycosaminoglycans selected from the group consisting of chondroitin sulfate and hyaluronic acid.

~~[Claim 16]~~

~~A preservation solution having a potassium ion concentration of more than 0 mM and less than 115 mM, for preserving neural tissue derived from pluripotent stem cells at a preservation temperature of 8°C to 30°C.~~

~~[Claim 17]~~

~~The preservation solution according to claim 16, wherein the preservation temperature is 12°C to 22°C.~~

~~[Claim 18]~~

~~The preservation solution according to claim 16 or 17, wherein the neural tissue is a cell aggregate having a layer structure.~~

~~[Claim 19]~~

~~The preservation solution according to claim 18, wherein the neural tissue is a cell aggregate having a neuroepithelial structure.~~

~~[Claim 20]~~

~~The preservation solution according to claim 19, wherein the neuroepithelial structure is a continuous epithelium structure present on a surface of the cell aggregate and/or a rosette structure present on a surface of or inside the cell aggregate.~~

[Claim ~~21~~16]

A transport method for retinal~~neural~~ tissue, comprising transporting retinal~~neural~~ tissue in a preservation solution having a potassium ion concentration of more than 0 mM and less than 115 mM at a preservation temperature of ~~8~~12°C to

~~30~~22°C, wherein the retinal tissue has a continuous epithelium structure, and has a cell layer comprising a photoreceptor precursor cell, and a cell layer comprising a neural retinal precursor cell.

[Claim ~~22~~17]

The transport method according to claim ~~21~~16, wherein the preservation temperature is ~~12~~17°C ~~to 22°C~~.

[Claim ~~23~~18]

The transport method according to claim ~~21~~ 16 or ~~22~~17, wherein the retinal~~neural~~ tissue is a tissue derived from human pluripotent stem cells.

[Claim ~~24~~19]

The transport method according to any one of claims ~~21~~ 16 to ~~23~~18, wherein the retinal~~neural~~ tissue is a tissue to be subjected to transplantation.

[Claim ~~25~~20]

The transport method according to any one of claims ~~21~~ 16 to ~~24~~19, wherein the photoreceptor precursor cell is Crx-positive cell, and the neural retinal precursor cell is Chx10-positive cell~~neural tissue is a cell aggregate having a layer structure~~.

[Claim ~~26~~21]

The transport method according to any one of claims ~~25~~16 to 20, wherein the potassium ion concentration is more than 0 mM and less than 60 mM~~neural tissue is a cell aggregate having a neuroepithelial structure~~.

[Claim ~~27~~22]

The transport method according to claim ~~26~~21, wherein the potassium ion concentration is more than 0 mM and less than 30 mM~~neuroepithelial structure is a continuous epithelium structure present on a surface of the cell aggregate and/or a rosette structure present on a surface of or inside the cell aggregate~~.

~~[Claim 28]~~

~~The transport method according to any one of claims 21 to 27, wherein the~~

~~neural tissue is one or more neural tissues selected from the group consisting of forebrain tissue, midbrain tissue and retinal tissue~~

~~[Claim 29]~~

~~A composition for transplantation at a temperature of 12°C to 22°C, comprising an aqueous solution having a potassium ion concentration of more than 0 mM and less than 115 mM and pH controlled by a buffering agent within the range of 6.0 to 8.6 and a human neural tissue derived from pluripotent stem cells.~~

~~[Claim 30]~~

~~The composition according to claim 29, wherein the neural tissue is a cell aggregate having a layer-like neuroepithelial structure.~~

~~[Claim 31]~~

~~The composition according to claim 30, wherein the neuroepithelial structure is a continuous epithelium structure present on a surface of the cell aggregate and/or a rosette structure present on a surface of or inside the cell aggregate.~~

~~[Claim 32]~~

~~The composition according to any one of claims 29 to 31, wherein the neural tissue includes one or more neural tissues selected from the group consisting of forebrain tissue, midbrain tissue and retinal tissue.~~

~~[Claim 33]~~

~~The composition according to any one of claims 29 to 32, wherein the aqueous solution is the aqueous solution further containing a glycosaminoglycan of 0.1% (w/v) or more and 10% (w/v) or less.~~