METHODS AND COMPOSITIONS FOR TREATMENT OF RETINAL DEGENERATION

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Application No. 61/711,665, filed October 9, 2012, the disclosure of which is hereby incorporated by reference herein in its entirety.

STATEMENT REGARDING FEDERAL SUPPORT

[0002] Not applicable.

FIELD

[0003] The present application is in the field of cell therapies for retinal degeneration as occurs, for example, in retinitis pigmentosa and in age-related macular degeneration (AMD).

BACKGROUND

[0004] Retinal degeneration, resulting, for example, from choroidal neovascularization ("wet AMD") or from buildup of cellular debris between the retina and the choroid ("dry AMD"), is one of the major causes of blindness in the world today. Cai et al. (2012) *Front Biosci.* **17**:1976-95. Similarly, degeneration and death of photoreceptor cells (rods and cones), as occurs in Retinitis pigmentosa, can also lead to deterioration and/or loss of vision. Accordingly, treatments that block and/or reverse retinal degeneration, in particular treatments that restore photoreceptor function, are needed.

SUMMARY

[0005] Disclosed herein are methods and compositions for treating retinal degeneration, using cells descended from marrow adherent stem cells (MASCs) that have been engineered to express an exogenous Notch intracellular domain. Such cells are denoted SB623 cells for the purposes of the present disclosure.

[0006] In one ~~aspect~~example, disclosed herein are methods of treating retinal degeneration by administering SB623 cells to the eye of a subject in need thereof.

The present invention disclosed herein refers to the use of SB623 cells in the manufacture of a medicament for treating retinal degeneration in a subject in need thereof.

[0007] In another ~~aspect~~example, disclosed herein are methods of increasing photoreceptor activity in the eye of a subject, the methods comprising administering SB623 cells to the eye of the subject such that photoreceptor activity is increased.

[0008] In another ~~aspect~~example, disclosed herein are methods of enhancing photoreceptor function in the eye of a subject, the methods comprising administering SB623 cells to the eye of the subject such that photoreceptor function is enhanced.

[0009] In another ~~aspect~~example, disclosed herein are methods of enhancing transmission of visual signals from the retina to the visual cortex of the brain, the methods comprising administering SB623 cells to the eye of the subject such that transmission of visual signals from the retina to the visual cortex of the brain is enhanced.

[0010] In any of the methods described herein, the cells can be administered by any delivery method, including direct injection, topical administration and the like. In certain ~~embodiments~~examples, the SB623 cells are administered as a composition (or formulation) comprising the cells, for example in combination with one or more pharmaceutical carriers. In addition, the methods can involve repeated administration of SB623 cells, in the same or different formulations.

[0011] Accordingly, the present disclosure ~~provides~~describes, *inter alia*, the following ~~embodiments~~examples:

1. A method for treating retinal degeneration in a subject in need thereof, the method comprising administering SB623 cells to the subject.

2. The method of ~~embodiment~~ example 1, wherein SB623 cells are transplanted into the eye of the subject.

3. The method of either of ~~embodiments~~ examples 1 or 2, wherein the transplantation is intravitreal.

4. The method of either of example~~embodiment~~ 1 or 2, wherein the transplantation is subretinal.

5. The method of any of examples~~embodiments~~ 1-4, wherein the retinal degeneration occurs in retinitis pigmentosa.

6. The method of any of examples~~embodiments~~ 1-4, wherein the retinal degeneration occurs in age-related macular degeneration (AMD).

[0012] These and other aspects will be readily apparent to the skilled artisan in light of disclosure as a whole.

CLAIMS

What is claimed is:

1. Use of SB623 cells in the manufacture of a medicament ~~A method~~ for treating retinal degeneration in a subject in need thereof~~, the method comprising administering SB623 cells to the subject~~.

2. The ~~method~~ use of claim 1, wherein SB623 cells are to be transplanted into the eye of the subject.

3. The ~~method~~ use of claim 2, wherein the transplantation is intravitreal.

4. The ~~method~~ use of claim 2, wherein the transplantation is subretinal.

5. The ~~method~~ use of any of claims 1 to 4, wherein the retinal degeneration occurs in retinitis pigmentosa.

6. The ~~method~~ use of any of claims 1 to 4, wherein the retinal degeneration occurs in age-related macular degeneration (AMD).