CLAIMS

1. A vector comprising a nucleic acid encoding a gene product that is light-sensitive and/or that modulates endogenous light-sensitive signalling in a photoreceptor cell, for use in a method of improving vision in a patient with cone photoreceptor dysfunction and/or degeneration by introduction of said nucleic acid into healthy rod photoreceptors in the retina of the patient and expression of said gene product therein, such that the range of light intensities to which the rod photoreceptor responds is extended and/or the speed at which the rod photoreceptor responds to light is increased,

wherein the gene product is ArchT, Jaws (cruxhalorhodopsin), iC1C2, or R9AP.

2. A vector for use according to claim 1, wherein the vector is a viral vector.

3. A vector for use according to claim 2, wherein the vector is an adeno associated virus (AAV) vector.

4. An AAV vector for use according to claim 3, whose capsid is derived from AAV8.

5. An AAV vector for use according to claim 3 or 4, whose genome is derived from AAV2.

6. A vector for use according to any of the preceding claims, wherein the patient suffers from macular degeneration, achromatopsia or Leber congenital amaurosis.

7. A vector for use according to claim 6, wherein the macular degeneration is age-related macular degeneration (AMD), an inherited macular degeneration condition or an inherited cone dystrophy.

8. A vector for use according to claim 7, wherein the AMD is wet or neovascular AMD or geographic atrophy.

9. A vector for use according to any of the preceding claims, wherein rod photoreceptor signalling is extended into the mesopic and/or photopic illumination range.

10. A vector for use according to any of the preceding claims, wherein the rods exhibit improved modulation strength and/or faster activation/inactivation kinetics.

11. A vector for use according to any of the preceding claims, wherein the vector is introduced into rod photoreceptors in vitro followed by transplantation into the retina.

12. A vector for use according to any of the preceding claims, wherein the mesopic and/or photopic vision of the patient is improved.

13. A vector for use according to any of the preceding claims, wherein the nucleic acid is expressed under the control of a photoreceptor-specific or photoreceptor-preferred promoter.

14. A vector for use according to claim 13, wherein said photoreceptor-specific or photoreceptor-preferred promoter is a rod-specific or rod-preferred promoter.

15. A vector for use according to claim 14, wherein the nucleic acid is expressed under the control of a Rhodopsin (Rho), Neural retina-specific leucine zipper protein (NRL) or Phosphodiesterase 6B (PDE6B) promoter.

16. An expression cassette comprising a nucleic acid as defined in claim 1, operably linked to a rod-specific or rod-preferred promoter as defined in claim 14 or 15.

17. A vector comprising an expression cassette according to claim 16.

18. A vector comprising a nucleic acid encoding a gene product that is light-sensitive and/or that modulates endogenous light-sensitive signalling in a photoreceptor cell, such that the range of light intensities to which the rod photoreceptor responds is extended and/or the speed at which the rod photoreceptor responds to light is increased,

wherein the gene product is ArchT, Jaws (cruxhalorhodopsin), iC1C2, or R9AP, and wherein the nucleic acid is operably linked to a photoreceptor-specific or photoreceptor-preferred promoter.

19. A vector according to claim 17 or 18, wherein the vector is a viral vector as defined in any one of claims 2 to 5.

20. A host cell comprising a vector according to any one of claims 17 to 19.

21. Use of a vector as defined in any one of claims 1 to 5, 13, 14, 17 or 18 in the manufacture of a medicament for the improvement of vision as defined in any one of claims 1 or 6 to 12.