

FUNDING PROGRAM FOR NEXT GENERATION WORLD-LEADING RESEARCHERS

Project Title: Research on neurodegenerative disorders that generate visual impairment

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1. Background of research

In Japan, around 1.64 million people are affected by visual impairment and most visual disturbances in adults are caused by degeneration of the retina and optic nerve, including glaucoma and diabetic retinopathy. Combating what may be called “adult diseases of the eye”, such as glaucoma, is a major challenge and it is becoming more and more important, particularly since the cases are increasing because of the changes in life style and the shifts toward aging society. However, the detailed mechanisms of these diseases are not fully understood.

2. Research objectives

To reveal the mechanisms of retinal and optic nerve degeneration by establishing animal disease models; to study neuroprotection and regeneration therapy; to investigate the genetic abnormalities in human patients.

3. Research characteristics (incl. originality and creativity)

Retinal and optic nerve degeneration are neurodegenerative diseases that are caused by neural cell death. Therefore, these form useful models to investigate a number of other neurodegenerative diseases, such as Alzheimer’s disease and amyotrophic lateral sclerosis, and could prove useful for developing novel therapeutic strategies for such diseases. In our study, we aim to establish new diagnostic and therapeutic methods for neurodegenerative diseases by utilizing the latest techniques of neuroscience and molecular biology.

4. Anticipated effects and future applications of research

Research into establishing new diagnostic and therapeutic methods for retinal and optic nerve degeneration offers improvement of the quality of vision for patients. In addition, our results may be applied to many neurological disorders in the central nervous system.