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■ Researcher information

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Major

Molecular Cell Biology

■ Research topics

Functional analysis of cell adhesive molecules involved in neurogenesis

Keywords

Cell adhesive molecule, extracellular matrix, integrin, cadherin, vitronectin

Contents

■ Overview (background, goal, detail)

Cell-cell adhesion and cell-extracellular matrix adhesion play critical roles in organization of tissue structure in multi-cellular animals. These adhesions are contributed to not only physical tissue structure, but also cell proliferation, cell differentiation, and cell movement. I am studying how these cell adhesions affect the cell fate during neurogenesis.

■ case study

1) Role of neurospecific cell adhesive molecule, N-cadherin on neurogenesis of midbrain dopaminergic neurons.

Mouse midbrain dopaminergic neurons are generated from 10 days of embryo. I am studying how N-cadherin is involved in the neurogenesis, using genetically engineered mouse.

2) Contribution of extracellular matrix protein, vitronectin to the neurogenesis (granule cells) during the developing of cerebellum

Neuro-progenitor cells are isolated from the developing cerebellum, and the cells are cultured for analysis of role of extracellular matrix protein, vitronectin on cell proliferation and differentiation into neuron using methods of molecular cell biology.

3) Regulation of cell adhesive molecule expression during neurogenesis

The regulation of cell adhesive protein expression are shown during neurogenesis. I am studying about the mechanism of the expressional regulation.

■ Potential (applications, future goals)

In the case study 1), dopaminergic neurons has been reported to be involved in Parkinson's disease, depression, and integration disorder syndrome. It is expected the analysis of mechanism in the neurogenesis of dopaminergic neurons leads to the development of an effective therapy for the diseases.

In the case study 2), it is expected the study leads to the development of an effective therapy for disorder of movement, because the cerebellar neurons control movement.

As future goals, it is expected analysis of role of cell adhesive molecule on the neurogenesis is contributed to the basic research of tissue engineering.

Potential of social/industrial contribution

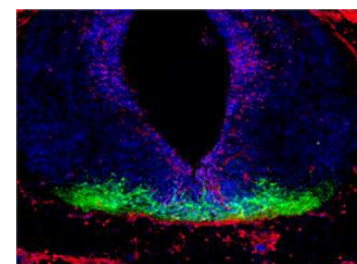
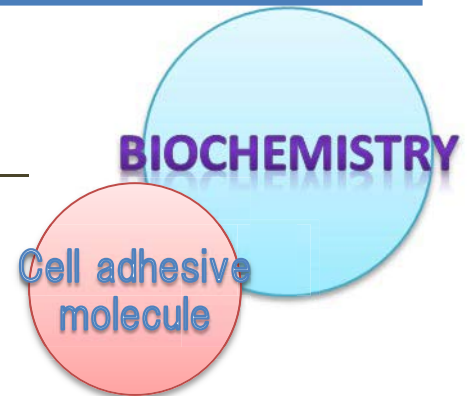
■ Joint research

Joint research for drug development

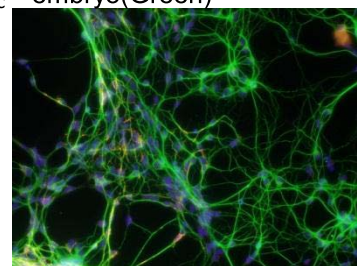
It is expected the development of drug for suppression of neuronal death and neuron regeneration from neuro stem cells.

■ Knowledge sharing (open courses, workshops, publications)

I hope to become more involved in the open courses and workshops related to my research topics and case studies.



Midbrain dopaminergic neurons in mouse embryo (Green)



Cultured mouse cerebellar neurons (Green)