

Syllabus

1. Course title, style, and credit

Molecular and Cellular Neurobiology

1 credit

2. Appropriate grade level and Eligible Departments

D1, 2 (obligatory), D3-5 (optional) School of Life Science

3. Lectures

Masaki Fukata

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4. Time

[Oral]

October 21, 24, 31

November 7, 28

December 5, 15, 19

October 21 (Tue) 13:00~15:00

December 15 (Mon) 15:00~17:00

Other than that above (Fri) 10:00~12:00

5. Place

Seminar Room, 2nd Floor West, 2nd Building, NIPS (Yamate Area)

6. Prerequisites and Styles

Basic knowledge on the molecular and cellular biology will help to understand the lecture but is not essential.

7. Contents

Reorganizing cytoskeleton and cell adhesion, cells, especially neurons, exert their physiological functions such as morphological change, cell migration, cell polarization and synaptic transmission. In this course, we will give a series of lectures on their molecular mechanisms, which are being elucidated.

8. Course objectives

1. Understand the basis of cytoskeleton, cell adhesion and motor proteins.
2. Learn the basis of cell biology and molecular biology and understand

the basis of signal transduction.

3. Understand the molecular basis of synaptic transmission and synaptic plasticity

9. Schedule

(1) October 21st

Cytoskeleton and cell adhesion

Masaki Fukata (NIPS)

(2) October 24th

Signal transduction and posttranslational modification of proteins

Masaki Fukata (NIPS)

(3) October 31st

Methods in molecular and cellular neurobiology: Immunological methods and superresolution microscopy

Yuko Fukata (NIPS)

(4) November 7th

Basic structural biology for neurobiology: Protein structure and synaptic transmission

Norihiko Yokoi (NIPS)

(5) November 28th

Synaptic transmission ~ Molecular basis of presynapse ~

Toshihisa Ohtsuka (Yamanashi University)

(6) December 5th

Synaptic transmission ~ Molecular basis of postsynapse ~

Yuko Fukata (NIPS)

(7) December 15th

Synaptic plasticity in cerebellar Purkinje cells

Keiko Tanaka (Korea Institute of Science and Technology)

(8) December 19th

Molecular basis of synaptic plasticity -Imaging signal transduction by two photon fluorescence microscopy-

Hideji Murakoshi (NIPS)

10. Lecture materials and readings

Bruce Alberts et al, "Molecular Biology of the Cell 5th edition": Garland Science

Mark F. Bear et al, "Neuroscience: Exploring the Brain, 3rd edition": Lippincott Williams & Wilkins Inc.

(These books are in our Lab.)

1 1. Grades

Students are requested to file the short essay related to the Course Objectives. Either passed or failed is determined by the quality of the report. Students must attend the classes at least half of total classes to take a credit.

1 2. Notes

Nothing in particular