

BIO-611

Practical - Constam Lab

Constam Daniel

Cursus	Sem.	Type
Molecular Life Sciences		Obl.

Language of teaching	English
Credits	1
Session	
Exam	Written
Workload	30h
Hours	27
Courses	7
TP	20
Number of positions	2

Frequency

Every 2 years

Remark

3-day Block course, every year in January. To register, contact EDMS Administration

Summary

During development, cell fates are governed by multiple microenvironmental cues and their integration by specific signal transduction pathways. This course focuses on imaging of mechanosensory cilia or of molecules implicated in specific signal transduction events during mammalian embryogenesis.

Content

A theoretical introduction will summarize known roles of one of several specific signal transduction pathways in mammalian embryogenesis and their relevance for cancer and other diseases. Students will then transfect cultured cells and microdissect mouse embryos or organs under a stereomicroscope for live imaging of either cilia-induced signaling events or of a FRET-based biosensor of proteolytic activities. It is recommended to enquire in advance on which of these systems the course will focus on because this choice will be adapted to evolving research priorities at the time of the actual experiment.

The student will be enabled to:

- microdissect mouse embryos or tissues under a stereomicroscope
- prepare small tissue samples for whole mount imaging of RNA or protein expression and localization, and to design the necessary experimental and control groups
- explain known functions of mechanosensitive primary cilia or of localized proteolysis of specific growth factors or adhesion molecules in epithelial cell differentiation and polarization
- recognize limitations of available methods to study dynamic processes in mammalian development

Note

Note that while the course is open to all first year EPFL doctoral students, priority will be given to EDMS students, given that they are mandated to take three of EDMS practical modules. Note also that doctoral students from the Constam laboratory cannot take this course. Access is limited to 3 students.

Keywords

Embryogenesis, cancer, proteases, TGF β signaling, primary cilia, imaging

Learning Prerequisites

Recommended courses

Basics of molecular and cell biology.

Assessment methods

Quiz (multiple choice questions)

Resources

Websites

- <http://constam-lab.epfl.ch/>