

Master class Developmental Biology and Cancer genomics
“The role of membrane traffic in disease and development”

Week 5-9 March 2012



Venue:

HvB, exact room to be announced

Organizer:

Dr. Madelon Maurice, Dept. of Cell Biology, UMC Utrecht

Background:

The architecture and homeostasis of all mammalian cells is established and maintained by an elegant system of lipid membranes that organize cells into distinct compartments and regulate transport into, out of, and within cells. Up to a third of the human genome is estimated to encode membrane proteins and proteins which are part of the membrane traffic machinery necessary to direct membrane proteins to the intracellular sites at which they function. The importance of membrane traffic in organismal homeostasis is underscored by the fact that mutations affecting these cellular systems can cause devastating, if not fatal, effects for the whole organism.

The purpose of this Master Class has two aspects:

- Acquire basic and advanced knowledge on membrane traffic and its relationship to disease and development.
- Use this knowledge to read a series of articles on a given subject and produce your integrated view of how the studied membrane traffic defect (due to a given mutation) explains the etiology of the disease or the developmental defect.

Course organization: A minimum of 12 to max 20 students will receive training in reading and interpreting scientific literature dealing with membrane traffic in disease and development.

Lectures and seminars:

- First, students will get 5 introductory lectures on the relationship between different aspects of membrane traffic, diseases and development by Judith Klumperman, Peter van der Sluijs, Fulvio Reggiori, Catherine Rabouille and Madelon Maurice. Each of these lectures will be followed by a short research seminar.
- Integrated in the course is seminar of a leading (inter)national scientist on the topic

Student work:

- The students will form 5 groups and choose a given subject that they will prepare. At the end of this week, the students are expected to:

1) Write a 250 words summary of the subject they choose.

2) provide a concise and coherent oral presentation of two or more research papers in a format of a journal club for 20 min, followed by a 10 min discussion **COMBINING** several papers (see

guidelines) given by the teachers. You need to present primary data to support the facts that you present. It CANNOT be done as a review with NO data.

The presentation will have to integrate the data of these papers to make a single and cohesive story while presenting primary data (See guidelines).

This is an important research exercise, so you learn to read, integrate information and write a introduction/ review/ scriptie etc.

3) After the final presentation on Friday, there will be **an exam**: you will be asked to answer questions about the subjects you have not chosen (4 in total) for 1 hour. This is important for you to gather sufficient information during the presentation of your fellow students BUT also it is to drive you into presenting the best you can so that others can understand.

Further remarks

The week is meant to be dedicated to this course. The students have to be together all the time, either as a small or large group. The preparation of the presentation and the research proposal has to be made TOGETHER as a small group to start with. Thursday, however, is dedicated to rehearse your presentation and IMPROVE it with all your colleagues of the course who do not deal with the same subject but who are intelligent enough to understand and help.

Our experience is that the course looks easy but at the end, the presentations and the research proposals could be MUCH improved. **Please note** that the feedback at this stage is not to discuss the subject but IMPROVE THE PRESENTATION

Grades: The grade will be based on **performance during the week** (interest, participation 40%), **the presentation** itself (with a separate mark for the introduction, result section and answers to questions 40%), and **the exam at the end** (20%)

Programme Week 5-9 March 2012

Monday 05-03-2012 Lectures

900-930: Introductory remarks and overview by course coordinator Madelon Maurice.

930-1045: Lecture **Judith Klumperman**: “The role of the endocytic pathway in disease

1100-1215: Lecture **Peter van der Sluijs**: “Recycling endosomes in plasma membrane remodeling”

1215-1315: *Lunch*

1315-1430: Lecture **Fulvio Reggiori**: **Autophagy in health and disease”**

1445-1600: Lecture **Catherine Rabouille**: “The role of the secretory pathway in development”

1615-1730: Lecture **Madelon Maurice**: “Wnt signalling employs the endosomal system in development and cancer”

1730: **Students make 5 groups and choose subjects**

1) Subject Judith Klumperman: **Lysosomes, lysosomal cell death and cancer**

2) Subject Peter van der Sluijs: **Recycling endosomes in synaptic plasticity**

3) Subject Fulvio Reggiori: **Autophagy, innate immunity and elimination of Mycobacterium tuberculosis**

4) Subject Catherine Rabouille: **GOLPH3: A link between Golgi and cancer via TOR**

5) Subject Madelon Maurice: **FZD4 in vascular development in the retina and inner ear**

Tuesday 06-03-2012. Research seminars (5x45 min)

900-945: Research seminar “**Mechanisms of Wnt-induced receptor trafficking**”

1000-1045: Research seminar “**GRASP and epithelium integrity**”

1100-1145: Research seminar “**Key role of a novel Atg9-containing compartment in the early steps of autophagosome biogenesis**”

1145-1300: *Lunch*

1300-1345: Research seminar “**Secretory lysosome release in haematopoietic cells**”

1400-1445: Research seminar “**hVps33B, a key protein in lysosome biogenesis and maintenance**”

1500: Start preparing presentations

Wednesday 07-03-2012

900-1500: Prepare papers for Friday presentation

1500-1700: Contact hours for meetings with the teachers for questions etc regarding the papers.

The preparation of the talks has to be made **together**. Two students will actually present. But the others are meant to answer the questions at the end, so that the workload is shared.

Thursday 08-03-2012

0900-1230: Preparation of talks

1230-1530: General rehearsal as a big group **without** teachers (30-40 min per groups)

Each group presents the oral presentation to the rest of the students and **GET feedback**. This will be important to improve the presentation. This, in turn, is important because on Friday afternoon, the students will have to answer one question of each presentation.

NOTE: General discussion on the subject should be avoided. Point out what you do not understand.

Challenge the content, the clarity, the logics, the amount of info etc

1600-1700: Seminar of external keynote speaker.

1700-1720: Question time to speaker

Friday 09-03-2012

0900-1130: Implementation of feedback, finalization of the presentation

1230-1500: **5x30 minutes paper presentation** including **10 minutes** discussion. Two students will present and the other two answer the questions. Students will be asked to present themselves beforehand.

1230: Presentation of paper 1

1300: Presentation of paper 2

1330: Presentation of paper 3

1400: Presentation of paper 4

1430: Presentation of paper 5

1500-1515: Feedback on presentation by the teachers

1600-1700: Exam (questions on presentations + external speaker seminar)

1700: Filling up of evaluation questionnaire