BIOENG-451 **Scientific literature analysis in neuroscience**

La Manno Gioele

Cursus	Sem.	Type
Life Sciences Engineering	MA1, MA3	Opt.
Neuro-X minor	H	Opt.
Neuro-X	MA1, MA3	Opt.

Language of teaching	English
Credits	4
Withdrawal	Unauthorized
Session	Winter
Semester	Fall
Exam	During the semester
Workload	120h
Weeks	14
Hours	**4 weekly**
Lecture	1 weekly
Exercises	3 weekly
Number of positions	**20**

Remark

Only one registration per student to a scientific thinking course

Summary

The goal of this course is to learn to analyze a scientific paper critically, question if the data support the conclusions, and produce constructive referee reports in written or oral form. The papers considered will give an overview of the field of developmental neurobiology.

Content

In this course, you will learn how to read a paper critically and understand its content. We will examine published papers and discuss which conclusions can be justified and which require some wishful thinking. We will dissect papers in the field of 'Developmental Neurobiology', focusing in particular on a molecular and cellular perspective, discussing recent research, as well as classic landmarks. The subareas you will learn about include 'Patterning and Gene Regulation', 'Lineages and Tracing', "Migration and Synaptogenesis", "Single-cell analyses and computation", and "Human development and in vitro models".
In part I (8-9 weeks), after two introductory lectures, each week, we will evaluate in class papers: few of the participants will be asked to lead the discussion (in the form of an oral presentation, i.e., a journal club), while the rest of the class will be expected to participate in the discussion, producing a summary of the main findings in the proper context, and an assessment of the strengths and weaknesses of the paper. This will require studying background material so that your presentation places the paper in context.
In part II (5-6 weeks), students will work in small groups and perform mini-projects where they will reproduce/extend analyses of key papers. The projects will be orally presented by the teams during the last week.
The assessment will be based on your oral presentations, written submissions and participation in the discussions throughout the course during the semester.

Keywords

critical reading, science writing, neurobiology, development, neuroscience

Learning Prerequisites

Required courses

None in particular, but a good knowledge of basic biology, biochemistry, physics, and bioinformatics is desirable.

Learning Outcomes

By the end of the course, the student must be able to:

- Demonstrate the ability to place the individual research results within the context of the larger field.
- Critique the content of papers and express this analysis in oral and written form
- Synthesize a scientific review narrative demonstrating a deep comprehension of the assigned papers
- Assess / Evaluate a related group of research papers
- Analyze data encountered in literature to check for or extend the conclusions of the original paper

Teaching methods

Lectures to give background information required to choose and read the papers.
Group discussion of papers and their contribution to the larger narrative.

Expected student activities

Oral presentation of papers, individually or in group.
Read background literature to present the paper in the appropriate context.
Prepare a written summary and a critical, constructive assessment of the paper.
Final project to test understanding of material and hands-on ability to interact with the specific data.

Assessment methods

Evaluation of the quality of the written summary and assessment reports. In course assessment of the oral presentations, participation in discussions and final project.

Supervision

Office hours	Yes
Assistants	Yes
Forum	Yes

Resources

Moodle Link

- https://go.epfl.ch/BIOENG-451