BIO-468

# Scientific literature analysis in computational molecular biology

Naef Felix

| Cursus | Sem. | Type |
|---|---|---|
| Bioengineering | MA1, MA3 | Opt. |
| Sciences du vivant | MA1, MA3 | Opt. |

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| Language of teaching | English |
| Credits | 5 |
| Withdrawal | Unauthorized |
| Session | Winter |
| Semester | Fall |
| Exam | During the semester |
| Workload | 150h |
| Weeks | 14 |
| **Hours** | **5 weekly** |
| Courses | 2 weekly |
| Exercises | 3 weekly |
| **Number of positions** | **12** |

**It is not allowed to withdraw from this subject after the registration deadline.**

## Remark

MA3 only - only one registration per student to a scientific thinking course

## Summary

The goal is to learn to analyze a paper critically, asking whether the data presented support the conclusions that are drawn. The analysis is presented in the form of a summary abstract and critical, constructive referee's report.

## Content

The goal of the course is to teach you 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 ‘Computational Molecular Biology’, discussing recent development, as well as classics. More specific areas will include ‘Systems biology approaches for gene expression analysis’, ‘Population genetics of adaptation’, ‘Molecular modeling’. Each week, we will ask you to evaluate a paper, and one of the participants will lead the discussion (oral presentation, journal club). Each of you will be expected to produce a summary of the main findings in the proper context, and an assessment of the strengths and weaknesses of the paper. You will present the paper from this standpoint. This will require you to study background material so that your presentation places the paper in context. The assessment will be based on your oral presentations, written submissions and participation in the discussions throughout the course. There will be an exam in the final week of the course, in which you will have to provide a written assessment of a paper.

## Keywords

critical reading, computational biology

## Learning Prerequisites

### Required courses

None, but a good knowledge of basic biology and bioinformatics is desirable.

## Learning Outcomes

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

## Transversal skills

- Give feedback (critique) in an appropriate fashion.
- Access and evaluate appropriate sources of information.
- Demonstrate the capacity for critical thinking
- Continue to work through difficulties or initial failure to find optimal solutions.

## Teaching methods

Lectures to give background information required to read the paper
Group discussion of paper
Written exam at the end of the course

## Expected student activities

Oral presentation of paper, singly or in group.
Read background literature to present the paper in an appropriate context.
Prepare a written abstract of the paper, and a critical, constructive evaluation of the paper.

## Assessment methods

In course assessment of the quality of the written abstract and referee's report.
In course assessment of the oral presentation, and participation in discussions.
Written examination in the final week of the course. This is likely to be preparation of an abstract and/or referee's report for a paper that will be provided on the day of the examination. More details will be given during the course.