BIO-468

# Scientific literature analysis in computational molecular biology

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| Cursus | Sem. | Type |
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| Life Sciences Engineering | MA1, MA3 | Opt. |

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| 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** | **12** |

**Il n'est pas autorisé de se retirer de cette matière après le délai d'inscription.**

## 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, asking whether the data presented support the conclusions that are drawn. The analysis is presented in the form of a summary presentation and critical, constructive assessments of the paper.

## 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 broad field of 'Computational Molecular Biology', focusing in particular on molecular, structural, evolutionary, and mechanistic aspects of biomolecules, discussing recent development, as well as classic ones. More specific areas will include 'Structural Biology', 'Protein Design', 'Bioinformatics' and 'Molecular Modeling'. Each week, we will evaluate a paper:  one of the participants will 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 to 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 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 during the semester.

## Keywords

critical reading, computational biology, structural biology, bioinformatics, coevolution, machine learning, protein design, molecular modeling

## Learning Prerequisites

### Required courses

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

## Learning Outcomes

## Transversal skills

- Make an oral presentation.
- Summarize an article or a technical report.
- Access and evaluate appropriate sources of information.
- Demonstrate the capacity for critical thinking

## Teaching methods

Lectures will give background information required to read the scientific literature.
Group presentation and discussion of scientific papers.

## 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.

## Assessment methods

In course evaluation of the quality of the written summary and assessment reports.
In course assessment of the oral presentation and participation in discussions.

## Supervision

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| Office hours | Yes |
| Assistants | Yes |
| Forum | Yes |

## Resources

### Moodle Link

- https://go.epfl.ch/BIO-468