

BIO-643

**Integrative structural biology for Life sciences**

Abriata Luciano Andres, Duhoo Yoan, Lau Kelvin, Pojer Florence

Cursus	Sem.	Type		
Computational and Quantitative Biology		Opt.	Language of teaching	English
Molecular Life Sciences		Opt.	Credits	2
			Session	
			Exam	Oral presentation
			Workload	60h
			<b>Hours</b>	<b>28</b>
			Courses	10
			Exercises	14
			TP	4
			<b>Number of positions</b>	<b>12</b>

**Frequency**

Every year

**Remark**Registration via [edms@epfl.ch](mailto:edms@epfl.ch)**Summary**

Hands-on course in Biomolecular Integrative Structural Biology by SV experts in the field of X-ray crystallography, cryo-Electron Microscopy, Bio-NMR and protein modeling tools. No previous knowledge in Structural Biology or Bioinformatics is required.

**Content**

This course will teach how to interpret data from major structural biology techniques and connect experimental approaches to computational modeling. You will have sessions that are tutorial based on the main structural biology software as an introduction to data processing workflows.

Topics discussed in class are expected to include:

- Modeling tools for proteins, such as alphafold; and integration with experimental data
- Single Particle Cryo-Electron Microscopy
- Macromolecular X-ray crystallography
- Bio-NMR

Other topics may be included as needed. Lectures and hands-on will be presented by experts from EPFL and in the Lemanic region.

Doctoral students will present in duo a 25 mins talk on a specific subject within the field at the end of the course.

Visit of structural Biology Core Facilities within EPFL will be proposed.

**Note**

Do not register by yourself, but please contact [edms@epfl.ch](mailto:edms@epfl.ch).

The course is open to max. 12 students and it will take place every 1.5 year (last time was from 19th February to 27th May 2024 --> every Monday from 15h00 to 16h45 in room CO120).

The final dates are not set yet, but next course will probably take place in Autumn 2025!

**Keywords**

Macromolecular X-ray crystallography, Modeling and molecular dynamic of proteins, Single Particle Cryo-Electron Microscopy, Bio-NMR, Mass Spectrometry applied to Structural Biology.

**Learning Prerequisites**

### **Required courses**

Basic molecular Biology

**Please bring your own laptop and mouse**

### **Learning Outcomes**

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

- Develop skills in interpreting data from major structural biology techniques and effectively connecting experimental methods with computational modeling.

### **Assessment methods**

Oral presentation

### **Resources**

#### **Moodle Link**

- <https://go.epfl.ch/BIO-643>