

Program CUSO : Electron microscopy 9-13 October 2023 – Amphipôle and Biophore, UNIL

Aim : Cover the theoretical and practical basics of cellular electron microscopy and basics of cryo-EM (3h theory). Workshops will illustrate practically the techniques used in EM these days to solve biological questions.

Tasks for students: On Monday morning, each student has 3 minutes (1-2 slides) to explain his needs in electron microscopy in the frame of the PhD work. If students wish to bring their own samples for tests, please contact damien.debellis@unil.ch

The courses are given in Amphipôle room 340.1. Metro station is UNIL Sorges

<https://planete.unil.ch/?share=6340a900-7fed-4eac-937c-21dbe491eba3>



The Morning are dedicated to courses covering the technical aspects and main workflows. It alternates with talked given by experts to show how they solve biological problems with EM.

Students are following 4 basic workshops on Monday and Tuesday afternoons. They will be able to choose between different advanced workshops on Wednesday and Thursday depending on their interests (choice to be made during the two first days).

On Friday afternoon, students have access to teachers and techniques to ask questions, going deeper in a technique or elaborate a protocol for a particular case.

	Monday	Tuesday	Wednesday	Thursday	Friday
9h15-10h00 (340.1 AMPHIP.)	EM intro – student’s talks	Sample prep 1 (JD)	CLEM approaches (AL)	cryo-EM : tomo (Iva Ganeva)	Image analysis 1 stereo (JD)
10h15-11h00 (340.1 AMPHIP.)	EM intro – student’s talks	Sample prep 2 (CG)	Cryo immuno (CL)	Fast EM and new develop.(JH)	Image analysis 2 (B. Boury Jamot)
11h15-12h00 (340.1 AMPHIP.)	Intro TEM/ SEM (JH)	intro cryo-EM (A. Myasnikov)	cryo-EM Ulrich Lorenz	VolumeEM (CG)	EM in neuroscience (Graham Knott)
	<i>Lunch break</i>	<i>Lunch break</i>	<i>Lunch break</i>	<i>Lunch break</i>	<i>Lunch break</i>
13h15-14h45 (EMF-1219)	Basic practicals	Basic practicals	Advanced workshops	Advanced workshops	Group work
14h45-15h15	<i>Break</i>	<i>Break</i>	<i>Break</i>	<i>Break</i>	<i>Break</i>
15h15-16h45 (EMF-1219)	Basic practicals	Basic practicals	Advanced workshops	Advanced workshops	Group work

Teachers :

Christel Genoud, head of EM platform UNIL

Jean Daraspe, Expert scientist EMF UNIL, expert FIBSEM tomography

Jacob Hoogenboom; invited professor from Delft University, expert EM method development

Céline Loussert, expert cryo-immuno, CSEM, Neuchâtel

Iva Garneva, post-doc, gr W. Kukulski, UNIBE

Graham Knott, head of bio-EM facility, SV, EPFL

Amanda Lewis, post-doc EPFL, expert CLEM in human neurodegenerative diseases

Benjamin Boury jamot, imaging specialist, CEC, CHUV,

Alexandre Myasnikov, head of Dubochet Center for Imaging, expert in cryo-EM

Cristina Martin Olmos, head cryo-SEM, EPFL,

Ulrich Lorenz, Professor, Laboratory of molecular nanodynamics, LND; EPFL

Basics practicals :

Sample preparation : Damien De Bellis

Cutting sections : Wei Jiao

Introduction to TEM : Jean Daraspe

Introduction to SEM : Antonio Mucciolo, Cristina Martin Olmos

Workshops for Thursday/Friday

Tomography Jean Daraspe - Thursday

Students will follow the imaging process leading to tomograms at high resolution using a 200 kV TEM

CLEM demo 1 Amanda Lewis – Thursday

Students are following a workflow going from serial section immuno for light microscopy and TEM imaging of the same ROI.

FIBSEM demo Jean Daraspe – Wednesday

Students can follow how an acquisition on a FIBSM is initiated and the parameters to take in count to make it successful.

volumeEM demo Christel Genoud – Thursday

Students are discussing the 3 main techniques of volumeEM and their strengths/limitations for their projects

SEM EDX Antonio Mucciolo

Students are following the workflow leading to the determination of the presence of elements in a sample.

Cryo immuno Céline Loussert-Fonta – Wednesday

Students see how cryo-section are cut with a cryo-ultramicrotome. They the sections are brought to room temperature for an immunolabeling before being observed in a TEM

HPF Damien De Bellis

Students can bring their own samples and practice the cryo-fixation on our 2 instruments.

Wednesday 13h15-14h45	Thursday 13h15-14h45
FIBSEM	VolumeEM
SEM-EDX	CLEM
Cryo-immuno	tomography
HPF	HPF
Wednesday 15h15-16h45	Thursday 15h15-16h45
FIBSEM	volumeEM
SEM-EDX	CLEM
Cryo-immuno	tomography
TBD	SEM-EDX