1st Workshop on Single Particle Electron Microscopy: from Theory to Practice

Under the patronage of AIC-Associazione Italiana di Cristallografia and of the Proteins Group of SIB-Italian Biochemical Society

Dates: 12-14th September 2018

Venue: Cryo-EM Lab, Dip. BioScienze, Universita' di Milano, Via Celoria 26.

Max participants: 10 (a few bursaries will be available)

Single-particle Electron Microscopy (SP-EM) has stepped up as the mainstream technology for studying the structure of cells, viruses and protein complexes at molecular resolution. Despite recent advances in microscope design, imaging hardware and enhanced image processing, the experiments' outcome still depends on many practical aspects of sample preparation and image acquisition.

The Workshop, first of its kind in Italy, is particularly aimed at PhD-Students, PostDocs and Scientists in general who wish to learn single-particle EM theory and practice. The course will provide a comprehensive overview of sample preparation, image acquisition and data analysis. Tutored sessions will allow each participant to practice sample preparation through both negative staining EM and cryo-EM (sample vitrification will be practiced on a Thermo Fischer FEI Vitrobot™ Mark IV).

The course will also cover theoretical and practical aspects regarding the anatomy of a transmission electron microscope, setup of image collection, image analysis.
After the workshop, attendants will be able to understand the foundations of SP-EM sample preparation, data collection and image processing. Most notably, they will be able to apply these techniques to their own research projects.

How to apply:

The course is limited to 10 participants. For selection purposes applicants are required to submit a brief scientific CV and letter of motivation (max 200 words explaining why your project/research group will benefit from the workshop), by July 1st 2018 to the following mail address: martino.bolognesi@unimi.it. Selected participants will be notified one week after the submission deadline, together with logistics and participation details.

Registration Fees:

Academic Fee 200 € Non-Academic Fee 500 €

*** *Workshop Programme Draft* ***
Speakers to be announced

Day 1 (Sept. 12)

10:30 - 11:00	Welcome: participants will also introduce their lab and projects
11:00 – 11:45	[Theory] Anatomy of a transmission electron microscope
11:45 – 12:30	[Theory] Sample preparation for single-particle EM
12:30 – 14:00	Lunch break
14:00 – 15:30	[Practice] Sample preparation by negative staining EM
15:30 – 16:30	[Practice] Neg. staining sample screening on TEM
16:30 – 17:30	Discussion panel: Q&A about Negative Stain EM + Projects review (discussion about potential projects, best approaches, experimental design)

Day 2 (Sept. 13)

9:00 - 9:45	[Talk 1]
9:30 - 10:15	[Talk 2]
10:15 - 10:30	Break
10:30 - 12:30	[Practice] Cryo-EM Sample Preparation using the FEI Vitrobot
12:30 – 14:00	Lunch break
14:00 – 16:30	[Practice] Cryo-EM Screening and setup a data collection using FEI EPU
16:30 – 17:30	Discussion panel: Q&A about Cryo- EM + Projects review (discussion about potential projects, best approaches, experimental design)

Day 3 (Sept. 14)

9:00 – 9:45	[Theory] Image processing Part 1
9:45 – 10:30	[Theory] Image processing Part 2
10:30 – 10:45	Break
10:45 – 12:00	[Practice] Data analysis workflow: from the raw image to a high-res 3D