

MEMBRANE PROTEIN STRUCTURAL BIOLOGY: HISTORY, METHODS, AND SOME RESULTS

**ORGANIZER: Prof. Mancia
Dott.ssa Federica Cossu
Dott. Pietro Roversi**

2-6 December 2024



MEMBRANE PROTEIN STRUCTURAL BIOLOGY: HISTORY, METHODS, AND SOME RESULTS

PROGRAM

DECEMBER 2, 2024

ROOM 110

14,30-16,30

DOTT.SSA FEDERICA COSSU - IBF-CNR

Macromolecules and complexes in crystals and solution.
Methods, case study, drug discovery of novel interfacial inhibitors

DECEMBER 3, 2024

ROOM LAMBDA

8,30-13,30

DOTT. PIETRO ROVERSI - IBBA-CNR

Docking of models in cryo-EM maps (workshop): 1) generation of protein homology models (alpha-fold, etc). 2) strategies for docking of the protein homology models in a 2.7 Å Cryo-EM map. 3) real space refinement of the docked models against the Cryo-EM map



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PROGRAM

DECEMBER 4, 2024 ROOM G09 14,30-16,30

DECEMBER 5, 2024 ROOM 201 14,30-16,30

DECEMBER 6, 2024 ROOM 207 9,30-11,30

PROF. FILIPPO MANCIA

Columbia University

Department of Physiology & Cellular Biophysics

Structural biology of membrane proteins.

Methods, study cases, protein mechanisms of action

The course will provide a historical perspective on the field of membrane protein structural biology from its onset in the 1970's and 80's with bacteriorhodopsin and the photoreaction center, to modern days. We will then briefly discuss the theory behind the main methods utilized to gain high resolution information, again placed in a historical context, from X-ray crystallography on detergent-solubilized proteins, to crystallization in lipidic phases, to single-particle cryo-electron microscopy in reconstituted membrane bilayers. Finally, the course will focus on some "real life" examples detailing the impact that structural biology has had on our understanding of the mechanisms of select cellular processes, from the transfer of nutrients into the cell and across the blood-brain barrier into the brain, to the assembly of the outer membrane of Gram-negative bacteria.

