



UNIVERSITÀ DEGLI STUDI DI MILANO



Doctorate program
Milan
EXPERIMENTAL
MEDICINE

PhD course: Quantification and characterization of extracellular vesicles in biomedical research

Learning objective

Extracellular vesicles (EVs) are increasingly recognized as masters of intercellular communication with a relevant role in human health and disease. The course is intended to provide students with basic knowledge about EVs, their nomenclature, biogenesis, release and uptake mechanisms, and cargo. The course will focus on emerging approaches for EV quantification and characterization, including procedures for collection and processing of samples prior to EV isolation, different isolation methods, as well as quantification and characterization techniques. The course will also exploit the potential of using artificial vesicles in biomedical research.

Lead instructor: [Silvia Angela Maria Della Bella](#)

For enrolment: see Unimi [Web site](#)

Program

18/1/2024 – LITA di Segrate, Room E

h. 9.30-10.30

Silvia Della Bella (UniMi, BioMeTra)

Lecture: Introduction to the course

Relevance of EVs in scientific literature, EV nomenclature based on vesicle size and cell origin

h. 10.30-11.30

Elena Borroni (UniMi, BioMeTra)

Lecture: Extracellular vesicles tell-all: how vesicles mediate cellular communication and shape cell biology

Role of EVs in cell biology and communication

h. 11.30-12.30

Elena Borroni (UniMi, BioMeTra)

Practical issues: The Yin and Yang of EVs isolation methods: from conventional practice to microfluidics and commercial kits

Overview of current EVs isolation methods

h. 12.30-13.30 LUNCH



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h. 13.30-14.30

Silvia Della Bella (UniMi, BioMeTra)

Practical issues: Immunophenotypic characterization of EVs by flow cytometry

h. 14.30-15.30

Valeria Rondelli (UniMi, BioMeTra)

Practical issues: EVs characteristics and internalization routes: a biophysical approach

h. 15.30-16.30

Valeria Rondelli (UniMi, BioMeTra)

Wet lab: EVs by laser scattering

19/1/2024 – LITA di Segrate, Room E

h.8.30-9.30

Silvia Della Bella (UniMi, BioMeTra)

Wet lab: EVs by flow cytometry

h.9.30-10.30

Laura Vilardo (CNR, ITB)

Wet lab: EVs by nanosight

h. 10.30-11.00 COFFEE BREAK

h.11.00-12.00

Flavia Antonucci (UniMi, BioMeTra)

Seminar: Extracellular vesicles in neuronal physiology and pathology

h.12.00-13.00

Raffaella Chiamonte, Domenica Giannandrea (UniMi, DiSS)

Seminar: Tumor-derived extracellular vesicles: role in disease progression and its treatment

Chiusura corso