



Univerzita Palackého
v Olomouci

SUMMER SCHOOL: MAGNETIC NANOCARRIERS - SYNTHESIS, FUNCTIONALIZATION, AND BIOMEDICAL APPLICATIONS

Location: [Regional Centre for Advanced Technologies and Materials \(RCPTM\)](#), Palacký University Olomouc, Czech Republic

Date: May 26-28, 2025

Duration: 3 days

Organised within the HORIZON MSCA STRIKE project

The Summer School will offer participants an overview of magnetic nanocarriers, with a focus on their synthesis, functionalization, and biomedical applications. The sessions will be led by experienced researchers and faculty members, including contributors from the STRIKE consortium.

Day 1 - Monday, May 26, 2025

13:00 - Welcome speech

13:15 - Synthesis and Applications of Magnetic Nanomaterials/Nanostructures (1 hour)

Led by Dr. Medříková

This session will delve into the fundamental principles and cutting-edge techniques for synthesizing magnetic nanomaterials and nanostructures, along with their diverse applications across various fields.

14:15 - Synthesis and Applications of Carbon-Based Nanomaterials and Their Derivatives (1 hour)

Led by Assoc. Prof. Ranc

An overview of carbon-based nanomaterials (graphene, CNTs, fullerenes), focusing on their synthesis, functionalization, and potential applications in electronics, energy storage, and biomedicine.

15:15 - Coffee break

15:45 - Functionalization of Nanomaterials for Bio-Medical Applications (1.5 hours)

Led by Assoc. Prof. Ranc

This session highlights methods for surface modification and functionalization to enhance nanomaterials' biocompatibility, targeting ability, and therapeutic potential.

17:15 - Discussion and wrap-up



CATRIN
Czech Advanced
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Institute



RCPTM
Regional Centre of Advanced
Technologies and Materials



**INSTITUTE OF MOLECULAR AND
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Day 2 – Tuesday, May 27, 2025

9:00 - Characterization of Nanomaterials by Microscopy Techniques: TEM, SEM, and AFM (2 hours)

Led by MSc Sukur and Dr. Opletalová

An introduction to the basic principles, applications, and practical insights from research experience using advanced microscopy techniques - transmission electron microscopy (TEM), scanning electron microscopy (SEM), and atomic force microscopy (AFM) - to characterize the morphology, structure, and properties of nanomaterials.

11:00 - Coffee break

11:30 - Toxicology of Nanomaterials (1 hour)

Led by Dr. Polakova

This session will focus on potential toxicological effects of nanomaterials on human health, environmental impact, and safety in nanomaterials research (risk assessment, safety guidelines, responsible research practices).

12:30 - Lunch break

13:30 - Characterization of Materials by Molecular Spectroscopy: Raman, SERS, TERS, CARS (1.5 hours)

Led by Assoc. Prof. Ranc

An exploration of the principles and applications of various molecular spectroscopy techniques, including Raman spectroscopy, surface-enhanced Raman spectroscopy (SERS), tip-enhanced Raman spectroscopy (TERS), and coherent anti-Stokes Raman scattering (CARS), for the characterization of nanomaterials and their interactions with biological systems.

15:00 - Tour of RCPTM facilities (2 hours)



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Day 3 – Wednesday, May 28, 2025

9:00 - ESRs progress report: Session 1 (1 hour)

UP – Sunčica SUKUR

UNIME – Ana Laura CORIA GUTIÉRREZ

NUIM – Giulia FERRARI

MUW – Ines LOPEZ MARTINEZ

10:00 - Coffee break

10:30 - ESRs progress report: Session 2 (1 hour)

CNR – Mohamed SAQAWA

UN – Joshua MOUNTFORD

Cogentech – Beatriz NARANJO MARTÍNEZNTSOL

NTSOL – Sedef ÖZEL

11:30 - Joint discussion: future plans in the project

12:00 - Lunch break

13:00 - Transfer to Olomouc University Hospital

14:00 - Visit to the Institute of Molecular and Translational Medicine (IMTM), Palacký University (2 hours)

This guided visit offers insight into cutting-edge research in molecular medicine and translational science.

16:00 - Closing remarks and end of the program