



Pan-European Network For Neuroscience Research Infrastructure and
Strengthening of Support Capacities (PANERIS)

PANERIS Summer school practical

At the **Life Sciences Center, Vilnius University**

25th-29th August 2025

Vilnius, Lithuania



Instytut Farmakologii
im. Jerzego Maja
Polskiej Akademii Nauk



Instituto
de Medicina
Molecular

João
Lobo
Antunes



Vilniaus
universitetas



Funded by
the European Union

PANERIS project is funded under the HORIZON Europe call HORIZON-WIDERA-2023-ACCESS-04-01 – Pathways to Synergies, as a HORIZON Coordination and Support Action under the title "Pan-European Network for Neuroscience Research Infrastructure and Strengthening of Support capacities" (project no 101160180). The project duration is 24 months, with a start date of 1 May 2024 and an expected end date of 30 April 2026.

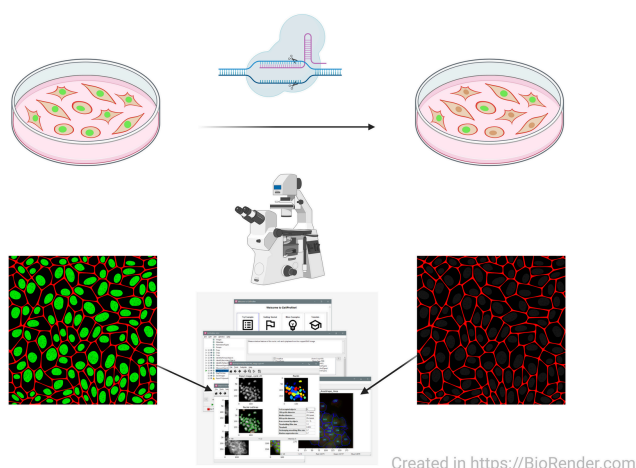
Course 1

Hands-On CRISPR: Practical Gene Editing for Mammalian Systems

Workshop topics

This hands-on CRISPR-Cas9 workshop offers a unique opportunity to develop practical gene editing skills in mammalian cells. Designed to guide participants through every stage of a gene editing experiment - from initial planning to evaluating editing efficiency - the workshop combines theory with real lab work.

Skills



Participants will learn essential techniques, including:

- in silico design of guide RNAs,
- plating of a neuroblastoma reporter cell line stably expressing GFP,
- transfection with a plasmid encoding Cas9 and a GFP-targeting sgRNA to induce knock-out.

You'll gain hands-on experience using widefield microscopy and image analysis software to quantify editing outcomes at the single-cell level - all without relying on sequencing. By the end of the workshop, you'll have deepened your understanding of CRISPR technology and generated and analyzed your own data in a real laboratory environment.

Lecturer

Neringa Daugelavičienė received her PhD in Biochemistry at Vilnius University (Lithuania). Following her doctoral studies, she joined the group of Prof. Urtė Neniškytė at the VU-EMBL Partnership Institute for Genome Editing Technologies. Her research focuses on CRISPR-Cas systems and their applications in mammalian cells. She brings expertise in eukaryotic cell culture, molecular biology, advanced microscopy, and viral vector packaging.



Neringa Daugelavičienė, PhD

neringa.daugelaviciene@gmc.vu.lt

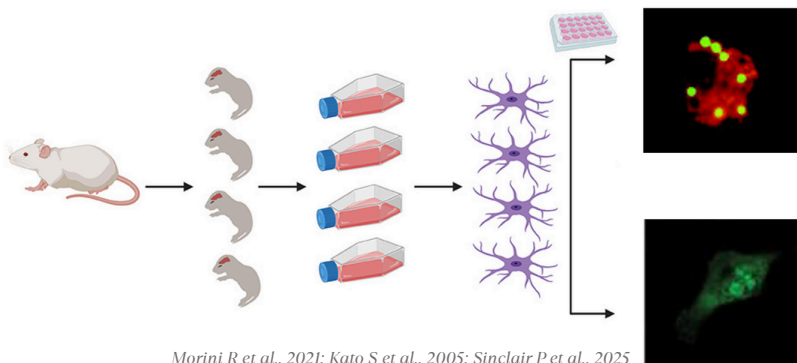
Course 2

Microglia isolation and functional imaging

Workshop topics

This hands-on microglia workshop offers a unique opportunity to develop practical skills in isolating and functionally characterizing primary microglia. Designed to guide participants through each stage of the experimental process – from tissue preparation and cell isolation to performing and analyzing functional assays – the workshop combines essential theoretical knowledge with real laboratory experience.

Skills



Morini R et al., 2021; Kato S et al., 2005; Sinclair P et al., 2025

Participants will learn essential techniques, including:

- isolating primary microglia from mouse pup brain tissue,
- phagocytosis assay,
- oxidative stress assay.

You'll gain hands-on experience using fluorescent microscopy to visually track the uptake of fluorescently labeled particles during phagocytosis and detect reactive oxygen species (ROS) generation using fluorescence-based indicators. These direct visualizations will provide valuable insights into microglial activation, their role in neuroinflammation, immune surveillance, and their overall contribution to maintaining brain homeostasis. Through these techniques, students will develop a deeper understanding of the broader implications of microglial dysfunction in neurological disease processes.

Lecturer

Monika Iešmantaitė is a fourth-year PhD student at the Department of Biological Models within the Vilnius University Life Sciences Center. Her research focuses on the role of cannabinoid receptors in regulating neuroinflammation, with a particular interest in the cellular mechanisms underlying neuroimmune interactions. She employs both in vitro microglial cultures and in vivo mouse models to explore how these receptors influence neuroinflammatory processes.



Monika Iešmantaitė,
PhD student

monika.iesmantaite@gmc.vu.lt