LMU KLINIKUM
LMU Open Science Initiative in Medicine

OSIM Open Science in Medicine

OSC LMU Open Science Center

Reproducible analysis of high-throughput data with R

May 6th 2025 | 9 am – 1 pm

Abstract

The LMU Open Science Initiative in Medicine (OSIM) strives to empower students and researchers to adopt Open Science practices in their everyday research effectively. Analyses of large, complex omics datasets greatly benefit from reproducible workflows and transparent documentation. This course introduces participants to the principles of reproducible analysis. We will use metagenomic data as an example, however, the concepts introduced are applicable to all biological data requiring several steps for their analysis. Participants will receive a brief overview of modern workflow management tools, including Nextflow and Snakemake, illustrating their utility in creating robust, reproducible bioinformatics pipelines. During the practical component, we will focus on the analysis of data and the creation of dynamic, fully documented, and reproducible analysis reports using R Markdown and Quarto. The course will cover best practices for sharing code, data, and analyses in alignment with FAIR (Findable, Accessible, Interoperable, Reusable) principles, fostering openness and transparency in research. Finally, participants will be taught how generative artificial intelligence can help or hinder reproducibility.

Requirements

- Basic familiarity with R and RStudio
- **Software**: R/RStudio
- **Hardware**: Personal computer (laptop) and internet connection
- Access to eduroam / LRZ system
- 1 hour preparation at home

Details

- **Number of participants**: 20
- **Target audience**: Medical students, postgraduate students, postdoctoral fellows, and principal investigators of the Medical or Biology Faculty interested in learning about workflows for reproducible data analysis. A priority is given to members of the Medical Faculty.
- **Time required**: 4 hours on-site, 1 hour preparation at home
- **Type of training**: On-site
- **Date and time**: May 6, 2025, 9:00 am – 1:00 pm
- **Location**: Downtown Campus, CIP room at the Walther-Straub-Institut für Pharmakologie und Toxikologie (Pettenkoferstraße 14, 80336 Munich)
- **Credit for the curriculum** as part of the degree (Module 6) or doctorate (Dr. med., Dr. med. dent., Dr. hum. biol., Dr. rer. nat., or Ph.D. in Medical Research) is possible. ECTS credits can be awarded for the Ph.D. in Medical Research if the course is combined with other short courses (see: http://www.med.lmu.de/).

Sign up under: https://www.pretix.osc.lmu.de/lmu-osim/high-throughput/