INSTITUTE OF MOLECULAR GENETICS OF THE CZECH ACADEMY OF SCIENCES
and **DOCTORAL STUDY PROGRAMS IN BIOMEDICINE at CHARLES UNIVERSITY**
and **THE CZECH ACADEMY OF SCIENCES in PRAGUE**
invite you to the lecture course

49th ADVANCES IN MOLECULAR BIOLOGY AND GENETICS 2025

Typical attendees are **the first and second year PhD students from biomedical programs.** The main aim of the two-week course is to inform the participants about the recent progress in the fields of molecular biology, genetics and biomedicine together with selected new biotechnology approaches. **The course is accredited (MPGS0034) at the Charles University.**

Time and place:

3 – 14 November 2025

in the Milan Hašek Auditorium of the Institute of Molecular Genetics of the Czech Academy of Sciences (IMG), Vídeňská 1083, Praha 4 Krč.

Please follow **https://pokroky.img.cas.cz/** for possible changes.

Program of the course

All lectures will be given **in English** by active scientists.
The course consists of **43 lectures** organized into the following thematic blocks:

DNA/cell nucleus: nuclear microstructure-function relationship, nuclear lamina, spatio-temporal organization, human genome structure and evolution, CRISPR.
RNA: organization and regulation of RNA polymerase II transcription, RNA and innate immunity, non-coding RNAs, RNA and cellular structures.
Proteins: eukaryotic protein synthesis, proteomics and proteomes, structural biology tools, prions, synthetic protein biology.
Cell biology and signaling: integrative biology of intermediate microfilaments, biophysics of ciliary transport, actomyosin in early embryo morphogenesis, interaction between cells and the extracellular matrix, microtubules and signal transduction.
Developmental biology: evo-devo of animal development, early mouse development, zebrafish as a model system in developmental biology, zebrafish as a model system in developmental biology, transposable elements in mammalian development.
Biomedicine – genomics: rare genetic variants in Mendelian complex diseases, sequencing methods, RNA delivery particles, CRISPR and synthetic biology, genetic engineering.
Biomedicine – cancer biology: horizontal mitochondrial transfer in cancer, roles of tumor suppressor p53, metabolic communication in tumors, DNA repair and human pathologies, chromosomal aberrations in cancer cells.
Biomedicine – hematology & immunology: CAR-T biology & therapy, metabolic rewiring in leukemia therapy resistance, tumor immunology and cancer immunotherapy, oxygen transport at the molecular level, non-coding RNAs in leukemias and lymphomas.
Workshopy: academic ecosystem, career in science, research ethics and scientific misconduct, conflict management.

At the end of the course participants receive the credit.

Registration: If you wish to attend the course, please fill-in an online registration form at the address: **https://pokroky.img.cas.cz/** before **23 October 2025.** Any questions concerning the registration and payments, please, send to **pokroky@img.cas.cz.**

Professor Jiří Jonák, M.D., D.Sc. and Professor Petr Svoboda, Ph.D. (organizers of the course)

Course fee:
FREE

More information about the course, including transport and accommodation, can be found on the course website:
https://pokroky.img.cas.cz/