IMG

Institute of Molecular Genetics
of the Czech Academy of Sciences

Regular Wednesday IMG seminar

Jakub Onhajzer, M.Sc.

Laboratory of Cell and Developmental Biology

"Reactivation of oncofetal genes reveals cellular heterogeneity and zonation in intestinal tumors"

Colorectal cancer is one of the most common malignancies. Recent studies have shown that tumor cells can reactivate so-called oncofetal genes — genes normally expressed during embryonic development but silenced in healthy adult intestinal tissue. These include *Trop2* and *Sca1*, both of which are reactivated during the development and progression of intestinal tumors. Using a mouse model, we investigated the timing and molecular mechanisms driving the reactivation of these genes during the transformation of intestinal epithelial cells into tumor cells. By combining flow cytometry, 3D microscopy, and transcriptional profiling, we demonstrate that the re-expression of oncofetal genes is not uniform. Instead, it creates spatial heterogeneity — a phenomenon known as tumor zonation. This zonation is associated with the activation of fetal gene programs and the acquisition of stem cell-like properties. We also show that *Sca1*- and/or *Trop2*-positive tumor cells activate distinct molecular pathways and display unique biological properties. As several oncofetal genes (antigens) are already being explored as potential therapeutic targets, understanding the mechanisms underlying their reactivation could contribute to the development of new targeted therapies for colorectal cancer.

The seminar will be held

on Wednesday 12th March 2025 at 15:00

in the Milan Hašek Auditorium at IMG

(Institute of Molecular Genetics of the Czech Academy of Sciences, Vídeňská 1083, Prague 4)