

Study program: Biomedical Sciences
Supervisor: **Mgr. Zuzana Koledova, PhD.**

Specialization: Cell and Tissue Morphology
Affiliation: Masaryk University, Faculty of Medicine

Research Area: **Developmental Biology:
Regulation of Epithelial Morphogenesis and Cancer**

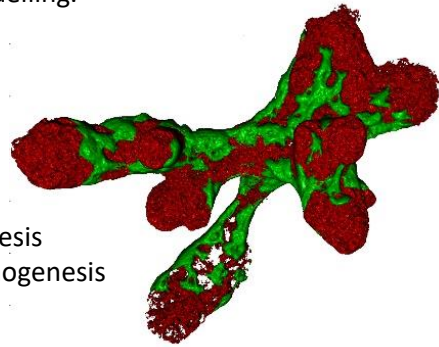
Our research:

We study processes, which govern epithelial morphogenesis and homeostasis, and deregulation of which can lead to developmental defects and cancer. Our ultimate goal is to understand how cells communicate to form complex functional structures. To this end, we use mammary gland as the main model organ because of the major morphological and functional changes it physiologically undergoes postnatally.

During puberty, mammary epithelial ductal tree is formed by branching morphogenesis and undergoes further remodeling with each estrus cycle and pregnancy. These processes are highly regulated systematically by hormones and locally by epithelial-stromal interactions via paracrine signals and mechanosignaling. Deregulation of these signaling mechanisms leads to tumorigenesis.

Methodology: 3D cell culture (organoids), state-of-the-art imaging techniques (time-lapse, confocal and two-photon microscopy), image analysis, genetic mouse models (incl. intravital microscopy), molecular biology techniques (Western blot, qPCR...), mathematical modelling.

More information on our team and publications:
<https://www.med.muni.cz/histology/zuzana-koledova/>



Several PhD research topics are available, including:

1. Mechanical forces in mammary epithelial morphogenesis
2. Signaling dynamics during mammary epithelial morphogenesis
3. Breast cancer-associated fibroblasts

Requirements:

- MSc. degree from biology, biochemistry or its equivalent
- Interest in developmental biology and fundamental processes of life
- High motivation and work ethics, scientific curiosity and critical thinking, self-drive
- Interest in learning new methods, dexterity
- Willingness to travel abroad for research internship and conferences
- Active knowledge of English
- Tissue culture skills, imaging and/or mouse work experience are advantageous

We offer:

- Interdisciplinary projects on highly relevant scientific topics
- Work in a young, enthusiastic team with active international collaborations
- Participation at international meetings, internships at collaborating laboratories abroad
- Competitive salary, based on skills and performance

To apply:

First contact the supervisor Dr. Koledova and send her your CV, motivation letter and a reference letter:
koledova@med.muni.cz. Then apply at <https://biology.med.muni.cz/doctoral-studies>