

PhD Position in Developmental Biology: Fibroblasts in Organ Development

The Sumbalova Koledova laboratory at the Institute of Molecular Genetics (IMG) - BIOCEV Centre, Prague, CZ, is looking for a passionate, intellectually curious doctoral candidate with an interest in developmental biology.

The PhD project will tackle the role of fibroblasts during mammary gland development. The doctoral candidate will analyze genetic mouse models (functional models, lineage tracing) and perform advanced organoid cultures, scRNA sequencing and spatial transcriptomics analyses (among other techniques).

About the research group

In the Sumbalova Koledova's Laboratory of Tissue Morphogenesis and Cancer we study processes and mechanisms, which govern epithelial morphogenesis and homeostasis, and how their deregulation can lead to developmental defects and cancer.

We investigate the interplay of biochemical and mechanical signals in shaping epithelial sheets to functional structures, with particular interests in the role of fibroblasts, ECM mechanics, and signaling dynamics in this process. Our ultimate research goal is to understand, how organs are formed and how tumors emerge.

We use an interdisciplinary approach, combining advanced organoid models, state-of-the-art imaging techniques (time-lapse live cell imaging, confocal and light-sheet microscopy), genetic mouse models, biosensors, single-cell and spatial transcriptomic analyses, mathematical modeling, and AI-driven image analysis.

Our publications most relevant to the project

- Sumbal J, Fre S, **Sumbalova Koledova Z**: Fibroblast-induced mammary epithelial branching depends on fibroblast contractility. *bioRxiv* 2023.03.24.534061.
doi: <http://doi.org/10.1101/2023.03.24.534061>
- Sumbal J, Belisova D, **Koledova Z**: Fibroblasts: The grey eminence of mammary gland development. *Sem Cell Dev Biol.* 2020. S1084-9521(20)30169-5.
doi: <https://doi.org/10.1016/j.semcdb.2020.10.012>
- Sumbal J, **Koledova Z**: FGF signaling in mammary gland fibroblasts regulates multiple fibroblast functions and mammary epithelial morphogenesis. *Development.* 2019; 146(23). pii: dev185306.
doi: <https://doi.org/10.1242/dev.185306>
- **Koledova Z**, Zhang X, Streuli C, Clarke RB, Klein O, Werb, Z, Lu P: SPRY1 Regulates Mammary Epithelial Morphogenesis by Modulating EGFR-dependent Stromal Paracrine Signalling and ECM

Remodeling. *Proc Natl Acad Sci USA*. 2016; 113(39): E5731 – 5740.
doi: <https://doi.org/10.1073/pnas.1611532113>

Requirements and qualifications of the candidate

- Interest in developmental, cell or cancer biology, biophysics or biochemistry,
- Master's degree in biological sciences,
- Highly motivated and independent with excellent communication skills, enthusiastic about performing interdisciplinary work and open to learn and apply new techniques,
- Excellent organizational skills and the ability to maintain meticulous records, with ability to plan and prioritize own work in order to meet deadlines,
- Committed to personal development and updating of knowledge and skills,
- Hands-on experience in work with genetic mouse models, organoids, live cell imaging, 3D immunofluorescence will be viewed positively.
- The IMG strives for gender equality and diversity. We welcome applications from all backgrounds, regardless of gender, nationality, ethnicity, sexual orientation, religion, age, and other components of identity.

We offer

- Position funded from the ERC-CZ grant,
- Fixed-term employment contract, starting from 1 January 2024 or upon agreement,
- 5 weeks of vacation and 3 sick days,
- Employment benefits, including meal allowance and childcare services,
- A collaborative scientific environment supported by state-of-the-art facilities, including excellent imaging and animal model facilities,
- Training, with possible opportunities in the form of specialized courses,
- Support and guidance in individual career development.

How to apply

Written applications should include all of the following in a single pdf file:

1. a cover letter (stating your motivation to apply for this position and a brief description of your research interests and accomplishments),
2. a structured CV,
3. a list of publications (if applicable),
4. contact information for two references.

Send the application to the group leader Dr. Sumbalova Koledova
at zuzana.sumbalova-koledova@img.cas.cz;
e-mail subject title: "PhD in fibroblasts".

Applications will be reviewed on a rolling basis until the position is filled.

About the Institute

The Laboratory of Tissue Morphogenesis and Cancer of the IMG is situated in the BIOCEV Centre (The Biotechnology and Biomedicine Centre of the Academy of Sciences and Charles University). The BIOCEV Centre is a unique research platform and a cutting-edge scientific facility with an international reach. It is a well-established center of excellence in basic research. Its scientific work is divided into five programs – Functional Genomics, Cell Biology and Virology, Structural Biology and Protein Engineering, Biomaterials and Tissue Engineering, and the Development of Diagnostic and Therapeutic Procedures.

More information

- Sumbalova Koledova Laboratory: www.img.cas.cz/group/zuzana-sumbalova-koledova/
- X (former Twitter): [@KoledovaZuzana](https://twitter.com/KoledovaZuzana)
- IMG: www.img.cas.cz/en/
- BIOCEV: www.biocev.eu/en
- For further information about the position, contact Dr. Sumbalova Koledova (zuzana.sumbalova-koledova@img.cas.cz)