

**Doctoral study program: Biomedical Sciences**

**Form:** *doctoral (present)*

**Department:** Histology and Embryology, Faculty of Medicine, Masaryk University

**Supervisor:** Mgr. Dáša Boháčiková, Ph.D.

**Consultant:** Mgr. Jana Slováčková, Ph.D.

**Ph.D. position:**

**Using stem cell-based models to study Glioblastoma**

**Annotation:**

Glioblastoma, IDH-wildtype (GBM) is the most aggressive primary brain tumor, characterized by its high invasivity and poor prognosis. Despite extensive research, effective treatment strategies remain limited. Our laboratory has developed "GLICO" models, a co-culture system combining GBM tumoroids and human-induced pluripotent stem cell (iPSC)-derived brain organoids, allowing us to model tumor growth and invasion in a physiologically relevant 3D environment. Using this model, we aim to investigate the interactions between GBM and the healthy brain microenvironment, focusing on the mechanisms driving tumor invasivity. The Ph.D. candidate will gain expertise in stem cell culture, advanced microscopy techniques, and tumor–microenvironment interactions. In collaboration with clinical researchers at St. Anne’s Faculty Hospital in Brno, the student will also have the opportunity to work with clinical samples and ongoing translational studies. This project will contribute to a better understanding of glioblastoma pathogenesis, providing new insights that could inform future therapeutic strategies.

**Funding of the research:**

Currently, our research is supported by two active grants from **AZV and GACR**, which will contribute to funding this Ph.D. position. Additionally, we are continuously seeking further funding opportunities, making it likely that additional grant resources will be available to support this position in the future.

- **NW24-08-00157 2024-2027**

Využití 3D modelu cerebrálních organoidů pro objasnění mechanismů rezistence léčby a rozvoje recidivy u glioblastomu

- **GA24-11357S 2024-2026**

Vývoj modelů mozkových organoidů pro studium úlohy buněčné senescence v patogenezi glioblastomu

**Information on funding PGS positions:**

The program requires that all PhD students have some means of financial support of min. 25 000 CZK per month. This is often a combination of various sources (grants, scholarship etc.)

**Masaryk University, Faculty of Medicine**

Kamenice 753/5, 625 00 Brno, Czech Republic

T: +420 549 49 2910, E: [info@med.muni.cz](mailto:info@med.muni.cz), [www.med.muni.cz](http://www.med.muni.cz)

Bank account: KB Brno, Ref. No.: 85636621/0100, ID: 00216224, Tax ID: CZ00216224

Please quote the Reference Number in your reply.

**Requirements for the student according to the Doctoral Board:**

The student's minimum publication activity within the course of study is one first-author publication with an IF value above the median in the field or 2 first-author publications in journals with an IF value in the 3rd quartile in the field (Q3). A condition for successful completion of the studies is also a foreign internship of at least 1 month, which is an inseparable part of the studies. As part of their studies, students will also participate in the teaching.

**Information about supervisor:**

Supervisor, Mgr. Dáša Boháčiková, Ph.D., is a leading expert in stem cell biology, neurodifferentiation mechanisms, and disease modelling using stem cell-based approaches. With an international research team, she has published over 40 scientific articles on these topics. Since 2020, her research has also focused on glioblastoma multiforme, aiming to uncover its mechanisms of action and identify clinically relevant targets for potential treatments. Her work integrates advanced stem cell technologies, 3D brain models, and translational neuroscience, bridging fundamental research with clinical applications.

Consultant, Mgr. Jana Slováčková, Ph.D., is a molecular biologist specializing in tumor molecular mechanisms. In her current role, she has successfully established patient-derived tumoroid cultures and routinely utilizes the GLICO co-culture system, integrating GBM tumoroids with human iPSC-derived cerebral organoids. Her expertise includes microscopic analysis of tumor invasivity and drug testing, contributing to the development of physiologically relevant models for studying glioblastoma progression and potential therapeutic strategies.

The project is based in the Department of Histology and Embryology, an expert center for working with iPSCs and 3D neuronal models. The laboratory has extensive experience in stem cell technologies, organoid models, and neural tissue engineering. The project also benefits from strong interdisciplinary collaboration with clinical researchers, ensuring a translational perspective.