

**Affiliation:** Masaryk University, Faculty of Medicine  
**Study program:** PhD program Biomedical Sciences  
**Specialization:** Cell and Tissue Morphology  
**Workplace:** Department of Anatomy, Faculty of Medicine, MU  
**Form of study:** Full-time

**Supervisor:** doc. MUDr. Marek Joukal, Ph.D.; mjoukal@med.muni.cz

**Title:** Changes of the Brain Barriers Induced by Diabetes Mellitus

**Brief annotation (max 200 words):** The Diabetes Mellitus (DM) is a chronic disease with increasing incidence and prevalence. The DM has negative impact on the whole organism including the brain tissue. The delayed complication of the DM is the diabetic encephalopathy (DE) that includes microvascular changes in brain parenchyma. Therefore, blood-brain (BBB) and blood-cerebrospinal fluid barrier (B-CSF-B) may play an important role in development of the DE. The aim of the proposed doctoral topic is to focus on molecular changes of endothelial cells of the BBB and epithelial cells of the choroid plexus (B-CSF-B). Specifically, the pro- and anti-inflammatory cytokines and chemokines as well as expression of the tight junction proteins will be assessed using immunohistochemical methods, western blot and RT-PCR on *in vivo* and *in vitro* models.

**Funding:**

The PhD position is supported by InGA projects.

**Requirements:**

- Graduate student of the General Medicine, Molecular Biology or Biochemistry
- Experience with the lab work – *in vivo* models, IHC, WB, RT-PCR
- Active knowledge of English (min. B2)

Requirements to successfully obtain a PhD degree in the Biomedical Sciences PhD program:

- Have at least one first author publication in an international research journal with an impact factor above the median IF in the field or have two first author publications with the IF in Q3. Importantly, the affiliation to the Faculty of Medicine, Masaryk University must be listed.
- Gain a set of minimum credits (240 ECTS in 4-year study period), pass 4 faculty-wide courses + an English language course and 4 field-specific courses.
- Pass the doctoral state exam.
- Take an active part in teaching.
- Participate in the annual PhD conference.
- Present research outcomes at least once at an international conference (poster, presentation).
- Spend at least one month abroad on an internship.

**Additional information on the supervisor:** <https://anatomy.med.muni.cz/>

**Masaryk University, Faculty of Medicine**

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