MUNI
MED

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

**Supervisor:** Andrea Vítečková Wünschová PhD
**Lab´s website:**
Cooperation with Institute of Biophysics Academy of Sciences Czech Republic – webpage: https://www.ibp.cz/en/research/departments/biophysics-of-immune-systems/research-profile/group-of-vitecek-jan

**Title:** A 3D printing as a tool to study cardiovascular system

**Brief annotation:**
Cardiovascular diseases have a high rate of mortality and morbidity worldwide. Molecular mechanisms causing these diseases are unclear. Preclinical studies often use animal models, however, it does not allow high-throughput testing. Also it is difficult to study certain aspects of mentioned diseases. Thus, *in vitro* models can be an interesting alternative mainly when human blood or cells are employed.

The main task of the study will be focused on preparation of 3D printed models with brain aneurysm due to starting AZV grant Blood Flow Modelling in Intracranial Vessels in Relationship to Endothelium Changes and Development of Intracranial Aneurysm. Stenosis and ischemic cerebrovascular diseases will be studied next to it and are focus of another AZV grant NV19-04-00270 Assessment of emodynamic Parameters of Stable and Unstable Atherosclerotic Plaques in the Carotid Arteries in *in vitro* Models.

**Funding:**
AZV grant starting this year 2022 called Blood Flow Modelling in Intracranial Vessels in Relationship to Endothelium Changes and Development of Intracranial Aneurysm. The supervisor is a holder of this grant.

**Requirements:**
Due to interdisciplinary topic a student should be proficient in molecular biology methods such as real-time PCR or biochemical methods or 3D printing or hemodynamics. It is necessary to be interested in other mentioned methods and willing to learn. Creativity is very welcome. The student should be able to communicate in English to be able to publish papers and to be part of exchange programs abroad.