

**Doctoral study program:** Biomedical Sciences

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

**Department:** Department of Biology, Faculty of Medicine, MU, Brno

**Supervisor:** prof. MUDr. David Šmajš, Ph.D. / Consultant: Mgr. Juraj. Bosák, Ph.D.

**Ph.D. position:** **The role of *Escherichia coli* in human infections and in malignancies of the gastrointestinal tract**

### **Annotation**

*Escherichia coli* is a commensal of the human gastrointestinal tract, but also one of the most important human pathogens, which emerged from nonpathogenic strains by acquiring virulence factors. While *E. coli* have been clearly identified as the causative agent for infections of urinary tract and diarrheal conditions, the role of *E. coli* in other pathologies, such as inflammatory bowel diseases and colorectal cancer, remains unclear. At the same time, several probiotic *E. coli* preparations are used in the human medicine for decades. The PhD thesis will characterize *E. coli* from various sources including human resident flora (potential probiotic candidates) and isolates from malignancies of the gastrointestinal tract and other conditions. These *E. coli* isolates will be analyzed on a genomic level in combination with functional/phenotypic analyses to reveal their effect (beneficial or adverse) on human host cells under *in vitro*, *ex vivo*, and *in vivo* conditions.

### **Funding for the research**

The work will be funded by the National Institute of Virology and Bacteriology (Programme EXCELES, ID Project No. LX22NPO5103).

### **Information on funding PGS positions**

The student will receive a part-time position (0.5), which will be funded by the grant funds and/or by institutional funds (BULF/MU Brno).

### **Requirements for the student according to the Board for the PhD studies in Healthcare**

#### **Simulation at MU**

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. An excellent knowledge of the English language is assumed.

### **Supervisor**

D. Šmajš is the author or co-author of more than 140 papers in the international scientific impacted journals, with more than 4,000 citations according to WoS; his H-index is 33. He is also the author or co-author of several textbooks. He has been the principal investigator of more than 20 grants (GAČR, MZd, MŠMT, GAMU, NIH, Bill & Melinda Gates Foundation) and he is also involved in several international projects. He is a supervisor of 3 PhD students, 11 PhD students already successfully finished their studies. He was a supervisor of over 20 diploma students, out of which 12 students received local scientific conference awards.

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