

Doctoral study program: *Biomedical Sciences (at Department of Biology)*

Form: *doctoral (present)*

Department: *Mechanobiology of Disease, FNUSA-ICRC*

Supervisor: *Pavel Šimara, Ph.D.*

Ph.D. position: *The effect of mechanical stimuli on the RNA splicing*

Annotation

Several studies published in recent years brought evidence that RNA-splicing is altered when mechanical stimuli are applied. This is catalysed through RNA-binding proteins (mainly heterogeneous nuclear ribonucleoproteins, hnRNPs, and serine/arginine-rich proteins, SR) that play a major role in splicing regulation. The process is closely related to three-dimensional spatial re-organization of splicing regulators. Recent data also associate the abnormal regulation of alternative splicing to the occurrence and development of tumors and therapeutic approaches based on targeting the splicing machinery emerge. Tumors display altered mechanical properties compared to healthy tissues that reflect into changes in proliferation, apoptosis, invasion, metastasis, angiogenesis, and metabolism of the tumor cells.

The overall aim of the doctoral thesis is to elucidate the relationship between mechanical signalling and splicing regulation. This topic is novel and ambitious with possible outcomes ranging from describing mechanisms fundamental for cellular biology in the early stages of development to the new insights into the regulation in cancer cells.

Funding of the research

The research will be funded by sources from MUQUABIS (Grant agreement ID: 101070546), institutional support, and further grants which will be obtained in the future

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.)

Requirements for the student according to the Board for the PhD studies

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.

Supervisor

Mgr. Pavel Šimara, PhD

Masaryk University, Faculty of Medicine

Kamenice 753/5, 625 00 Brno, Czech Republic

T: +420 549 49 2910, E: info@med.muni.cz, www.med.muni.cz

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

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