Téma DSP – akademický rok 2019/2020, zahájení studia jaro 2020

Program: Biomedicínské vědy / Biomedical Sciences

Specializace: Molekulární medicína / Molecular Medicine

Forma studia: prezenční

Pracoviště: Středoevropský technologický institut, Centrum molekulární medicíny, Výzkumná skupina Mikroprostředí imunitních buněk

Školitel: doc. Marek Mráz

Téma: **MICROENVIRONMENTAL INTERACTIONS AND REGULATION OF THEIR CROSSTALK IN MALIGNANT B-CELLS BY TRANSCRIPTION FACTORS**

Počet stipendijních míst: 1

Annotation:
PROJECT: We are looking for a motivated PhD student that would like to work on the following project funded by the ERC (European Research Council) Starting grant. It is now understood that B-cell receptor (BCR) signaling is the key pathway deregulated during the onset of many B cell leukemias and lymphomas, and this pathway crosstalk's with other microenvironmental interactions such as adhesion and chemokine signalling. Targettin these interactions is considered a promising target for therapy in B cell malignancies, however, the recently approved inhibitors of BCR signalling are not able to permanently control or cure B cell maliganncies. We have recently revealed for the first time that CD20, and microRNAs miR-150 and miR-155 regulate the B-cell receptor signaling (Mraz et al., Blood, 2014; Musilova et al…Mraz, Blood, 2018; Mraz and Kipps, 2013, Musilova and Mraz, Leukemia, 2015). We have performed a complex profiling of mRNAand non-coding RNAs in the context of the tumor microenvironment interactions. In our preliminary data we have identified several transcription factors that likely modulate the BCR signalling, and its crosstalk with adhesion and chemokine signalling. The PhD candidate will work on the identification of key transcription factors (TFs) and their targets that orchestrate the microenvironmental interactions and activation of malignant cells. This has potential implications for therapy since some of our candidate TFs can be targeted by novel inhibitors, which will be tested pre-clinically in vitro and in mouse models
Key words: BCR signalling, leukemia, chronic lymphocytic leukemia, adhesion, B cells, chemokine signalling, transcription factors
Literature: Seda and Mraz, EJH, 2015; Pavlasova et al, Blood, 2016; Pavlasova et al, Leukemia, 2018; Mraz et al., Blood, 2014
WHAT DO WE OFFER:

- modern laboratories, project funded by the prestigious ERC grant = high risk and high gain, state-of-the-art instrument, stable funding, competitive scholarship
- You will work in a team of young investigators that challenge some long standing problems in the field of hematology. We do basic science, but with the objective to help patients in the future (we have access to primary samples with hem. malignancies, and we suggest novel clinical trials).

WHAT WILL YOU LEARN/DO:

- How to think and work independently as a scientist
- Writing of abstracts and papers (and course in grant writing and presentation of data)

- How to present data and will attend conferences to present your research
- You will spend 1-2 months visit(s) in collaborating labs in Europe or US
- Collaboration with experts in wet lab research and bioinformatics
- Novel methods such as Next Generation Sequencing (Illumina) and genome editing (Crispr).
- How to critically analyze scientific data (regular journal clubs)
- Classical methods of molecular biology (e.g. immunoblotting, flow cytometry, qRT-PCR, cell cultures, cloning), and you will use our in vitro models for microenvironmental interactions, and artificial activation/inhibition signalling pathways to decipher the gene regulatory loops.
- You can supervise bachelor and diploma students if interested

HOW TO APPLY:

- To apply please contact the supervisor and submit a CV by email to: marek.mraz@email.cz (Subject: PhD School).

OTHER INFO: The research is funded by ERC grant, and will be conducted at CEITEC MASARYK UNIVERSITY (campus Bohunice). Our laboratory extensively collaborates with the University Hospital Brno in the same campus to obtain primary samples from patients. The campus provides a vibrant, multidisciplinary and highly collaborative scientific environment. The lab is located in Brno, the second-largest city in Czech Republic that has the biggest concentration of biomedical research in the region. Brno is one of the major cultural hubs, with a vibrant and lively atmosphere housing ~60.000 students. The city has a very good public transport and plenty of interesting places to visit within the reach of trains (within small distance of several major cities such as Prague, Vienna, Bratislava, Budapest) and close to international airports.

Požadavky na uchazeče:

- Motivated smart people that have the “drive” to work independently, but also willing to learn from other people in the lab and collaborate.
- Candidates should have a master’s degree in Molecular biology, Biochemistry, or similar field and have deep interest in molecular biology and cancer cell biology.

Informace o školiteli: aktuální informace o školiteli jsou zveřejněny na https://www.ceitec.cz/doc-mudr-mgr-marek-mraz-ph-d/u26692

ceitec.cz/mrazlab