

Summer Research Internship Project Proposal

Project Topic	Functional characterization of RASAL3 protein in T lymphocytes		
Name	Dr. Michal Šmída	Field	Cell and molecular biology
Department	Molecular Medicine, CEITEC MU	Keywords	RASAL3, T lymphocytes, GTPases, CRISPR/Cas9

Description of the Project (overview, expected outcomes, reason for research, proposed outcomes for student(s))

RASAL3 is a relatively newly identified protein with so far unclear biological function. It presumably regulates the activity of cellular small GTPase Ras (and perhaps other small GTPases), which is essential for proper activation and function of T lymphocytes.

This projects aims to explore the involvement of RASAL3 protein in the activation of several distinct small cellular GTPases with the help of pull-down assays. The student will investigate the consequences of RASAL3 deletion (RASAL3 knockout) upon various T-cell signaling pathways and T-cell functions like adhesion or migration. Using CRISPR/Cas9 technology, the student will abrogate RASAL3 expression in primary human T cells and will verify the alterations in their activity.

Student Requirements (prerequisites, experience, acceptable fields of study, etc.)

- Students of molecular biology, cell biology, biochemistry or related fields
- Laboratory experience of advantage
- Theoretical knowledge of CRISPR/Cas9 system welcome
- Curiosity, enthusiasm, persistence
- Willingness to learn new things

Proposed responsibilities of the student(s)

- Culturing human cells (primary cells and immortalized cell lines)
- Learning new techniques and performing them: analysis of cell signalling, cell adhesion, migration, CRISPR-based gene editing
- Adhering to defined schedule and to set appointments
- Reporting results (and also problems) to the supervisor

Additional important information (max. number of students, additional staff/faculty involved, etc.)

- Max. 1 student