# Open PhD positions for the Academic Year 2021/2022

## Faculty of Science BIOCEV

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| **Laboratory:** | Laboratory of Cancer Cell Invasion |
| **Group Leader:** | Doc. Jan Brábek + Doc. Daniel Rosel |
| **Website:** | http://web.natur.cuni.cz/cellbiol/invalab/ |

| **Project summary** | **Supervisor:** | Doc. Daniel Rosel |
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| **Project title:** | The determination of p130Cas/BCAR1 role in mechanics of Cell-ECM mechanosensing. | |

*Project description:*

The ability of cells to sense mechanical properties of surrounding environment is crucial for many physiological as well as pathological processes including morphogenesis, tissue homeostasis or cancer. Cells sense these mechanical cues through specialized mechanosensory proteins. One of such mechanosensory proteins is p130Cas. P130Cas is a major substrate of Src proto-oncogene, plays an important role in oncogenic transformation mediated by the v-crk and v-src oncogenes and increased levels of its human ortholog, BCAR1, are associated with exacerbated prognosis in breast cancer patients. The project aims to determine the mechanistic role of CAS substrate domain in mechanosensing and mechanotransduction and to prepare FRET-based p130Cas-derived biosensors of intracellular mechanical tension.

*Candidate profile:*

The PGS candidate should have experience in mammalian cell cultivation techniques and basic fluorescence microscopy. Experience with live-cell microscopy, FRET and biophysical methods analyzing mechanical properties of cells are of further advantage.

*Suggested reading:*

Koudelková L, Brábek J, Rosel D. Src kinase: Key effector in mechanosignalling. Int J Biochem Cell Biol. 2021. doi: 10.1016/j.biocel.2020.105908

Koudelková L, Pataki AC, Tolde O, Pavlik V, Nobis M, Gemperle J, Anderson K, Brábek J, Rosel D. Novel FRET-Based Src Biosensor Reveals Mechanisms of Src Activation and Its Dynamics in Focal Adhesions. Cell Chem Biol. 2019 Feb 21;26(2):255-268.e4. doi: 10.1016/j.chembiol.2018.10.024.

Braniš J, Pataki C, Spörrer M, Gerum RC, Mainka A, Cermak V, Goldmann WH, Fabry B, Brabek J, Rosel D. The role of focal adhesion anchoring domains of CAS in mechanotransduction. Sci Rep. 2017 Apr 13;7:46233g