

PhD Student Position in Cellular Bionanotechnology/Biophysics

TOPIC: Quantifying interactions that functionally regulate membrane receptors of living cells

Cells express and regulate membrane proteins to control whether or not, how strong and how long they adhere to the surfaces they encounter. Such cell adhesion molecules (CAMs) are membrane receptors that do not only form adhesive interactions, but also activate signal transduction pathways and regulate cellular processes. In regulatory processes termed 'crosstalk', CAMs regulate the activity of other CAMs. This allows the cell to actively adapt its adhesion properties to the environment. In a first attempt we develop a single-cell force spectroscopy (SCFS) based approach to initially characterize one such crosstalk pathway. This PhD project attempts to further develop and apply SCFS to characterize in depth how CAMs are regulated by crosstalk. In addition to the regulation of CAMs, the SCFS assays will allow us to determine how extracellular signals such as ligand-binding to membrane receptors regulate other receptors that control the adhesive properties of cells.

We search for a highly motivated candidate to work in an inspiring multidisciplinary field that combined engineering, biophysics, cell biology and molecular biology. The candidate having a strong background in physics, biophysics, molecular and cell biology will be coached by a vibrant consortium of international experts such as needed to perform an excellent PhD project.

Please send two hardcopies of your application including CV, publication list and three letters of recommendation to Prof. Dr. Daniel Müller, ETH Zurich, D-BSSE, Mattenstrasse 26, CH-4058 Basel, Switzerland.

REFERENCES FOR FURTHER READING

Müller DJ, Helenius J, Alsteens D, Dufrene YF. Force probing surfaces of living cells to molecular resolution. *Nature Chemical Biology* (2009) **5**, 383-390.

Müller DJ, Dufrene YF. Atomic force microscopy as a multifunctional molecular toolbox in nanobiotechnology. *Nature Nanotechnology* (2008) **3**, 261-269.