PhD Program between the Freie Universität Berlin (FUB) and the China Scholarship Council (CSC)

Open PhD position at FUB for CSC scholarship candidates 2018

Please note: the PhD position is only offered to Chinese PhD candidates for application in the framework of the FUB-CSC PhD Program.

Department/Institute:	Department of Biology, Chemistry, Pharmacy / Institute of Chemistry and Biochemistry
Subject area:	Cell Biology, Biophysics
Name of Supervisor:	Prof. Dr. Helge Ewers
Number of open PhD positions:	1
Type of the PhD Study:	Full-time or Sandwich-Model
Project title:	Biophysics of the membrane cytoskeleton

PhD Project description:

Many cellular processes require a precisely controlled spatiotemporal organization of membrane proteins. However, it is not clear, how the cell can compartmentalize proteins in the continuous and fluid plasma membrane. We have recently demonstrated that membrane proteins can be partitioned by the cytoskeleton beneath the plasma membrane in the initial segment of neuronal cells between the axon and the dendritic domain (See Publication #1). Here a periodical arrangement of actin rings creates an array separated by spectrin tetramers that seems to create compartments in which membrane proteins are confined. We now aim to understand the precise contribution of the organization of the membrane cytoskeleton to this process by superresolution microscopy methods and will investigate the motion of cytoskeletal proteins in the plasma membrane by ultrahigh speed single particle tracking. This project includes live cell microscopy of cultured mammalian cells, single molecule microscopy and pharmacological and genetic perturbations of membrane proteins. It also involves image analysis and superresolution imaging. We are looking for a Biologist with a strong interest in microscopy methods or a physicist with an interest in biological problems.

Language requirements:

IELTS 6.5 or TOEFL 95 ibt.

Academic requirements:

Bachelors or Masters degree in Cell Biology, Biochemistry, Biophysics or Physics

Information of the professor or research group leader:

Ewers, Helge, Prof. Dr.
www.bcp.fu-berlin.de/en/chemie/biochemie/research-groups/ewers-group/index.html
Twitter: @ewerslab

Professional Career

Since 2014	W3 Professor for Membrane Biochemistry, Institut für Chemie und Biochemie, Freie Universität Berlin, Germany
Since 2017	Leader of X-ray microscopy group at Helmholtz Zentrum Berlin
2013 - 2014	Senior Lecturer, Randall Division of Cell and Molecular Biophysics, King's College London, United Kingdom
2009 - 2013	Group Leader, Laboratorium für Physikalische Chemie, ETH Zurich, Switzerland

Further professional aspects

2011	Pfizer Research Prize
2011	Holcim Foundation Research Fellowship
2008	Hans-Heinrich-Niemann Prize for Dissertation
2017	Organizer of EMBO Workshop Molecular and Cellular Biology of Septins
since 2017	Editorial Board, Scientific Reports

since 2012 Organizer and Founder of SMLMS meeting series

Selected Publications

1. Albrecht, D., Winterflood, C. M., Sadeghi, M., Tschager, T., Noé, F., and **Ewers, H.** (2016) Nanoscopic compartmentalization of membrane protein motion at the axon initial segment. *J Cell Biol*. **215**, 37–46
2. Mikhaylova, M., Cloin, B. M. C., Finan, K., van den Berg, R., Teeuw, J., Kijanka, M. M., Sokolowski, M., Katrukha, E. A., Maidorn, M., Opazo, F., Moutel, S., Vantard, M., Perez, F., van Bergen en Henegouwen, P. M. P., Hoogenraad, C. C., **Ewers, H.***, and Kapitein, L. C.* (2015) Resolving bundled microtubules using anti-tubulin nanobodies. *Nat Commun*.
3. Kaplan, C., Jing, B., Winterflood, C. M., Bridges, A. A., Occhipinti, P., Schmied, J., Grinhagens, S., Gronemeyer, T., Tinnefeld, P., Gladfelter, A. S., Ries, J., and **Ewers, H.** (2015) The absolute arrangement of subunits in cytoskeletal septin filaments in cells measured by fluorescence microscopy. *Nano Lett*. 10.1021/acs.nanolett.5b00693
4. Ries, J., Kaplan, C., Platonova, E., Eghlidi, H., and **Ewers, H.** (2012) A simple, versatile method for GFP-based super-resolution microscopy via nanobodies. *Nat Methods*.
5. Winterflood, C. M., Platonova, E., Albrecht, D., and **Ewers, H**. (2015) Dual-Color 3D Superresolution Microscopy by Combined Spectral-Demixing and Biplane Imaging. *Biophys J*. **109**, 3–6
6. Platonova, E., Winterflood, C. M., and **Ewers, H.** (2015) A simple method for GFP- and RFP-based dual color single-molecule localization microscopy. *ACS Chem. Biol.* **10**,
7. Kaplan, C., and **Ewers, H.** (2015) Optimized sample preparation for single-molecule localization-based superresolution microscopy in yeast. *Nat Protoc*. **10**, 1007–1021
8. Winterflood, C. M., and **Ewers, H.** (2014) Single-Molecule Localization Microscopy using mCherry. *Chemphyschem*. 10.1002/cphc.201402423
9. **Ewers, H.***, Römer, W.*, … Helenius, A., and Johannes, L. (2010) GM1 structure determines SV40-induced membrane invagination and infection. *Nat Cell Biol*. **12**, 11–8;
10. **Ewers, H.**, Jacobsen, V., Klotzsch, E., Smith, A. E., Helenius, A., and Sandoghdar, V. (2007) Label-free optical detection and tracking of single virions bound to their receptors in supported membrane bilayers. *Nano Lett*. **7**, 2263–2266

Please note: In a first step, the complete application must be submitted to the Beijing Office for evaluation by January 4th, 2018. Please do not contact the professor before. He/She will get in contact with you after having received the complete application via the Beijing Office in January.