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

Open PhD Position at Freie Universität Berlin, offered only to Chinese CSC scholarship candidates 2025

Department/Institute: **Biology, Chemistry, Pharmacy/ Institute of Chemistry & Biochemistry**

Subject area: **Biochemistry, Molecular Neuroscience, Molecular Biology**

Name of Supervisor: **Prof. Volker HAUCKE**

Number of open PhD positions: **2, full-time**

Type of the PhD Study: Full-time PhD study, sandwich is possible for one of the positions

Project title: **Autophagy and axonal vesicle transport in human brain neurons**

PhD Project description:

The ***Haucke laboratory*** aims to understand how organelles dynamically exchange information and materials in health and disease. Our main focus is on the endocytic and endolysosomal system and its roles in neurological and neurodegenerative disorders. The international laboratory uses a broad range of techniques such as proteomics, biochemistry, molecular biology/ genome-engineering, super-resolution light and electron microscopy, and electrophysiology at the cellular and organismal levels.
PhD project 1: Autophagy is a cellular process for the clearance of protein aggregates and defective organelles that is of particular importance to prevent neurodegeneration. The project combines proteomics of organelles isolated from mouse brain or genome-engineered human neurons to understand the content and function of different types of autophagosomes in neurons.
PhD project 2: Neuronal communication involves the release of neurotransmitter from synaptic vesicles at chemical synapses. We combine spatial proteomics with genome-engineering and live imaging of human neurons to unravel the content, ultrastructure and mode of delivery of the precursor vesicles that form synapses in human axons. Such knowledge is crucial for therapies against neurological diseases related to defective axonal transport such as ataxias.
PhD students benefit from a world-class scientific environment and state-of-the-art facilities in one of the most exciting scientific places in Europe.

Language requirements:

- English only; IELTS: 6,5 oder TOEFL: 95 ibt

Academic requirements:

BSc and ideally also an MSc degree in biochemistry, molecular biology, molecular medicine, or neuroscience including practical lab experience as part of an experimental thesis.

Information of the professor or research group leader (website, awards etc.):

Note that the supervisor holds a professorship at the FU Berlin but the laboratory is located at the Leibniz Research Institute for Molecular Pharmacology in Berlin.

See our website for further information: www.leibniz-fmp.de/haucke

Selected recent publications:

Ebner, M., Puchkov, D., Lopez Ortega, O., Muthukottiappan, P., Zillmann, S., Schmied, C., Su, Y., Nikonenko, I., Koddebusch, J., Dornan, G.L., Lucht, M.T., Koka, V., Jang, W., Koch, P.A., Wallroth, A., Lehmann, M., Brügger, B., Pende, M., Winter, D., **Haucke, V. (2023)** Nutrient regulated control of lysosome function by signaling lipid conversion. *Cell* **186**, 5328-5346. doi: 10.1016/j.cell.2023.09.027.

Rizalar, F.S., Lucht, M.T., Petzoldt, A., Kong, S., Sun, J., Telugu, N.S., Diecke, S., Kaas, T., Bullmann, T., Schmied, C., Cho, W., Hallermann, S., Puchkov, D., Sigrist, S.J., **Haucke, V. (2023)** Phosphatidylinositol 3,5-bisphosphate-controlled vesicle transport directs presynapse assembly. *Science* **382** (6667), 223-230. DOI: 10.1126/science.adg1075

Bolz, S., Kaempf, N., Puchkov, D., Krauss, M., Russo, G., Soykan, T., Schmied, C., Lehmann, M., Müller, R., Schultz, C., Perrais, D., Maritzen, M., **Haucke, V. (2023)** Synaptotagmin 1-triggered lipid signaling couples exo- and endocytosis. *Neuron* 111, 3765-3774.e7 https://doi.org/10.1016/j.neuron.2023.08.016

Jang, W., Puchkov, D., Samso, P., Liang, Y.T., Nadler-Holly, M., Sigrist, S.J., Kintscher, U., Liu, F., Mamchaoui, K., Mouly, V., **Haucke, V. (2022)** Endosomal lipid signalling reshapes the endoplasmic reticulum to control mitochondrial function. *Science* **378**, eabq5209 (2022).

Kuijpers, M., Kochlamazashvili, G., Stumpf, A., Puchkov, D., Swaminathan, A., Lucht, M.T., Krause, E., Schmitz, D., **Haucke, V. (2021)** Neuronal autophagy regulates presynaptic neurotransmission by controlling the axonal endoplasmic reticulum. *Neuron* **109**, 299-313 doi: 10.1016/j.neuron.2020.10.005

Soykan T., **Haucke V.***, Kuijpers M.* **(2021)** Mechanism of synaptic protein turnover and its regulation by neuronal activity. *Curr Op Neurobiol* **69**, 76-83

Selected awards of the supervisor:

2023	President of the German Society for Biochemistry & Molecular Biology
2020	ERC Advanced Grant, European Research Council
2020	Feldberg Prize for Research in Physiology and Pharmacology
2020	Professeur invité at the Institute of Psychiatry and Neuroscience of Paris, Université Paris Descartes (iPNP)
2019	Elected Member of the Academia Europaea/ Academy of Europe (AE)
2017	Elected Member of the Berlin-Brandenburg Academy of Sciences (BBAW)
2017	Elected Member of The German National Academy of Sciences, Leopoldina
2017	Avanti Award of the American Society for Biochemistry & Molecular Biology (ASBMB)
2016	Reinhart-Koselleck-Award of the Deutsche Forschungsgemeinschaft (DFG)
2014	Elected Member of the European Molecular Biology Organization (EMBO)
2003	Young Investigator Award (YIP), European Molecular Biology Organization
1998	Long-Term Fellowship Award, Human Frontier Science Program
1997	Long-Term Fellowship Award, European Molecular Biology Organization

Please Note: In a first step, the complete application should be uploaded to the online portal (https://fuberlin.moveon4.de/form/60acfece5d328710e40bdbd5/eng) for evaluation by January 15th, 2025.