



## 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 2019

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

<b><u>Department/Institute:</u></b>	Institute of Chemistry and Biochemistry
<b><u>Subject Area:</u></b>	Biochemistry, Cell/Molecular Biology, Biomedicine
<b><u>Name of Supervisor:</u></b>	Prof. Dr. Petra Knaus
<b><u>Number of Open PhD Positions:</u></b>	1
<b><u>Type of the PhD Study:</u></b>	Full-time
<b><u>Project Title:</u></b>	The Role of BMP Signalling and Mechanotransduction in Vascular Maintenance / Homeostasis

#### **PhD Project Description:**

Bone Morphogenetic Proteins (BMPs) are multifunctional cytokines, which belong to the Transforming Growth Factor beta (TGF- $\beta$ ) superfamily. They fulfil a plethora of cellular functions both in the developing embryo and in the adult organism ranging from organ development to tissue maintenance and regeneration. The BMP pathway is linked to other signaling routes via intense crosstalk. Further, specific mechanical cues such as shear forces, certain ECM characteristics and physical activity are integrated via integrins and mechanoreceptors. Overall, this forms an intricate network, which contributes to homeostasis of cells and tissues including the vascular system. We have previously shown that BMP signaling is involved in endothelial cell permeability as well as sprouting angiogenesis thus regulating vascular integrity. As yet, the precise molecular mechanisms how mechanical stimuli sensed by the endothelium are translated into the BMP pathway are poorly understood. In the proposed project, we aim to investigate the crosstalk of mechanical forces and BMP/growth factor signaling in vascular cells. For this, several biochemical, cell biological and biophysical methods will be applied to characterize cellular signaling capacity and mechanobiology. Further, diverse imaging techniques and genome editing (such as CRISP/Cas) approaches will be used.

#### **Language Requirements:**

IELTS: 6,5 / TOEFL: 95 ibt

#### **Academic Requirements:**

For the envisaged project, the candidate should have a Master's degree preferably in either Cell/Molecular Biology, Biochemistry or Biomedicine. Solid understanding of biological/biochemical topics preferably in the context of signal transduction is a plus. Advanced proficiencies in cell culture and basic biochemical methods are required. Further, experiences with genome editing techniques and microscopy methods are an advantage.

**Information of the Professor or Research Group Leader:**

Petra Knaus received her PhD (Dr. rer. nat) at the Center for Molecular Biology (ZMBH) in Heidelberg in 1991. As a Research Fellow and Associate she did her Postdoctoral Training with Harvey Lodish at the Whitehead Institute for Biomedical Research (MIT, Cambridge, MA, US) until 1996. After her return to Germany, she received a Junior Group position at the Biocenter in Würzburg, in the Department of Walter Sebald. There she established her own lab with the focus on BMP receptor biology and signal transduction. In 2004, she became Full Professor for Biochemistry - Signaltransduction at the Institute for Chemistry and Biochemistry, Freie Universität Berlin. In 2010, she received a W3 Professorship for Biochemistry - Signaltransduction and Regeneration at the Freie Universität and BSRT/Charité.

<http://www.bcp.fu-berlin.de/en/chemie/biochemie/research-groups/knaus-group/index.html>

**Please Note:** In a first step, the complete application should be submitted to the Beijing Office for evaluation by January 4<sup>th</sup>, 2019. 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.