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 Physics / Biophysics and Photosynthesis
Subject area:	Molecular Biology & Biochemistry & Biophysics
Name of Supervisor:	Dr. Yvonne Zilliges, Prof. Dr. Holger Dau
Number of open PhD positions:	2
Type of the PhD Study:	Full-time
Project title:	Identification of key residues in photosynthetic water splitting by generating and analysing genetically modified photosystem II variants in cyanobacteria and green algae

PhD Project description:

Photosystem II (PSII) is one of the most complex and functionally crucial protein complexes on earth. In PSII, solar energy drives the splitting of water into protons and electrons, and molecular oxygen. The elucidation of each partial step of water oxidation along the Mn4CaO5 cluster (inside PSII) is of enormous interest for biomimetic approaches on sustainable production of “solar fuels”.
The genetic modification of particular residues (site-directed mutagenesis) in the protein matrix around the Mn4CaO5 cluster and along the proton and water paths, especially of acidic amino acids which are involved in proton transfer, is the aim of this study. Due to the complexity of PSII (20 subunits, 100 cofactors) the genetic manipulation of the protein could be exclusively done inside the original producers such as cyanobacteria, green algae or plants. We are focusing on thermophilic cyanobacterial genus, namely Thermosynechococcus. The genetic manipulation of this genus, the generation of PSII mutants, the PSII protein preparation and the PSII crystallization are very demanding projects. These project tasks will highly qualify and develop the candidate´s competences in molecular biology and genetics, in phototrophic physiology and metabolism, and in protein and membrane biochemistry.
By combining (finally) site-directed mutagenesis, spectroscopic and structural analysis in our interdisciplinary consortium key residues and key paths within the PSII complex (of Thermosynechococcus) will be identified. These findings both will extend the working model on mechanism of photosynthetic water splitting at an atomistic level and will promote future viable biomimetic approaches on sustainable production of “solar fuels”.

Language requirements:

German: TestDaf: 16 or DSH 2 **OR**
English: IELTS: 6.5 or TOEFL: 95 ibt

Academic requirements:

- Master degree in Biology or Biochemistry or Biophysics is required
-Bachelor degree is not sufficient!!!
-Willingness to become an autonomous, intrinsically motivated, enthusiastic natural scientific researcher and reliable cooperation partner
-Willingness to support university teaching and experimental laboratory managing
-Willingness to work (and to scientifically communicate) in an interdisciplinary way on Physics/Chemistry/Biology

Information of the professor or research group leader:

http://www.physik.fu-berlin.de/en/einrichtungen/ag/ag-dau/index.html
Prof. Dr. Holger Dau – authority in both photosynthetic (biological) and artificial water oxidation

Dr. Yvonne Zilliges – specialist in molecular biology and biochemistry with long-standing expertise in cyanobacterial mutagenesis, physiology and metabolism, and in both photosynthetic light and dark reactions
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.