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

Open PhD Position at Freie Universität Berlin, offered only to Chinese CSC scholarship candidates 2027

Department/Institute: **Department of Biology, Chemistry, Pharmacy, Institute of Chemistry and Biochemistry, Takustr. 3, 14195 Berlin**

Subject area: **Synthetic Organic Chemistry / Natural Product Synthesis / Electrochemisty**

Name of Supervisor: **Prof. Mathias Christmann**

Number of open PhD positions: *1*

Type of the PhD Study: Full-time or Sandwich-Model

Project title: Electrochemical Functionalization and Electroorganocatalysis for Sustainable Organic Synthesis

PhD Project description:

This PhD project will develop sustainable synthetic methods that use electrical current as a tunable reagent for selective C-H functionalization and asymmetric bond formation. Building on NaCl-mediated Shono oxidation of protected amino acids and iodine-enabled enantioselective coupling of aldehydes with sulfur nucleophiles, the work will connect electrochemical functionalization with electroorganocatalysis. The candidate will study mediator, electrode, electrolyte and catalyst effects; establish substrate scope and functional-group tolerance; and use cyclic voltammetry, control experiments and product studies to clarify reaction pathways.

The aim is to identify mild, scalable methods that reduce the use of stoichiometric oxidants and precious metals while giving access to chiral sulfur-containing building blocks, dehydroamino acids and related intermediates for natural product and medicinal chemistry. Promising reactions will be translated from screening scale to preparative batch electrolysis, with attention to selectivity, atom economy, energy input and operational safety.

[1] M. Gausmann, N. Kreidt and M. Christmann, Electrosynthesis of Protected Dehydroamino Acids, *Org. Lett.* 2023, 25, 2228-2232, DOI: 10.1021/acs.orglett.3c00403.

[2] Z. Wang, M. Gausmann, J.-H. Dickoff and M. Christmann, Iodine-enabled organoelectrocatalysis: enantioselective cross dehydrogenative coupling of sulfides and aldehydes, *Green Chem.* 2024, 26, 2546-2551, DOI: 10.1039/D3GC03828A.

Language requirements:

- IELTS: 6,5 oder TOEFL: 95 ibt

Academic requirements:

Master's degree in Chemistry or a closely related field. A strong background in organic and synthetic chemistry is required. Practical experience in organic synthesis, natural product synthesis and/or catalysis is desirable. Experience with standard methods for the purification and characterization of organic compounds is expected.

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

Prof. Dr. Mathias Christmann is Full Professor of Organic Chemistry at Freie Universität Berlin and head of the Christmann Research Group at the Institute of Chemistry and Biochemistry. His research focuses on synthetic organic chemistry, natural product total synthesis, the development of new synthetic methods, organocatalysis and sustainable chemistry. He received the Carl Duisberg Memorial Prize (2013), the DECHEMA Young Scientist Award for Natural Products Research (2012), as well as fellowships from the Fonds der Chemischen Industrie.

Website:
https://www.bcp.fu-berlin.de/en/chemie/chemie/forschung/OrgChem/christmann/index.html

Publications of the group:
https://www.bcp.fu-berlin.de/en/chemie/chemie/forschung/OrgChem/christmann/Publications/index.html

Information on FU Berlin:
https://www.fu-berlin.de/universitaet/leitbegriffe/filmportraet/filmportraet_englisch_lang/index.html

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, 2027.