



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 2026**

Department/Institute: [Department of Biology, Chemistry, and Pharmacy]

Subject area: [Glycomics]

Name of Supervisor: [Kevin Pagel]

Number of open PhD positions: [1]

Type of the PhD Study: [Full-time]

Project title: [Development of an automated high throughput glycomics platform]

PhD Project description:

Almost all membrane proteins are modified by complex carbohydrates, also called glycans. These complex structures can change drastically in disease states such as cancer and inflammation. Although there is a well-recognized potential for glycan analysis to identify diseases at an early stage, practical challenges have limited clinical translation. This project will address three key hurdles: 1) The isolation of carbohydrates is laborious and lacks standardization leading to poor reproducibility. 2) Typical analysis using liquid chromatography-mass spectrometry analysis is time consuming (>30 min) leading to low throughput. 3) Data analysis pipelines lack automation, are error prone and require expert knowledge leading to a large degree of wrongly assigned structures.

To overcome these challenges, the student will develop standardized glycan isolation protocols based on established workflows that are modified to allow automation. These protocols will be transferred to a robotic sample handling system that will be programmed by the student to perform parallel, automated glycan isolation. Rapid glycan analysis procedures will be developed by the student based on our gas-phase chromatography technique and optimized for the separation of glycans. These procedures will be optimized for several glycan classes (O-glycans, N-glycans and glycosaminoglycans). Importantly, the student will collect so-called collisional cross sections (CCS) of the analyzed glycans. These CCS values will be integrated into a curated database containing the molecular features of each structure. Automated data analysis procedures including assignment and scoring algorithms will be developed by the student using the CCS database.

Language requirements:

IELTS: 6,5 or TOEFL: 95 ibt

Academic requirements:

Only candidates with a MSc in chemistry, pharmacy or closely related subjects will be considered. Experience with the operation and maintenance of mass spectrometers and the analysis of MS/MS spectra is required. Familiarity with the isolation of glycans and/or glycopeptides is a strong positive.

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

Prof. Dr. Kevin Pagel holds a full professorship position (W3) in Bioorganic Chemistry at the Department of Biology, Chemistry, and Pharmacy at Freie Universität Berlin and a guest position at the Fritz Haber Institute of the Max Planck Society. The research team led by Prof. Dr. Pagel pioneered the characterization of isomeric glycans using gas-phase techniques, most notably the integration of ion-mobility and IR spectroscopy to identify exact glycan structures inside mass spectrometers. These findings have been published in leading academic journals including Nature, Nature Chemistry, JACS, Angewandte Chemie and Nature Communications. The contributions of Prof. Dr. Kevin Pagel (h index > 50) have been well-recognized by the scientific community by > 8000 citations and academic distinctions including the Fresenius Lectureship from the German chemical society and the Ron Hites award from the American Society of Mass Spectrometry.

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 December 15th, 2025.