Mark Hardmeier

me@markhardmeier.com ● (+44) 5651 1951 ● London, UK ● Webpage

RESEARCH EXPERIENCE

Associate Lecturer **June 2024 – Sept. 2024**
Supervised by: Michael Cook *SoP UCL, London, UK*

- The PI, Mike, is a lecturer in pharmaceutics at the School of Pharmacy (UCL), my role involved experimental planning and supervision of PhD and MSc students as well as support in lecturing and teaching.

PhD Research **2019 – 2023**
Supervised by: Gemma-Louise Davies & Gareth Williams *UCL, London, UK*

- The Davies Lab works on bio-functional nanomaterial focusing on the development of MRI contrast agents.
- My PhD thesis revolved around the development of glycodendritic fluorescent nanoparticles for early detection of mucinous adenocarcinoma. This involved:
    - Synthesis of nanomaterials, organic molecules, and their characterization (DLS/Zeta, HPLC, IR, NTA, fluorescence/UV-Vis Spectroscopy, TEM, TGA).
    - Surface functionalisation of nanoparticles and monitoring of the reactions (qNMR, GC-MS, HS-GC, XPS).
    - Characterization and validation of functionalised nanoparticles on cancer (CaCo-2) and healthy murine cells (L929) using cytotoxicity, adherence assays (DLS) and SPR measurements.
- During these years I developed resilience and perseverance to continue in a project with low positive feedback. Skills like adaptability and problem solving were important to pursue the aim even when the expected results were not met. Data analysis and presentation skills were crucial to successfully gain useful feedback and engage in collaboration. To finish my PhD, I improved my writing and data analysis skills while writing the thesis.

MSc Research **2017 – 2019**
Supervised by: Michal Shoshan & Elisabeth Engelsberger *ETH Zürich, CH*
Wennemers Lab

- The Wennemers lab is interested in peptide-based chemistry with an emphasis on peptide catalysts and supramolecular collagen structures. My project was to use SPPS to synthesize different modified peptide additives that act as stabilizers for platinum nanoparticles for liver cancer targeting.
- During this project I learned SPPS, modification and purification of peptides (preparative HPLC), characterisations of peptides (NMR, HPLC, MS) and nanoparticles (TEM). Essential for my thesis was to work as a team under close supervision, as well as time managing of different parallel experiments.

Supervised by: Bartosz Lewandowsky & Matthew Aronoff *ETH Zürich, CH*

- This project revolved around native chemical ligation and the development of a peptide catalyst for peptide couplings. My project aim was the synthesis of a plausible peptide-based catalyst through SPPS and testing in different conditions with different reagents to prove its catalytic activity.
- While working on this I learned synthesis, purification, and characterisation (HPLC, MS, NMR) of peptides, analysis of catalytic activity via HPLC-MS. This work helped me to learn, collaborating, and team work under stress in a tight workplace.

Supervised by: Fred F. Damberger & Sebastian Campagne *ETH Zürich, CH*
Allain Lab

- This project involved NMR titration experiments (HNCO, HN(CA)CO, CBCACONH, HNCACB) to analyse interactions of DNA oligonucleotides with RNA recognition motifs (RBM39).
- During this project I was trained in NMR techniques and structural assignments of NMR. While working in the Allain lab I was motivated for independent work and resilience to work on the peptide assignment.

LANGUAGES

- **Languages:** Englisch (fluent), German (fluent), Spanish (native), Swiss-German (fluent) and French (limited).

TEACHING EXPERIENCE

University College London

UPCSE – Undergraduate preparatory certificate **2022 – 2023**, *London, UK*

- Teaching pre-undergraduate students and their preparation for university through lab tutorials and demonstrations. My responsibility was focused on practical lab skills and planning experiments. Working with the students taught me team work and the sensitivity required to approach each student independently to teach them relative to their needs.

Synthesis and Characterization Techniques **2022**, *London, UK*

- Supervising weekly organic chemistry laboratory practicals for third-year students and instructing in synthesis and analysis of the assigned tasks.

Analysis and Quality Control **2021**, *London, UK*

- Supervising weekly pharmaceutical laboratory for masters students. Teaching FT-IR and marking assignments provided me practice in concise and effective teaching under time pressure.

Swiss Federal Institute of Technology Zürich

Teaching assistant for Organic Chemistry I & II **2015 - 2016**, Zürich, *CH*

- Teaching tutorials to first-year biologists, pharmacists, and health technologists in preparation for the first-year exams in organic chemistry. These classes varied between 5 to 50 students and provided me with presentation skills, experience teaching and interacting with students in close contact.

EDUCATION

University College London **Sept. 2019 – Mar. 2024**

PhD, Biofunctional inorganic nanomaterials *London, UK*

- Development of a modular nanostructure: Saccharide modified nanomaterials for applications in adenocarcinoma detection via mucoadhesion.

Swiss Federal Institute of Technology Zürich **Jan. 2017 - May. 2019**

MSc, Chemical Biology *Zürich, CH*

- Highly focused on peptide chemistry and NMR with interest in supramolecular chemistry, glycochemistry and protein modifications. Average mark: 5 out of 6 (Good, 76%)

Swiss Federal Institute of Technology Zürich **Sept. 2013 - Mar. 2018**

BSc, Biology *Zürich, CH*

- Highly focused on Organic chemistry and chemical biology. Average mark: 4.8 out of 6 (Good, 72%)

REFEREES

Dr Gemma-Louise Davies
Associate Professor of Nanomaterials
School of Chemistry
University of Birmingham
g.davies.7@bham.ac.uk

Prof. Gareth Williams
Professor of Pharmaceutical Materials Science
School of Pharmacy
University College London
g.williams@ucl.ac.uk