Dr. Eng. Jürgen Brem

SUMMARY

Experienced (medicinal) chemist with strong interpersonal skills and >10 years deep drug discovery experience, 8+ years line management experience, 7+ years manager experience (project management, multidisciplinary team management and administration of multidisciplinary teams working in matrix system). Extensive experience in leading and building interdisciplinary teams (industry-industry collaborations and industry-academia consortia's) and CRO management. Expert-level knowledge and experience of modern aspects of small molecule optimization including QSAR, CADD, the role of physiochemical properties in compound quality, interpretation of *in vitro* and *in vivo* PK&PD and tox studies and the key aspects that drive human dose. Long term experience working with small-molecule drug discovery development from target identification (tractability assessments, hit-finding strategies) to clinical candidate stage. Experience in project budgeting, grant writing and review, in patent writing and patent scouting. Advanced domain knowledge enzymology, structural biology and computational chemistry. Experience with different modalities: oral small molecules (SM) including beyond rule-of-5 therapeutics, IV drugs, gut restricted SM, and some experience with LAI (long acting injectables), prodrugs, cyclic peptides, and ADCs.

WORKING & RESEARCH EXPERIENCE (Selected)

2023-2025 — ***Director Drug Discovery,* Lead Pharma, The Netherlands**
Obesity, Immunology and (Immuno)-Oncology therapeutic areas - project and team leader.

2021-2023 — ***Principal Scientist Medicinal Chemistry*, Janssen (Johnson & Johnson), Belgium**
Oncology, microbiome and infectious disease project and team leader (Modalities: small molecules, ADCs, peptides, long-acting injectables). Responsible for generating high quality, IP free chemical starting points for projects and driving innovation. Patent writing and busting, people leadership, coaching, mentoring, development, computer-aided drug design(CADD), AI ML, SBDD and FBDD.

2017-2020 — ***GlaxoSmithKline Open Lab Fellow*, GSK Spain and Oxford University**
Providing technical expertise for early-stage drug discovery projects (selection of potential new targets, novel assay and High- throughput screening development) in the GlaxoSmithKline´s Tres Cantos site.

2015-2021 — ***Scientific Project Leader and Manager*, IMI ENABLE and University of Oxford, United Kingdom**
Led and managed a team of more than 20 researchers (medicinal chemist, microbiologist, ADME, and *in vitro, in vivo* pharmacologist and toxicologist). Compound design and design experiments for the enzymology, microbiology, ADME and *in vivo* part of the project (Hit finding strategies, Hit to lead and Lead optimisation). Coordinating and drive the work between European academic institutes and pharmaceutical companies, including GlaxoSmithKline (project lead), Sanofi/Evotec, Basilea, and CROs.

2012-2015 — ***Postdoctoral Research Scientist*, University of Oxford, United Kingdom**
PI: Prof Christopher J. Schofield

Medicinal and bioconjugate chemistry, structure-based drug discovery, fragment-based drug discovery using ESI-MS, ^{19}F NMR, SPR and X-Ray protein crystallography (XChem). Kinetic and mechanistic work with enzymes involved in antibiotic and anticancer agent resistance, mechanistic studies with 10+ enzymes focusing on ID; SM and protein LC-MS studies, protein-ligand studies using native MS studies; steady-state and transient kinetic assays (including assay development); recombinant protein production; experiment design, data analysis, grant and publication writing, presentation of the results in conferences, day-to-day supervision (manager) of undergraduate and postgraduate students.

2010 — ***CIMO Fellow*, Faculty of Medicine, University of Turku, Finland**
Development and implementation of novel immobilization methods and systems for various enzymes.

2008-2010 — ***Research Assistant*, Biotransformation of Organic Substrates Research Centre (University spin-off, biotech), Cluj-Napoca, Romania**
Design and synthesis of small molecules used as substrates for multiple enzymes. Improve biocatalytic process to produce APIs. Setup and run new chemistry and biochemistry lab.

2007 — ***Student Researcher*, Biochemical Engineering Department, Babeș-Bolyai University, Romania**
Purification of proteins from blood, spectroscopy measurements.

EDUCATION

2008-2011 — **PhD in Chemistry** (commendation) (focusing on asymmetric synthesis using enzymes)
Faculty of Chemistry and Chemical Engineering Babes-Bolyai University, Romania

2007-2008	**Master of Science in Cellular Biotransformation** (distinction)
	Faculty of Geology and Biology, Babes-Bolyai University, Romania
2007-2002	**Diploma of Chemical Engineering (Biochemist and Biochemical Engineering)**
	Faculty of Chemistry and Chemical Engineering, Babes-Bolyai University, Romania

Fellowships, Scholarships and Selected Awards

2024-2026	Secured >1.3 Million euro funding
2017-2021	Oxford Innovation (OUI) Fellow and Champion,
2015-2020	Junior Research Fellow at St Cross College, University of Oxford
2008-2011	Scholarship and Special award for excellent performance during PhD studies (POSDRU)
2010	CEEPUS studentship in Hungary and Bulgaria
2008-2009	Domus Hungarica Fellowship, Special award from the Hungary Academy of Science

PUBLICATIONS

Co-authored over **90+ publications** in peer-reviewed journals, **h-index > 30, 9+** granted **patents** and **1 book**. 3 selected works are included below, full list can be accessed via ORCID ID: https://orcid.org/0000-0002-0137-3226 and ResearchGate: https://www.researchgate.net/profile/Juergen_Brem.

- **J. Brem**, T. Panduwawala, J.U. Hansen et al. "Imitation of β-lactam binding enables broad-spectrum metallo-β-lactamase inhibitors", **Nature Chemistry**, (2022) 1, 15-24. ***First and co-corresponding author, Paper featured on the cover of the journal.***

- **J. Brem**, R. Cain, S. Cahill, M. A. McDonough, I. J. Clifton, J.-C. Jiménez-Castellanos, M. B. Avison, J. Spencer, C. W. G. Fishwick, C. J. Schofield, "Structural basis of metallo-β-lactamase, serine-β-lactamase and penicillin-binding protein inhibition by cyclic boronates" **Nature Communications**, (2016) 7:12406.

- **J. Brem**, S.S. van Berkel, W. Aik, A.M. Rydzik, M.B. Avison, I. Pettinati, K.D. Umland, A. Kawamura, J. Spence, T.D. Claridge, M.A. McDonough, C.J. Schofield, "Rhodanine hydrolysis leads to potent thioenolate mediated metallo-β-lactamase inhibition", **Nature Chemistry**, (2014) 6, 1084.

PROFESSIONAL SKILLS

Organic chemistry	Organic synthesis of drug-like molecules and APIs, analysis of the compounds by HPLC, LC-MS, IR, NMR.
Biochemical assays:	Steady-state kinetic assays (both mass spectrometry and plate reader-based), inhibition studies (small molecule inhibitor screening, IC_{50} and Ki determination, mode of inhibition studies); stopped-flow; native ESI-MS (NanoMate (Advion)-Q-TOF (Waters).
Protein-ligand interactions, spectroscopy	Determination of binding constants using UV/Vis and fluorescence spectroscopy techniques, CD spectroscopy, DLS, Protein crystallography and NMR.
Protein crystallography	Protein crystallisation and crystal handling, data collection, data analysis, structure determination, refinement, high throughput crystallography, Small angle X-ray scattering at a basic level and X-Ray Free-Electron Laser experience.
Protein purification/ Molecular Biology	Bacterial culturing, DNA isolation/cloning, site-directed mutagenesis, recombinant protein expression in bacteria and chromatography-based (FPLC) purification (IEX, affinity chromatography, SEC), quality control by SDS-PAGE and LC-MS.
Microbiology and Cell biology:	Inhibition assays (small molecule inhibitor screening, MIC, EC_{50} determination), FoR studies, standard cell culture maintenance techniques. Basic microbiology and cell culture experience.
Data analysis & IT:	Project management software (Microsoft Project and OneNote); Drug discovery software (Dotmatics Vortex, DataWarrior and CDD Vault) Kinetic data analysis software. (Origin, GraphPad Prism, KinTek), Protein crystallography (Phenix, CCP4, Coot, Pymol, GNOM), Matlab, Adobe Photoshop/Illustrator, PyMol, MS Office, instrument based software.
Teaching	Several years of teaching experience, including as lecturer (courses, seminar and teaching laboratory). Co-supervision of >30 undergraduate and graduate students working on their Diploma Projects, Master of Science and PhD degrees.