

Felix Kaspar



CV

Believes that enzymes will be central to the chemistry of tomorrow.

Personal Information

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Date of birth 23.05.1995

Motivation

What motivates me to do science is a fundamental curiosity to discover, understand and apply new technologies and phenomena.

What brings me the most joy in my profession is the moment of scientific discovery. Having a data set come together to support a hypothesis or seeing a concept come to life for the first time are special moments. On a more daily basis, I enjoy working together with students and collaborators to add fresh perspectives on joint projects.

What keeps my job interesting is what I often call *curiosity-driven lateral exploration*: unexpected discoveries leading projects in different and unforeseeable directions and opening new opportunities.

What consistently amazes me about my research is the fact that enzymes actually work. "Loosely aggregated long chains of amino acids doing extremely precise chemistry" does sound rather unlikely. Nonetheless, that is what enables life on earth and almost all the diverse and fascinating chemistry in nature.

Academic Career

- since 2021 **Postdoctoral Researcher & Project Leader**
Technische Universität Braunschweig, Braunschweig, Germany (with Prof. Schallmeyer)
- 2019 - 2020 **PhD** in Biochemistry (*summa cum laude*, with distinction)
Technische Universität Berlin, Berlin, Germany
Thesis: Analytical Methods and Thermodynamic Frameworks for Efficient Biocatalytic Nucleoside Synthesis via Nucleoside Phosphorylases (with Prof. Neubauer, thesis available at <https://doi.org/10.14279/depositonce-11851>)
- 2019 - 2021 Scientist at BioNukleo GmbH (Berlin, Germany)
- 2016 - 2019 **Master Biochemistry / Chemical Biology** (overall average grade: 1.1, with honors)
Technische Universität Braunschweig, Braunschweig, Germany
Thesis: Yield Prediction and Optimization via Thermodynamic Characterization of Enzymatic Nucleoside Phosphorylation Reactions with a UV-Spectroscopy-Based High-Throughput Assay (with Prof. Neubauer)
- 2017 - 2018 Research Internship in the group of Prof. Capon (University of Queensland, Brisbane, Australia)
- 2013 - 2016 **Bachelor Biotechnology** (overall average grade: 1.6)
Technische Universität Braunschweig, Braunschweig, Germany
Thesis: Investigations on the Secondary Metabolism of Nematode-Associated Fungi (with Prof. Stadler)
- 2016 DAAD Research Internship (RISE) in the group of Prof. Arduengo (University of Alabama, Tuscaloosa, USA)
- 2015 DAAD Research Internship (RISE) in the group of Prof. Jelinek (Charles Sturt University, Albury, Australia)
- 2005 - 2013 **Abitur** (overall average grade: 1.2)
König-Karlmann-Gymnasium, Altötting, Germany
- 2011 Otis-Bison High School, Otis, USA

Awards and Honors

- since 2022 Elected chairman of the Junge BWG (Braunschweigische Wissenschaftliche Gesellschaft; member since 2021)
- 2022 *ChemBioChem* ChemBioTalent
- 2022 Forschungspreis der Fakultät III für Nachwuchswissenschaftler*innen (TU Berlin) (PhD thesis award)
- 2020 *The Next Generation of Biocatalysis in Bern 2021* travel grant
- 2019 Freunde des Institutes für Organische Chemie e.V. (TU Braunschweig) award for an outstanding Master degree
- 2017 - 2018 Germany scholarship
- 2015 & 2016 DAAD RISE scholarships

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Key Publications

*corresponding author, #joint first authors (see below for a comprehensive list)

- [1] **Kaspar, F.***, Crameri, F.* Coloring Chemistry: How Mindful Color Choices Improve Chemical Communication, *Angew. Chem. Int. Ed.* **2022**, 61, e202114910, <https://doi.org/10.1002/anie.202114910>
This opinion piece outlines best practices for inclusive figure design, with a specific focus on an audience of life scientists.
- [2] **Kaspar, F.*#**, Brandt, F.#, Westarp, S., Eilert, L., Kemper, S., Kurreck, A., Neubauer, P., Jacob, C., Schallmeyer, A. Biased Borate Esterification during Nucleoside Phosphorylase-Catalyzed Reactions: Apparent Equilibrium Shifts and Kinetic Implications, *Angew. Chem. Int. Ed.* **2023**, e202218492, <https://doi.org/10.1002/anie.202218492>
This project was sparked by a serendipitous discovery, which we pursued purely out of curiosity. Getting to the bottom of this one was a challenging process!
- [3] **Kaspar, F.*** Quality Data from Messy Spectra – How Isometric Points Increase Information Content in Highly Overlapping Spectra, *ChemBioChem* **2023**, 24, e202200744, <https://doi.org/10.1002/cbic.202200744>
This somewhat unconventional tutorial outlines how isometric points (points in a spectrum where nothing happens) can be used to extract valuable information from spectroscopic data featuring high degrees of signal overlap.
- [4] **Kaspar, F.***, Seeger, M., Westarp, S., Köllmann, C., Lehmann, A.P., Pausch, P., Kemper, S., Neubauer, P., Bange, G., Schallmeyer, A., Werz, D.B., Kurreck, A., Diversification of 4'-Methylated Nucleosides by Nucleoside Phosphorylases, *ACS Catalysis* **2021**, 11, 10830-10835, <https://doi.org/10.1021/acscatal.1c02589> (**highlighted by the ESRF**: <https://tinyurl.com/2c5sphjc>)
This highly interdisciplinary study describes how biocatalysis and principles of thermodynamic control can be used to install different nucleobases on a modified sugar scaffold.
- [5] **Kaspar, F.***, Stone, M.R.L., Neubauer, P., Kurreck, A. Route Efficiency Assessment and Review of the Synthesis of β -Nucleosides via *N*-Glycosylation of Nucleobases, *Green Chem.* **2021**, 23, 35-50, <https://doi.org/10.1039/D0GC02665D> (selected as **2020 Green Chemistry Hot Article**)
This comprehensive literature assessment outlines synthetic approaches to contemporary nucleoside synthesis and describes bottlenecks hampering their sustainability.
- [6] Eilert, L., Schallmeyer, A., **Kaspar, F.*** UV-Spectroscopic Detection of (Pyro-)Phosphate with the PUB module, *Anal. Chem.* **2022**, 94, 3432-3435, <https://doi.org/10.1021/acs.analchem.1c05356>
This general method for high-throughput detection of phosphate species proved exceptionally valuable for kinetic studies and enzyme engineering. Definitely our most thorough paper to date.
- [7] **Kaspar, F.***, Neubauer, P., Kurreck, A.* Kinetic Analysis of the Hydrolysis of Pentose-1-Phosphates through Apparent Nucleoside Phosphorolysis Equilibrium Shifts, *Chem-PhysChem* **2021**, 22, 283, <https://doi.org/10.1002/cphc.202000901> (**invited for the front cover**)
This out-of-the-box approach was immensely fun to develop and write up!

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