

## Prof. Dr. Karl Gademann

Department of Chemistry, University of Zurich, Switzerland

### Curriculum Vitae

2017 – present Research councilor (Forschungsrat), Swiss National Science Foundation, Division II, Bern.  
2016 – present Head of the Department of Chemistry and Division III/MNF, University of Zürich.  
2015 – present Full professor for organic chemistry and chemical biology, University of Zürich.  
2014 – 2017 Executive Board Member, Swiss Academy of Sciences, Bern.  
2012 – 2014 Dean of Research, Faculty of Sciences, University of Basel.  
2012 – 2015 Ordinarius für Chemie (full professor/chair), University of Basel.  
2010 – 2012 Extraordinarius (associate professor), University of Basel.  
2006 – 2010 Assistant professor (Tenure Track), EPF Lausanne.  
2002 – 2006 Habilitation ETH Zürich, *venia legendi*, awarded 10/2006.  
2000 – 2001 Postdoctoral fellow (Chemistry and Chemical Biology, Harvard University).  
2000 Postdoctoral fellow (Givaudan Fragrance Research, Dübendorf).  
1997 – 2000 Dr. sc. nat. ETH (ETH Zürich).  
1996 Dipl. Chem. ETH (ETH Zürich).  
1991 – 1992 Internship (CILAG AG, Schaffhausen).

### Research Interests

Natural products influence our lives and change the way we die. We investigate these processes by using synthetic chemistry as a main driver for discovery. Located at the interface of chemistry and biology, reaching out into toxicology, pharmacology, drug discovery, microbiology. Emphasis is placed on natural product structure and function, related to the triangle human/plant/bacteria interactions.

### Currently Funded Research Projects 2015-2020

2019-2023 Swiss National Science Foundation (SNSF) “A New Class of Signal Molecules in Bacteria: Data-Driven Discovery, Mechanism, and Biological Function (Signalin’Bac)“ (CHF 1’868’605, Main PI).  
2019-2023 Swiss National Science Foundation (SNSF) “Mechanism-Based Design, Synthesis, Biological Evaluation, and Delivery of Next-Generation Antibiotics” (CHF 1’100’000, Single PI).  
2019- SNSF “Ion Mobility Mass Spectrometry to Unscramble Complex Biological Samples” (CHF 479’500, Co-PI),  
2018-2019 Dr. Helmut Legerlotz Foundation (CHF 80’000, Single PI)  
2016-2019 SNSF “Copper availability, methanobactin production and methane oxidation in two Swiss lakes: Constraints on copper acquisition by methanotrophic bacteria” (CHF 226’008, Co-PI)

**Lectures (195 total)** at Departments of chemistry, plant biology, oceanography, pharmacy, toxicology, materials science, ecology, law, and the children’s hospital, Recent selected plenaries: Tetrahedron Symposium (2019), French Chemical Society (2017), GECCO (2016), SMM (2016), European Colloquium on Heterocyclic Chemistry (2016), French Total Synthesis Days (2015), Portuguese Chemical Society (2013), Leibniz Symposium (2013), BOSS (2012), Bürgenstock (2011).

### Selected Service Activities

Prof. Dr. Hans E. Schmid-Stiftung, CHE- 100.678.935, president of the foundation. Stiftung für die Paul Karrer-Vorlesung, in Zürich, CHE-110.379.003, vice-president of the foundation. DECHEMA, Wissenschaftlicher Beirat Fachgruppe Biotechnologie/Naturstoffe (2016–), Energy commission of the Swiss Academies, member (2016–2018), Delegate to the Swiss Academies (a+) (2016–2018), DAAD, Scientific expert in the panel for outgoing postdoctoral applications (2015–2016), President, Swiss Academy of Sciences, Platform chemistry (2010-2013). HCERES and AERES evaluation committee member, France (2018, 2017, 2010)

### Selected Honors and Awards

Chemistry Europe Fellow (2020), Novartis Lectureship (2016), National Latsis Prize (2011), Novartis Early Career Award in Organic Chemistry (2010), Ruzicka Prize and Medal, ETH Zürich (2009), Liebig Lectureship of the German Chemical Society (2009)  
ERC Starting Grant (2008, declined in favor of EURYI award), European Young Investigator Award (2007)“, Prix A. F. Schläfli“, Swiss Academy of Sciences (2006)  
Visiting professor, UNICAMP, Universidade Estadual de Campinas, Brasil (2014)

## Major scientific achievements

Karl Gademann and his group established a thriving research program focused on the research question:

*“How do natural products influence our life, our environment, and our health?”*

To address this general question, a series of specific areas are being investigated that include the biogenic origin of natural products, natural products from symbiotic bacteria, new approaches to antibiotic therapy, natural toxins and water quality, and chemical approaches to neurodegenerative diseases.

The research program is driven by the core expertise in synthetic organic chemistry, which is complemented and leveraged by cutting-edge analytical methods, biochemical and cellular assays, animal experiments, to modern approaches of cell surface engineering. In addition, a series of key collaborations with scientists from industry and academia, with researchers from within UZH, from Switzerland, and global institutes further strengthens the research program. Research findings are published in general journals such as in the *Nature* group, *J. Am. Chem. Soc.*, or *Angew. Chem. Int. Ed.* documenting excellence and significance to a broader community, but also in highly specialized journals such as *Organic Letters*, *Synthesis*, *Aquatic Toxicology*, or the *ISME J.* to present detailed studies of significant depth. The research of the Gademann group is often acclaimed in public comments by peers in the field and is also taken up by media on a global level. Outreach activities by Karl Gademann on Twitter or Instagram often evoke over 50'000 impressions per month, therefore strongly resonating in the community and beyond.

The research impact as judged by citations, by alternative metrics, by comments by peers, and invitations for plenaries at global conferences is very strong, as is the impact of training coworkers and students. One patented discovery on catechol-based surface modification (WO2007022645A1) was successfully brought to the market and enabled a start-up company to grow over the last ten years. Past coworkers have obtained full professorships abroad, became chief scientific officers of startup companies, or joined leading global pharmaceutical and chemical companies in research and management.

### Five Recent Key Publications (total 137, and 3 patents)

- Nicolas Lardon, Raphael Liffert, Anthony Linden, Karl Gademann  
The Furan Shuffling Hypothesis: a Biogenetic Proposal for Eremophilane Sesquiterpenoids  
*Angew. Chem. Int. Ed.* **2019**, 58, 7004. doi: 10.1002/anie.201901898
- Mathieu Szponarski, Fabian Schwizer, Thomas R. Ward, Karl Gademann  
On-Cell Catalysis by Surface Engineering of Live Cells with an Artificial Metalloenzyme  
*Nature Communications Chemistry*, **2018**, 1, 84. doi: 10.1038/s42004-018-0087-y
- R. Liffert, A. Linden, K. Gademann,  
Total Synthesis of the Sesquiterpenoid Periconianone A Based on a Postulated Biogenesis,  
*J. Am. Chem. Soc.* **2017**, 139, 16069. doi: 10.1021/jacs.7b10053
- Christian Jenul, Simon Sieber, Christophe Daepfen, Anugraha Mathew, Martina Lardi, Gabriella Pessi, Dominic Hoepfner, Markus Neuburger, Anthony Linden, Karl Gademann\*, Leo Eberl\*  
Biosynthesis of fragin is controlled by a novel quorum sensing signal  
*Nature Commun.* **2018**, 9, 1297. doi: 10.1038/s41467-018-03690-2
- Manuel Scherer, Dominik Bezold, and Karl Gademann,  
Toxicity of the Aeruginosin Chlorosulfopeptides Investigated by Chemical Synthesis”  
*Angew. Chem. Int. Ed.* **2016**, 55, 9427-9431. doi: 10.1002/anie.201602755