Biosketch

Dr.in rer. nat. Katharina Kitzinger

Position in CoE: Key Researcher

Personal Details

Place of birth	St. Pölten, Austria
Nationality	Austrian
Children	–
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List of publications	ORCID: 0000-0001-7382-7103
Academic age	3 years since PhD

Academic Career and Positions Held

I earned my **Master's degree** in **molecular microbiology** from the **University of Vienna** in 2015 (MSc, passed with distinction). Afterwards, I pursued my **PhD** as a **joint degree** (cotutelle de thèse) between the University of Vienna and the Max Planck Institute for Marine Microbiology/University of Bremen, under the supervision of Prof. Dr. Michael Wagner and Prof. Dr. Marcel Kuypers. I completed my PhD in **2019** (passed with distinction), followed by a three-year PostDoc position at the Biogeochemistry Department of the **Max Planck Institute for Marine Microbiology**. Since summer 2022, I am employed as a **staff scientist** at the **Centre for Microbiology and Environmental Systems Science at the University of Vienna**.

Scientific Achievements and Scientific Contribution to the CoE

Scientific Achievements. My research focuses on the **biogeochemistry and microbiology of nitrogen cycling**, where I developed novel setups for stable isotope probing experiments, could show the importance of organic N compounds for nitrifiers in the marine environment and elucidate the different life strategies of ammonia and nitrite oxidizing microorganisms. I use a variety of methods spanning from **cultivation** and investigation of **microbial physiology** under laboratory conditions, to **biogeochemical process measurements via stable isotope incubations in the field**. Additionally, I use state of the art **single cell and molecular techniques** to link the identity of specific microorganisms in complex communities to their activities and determine their growth rates in situ. So far, I have contributed to **11 publications** in leading journals (incl. Nature, Nature Microbiology, Nature Communications, PNAS) arising from international collaborations. For the research done during my PhD, I obtained several awards (**Otto Hahn Medal** by the Max Planck Society, Briese Award for Marine Research, MARUM Research Award for Marine Science), and I was awarded a personal Post-Doc fellowship by the Max Planck Society (**Reimar Lüst Fellowship**). I have given several talks at international conferences, including invited talks. Both at the University of Vienna and the Max Planck Institute for Marine Microbiology, I have been actively involved in teaching, and have supervised or co-supervised students during internships, MSc and PhD projects.

Scientific Contribution to the CoE. I will bring my expertise on nitrogen cycling microorganisms and processes, and on stable isotope probing techniques to several projects in the CoE. Among others, I will lead a work package on the control of nitrous oxide emissions in soils, where we will use a gnotobiotic soil system with defined communities to investigate the effect of land use- and climate-change related perturbations on soil nitrous oxide emissions.

10 Most Important Publications (*relevant for the CoE)

1. *Philippi, M.; **Kitzinger, K.**; Berg, J. S.; Tschitschko, B.; Kidane, A. T.; Littmann, S.; Marchant, H. K.; Storelli, N.; Winkel, L. H. E.; Schubert, C. J.; Mohr, W.; Kuypers, M. M. M. Purple Sulfur Bacteria Fix N2 via Molybdenum-Nitrogenase in a Low Molybdenum Proterozoic Ocean Analogue. *Nat Commun* **2021**, *12* (1), 4774. *https://doi.org/10.1038/s41467-021-25000-z*.
2. *Graf, J. S.; Schorn, S.; **Kitzinger, K.**; Ahmerkamp, S.; Woehle, C.; Huettel, B.; Schubert, C. J.; Kuypers, M. M. M.; Milucka, J. Anaerobic Endosymbiont Generates Energy for Ciliate Host by Denitrification. *Nature* **2021**, *591* (7850), 445–450. *https://doi.org/10.1038/s41586-021-03297-6*.
3. ***Kitzinger, K.**; Tienken, D.; Littmann, S.; Kidane, A. T.; Kuypers, M. M. M.; Milucka, J. Assigning Function to Phylogeny: FISH-NanoSIMS. In *Fluorescence In-Situ Hybridization (FISH) for Microbial Cells*; Azevedo, N. F., Almeida, C., Eds.; Methods in Molecular Biology; Springer US: New York, NY, **2021**; Vol. 2246, pp 207–224. *https://doi.org/10.1007/978-1-0716-1115-9_13*.
4. ***Kitzinger, K.**; Marchant, H. K.; Bristow, L. A.; Herbold, C. W.; Padilla, C. C.; Kidane, A. T.; Littmann, S.; Daims, H.; Pjevac, P.; Stewart, F. J.; Wagner, M.; Kuypers, M. M. M. Single Cell Analyses Reveal Contrasting Life Strategies of the Two Main Nitrifiers in the Ocean. *Nat Commun* **2020**, *11* (1), 767. *https://doi.org/10.1038/s41467-020-14542-3*.
5. *Daebeler, A.; **Kitzinger, K.**; Koch, H.; Herbold, C. W.; Steinfeder, M.; Schwarz, J.; Zechmeister, T.; Karst, S. M.; Albertsen, M.; Nielsen, P. H.; Wagner, M.; Daims, H. Exploring the Upper PH Limits of Nitrite Oxidation: Diversity, Ecophysiology, and Adaptive Traits of Haloalkalitolerant Nitrospira. *ISME J* **2020**, *14* (12), 2967–2979. *https://doi.org/10.1038/s41396-020-0724-1*.
6. ***Kitzinger, K.**; Padilla, C. C.; Marchant, H. K.; Hach, P. F.; Herbold, C. W.; Kidane, A. T.; Könneke, M.; Littmann, S.; Mooshammer, M.; Niggemann, J.; Petrov, S.; Richter, A.; Stewart, F. J.; Wagner, M.; Kuypers, M. M. M.; Bristow, L. A. Cyanate and Urea Are Substrates for Nitrification by Thaumarchaeota in the Marine Environment. *Nat Microbiol* **2019**, *4* (2), 234–243. *https://doi.org/10.1038/s41564-018-0316-2*.
7. ***Kitzinger, K.**; Koch, H.; Lücker, S.; Sedlacek, C. J.; Herbold, C.; Schwarz, J.; Daebeler, A.; Mueller, A. J.; Lukumbuzya, M.; Romano, S.; Leisch, N.; Karst, S. M.; Kirkegaard, R.; Albertsen, M.; Nielsen, P. H.; Wagner, M.; Daims, H. Characterization of the First " Candidatus Nitrotoga" Isolate Reveals Metabolic Versatility and Separate Evolution of Widespread Nitrite-Oxidizing Bacteria. *mBio* **2018**, *9* (4), e01186-18. *https://doi.org/10.1128/mBio.01186-18*.
8. *Koch, H.; Lücker, S.; Albertsen, M.; **Kitzinger, K.**; Herbold, C.; Spieck, E.; Nielsen, P. H.; Wagner, M.; Daims, H. Expanded Metabolic Versatility of Ubiquitous Nitrite-Oxidizing Bacteria from the Genus Nitrospira. *Proc. Natl. Acad. Sci. U.S.A.* **2015**, *112* (36), 11371–11376. *https://doi.org/10.1073/pnas.1506533112*.
9. *Gruber-Dorninger, C.; Pester, M.; **Kitzinger, K.**; Savio, D. F.; Loy, A.; Rattei, T.; Wagner, M.; Daims, H. Functionally Relevant Diversity of Closely Related Nitrospira in Activated Sludge. *ISME J* **2015**, *9* (3), 643–655. *https://doi.org/10.1038/ismej.2014.156*.
10. *Mooshammer, M.; **Kitzinger, K.**; Schintlmeister, A.; Ahmerkamp, S.; Nielsen, J. L.; Nielsen, P. H.; Wagner, M. Flow-through Stable Isotope Probing (Flow-SIP) Minimizes Cross-Feeding in Complex Microbial Communities. *ISME J* **2021**, *15* (1), 348–353. *https://doi.org/10.1038/s41396-020-00761-5*.