

Curriculum Vitae

Univ.-Prof. Dr. rer. nat. Dr. h.c. Michael Wagner

Position in CoE: Director of Research

Personal Details

Place of birth	München, Germany
Nationality	German
Children	4 (1994, 1998, 2012, 2014)
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Profile	ResearcherID: A-7801-2011
List of publications	ORCID: 0000-0002-9778-7684
Academic age	27 years since PhD



Research Institution

I am a member of the [Centre for Microbiology and Environmental Systems Science](#) at the University of Vienna.

Academic Career and Positions Held

I earned a **Master's degree in microbiology** in 1992 (Diploma grade with distinction; 1.0) and received my **PhD** in 1995 (*summa cum laude*) from the **Technische Universität (TU) Munich**, Germany. Subsequently, I did a **PostDoc with Dave Stahl and Bruce Rittman at Northwestern University**, USA, financed by a German Research Foundation (DFG) research fellowship, before returning in 1996 to TU Munich as group leader. There, I obtained my habilitation (*venia docendi*, 2000) and became associate professor (wissenschaftlicher Oberassistent). In 2003, I accepted a **full professorship in Microbial Ecology** at the **University of Vienna** and established the Division of Microbial Ecology. I served as division and department head (2003–2018) and vice dean of the Faculty of Life Science (2005–2010). In 2019, I became **founding director of the Centre for Microbiology and Environmental Systems Science** (full faculty status) at the **University of Vienna**, and I am the Centre's vice-head since 2021. Since 2019, I am **distinguished professor (20%) at Aalborg University, Denmark**, and **visiting professor in Engineering Science at University of Oxford, UK**.

Leadership and Experience in Similar Projects

I have ample experience in leading large research projects, units, and societies, as illustrated below. The last years, my research team was mainly funded by an **ERC Advanced Grant** (2.5 million €) and the **Wittgenstein award** (1.5 million €) of the Austrian Science Fund FWF. Since 1997, I have raised **33 third party fund projects** from Germany, Austria, Denmark, the USA and the EU, as PI and Co-PI (total >11 million €). I was part of a special research area program (DFG), national research networks (FWF), international training networks (EU), and two doctoral schools (FWF). **24 of my former PostDocs and PhD students hold permanent or tenure-track positions in academia, including 14 professorships in 7 countries.**

President of the International Society of Microbial Ecology (ISME) & meeting organizations. I served as incoming president, president, and past president in the team of ISME for 6 years. I was responsible for organizing the ISME-15 meeting in Seoul, Korea, in 2014 (1,600 participants) and was strongly involved in organizing ISME-14 in Copenhagen and ISME-16 in Montreal. Furthermore, I was head of the local organizing committee for the ISME-11 in Vienna in 2006 (2,000 participants). I also was a member of the Program and Steering Committees of the Microbe 2017 Meeting of the American Society for Microbiology (ASM, ~10,000 participants).

Foundation of a new faculty at the University of Vienna. In 2003, I moved together with three young team members (Daims, Horn, Loy) to Vienna to establish under my leadership the Division of Microbial Ecology (DOME), which currently has ~100 members from 27 countries. During the last years, I initiated mergers of our unit with divisions of bioinformatics, terrestrial ecosystem research, and environmental geosciences. Based on my suggestion, in 2019, the rectorate invited us to establish with me as founding director a **new Centre with full faculty status**. The Centre currently has **~200 members** and moved into a new building at the Vienna Biocentre in 2021. Researchers at the Centre have received 8 ERC grants and four of them were recognized as highly cited scientists 2021 (see also our [report 2021](#)).

Panel memberships. My scientific leadership is also reflected by my service as member of the ERC Advanced Grant Panel LS8 (2014, 2016, 2018), and of the Scientific Advisory Boards of the Helmholtz Center for Environmental Research, Leipzig, Germany (since 2018), the Institute of Integrative Biology of the Cell, Gif, France (2018), and the Soehngen Institute of Anaerobic Microbiology, Netherlands (Radboud University, Wageningen University, Technical University Delft, and the Royal Netherlands Institute for Sea Research). I served as external evaluator for the Institute of Molecular Life Sciences and the Institute of Plant Biology at the University of Zurich, Switzerland (2013), and the Institutes for Water and Wetland Research (2014) and for Biological and Environmental Sciences (2021), both at Radboud University, Netherlands.

Pandemic response. In March 2020, I initiated together with colleagues the [Vienna Covid-19 detection initiative](#). Together, we developed a **smart testing pipeline** combining gargling, pooling, and RT-qPCR. This is now offered by the City of Vienna free of charge to the public and has been a major pillar in the fight against the pandemic. Based on these inventions, I initiated a **nationwide SARS-CoV-2 monitoring study involving four universities** and 250 Austrian schools to determine the prevalence of infected pupils and teachers in a representative sample of almost 15,000 persons. We completed six measurement rounds in 2020/2021 and our approach was partly adopted for routine school testing in Austria in 2021/2022. Results were published in Lancet Regional Health:Europe and in Eurosurveillance, with me as last author. Our findings were extensively covered in the media, including main news in Austria, Germany and the Netherlands, and numerous articles in major international newspapers and newsmagazines. I am in the COVID-19 advisory team of the mayor of Vienna and serve as expert in the [Future Operations Platform](#) for interdisciplinary exchange between academia and the public.

Main Research Areas and Most Important Research Achievement

My research spans a variety of topics from **nitrifying microbes**, symbiotic chlamydiae, sulfate-reducing microbes, sponge-microbe interactions, to wastewater microbiology and has led to the **discovery and characterization of major new microbial players & processes**. In 2015, my team discovered together with H. Daims **complete nitrifying bacteria (comammox organisms)** – a finding that significantly changed our perception of the biochemical nitrogen cycle and offers exciting opportunities for more efficient wastewater treatment and a more sustainable agriculture. Our description of comammox was recognized as the most important scientific finding of 2015 by the Danish minister for science. Since 1992, I have authored **282 publications**, most in leading interdisciplinary and disciplinary journals. My publications have been **cited >43,143 times**, I have an **h-factor of 111** (Web of Science; Oct. 2022) and am listed as **highly cited researcher since 2014** by Clarivate. I presented **242 invited talks** in 28 countries. My research achievements were also recognized by memberships in national and international **academies** (Austrian Academy of Sciences OEAW, National German Academy of Sciences Leopoldina, European Academy for Microbiology, American Academy for Microbiology). In addition, I am fellow of the European Molecular Biology Organisation (**EMBO**) and Einstein professor of the Chinese Academy of Sciences. I have received an ERC Advanced Grant and several awards, including the Wittgenstein Award of the FWF (highest science award in Austria), the Schrödinger Prize of the OEAW (lifetime achievement award), the Main Award of the City of Vienna for Life and Technical Sciences, and the Jim Tiedje Award of the ISME (lifetime achievement award). My current research foci

are **nitrifying microbes** and the **development of innovative single cell tools** for genomic and functional characterization of microbiomes. Scientifically, I will mainly **contribute to our CoE** by leading a work package on chemical perturbation of microbiomes and the development and application of **novel chemical imaging methods** (SRS-FISH spectroscopy and sorting) for characterizing the response of **human small and large intestine microbiomes to non-antibiotic drugs**. Furthermore, I will contribute to establishing **spatially resolved single cell transcriptomics** for our joint microbiome research projects.

10 Most Important Publications (*relevant for the CoE)

1. *Ge, X.; Pereira, F. C.; Mitteregger, M.; Berry, D.; Zhang, M.; Hausmann, B.; Zhang, J.; Schintlmeister, A.; **Wagner, M.**; Cheng, J.-X. SRS-FISH: A High-Throughput Platform Linking Microbiome Metabolism to Identity at the Single-Cell Level. *Proc. Natl. Acad. Sci. U.S.A.* **2022**, *119* (26), e2203519119. <https://doi.org/10.1073/pnas.2203519119>.
2. *Willeit, P.; Krause, R.; Lamprecht, B.; Berghold, A.; Hanson, B.; Stelzl, E.; Stoiber, H.; Zuber, J.; Heinen, R.; Köhler, A.; Bernhard, D.; Borena, W.; Doppler, C.; von Laer, D.; Schmidt, H.; Pröll, J.; Steinmetz, I.; **Wagner, M.** Prevalence of RT-QPCR-Detected SARS-CoV-2 Infection at Schools: First Results from the Austrian School-SARS-CoV-2 Prospective Cohort Study. *The Lancet Regional Health – Europe* **2021**, *5*, 100086. <https://doi.org/10.1016/j.lanep.2021.100086>.
3. *Kits, K. D.; Sedlacek, C. J.; Lebedeva, E. V.; Han, P.; Bulaev, A.; Pjevac, P.; Daebeler, A.; Romano, S.; Albertsen, M.; Stein, L. Y.; Daims, H.; **Wagner, M.** Kinetic Analysis of a Complete Nitrifier Reveals an Oligotrophic Lifestyle. *Nature* **2017**, *549* (7671), 269–272. <https://doi.org/10.1038/nature23679>.
4. *Daims, H.; Lebedeva, E. V.; Pjevac, P.; Han, P.; Herbold, C.; Albertsen, M.; Jehmlich, N.; Palatinszky, M.; Vierheilig, J.; Bulaev, A.; Kirkegaard, R. H.; von Bergen, M.; Rattei, T.; Bendinger, B.; Nielsen, P. H.; **Wagner, M.** Complete Nitrification by Nitrospira Bacteria. *Nature* **2015**, *528* (7583), 504–509. <https://doi.org/10.1038/nature16461>.
5. *Palatinszky, M.; Herbold, C.; Jehmlich, N.; Pogoda, M.; Han, P.; von Bergen, M.; Lagkouvardos, I.; Karst, S. M.; Galushko, A.; Koch, H.; Berry, D.; Daims, H.; **Wagner, M.** Cyanate as an Energy Source for Nitrifiers. *Nature* **2015**, *524* (7563), 105–108. <https://doi.org/10.1038/nature14856>.
6. *Berry, D.; Mader, E.; Lee, T. K.; Woebken, D.; Wang, Y.; Zhu, D.; Palatinszky, M.; Schintlmeister, A.; Schmid, M. C.; Hanson, B. T.; Shterzer, N.; Mizrahi, I.; Rauch, I.; Decker, T.; Bocklitz, T.; Popp, J.; Gibson, C. M.; Fowler, P. W.; Huang, W. E.; **Wagner, M.** Tracking Heavy Water (D₂O) Incorporation for Identifying and Sorting Active Microbial Cells. *Proc. Natl. Acad. Sci. U.S.A.* **2015**, *112* (2). <https://doi.org/10.1073/pnas.1420406112>.
7. *Berry, D.; Stecher, B.; Schintlmeister, A.; Reichert, J.; Brugiroux, S.; Wild, B.; Wanek, W.; Richter, A.; Rauch, I.; Decker, T.; Loy, A.; **Wagner, M.** Host-Compound Foraging by Intestinal Microbiota Revealed by Single-Cell Stable Isotope Probing. *Proc. Natl. Acad. Sci. U.S.A.* **2013**, *110* (12), 4720–4725. <https://doi.org/10.1073/pnas.1219247110>.
8. Hatzenpichler, R.; Lebedeva, E. V.; Spieck, E.; Stoecker, K.; Richter, A.; Daims, H.; **Wagner, M.** A Moderately Thermophilic Ammonia-Oxidizing Crenarchaeote from a Hot Spring. *Proc. Natl. Acad. Sci. U.S.A.* **2008**, *105* (6), 2134–2139. <https://doi.org/10.1073/pnas.0708857105>.
9. *Strous, M.; Pelletier, E.; (33 authors); **Wagner, M.**; Le Paslier, D. Deciphering the Evolution and Metabolism of an Anammox Bacterium from a Community Genome. *Nature* **2006**, *440* (7085), 790–794. <https://doi.org/10.1038/nature04647>.
10. *Horn, M.; Collingro, A.; Schmitz-Esser, S.; Beier, C. L.; Purkhold, U.; Fartmann, B.; Brandt, P.; Nyakatura, G. J.; Droege, M.; Frishman, D.; Rattei, T.; Mewes, H.-W.; **Wagner, M.** Illuminating the Evolutionary History of Chlamydiae. *Science* **2004**, *304* (5671), 728–730. <https://doi.org/10.1126/science.1096330>.