

iFAST: The International Forum on Advanced Environmental Sciences and Technology

A series of distinguished seminars by eminent scientists

8 a.m. CST; 9 a.m. EST; 2 p.m. GMT; 10 p.m. Beijing

Wednesday, Dec. 15, 2021



Michael Wagner
UNIVERSITY OF VIENNA

www.microbial-ecology.net/wagner

Michael Wagner is currently vice-head and has been the founding director of the Centre for Microbiology and Environmental Systems Science at the University of Vienna and a distinguished professor at Aalborg University, Denmark. Wagner received his doctoral degree from the Technische Universität Munich, Germany, in 1992, and subsequently worked as a postdoc at Northwestern University, USA, before he returned to Munich as a group leader. In 2003, he became full professor for microbial ecology at the University of Vienna, Austria. Wagner's work spans a variety of topics, including symbiotic chlamydiae, sulfate-reducing microbes, sponge-microbe interactions and wastewater microbiology, as well as nitrifying bacteria and archaea, and has led to the discovery and characterization of major new microbial players and processes. His current research foci are nitrifying bacteria and archaea and the development of innovative single cell tools for the genomic and functional characterization of microbiomes. He has been the president of the International Society for Microbiology (ISME) from 2012 to 2014. He was a senior editor of the *ISME Journal*, a member of various prestigious national and international academies (Austrian Academy of Sciences ÖAW, Leopoldina, European Academy for Microbiology, American Academy for Microbiology), an EMBO fellow and an Einstein professor of the Chinese Academy of Sciences. Wagner holds an ERC Advanced Grant and has received a number of awards, including the Wittgenstein Award of the FWF (highest science award in Austria), the Schrödinger Prize of the Austrian Academy of Sciences, the Main Award of the City of Vienna for Life and Technical Sciences, and the Jim Tiedje Award of the ISME. During the SARS-CoV-2 pandemic Wagner initiated gargle-based PCR testing for pupils and coordinated a large monitoring study of SARS-CoV-2 at Austrian schools.

Understanding nitrifying microbes, the gatekeepers of the nitrogen cycle

Nitrification, the oxidation of ammonia via nitrite to nitrate, is a key process of the global biogeochemical nitrogen cycle. This microbially mediated process plays a major role in fertilizer loss from agricultural soils, greenhouse gas production, and nutrient removal in wastewater treatment plants. In this talk, I will present new insights into the (eco)physiology of ammonia-oxidizing bacteria and archaea as well as the recently discovered complete nitrifiers belonging to the genus *Nitrospira* (comammox organisms) and discuss future strategies to modify the community composition of ammonia oxidizers in a targeted manner in order to minimize anthropogenic damage to the environment. Furthermore, I will highlight the many unknowns in the biochemistry of the electron transport chain of nitrifiers and present initial data on large-scale biomass production of comammox for their subsequent biochemical characterization.



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