Curriculum Vitae

Dr. Oliver Schmidt
Environmental Microbiologist
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Personal Data

Date of birth	11/29/1982
Personal status	unmarried, no children

Research Profile

I am an environmental microbiologist by heart and my interest lie within the diversity of microbial metabolism. So far, I have studied the anaerobic degradation of complex organic matter to methane and carbon dioxide in soil and gut ecosystems. Especially the hydrolysis of biopolymers by primary fermenters and the tight associations of syntrophic secondary fermenters with methanogens have been in the focus of my research. These processes are catalyzed by a complex microbial community in situ, and my research aimed at linking DNA or RNA sequence data to process data obtained via GC and HPLC analysis of anoxic incubations in order to assign a potential function to the often physiologically uncharacterized microbial diversity in the nature.

Studying atmospheric methane oxidation at UiT will be a thrilling new experience for me. This aerobic process at the thermodynamic edge of life fits well into my personal research moto “Thermodynamics sets the frame, evolution draws the picture.”

Academic Positions

10/2021 – 09/2023	Postdoctoral Researcher at the Department of Arctic and Marine Biology, UiT The Arctic University of Norway
07/2016 – 06/2019	Research Associate („Akademischer Rat auf Zeit“) at the Department of Ecological Microbiology, University of Bayreuth
01/2009 – 12/2009	Graduate Researcher at the Department of Ecological Microbiology, University of Bayreuth

Non-academic Professions

11/2019 – 10/2020	High school teacher for biology and chemistry at the Oberschule Netzschkau

University Education

01/2010 – 06/2016	PhD thesis in Microbiology (Dr. rer. nat.) at the Department of Ecological Microbiology, University of Bayreuth, “Interaction of hydrogen-metabolizing microbes during anaerobic mineralization of organic matter” Grade: *summa cum laude* (highest distinction)
10/2002 - 01/2008	Diploma studies (eq. MSc) in Biology at the University of Bayreuth Diploma Thesis: „Diversity of bacterial [Fe-Fe]-hydrogenases in an acidic fen: Relevance for the intermediary H_2-metabolism“. Grade: 1,0 (highest distinction)

Internships

06/2021 – 09/2021	Guest researcher at the Department of Arctic and Marine Biology, UiT The Arctic University of Norway
03/2008 - 10/2008	Intern at the Institute of Molecular Biosciences, Massey University Palmerston North, New Zealand, Design of knock-out mutants in the alginate synthesis pathway of *Pseudomonas aeruginosa*
08/2001 - 10/2001	Intern at the BioZent GmbH, Stollberg, Germany, Analytic of anorganic ion contents in bioreactor effluents and growth control of the green algae *Chlorella vulgaris*

Scholarships

2011 + 2019	Two travel scholarships from the German Academic Exchange Service (DAAD) for the annual meeting of the American Society for Microbiology in New Orleans, LA (2011) and Gordon Research Conferences for Applied and Environmental Microbiology in South Hadely, MA (2019)

Teaching

04/2013 - 03/2019	Basic and advanced lectures on microbial physiology and ecology. Supervision of practical courses and seminars for bachelor and master students

Supervision

2016 - 2019	Supervision of one PhD student and co-promotor for two PhD students
2010 - 2019	Supervision of five bachelor and five master students for their final thesis

Academic Services

2018 - today	Peer Reviewer for the Journals Frontiers in Microbiology, FEMS Microbial Ecology, Applied and Environmental Microbiology, PeerJ, and Environmental Science & Technology
10/2017 – 06/2019	Assigned person for the biological security regarding genetic engineering at the Department of Ecological Microbiology, University of Bayreuth

Skills

Analytics	Gas chromatography (GC) and High-Pressure-Liquid-Chromatography (HPLC) Colorimetric assays for the determination of inorganic ions
Microbiology	Preparation of anoxic media and working in an anaerobic chamber Microcosm experiments, enumeration of microbes via MPN counts, isolation
Molecular biology	DNA/RNA extraction and quantification, RNA Stable Isotope Probing (SIP) PCR/qPCR optimization, PCR primer design Setup and screening of a clone library, RFLP & T-RFLP analysis
Sequence analysis	Analysis of Illumina sequencing data Phylogenetic analysis of 16S rRNA and structural gene marker using ARB
Calculations	Thermodynamic calculations, carbon and reductant recoveries Statistical analysis (Past, R, LEfSe)

Language skills

German	Mother language
English	Fluent
Norwegian	Basic skills

French Basic skills

Publications

Meier AB, Oppermann S, Drake HL, **Schmidt O**. 2022. The root zone of graminoids: A niche for H_2-consuming acetogens in a minerotrophic peatland. Frontiers in Microbiology 13:978296.

Meier AB, Oppermann S, Drake HL, **Schmidt O**. 2021. Organic carbon from graminoid roots as a driver of fermentation in a fen. FEMS Microbiology Ecology 97:fiab143.

Zeibich L, Staege M, **Schmidt O**, Drake HL. 2019. Amino Acids and Ribose: Drivers of protein and RNA fermentation by ingested bacteria of a primitive gut ecosystem. Applied and Environmental Microbiology 85:e01297-19.

Wieczorek AS, **Schmidt O**, Chatzinotas A, von Bergen M, Gorissen A, Kolb S. 2019. Ecological functions of agricultural soil bacteria and microeukaryotes in chitin degradation – a case study. Frontiers in Microbiology 10:1293.

Zeibich L, **Schmidt O**, Drake HL. 2019. Dietary polysaccharides: fermentation potentials of a primitive gut ecosystem. Environmental Microbiology 21:1436-1451.

Zeibich L, **Schmidt O**, Drake HL. 2019. Fermenters in the earthworm gut: do transients matter? FEMS Microbiology Ecology 95: fiy221.

Zeibich L, **Schmidt O**, Drake HL. 2018. Protein- and RNA-enhanced fermentation by gut microbiota of the earthworm *Lumbricus terrestris*. Applied and Environmental Microbiology 84:e00657-18.

Schmidt O, Hink L, Horn MA, Drake HL. 2016. Peat: Home to novel syntrophic species that feed acetate- and hydrogen-scavenging methanogens. ISME Journal 10:1954-66.

Hunger S, **Schmidt O**, Gößner AS, Drake HL. 2016. Formate-derived H_2, a driver of hydrogenotrophic processes in the root-zone of a methane-emitting fen. Environmental Microbiology 18:3106-19.

Schmidt O, Horn MA, Kolb S, Drake HL. 2015. Temperature impacts differentially on the methanogenic food web of cellulose-supplemented peatland soil. Environmental Microbiology 17:720-734.

Hay ID, **Schmidt O**, Filitcheva J, Rehm BHA. 2012. Identification of a periplasmic AlgK-AlgX-MucD multiprotein complex in *Pseudomonas aeruginosa* involved in biosynthesis and regulation of alginate. Applied Microbiology and Biotechnology 93:215-227.

Schmidt O, Wüst PK, Hellmuth S, Borst K, Horn MA, Drake HL. 2011. Novel [NiFe]- and [FeFe]-hydrogenase gene transcripts indicative of active facultative aerobes and obligate anaerobes in earthworm gut contents. Applied and Environmental Microbiology 77:5842-5850.

Hunger S, **Schmidt O**, Hilgarth M, Horn MA, Kolb S, Conrad R, Drake HL. 2011. Competing formate and carbon dioxide-utilizing prokaryotes in an anoxic methane-emitting fen soil. Applied and Environmental Microbiology 77:3773-3785.

Schmidt O, Drake HL, Horn MA. 2010. Hitherto unknown [Fe-Fe]-hydrogenase gene diversity in anaerobes and anoxic enrichments from a moderately acidic fen. Applied and Environmental Microbiology 76:2027-2031.

Conferences & Seminar Contributions

Discussion Leader

2022	Gordon Research Seminar: Molecular basis of microbial one-carbon metabolism in Southbridge, MA, USA. Keynote session: Applied C1 biology from the microscale to the global scale.
2019	Gordon Research Seminar: Applied and Environmental Microbiology in South Hadley, MA, USA. Keynote session: Discovering the microbial Rosetta Stone.

Talks

2019	VAAM annual meeting in Mainz. Title: Root-derived organic carbon fuels diverse fermentative processes in a methane-emitting fen.
2018	Institute of Microbiology, Leibniz University Hannover. Title: Hydrogen metabolizers drive anaerobic degradation processes in two contrasting terrestrial hot spots: the rhizosphere of fen plants and the gut of earthworms.
2016	BayCEER Workshop, Bayreuth. Title: Syntrophic microbial consortia in peat: teamwork at the thermodynamic limit of live.
2014	VAAM annual meeting in Dresden. Titel: Novel syntrophic species link fermentation and methanogenesis in peat.
2013	VAAM annual meeting in Bremen. Title: *Acidobacteria*, *Bacteroidetes* and unclassified bacteria dominate the anaerobic degradation of cellulose in fen soil.
2008	VAAM annual meeting in Frankfurt/Main. Title: [Fe-Fe]-Hydrogenases: Molecular markers for hydrogen-metabolizing bacteria in an acidic fen.

Posters

2022	Gordon Research Conference: Molecular basis of microbial one-carbon metabolism in Southbridge, MA, USA. Title: Acetogens, methanogens or X: Who profits from fermentation-derived H_2 in the root zone of a minerotrophic peatland?
2019	Gordon Research Conference: Applied and Environmental Microbiology in South Hadley, MA, USA. Title: The root zone of sedges and grasses: an oasis for fermenters in a methane-emitting fen.
2018	Gordon Research Conference: Molecular basis of microbial one-carbon metabolism. Grand Summit Hotel at Sunday River, Newry, ME. Title: The rhizosphere of *Carex rostrata*: an oasis for H_2-cycling anaerobes.
2012	Gordon Research Conference: Molecular basis of microbial one-carbon metabolism. Bates College, Lewiston, ME. Title: Hydrogenase genes and transcripts as molecular flashlights for H_2-metabolising prokaryotes.
	VAAM annual meeting in Tübingen. Title: Community analyses of fermentative hydrogen producers in environmental samples.
2011	111th General Meeting of the American Society of Microbiology in New Orleans. Title: [FeFe]- and [NiFe]-hydrogenase transcript analysis identifies *Clostridiales* and *Enterobacteriaceae* as H_2-producers in the gut of earthworms.
	1st International Conference on Biogas Microbiology in Leipzig. Title: Community analyses of fermentative hydrogen producers.
	VAAM annual meeting in Karlsruhe. Title: Novel hydrogenase gene transcripts indicative of active facultative aerobes and obligate anaerobes in the earthworm gut.
2010	Gordon Research Conference: Molecular basis of microbial one-carbon metabolism. Bates College, Lewiston, ME. Title: H_2 – a hidden link between fermentation and methanogenesis in the intermediary ecosystem metabolism of a wetland soil.

Tromsø, 05/09/2022

Oliver Schmidt