

Curriculum Vitae

Kenneth Wasmund

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Nationality: Australian. D.O.B. 29/06/1982

Languages: English (native), German (elementary – level 'A2')

Academic positions:

Research Associate **2016-current**

Division of Microbial Ecology, University of Vienna, Austria.

Specialisations: Environmental and experimental 'omics of sulfur cycle intermediate-respiring microbes.

Postdoctoral Researcher **2013-2016**

Division of Microbial Ecology, University of Vienna, Austria.

Specialisations: Ecology and genomics of sulfate-reducers in arctic marine sediments.

Postdoctoral Researcher **2010-2013**

Department of Isotope Biogeochemistry,

Helmholtz Centre for Environmental Research (UFZ), Germany.

Specialisations: Ecology and genomics of *Chloroflexi* in the marine subsurface.

Education:

Doctor of Philosophy **2005-2010**

Australian Institute of Marine Science/University of the Sunshine Coast, Australia.

Specialisation: Microbial ecology of marine hydrocarbon seeps.

Bachelor of Science (Honours) **2004**

University of the Sunshine Coast, Australia.

Specialisation: Molecular microbiology.

Bachelor of Science (Microbial Ecology) **2000-2003**

University of the Sunshine Coast, Australia.

Specialisations: Environmental microbiology, biotechnology, medical microbiology & immunology.

Relevant employment history:

Research Assistant **2008**

Australian Institute of Marine Science, Australia.

Tasks: Conducting experiments and laboratory analyses involving the effects of heat stress on microbial communities associated with sponges, marine sediments and coralline algae.

Research Assistant**2008-2009**

School of Pharmacy and Molecular Sciences, James Cook University, Australia.

Tasks: Performing molecular analyses of gene expression in the algal symbionts (Zoothanthellae) of coral.

Publications:

Wasmund K*, Cooper M*, Schreiber L, Lloyd KG, Baker B, Petersen DG, Jørgensen BB, Stepanauskas R, Reinhardt R, Schramm A, Loy A, Adrian L. (2016). Single-cell genome and group-specific *dsrAB* sequencing implicate marine members of the class *Dehalococcoidia* (phylum *Chloroflexi*) in sulfur cycling. *mBio*. 7(3):e00266-16. doi:10.1128/mBio.00266-16.

*equal contribution.

Algora C, Vasileiadis S, **Wasmund K**, Trevisan M, Krüger M, Puglisi E, Adrian L (2015). Manganese and iron as structuring parameters of microbial communities in Arctic marine sediments from the Baffin Bay. *FEMS Microbiology Ecology*. 91(6): pii: fiv056. doi: 10.1093/femsec/fiv056.

Wasmund K, Algora C, Müller J, Krüger M, Lloyd KG, Reinhardt R, Adrian L (2015). Development and application of primers for the class *Dehalococcoidia* (phylum *Chloroflexi*) enables deep insights into diversity and stratification of sub-groups in the marine subsurface. *Environmental Microbiology*. 17(10):3540-3556. doi: 10.1111/1462-2920.12510.

Wasmund K, Schreiber L, Lloyd KG, Petersen D, Schramm A, Stepanauskas R, Jørgensen BB, Adrian L (2014). Genome sequencing of a single cell of the widely distributed marine subsurface *Dehalococcoidia*, phylum *Chloroflexi*. *The ISME Journal*. 8(2):383-97.

Rakoczy J, Feisthauer S, **Wasmund K**, Bombach P, Neu T, Vogt C, Richnow H-H. (2013). Benzene and sulphide removal from groundwater treated in a microbial fuel cell. *Biotechnology and Bioengineering*. 11(12):3104-3113.

Ainsworth T, **Wasmund K**, Ukani L, Seneca F, Yellowlees D, Leggat W. (2011). Defining the tipping point. A complex cellular life/death balance in corals in response to stress. *Scientific Reports*. 1, 160; DOI:10.1038/srep00160

Leggat W, Seneca F, **Wasmund K**, Ukani L, Yellowlees D, Ainsworth T. (2011). Differential Responses of the Coral Host and Their Algal Symbiont to Thermal Stress. *PLoS ONE* 6(10): e26687. doi:10.1371/journal.pone.0026687

Burns K.A., Brinkman D, Brunskill G, Logan G, Volk H, **Wasmund K**, Zagorskis I, (2010). Fluxes and fate of petroleum hydrocarbons in the Timor Sea ecosystem with special reference to active natural hydrocarbon seepage. *Marine Chemistry*. 118(3-4):140-155.

Wasmund K, Burns K.A., Kurtböke D.I., Bourne D.G. (2009). Novel Alkane Hydroxylase Gene (*alkB*) Diversity in Sediments Associated with Hydrocarbon Seeps in the Timor Sea, Australia. *Applied and Environmental Microbiology*. 75(23): 7391-7398.

Wasmund K, Kurtböke D.I., Burns K.A., Bourne D.G. (2009). Microbial diversity in sediments associated with a shallow methane seep in the tropical Timor Sea of Australia reveals novel aerobic methanotroph diversity. *FEMS Microbiology Ecology*. 68(2):142-151.

Conference proceedings:

EMBO Workshop on Microbial Sulfur Metabolism 2015 – Helsingør, Denmark. Tracking carbon flow from major classes of biomolecules into microorganisms under psychrophilic sulfate-reducing conditions in Arctic marine sediments. Poster Presentation.

EMBO Workshop on Microbial Sulfur Metabolism 2015 – Helsingør, Denmark. Single cell genomics provides hints into the unexpected roles of the widely distributed Dehalococcoidia (DEH), phylum *Chloroflexi*, in marine subsurface sulfur cycling. Poster Presentation.

ISME 2014 – Seoul, South Korea. Single cell genome and targeted gene amplifications implicate bacteria of the *Dehalococcoidia* (phylum Chloroflexi) in sulphur cycling in marine sediments. Poster Presentation.

ISME 2012 – Copenhagen, Denmark. Insights into the ecological distribution and genomes of the enigmatic and widely distributed marine subsurface *Dehalococcoidetes* (phylum *Chloroflexi*). Contributed Oral Presentation.

ISSM 2011 (International Society for Subsurface Microbiology) – Garmisch-Partenkirchen, Germany. Insights into the ecological distributions of *Dehalococcoidetes* in the marine subsurface. Oral Presentation.

FEMS 2011 – Geneva, Switzerland. Development of a real-time PCR method for the detection & quantification of the class '*Dehalococcoidetes*' in subsurface environments. Poster Presentation.

ISME 2008 – Cairns, Australia. Aerobic methanotrophs in sediments associated with hydrocarbon seeps in the tropical Timor Sea, Australia. Poster Presentation.

ISME 2006 – Vienna, Austria. Diversity of *Archaea* in sediments associated with a shallow hydrocarbon seep in the tropical Timor Sea, Australia. Poster Presentation.

Funding & awards:

- Austrian Science Foundation (FWF) – Stand-alone Project 'Missing links in the sulfur cycle' (PI)
 - 3 years funding for salary and research consumables
- Joint Genome Institute – Community Sequencing Program 2016
 - Small Scale Grant (sequencing of 48 genomes) (PI).
- Australian Biological Resources Study (ABRS) Postgraduate Scholarship (2005).
- Commonwealth Scientific and Industrial Research Organization (CSIRO) Postgraduate 'Top-Up' Scholarship (2005).
- Maroochy Shire Council Young Achievers Award - Research Funding Award (2006).
- CSIRO International Conference Travel Grant (2006).
- ABRS Domestic Conference Travel Grant (2008).

Technical experience:

Laboratory:

- Extensive experience in the design, optimisation and application of DNA- and RNA-based PCR and real-time PCR assays for the detection of various targets.
- Fluorescent *in situ* hybridisation:
 - Extensive experience in use of FISH, CARD-FISH, HCR-FISH assays.

- Development and application of novel fixation methods that enable post-FISH analyses of genomic material.
- Design and optimization of FISH assays/pipelines to sort hybridised cells from sediments by flow-cytometry for genomics.
- Development of gene-FISH assays (currently starting).
- Stable isotope probing:
 - anaerobic incubations, density gradients/fractionation, qPCR analysis, community profiling of labelled DNA.
- Design, application and analyses of 16S rRNA and functional gene-based high-throughput (i.e. 454 and Illumina) studies for microbial ecology analyses.
- Anaerobic enrichments of sulfate-reducers.
- Planning of/and high-throughput sequencing projects for genomic analyses.
- Preparation of sequencing libraries for genomic/metagenomic sequencing.
- Nanopore sequencing - currently testing MinION devices
- Multiple displacement amplification and Duplex-specific nuclease treatments for single cell genome sequencing.
- Clone library construction and analysis.
- DGGE.
- Extraction of DNA and RNA from various samples such as plants, corals and sediments.
- Experience in interrogating cDNA microarrays.
- Experience with SDS-PAGE and Western Blots.
- Field experience for marine sediment core sampling.

Bioinformatics:

- Proficient in self-teaching and applying various bioinformatics tools in Linux and Windows environments.
- Processing of pyrosequencing data sets for microbial ecological studies:
 - Well practised in use of *mothur* for processing 16S rRNA gene-based high-throughput sequence data and applying to answer ecological questions.
 - UniFrac analyses.
 - Modification/testing of classification systems for high-throughput sequence data.
 - Processing high-throughput sequence data of functional genes.
- *De novo* assembly and annotation of microbial genomes:
 - Velvet-SC/Euler-SR-EC and IDBA-UA for single cell genome assemblies of Illumina data.
 - AMOS package: minimus2, Hawkeye etc for manipulating and visualizing assemblies.
 - Experience in genome annotation using Artemis, MicroScope and RAST packages.
 - Comparative genome analyses.
 - Genome alignments.
 - Re-construction of biochemical pathways from genomic data.
 - Ecological interpretations of genomic properties.
 - Tetranucleotide analyses.
- Stand-alone BLAST:
 - General and custom blasting/bidirectional genome blasting on PCs and servers.
 - Searching metagenomes for genes of interest.
- Phylogenetics:
 - Experienced user of ARB, Mega5, FastTree.
 - TopiaryExplorer for connecting large phylogenetic trees to environmental metadata.
- Various general sequence analyses and alignment programs.

Teaching experience:

- Co-supervision of laboratory and theses of various Master (3) and PhD (3) students.

- Assisting in university practical courses, e.g. real-time PCR and International FISH Course.

Ad-hoc reviews for:

The ISME Journal, Environmental Microbiology, Scientific Reports, Microbial Ecology.

Scientific interests:

- Marine/aquatic sediment/subsurface microbial ecology and biogeochemistry.
- Biochemistry and energetics of anaerobic microorganisms.
- Carbon and energy flows within anaerobic microbial communities.
- Organic matter degradation in the marine subsurface, especially recalcitrant compounds.
- Complexity of organic matter and how this sustains microbial diversity.
- Niche partitioning due to substrate types/classes and how this is related to phylogenetic relationships.
- Hydrocarbon seep and hydrothermal vent microbiology and biogeochemistry.
- Hydrocarbon degradation.
- Organohalogen bioremediation.
- Functional genomics.
- Bioinformatics.
- Marine sciences, biology and microbiology.