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Personal information

Place and date of birth:	Illinois, USA, 25 November 1978
Nationality:	USA
Languages:	English (mother tongue), German (somewhat conversational)
Current position:	Senior Scientist, Department of Microbiology and Ecosystem Science, University of Vienna, Austria

Main research interest

One gram of soil contains over a million microorganisms, yet much of their function remains unknown. This has fascinated me since my PhD education. I have been investigating soil microorganisms (i.e. *Acidobacteriota*) via cultivation, '-omics' methods and metabolic process measurements. I am currently exploring mechanisms that allow for survival and success of soil microorganisms in their challenging soil environment, more specifically atmospheric gas oxidation for the generation of maintenance energy and the use of diverse terminal oxidases to permit flexibility in respiration.

My research interests and associated achievements are listed below:

- *Cultivating the uncultivables* – Developed novel methods to isolate, detect and subsequently culture elusive soil microorganisms. I am considered an expert in cultivating one of the most abundant soil phyla, members of the *Acidobacteriota*.
- *Physiology of soil microorganisms* - Using genome-resolved analysis, revealed physiological capabilities of *Acidobacteriota*, explaining their ubiquity, prevalence and success in soils. Namely their capacity to survive via H_2 oxidation, plant polymeric and readily oxidizable C degradation and the use low-affinity terminal oxidases to respire nanomolar O_2 concentrations, which were further explored using growth-based experimentations. My further expertise is with cellulose degrading microorganisms – one of the first researchers to successfully identify novel participants using DNA-stable isotope probing.
- *Single-cell method development for exploring the activity of soil microorganisms* – Made significant advancements in the application of nanoSIMS and Raman microspectroscopy to investigate the activity of microbial cells in soils.
- *Survival mechanisms and dormancy in terrestrial systems* - Identified dormancy mechanisms in temperate soil bacteria, particularly the mechanisms for energy generation such as atmospheric H_2 oxidation.

Education

2007	**PhD,** Microbiology and Molecular Genetics, College of Natural Science, Michigan State University, East Lansing, MI, USA. Graduated with Cum Laude (GPA 3.6/4.0).
2000	**Bachelor of Science**, Benedictine University, Lisle, IL USA. Graduated Magna Cum Laude (GPA 3.9/4.0).

Scientific experience

Since 2017	**Senior Scientist (permanent position),** Department of Microbiology and Ecosystem Science, University of Vienna, Austria.
2018	Maternity leave (April – October).
2012-2017	**Scientist**, Department of Microbiology and Ecosystem Science, University of Vienna, Vienna, Austria.
2011	**Guest Scientist,** Joint BioEnergy Institute, Emeryville, CA USA. PI: Steven W. Singer.
2007-2010	**Postdoctoral fellow** at Los Alamos National Laboratory, Bioscience Division, Los Alamos, NM USA. PI: Cheryl R. Kuske.
2007-2008	**Course coordinator** for the Microbial Diversity Course, Woods Hole, Massachusetts, USA. Course Directors: Prof. Thomas M. Schmidt & Prof. William Metcalf.
2007	**Postdoctoral researcher** at Michigan State University, East Lansing, MI USA. PI: Prof. Thomas M. Schmidt.
2001-2007	**PhD Student:** Microbiology and Molecular Genetics, College of Natural Science, Michigan State University, East Lansing, MI, USA. Advisors: Prof. Thomas M. Schmidt and Prof. John A. Breznak.
1996-2000	**Bachelor of Science**, Benedictine University, Lisle, IL USA.
1998-2000	**Undergraduate researcher** at Benedictine University, Lisle, IL USA.
1996-2000	**Undergraduate lab student technician**, Biology department, Benedictine University, Lisle, IL USA.

Academic publications - most important publications

Until now I have published 34 papers in peer-reviewed journals and two book chapters, which were cited >3500 times (Google scholar). I have a **Nature Microbiology, Nucleic Acid Research paper** and a **Nature Communications** manuscript in revision. A complete list of my publications can be found https://orcid.org/0000-0002-9017-7461

Imminger S, Meier DV, Schintlmeister A, Legin A, Schnecker J, Richter A, Gillor O, **Eichorst SA,** Woebken D. 2024. Survival and rapid resuscitation permit limited productivity in desert microbial communities. *Nat Commum*. 15, 3056. doi.org/10.1038/s41467-024-46920-6.

Trojan D, Garcia-Robledo E, Meier DV, Hausmann B, Revsbech NP, **Eichorst SA***, Woebken D. 2021. Microaerobic lifestyles at nanomolar O_2 concentrations mediated by low-affinity terminal oxidases in abundant soil bacteria. *mSystems*. 6(4): e0025021. doi: 10.1128/mSystems.00250-21. *denotes corresponding author.

Giguere AT*, **Eichorst SA***, Meier DV, Herbold CW, Richter A, Greening C, Woebken D. 2021. Acidobacteria are active and abundant members of diverse atmospheric H_2-oxidizing communities detected in temperate soils. *ISME J*. 15(2): 363-376. doi: 10.1038/s41396-020-00750-8. *denotes co-first authors.

Alteio LV, Schulz F, Seshadri R, Varghese N, Rodriguez-Reillo W, Ryan E, Goudeau D, **Eichorst SA,** Malmstrom RR, Katz LA, Blanchard JL, Woyke T. Complementary metagenomic approaches improve reconstruction of microbial diversity in a forest soil. *mSystems*. 5:e00768-19. doi:10.1128/mSystems.00768-19.

Eichorst SA, Trojan D, Roux S, Herbold C, Rattei T, Woebken D. 2018. Genomic insights into the Acidobacteria reveal strategies for their success in terrestrial environments. *Environ Microbiol.* 20:1041-1063. doi:10.1111/1462-2920.14043.

Kolinko S. Wu YW, Tachae F, Denzel E, Hiras J, Gabriel R, Bäcker N, Chan LJG, **Eichorst SA**, Frey D, Chen Q, Azadi P, Adams PD, Pray TR, Tanjore D, Petzold CJ, Gladden JM, Simmons BA, Singer SW. 2018. A bacterial pioneer produces cellulase complexes that persist through community succession. *Nature Microbiol.* 3(1): 99-104. doi: 10.1038/s41564-017-0052-z.

Eichorst SA, Strasser F, Woyke T, Schintlmeister A, Wagner M, Woebken D. 2015. Advancements in the application of NanoSIMS and Raman microspectroscopy to investigate the activity of microbial cells in soils. *FEMS Microbiol Ecol.* 91(10); pii: fiv106. doi: 10.1093/femsec/fiv106.

Eichorst SA, Varanasi P, Stavila V, Zemla M, Auer M, Singh S, Simmons BA, Singer SW. 2013. Community dynamics of cellulose-adapted thermophilic bacterial consortia. *Environ Microbiol*. 15:2573-87. doi: 10.1111/1462-2920.12159.

Eichorst SA, Kuske CR. 2012. Identification of cellulose-responsive bacterial and fungal communities in geographically and edaphically different soils by using stable isotope probing. *Appl Environ Microbiol*. 78(7):2316-27. doi:10.1128/AEM.07313-11.

Eichorst SA, Kuske CR, Schmidt TM. 2011. Influence of plant polymers on the distribution and cultivation of bacteria in the phylum *Acidobacteria*. *Appl Environ Microbiol.* 77:586-596. doi: 10.1128/AEM.01080-10.

Eichorst SA, Breznak JA, Schmidt TM. 2007. Isolation and characterization of bacteria from soil that define *Terriglobus* gen. nov., in the phylum *Acidobacteria. Appl Environ Microbiol.* 73:2708-2717. doi: 10.1128/AEM.02140-06.

Additional research achievements

2014-2017	FWF Stand-Alone Project: *Investigating the function of the ubiquitous Acidobacteria in terrestrial environments.* Funded by the "FWF – Der Wissenschaftsfonds" (Austrian Science Fund), Dagmar Woebken (PI) and Stephanie A. Eichorst (co-PI). P 26392-B20 (435,698 Euros).
2013-2016	FWF Stand-Alone Project: *A functional approach to understand active non-symbiotic diazotrophs in soil*. Funded by the "FWF – Der Wissenschaftsfonds" Dagmar Woebken (PI) and Stephanie A. Eichorst (co-PI). P 25700-B20 (448,751 Euros).
2012-2014	Project grant: *NanoSIMS enabled approach to understand bacterial and fungal cellulose degraders in soils*. Marie Curie International Incoming Fellowship (IIF), fellow Dr. Stephanie A. Eichorst. Funded by Marie Curie FP7 (EU), Host: Dr. Michael Wagner, Department of Microbiology and Ecosystem Science, University of Vienna. No. 300807 (180,191 Euro).
2010	Joint Genome Institute, Community Sequencing Proposal. *Populating the branches of the Phylum Acidobacteria with relevant soil strains.*
2007	Michigan State University, Rudolph Hugh Scholarship for academic achievement ($2000)
2003	Kellogg Biological Station's Long-Term Ecological Research Grant ($1200).
1998-1999	Howard Hughes Medical Institute (HHMI) Undergraduate Summer Research Award, Benedictine University, Lisle, Illinois.