

Biosketch

Univ.-Prof. Dr. Andreas Richter

Position in CoE: Key Researcher

Personal Details

Place of birth	Vienna, Austria
Nationality	Austrian
Children	3 (1987, 1992, 1997)
Affiliation:	University of Vienna
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Profile	ResearcherID: D-8483-2012
List of publications	ORCID: 0000-0003-3282-4808
Academic age	31 years since PhD



Academic Career and Positions Held

I earned a **PhD in botany** (major) and **geology** (minor) in 1989 at the University of Vienna. Subsequently, I worked as University Assistant at the Institute of Plant Physiology, with short terms as **postdoctoral researcher** in the **U.S.A.** (1994 with Bert Drake) and **Australia** (1996 with George Steward). In **2000**, I obtained my **habilitation** (*venia docendi*) for **Physiology and Ecology of Plants** and became **Associate Professor** at the **Institute of Ecology and Conservation Biology** of the University of Vienna, where I build up a research group for **Terrestrial Ecosystem Science**. I served as Deputy Head of the Department of Chemical Ecology and Ecosystem Science (2005–2011) and Vice Dean of the Faculty of Life Science (2010–2014). In **2011**, I became **full professor** at the University of Vienna. I was the founding director of the Austrian Polar Research Institute (2012–2016) and I am Senior Guest Research Scholar at the IIASA, the International Institute for Applied Systems Analysis, since 2016. In March 2019, I became vice director and in October 2020 director of the **Centre for Microbiology and Environmental Systems Science** at the University of Vienna.

Scientific Achievements and Scientific Contribution to the CoE

Scientific achievements. The central tenet of my research is that **microbial growth and turnover** is driving **carbon and nutrient cycling in soil**. Consequently, unraveling the controls over microbial growth and turnover is the key to understanding biogeochemistry. I have pioneered a range of **theoretical concepts** and **techniques** of microbial soil ecology, including new approaches to understand and measure microbial carbon and nitrogen use efficiency. I have a special interest in the effects of **climate change** on microbial interactions and microbial processes in soil, and their feedback to climate change. The research published by my group is well received internationally. I have published **>230 publications** with **>18,500 citations** (h-index 71; WoS). I am highly cited researcher since 2018.

Contribution to the CoE. I will contribute **microbial growth, turnover and carbon use efficiency** estimations (^{18}O or ^2H incorporation from labelled water vapor into DNA, RNA, PLFA and storage compounds) to essentially all projects in the CoE. In addition, I will contribute my theoretical and conceptual expertise to the synthesis module, where I am leading a work package on microbial growth, and to the climate change and land-use project in the perturbation theme that I co-lead. I will also contribute to approaching climate change mitigation with microbe enhanced silicate weathering, and helping to elucidate the effects of recurrent climate extremes on soil microbiomes.

10 Most Important Publications (*relevant for the CoE)

1. *Canarini, A.; Schmidt, H.; Fuchslueger, L.; Martin, V.; Herbold, C. W.; Zezula, D.; Gündler, P.; Hasibeder, R.; Jecmenica, M.; Bahn, M.; **Richter, A.** Ecological Memory of Recurrent Drought Modifies Soil Processes via Changes in Soil Microbial Community. *Nat Commun* **2021**, *12* (1), 5308. <https://doi.org/10.1038/s41467-021-25675-4>.
2. *Soong, J. L.; Fuchslueger, L.; Marañón-Jimenez, S.; Torn, M. S.; Janssens, I. A.; Peñuelas, J.; **Richter, A.** Microbial Carbon Limitation: The Need for Integrating Microorganisms into Our Understanding of Ecosystem Carbon Cycling. *Glob Change Biol* **2020**, *26* (4), 1953–1961. <https://doi.org/10.1111/gcb.14962>.
3. *Séneca, J.; Pjevac, P.; Canarini, A.; Herbold, C. W.; Zioutis, C.; Dietrich, M.; Simon, E.; Prommer, J.; Bahn, M.; Pötsch, E. M.; Wagner, M.; Wanek, W.; **Richter, A.** Composition and Activity of Nitrifier Communities in Soil Are Unresponsive to Elevated Temperature and CO₂, but Strongly Affected by Drought. *ISME J* **2020**, *14* (12), 3038–3053. <https://doi.org/10.1038/s41396-020-00735-7>.
4. *Prommer, J.; Walker, T. W. N.; Wanek, W.; Braun, J.; Zezula, D.; Hu, Y.; Hofhansl, F.; **Richter, A.** Increased Microbial Growth, Biomass, and Turnover Drive Soil Organic Carbon Accumulation at Higher Plant Diversity. *Global Change Biology* **2020**, *26* (2), 669–681. <https://doi.org/10.1111/gcb.14777>.
5. *Tveit, A. T.; Hestnes, A. G.; Robinson, S. L.; Schintlmeister, A.; Dedysh, S. N.; Jehmlich, N.; von Bergen, M.; Herbold, C.; Wagner, M.; **Richter, A.**; Svenning, M. M. Widespread Soil Bacterium That Oxidizes Atmospheric Methane. *Proc. Natl. Acad. Sci. U.S.A.* **2019**, *116* (17), 8515–8524. <https://doi.org/10.1073/pnas.1817812116>.
6. *Walker, T. W. N.; Kaiser, C.; Strasser, F.; Herbold, C. W.; Leblans, N. I. W.; Woebken, D.; Janssens, I. A.; Sigurdsson, B. D.; **Richter, A.** Microbial Temperature Sensitivity and Biomass Change Explain Soil Carbon Loss with Warming. *Nature Clim Change* **2018**, *8* (10), 885–889. <https://doi.org/10.1038/s41558-018-0259-x>.
7. *Mooshammer, M.; Hofhansl, F.; Frank, A. H.; Wanek, W.; Hämmerle, I.; Leitner, S.; Schneckler, J.; Wild, B.; Watzka, M.; Keiblinger, K. M.; Zechmeister-Boltenstern, S.; **Richter, A.** Decoupling of Microbial Carbon, Nitrogen, and Phosphorus Cycling in Response to Extreme Temperature Events. *Sci. Adv.* **2017**, *3* (5), e1602781. <https://doi.org/10.1126/sciadv.1602781>.
8. *Mooshammer, M.; Wanek, W.; Hämmerle, I.; Fuchslueger, L.; Hofhansl, F.; Knoltsch, A.; Schneckler, J.; Takriti, M.; Watzka, M.; Wild, B.; Keiblinger, K. M.; Zechmeister-Boltenstern, S.; **Richter, A.** Adjustment of Microbial Nitrogen Use Efficiency to Carbon:Nitrogen Imbalances Regulates Soil Nitrogen Cycling. *Nat Commun* **2014**, *5* (1), 3694. <https://doi.org/10.1038/ncomms4694>.
9. *Sinsabaugh, R. L.; Manzoni, S.; Moorhead, D. L.; **Richter, A.** Carbon Use Efficiency of Microbial Communities: Stoichiometry, Methodology and Modelling. *Ecol Lett* **2013**, *16* (7), 930–939. <https://doi.org/10.1111/ele.12113>.
10. *Séneca, J.; Söllinger, A.; Herbold, C. W.; Pjevac, P.; Prommer, J.; Verbruggen, E.; Sigurdsson, B. D.; Peñuelas, J.; Janssens, I. A.; Urich, T.; Tveit, A. T.; **Richter, A.** Increased Microbial Expression of Organic Nitrogen Cycling Genes in Long-Term Warmed Grassland Soils. *ISME COMMUN.* **2021**, *1* (1), 69. <https://doi.org/10.1038/s43705-021-00073-5>.