

ANDREAS ANATOL RICHTER

University of Vienna

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Research Initiative *Chemistry meets Microbiology*

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Academic Qualifications

- **Habilitation** (Univ.-Doz.) for “Physiology and Ecology of Plants” 07/2000
(Thesis: Physiology and Metabolism of Plant Inositol *O*-Methyl-Ethers)
- **Ph.D.** (Major: Botany, Minor: Geology) 07/1989
Studies of Botany and Geology at the University of Vienna 1982-1989
(Thesis title: Osmotically active solutes in the Mistletoe *Viscum album*)

Employments and Appointments

- **Full Professor** (Ecosystem Science) 10/2011-ongoing
Department of Microbiology and Ecosystem Science
Head of Terrestrial Ecosystems Division
- **Scientific Director** 01/2013-11/2016
Austrian Polar Research Institute, Vienna, Austria
- **Guest Research Scholar**
IIASA, International Institute for Applied Systems Analysis, Laxenburg 10/2016-ongoing
- **Vice Dean** (Research and Strategic Development)
Faculty of Life Sciences, University of Vienna 10/2010-09/2014
- **Visiting Professor** (research fellow) at the School of Earth and Environment, University of Western Australia, Perth, Australia 01/2011-07/2011
- **Associate Professor** 01/2005 – 09/2011
Department of Chemical Ecology & Ecosystem Research,
University of Vienna
- **Honorary Professor** (level E, principle fellow) at the School of Forest and Ecosystem Science, University of Melbourne, Australia 2006-2009
- **Associate Professor** 2000-2005
Institute of Ecology and Conservation Biology, University of Vienna

Postdoctoral and Research Fellowships

- University of Queensland, Brisbane, Australia (Prof. G.R. Stewart) 05/1996-10/1996
“Nitrogen status and photosynthetic capacity of higher plants”
- University of Bremen, Institute of Marine Botany, Germany (Prof. G. Kirst) 03/1995-04/1995
DAAD-Fellowship “Ice algae: role of cyclitols in stress adaptation”
- Dynamac Corporation, Florida, USA (Dr. B. Drake) 06/1994-10/1994
Joint NASA/Smithsonian project; “The role of polyols in the carbon metabolism of *Quercus* species under elevated CO₂”

Professional Activities

(a) Leadership (selection)

- Austrian Representative to the European Polar Board 2003-ongoing
- Substitute Member of the Austrian National Commission on Biological Diversity 2014-ongoing
- Member of the General Assembly of the EU-PolarNet (a Horizon 2020 Coordination Action) 2015-ongoing
- Austrian Representative to the Terrestrial Working Group of the International Arctic Science Committee (IASC) 2015-ongoing
- Speaker Research Focus "Global Change Biology" Faculty of Life Sciences, University of Vienna 2010-ongoing
- Coordinator of the EU PolarCLIMATE Network CryoCARB "Long-term Carbon Storage in Cryoturbated Arctic Soils" 2010-2013
- Management Board of the EU COST Action ES0806 SIBAE "Stable Isotopes in Biosphere-Atmosphere-Earth System Research" 2009-2013
- Scientific Steering Committee of the ESF Program MOLTER "Molecular Structures as Drivers and Tracers of Terrestrial Carbon Fluxes" 2008-2013
- Scientific Advisory Counsel of the EU FP7 ERA-NET Program EUROPOLAR "European Polar Consortium" 2005-2009
- Speaker/Coordinator FWF National Research Network MICDIF "Linking Microbial Diversity and Functions Across Scales and Ecosystems" 2006-2009
- Chair Scientific Steering Committee "Austrian Society for Long-Term Ecological Research" 2002-2010
- Speaker Research Focus "Microbial Ecosystems" Faculty of Life Sciences, University of Vienna 2010-2012
- Scientific Steering Committee of the ESF Program SIBAE "Stable Isotopes in Biospheric-Atmospheric Exchange" 2002-2007
- President of the Stable Isotope Network Austria 2004-2011

(b) University Service (selection)

- Vice Dean (Research and Strategic Development), Faculty of Life Sciences 10/2010-09/2014
- Member Faculty Executive Team (Quality Management), Faculty of Life Sciences 10/2008-09/2010
- Vice Head, Core Facility for Advanced Isotope Research in Life Sciences 2010-2014
- Vice Head, Department of Chemical Ecology & Ecosystem Research 2005-2009
- Co-Chair of the Senate Working Group "Master of Environmental Science" 2009-2011
- Member of the Senate Working Group "Master Ecology and Ecosystems" 2010-2012

(c) Reviewing• Reviewer for Journals (amongst others):

Annals of Botany; Arctic, Antarctic and Alpine Research; Applied Soil Ecology; Biogeochemistry; Biogeosciences; Biotechnology and Bioengineering; Carbohydrate Research; Ecology; Ecology Letters, Environmental Microbiology; Functional Plant Biology; Global Change Biology; Journal of Experimental Botany; Nature Geoscience; Nature Communication; New Phytologist; Oecologia; Planta; Plant Physiology; Plant Physiology and Biochemistry; PNAS, Phytochemistry; Physiologia Plantarum; Plant and Soil; Polar Biology; Rapid Communications in Mass Spectrometry; Seed Science Research; Soil Biology and Biochemistry; Tree Physiology.

• Reviewer for Grants:

ERC – European Research Council (Advanced Grants)
 NSF – National Science Foundation (USA)
 USDA – National Research Initiative Competitive Grant Program (USA)
 DFG – Deutsche Forschungsgemeinschaft (Germany)
 Helmholtz-Gemeinschaft (Germany)
 FWO - The Research Foundation – Flanders (Belgium)
 NWO – Netherlands Organisation for Scientific Research
 ESF – European Science Foundation (France)
 Alexander von Humboldt Stiftung (Germany)

(d) Organisation of Meetings, Workshops, Schools

- Co-Organiser of the International Atomic Energy Agency (IAEA) Coordination Meeting for Investigations in Benchmark Sites for Assessing the Impact of Climate Change; Vienna, November 2016
- Organiser CryoCARB Vulnerability Workshop
Vienna, September 2013
- Organiser/Convenor of the *International SIBAE Spring School*
“Stable Isotopes in Ecology”; Vienna, April 2007
- Organiser of the *Stable Isotope Network Austria Meeting 2007*
Vienna, December 2007
- Co-Organiser of the 6th *Austrian Stable Isotope User Group Meeting*. Vienna, November 2005
- Co-Organiser of the 1st *Joint European Stable Isotope Meeting*
JESIUM; Vienna, August/September 2004.
- Rapporteur CANADA-EU Workshop: Environmental Assessment, Climate Change
Research and Policy Implications in the Arctic. Brussels, Belgium, April 2004
- Organiser of the 1st *Austrian LTER Workshop*
Vienna, October 2002
- Organiser of the 3rd *Viennese Workshop on Stable Isotopes in
Biological and Environmental Research*. Vienna, November 2001
- Organiser of the Workshop “*Ecology of Glacier Forelands*”
Vienna, January 2000.

Grants and Funding

External funding for projects (excluding infrastructure grants) > € 2.9 Million

(a) Research and Education Projects

- **COUP** – Constraining uncertainties in the permafrost-climate feedback. 2015-2017
 JPI Climate (European Research Area, Joint Programming Initiative),
 (Coordinator: G. Hugelius, University of Stockholm, Sweden)
 PI of Austrian Project Part: € 154,000
- **ClimGrass C** - Grassland Carbon Dynamics in a Changing Climate. 2015-2018
 co-PI (PI M. Bahn); FWF P 28572; € 414.726 (total).
- **Microbial N Cycling** – From Single Cells to Ecosystems 2016-2019
 FWF W1257; PhD Program; PI (Coordinator C. Schleper)
- **EU-PolarNet** – Horizon 2020 Coordination Action. 2015-2020
 EU BG-15-2014, PI of Austrian Project Part: € 35,000
- **MicrON** – Environmental Controls of Microbial Organic Nitrogen cycling in
 Soils. 2015-2017
 Co-PI (PI Wolfgang Wanek): FWF P 28037, € 446,000
- **INT 5153** – Assessing the Impact of Climate Change and its Effects on 2014-2018
 Soil and Water Resources in Polar and Mountainous Regions
 Co-PI, International Atomic Energy Agency (IAEA)
- **CryoCARB** – Long-term Carbon Storage in Cryoturbated Arctic Soils. 2010-2015
 Leader of the CryoCARB Network (ESF – PolarCLIMATE), with total
 funding of >1.6 Mio €
 PI of Austrian Project Part: FWF I370-B17, € 285,000
- **CLIMEX** – Climate Extremes and Grassland Carbon Dynamics 2010-2014
 co-PI, FWF P 22214-B17, € 377,000
- **MICDIF** – Linking Microbial Diversity and Functions Across Scales and 2006-2010
 Ecosystems. Leader of the FWF National Research Network with a total
 funding of > 2.2 Mio €.
 PI of IP 1, FWF S10001-B17, Budget: € 267,000 (incl. start-up funding)
 Co-PI of IP 6, FWF S100-07, Budget: € 170,000
- **MYCOR** – A Novel Mycorrhiza-like Mutualistic Interaction between Fungi 2011-2013
 and Shoots of the Myrmecophytic Orchid *Caularthron bilamellatum*
 Co-PI, Faculty of Life Sciences, Budget: € 15,000
- **RELIS** – Resource Limitation of Microbial Decomposition of soil organic 2006-2009
 matter.
 PI, FWF P18495-B03, Budget: € 359,000
- **FERMAP** – Environmental Research, Monitoring & Assessment 2008
 Programme: Pilot Study.
 Co-PI, Austrian Academy of Sciences; Budget: € 10,000

- **BIPOLAR** – Bildungsinitiative Polarforschung - Lernen und Forschen 2007-2008
Co-PI, Federal Ministry of Science, Budget: € 69,500
- **LTSEr-Eisenwurz**en – Integrated Modelling of Social and Ecological 2005-2007
Material and Matter Flows.
Co-PI, ProVision (Federal Ministry of Science), Budget: € 275,000
- **ECOCATCH** – Understanding the effects of global change on ecosystem 2006-2009
processes and services at catchment scale
Co-PI, Government of Lower Austria, Budget: € 264,500
- **Phyllo-N** – Nitrogen uptake in the phyllosphere of two forest stands. 2005-2007
PI, Austrian Environmental Agency; Budget: € 20,500
- Metabolomics and matter flow in plant-microbe interactions 2005-2006
Co-PI, Hochschuljubiläumsstiftung der Stadt Wien, Budget: € 4,500
- **RAFFSEED** – Raffinose oligosaccharides in seed germination 2002-2006
PI, FWF P16150-B07, Budget: € 181,500
- **NitPROD** – Global Warming and Tundra Ecosystems. PI, Austrian 2001-2004
Academy of Sciences (IGBP-25/2001), Budget: € 108,000
- **ILTER-Austria**: Long-Term Ecological Research Network, Austrian Network 2000-2003
of Environmental Research
PI, BMWF (Federal Ministry of Science); Budget: € 100,000
- **GALACC** – Oligosaccharide Accumulation in Legume Seeds 1999-2002
PI, FWF P13955-B06, Budget: € 150,000
- **CYCGAL** – Physiology and Metabolism of Cyclitol Galactosides in Seeds 1996-1999
PI, FWF P10917-BIO: Budget: € 87,000
- Mechanism of O-Methyl-Inositol Accumulation under Drought Stress. 1994-1996
PI, FWF P09595-BIO, Budget: € 65,000
- Accumulation and Function of Cyclitols in Hemiparasitic Mistletoes 1991-1993
PI, FWF, Budget: € 14,000

(b) Exchange Projects (selection)

- Effects of climate change on the carbon cycling in alpine meadows in the 2007-2010
Tibet Plateau (OeAD - Austrian Exchange Service, WTZ)
Cooperation partners: Prof. Ouyang, Dr. Xu (Chinese Academy of
Sciences; Beijing, China)
- Long-Term Changes in Humid Mountain Ecosystems in Siberia: Causes 2005-2007
and Consequences (OeAD - Austrian Exchange Service, WTZ)
Cooperation partner: Dr. Nikolay Lashchinskiy (Russian Academy of
Sciences, Siberian Branch, Akademgorodok, Russian Federation)
- Soil organic matter development in a glacier foreland: establishing a 2002-2003
model system for studies of ecological succession (British Council &
Federal Ministry of Science); Cooperation partner: Dr. Roland Bol
(IGER, North Wyke, U.K.)

- Nitrogen dynamics in arctic and alpine ecosystems along a latitudinal and altitudinal transect (OeAD - Austrian Exchange Service, WTZ) 2000-2003
Cooperation partner: Dr. Pavel Barsukov (Russian Academy of Sciences, Siberian Branch, Novosibirsk, Russian Federation)

(c) Infrastructure Projects

- Various infrastructure project as PI and Co-PI with a total volume of 2.35 Mio € during the years 2002-2014, including 4 IRMS systems for compound specific isotope work, a LC-Orbitrap, a pyr-GC/MS, 2 ion chromatography units, etc.
- Together with M. Wagner responsible for the realization and establishment of the Viennese NanoSIMS facility (total 2.45 Mio €).

Publications

- **Researcher ID: D-8483-2012**
Full publication list and citation records available at
<http://www.researcherid.com/rid/D-8483-2012>
- **ORCID-ID: 0003-3282-4808**
Publications can also be viewed at
<http://orcid.org/0000-0003-3282-4808>
- **156 peer-reviewed publications in ISI** (16 November 2016); including *Nature* (2x), *Science* (1x), *PNAS* (4x), *Nature Geoscience* (1x), *Nature Communication* (1x), *Ecology Letters* (2x)
- **75 publications of peer-reviewed** publications since the beginning of 2011.
≈ **90% of publications in the Top 25%** of each ISI subject category since 2011 (Q1; ISI Journal Citation Reports 2015)
Eight of the publications since 2011 are Highly Cited Papers (Thomson Reuters) as per May/June 2016.
- ISI Web of Knowledge (16 November 2016) for Andreas Richter:
Total citations: ≈ 6,000; Average citations per article: ≈ 40;
Hirsch-Index: 41 (ISI Web of Science)

Seminars and Lectures (solicited/invited)

- Water, Energy and Food Nexus: Nuclear Science for Sustainable Development
Interactive Debate, European Development Days (EDD), Brussels, Belgium 16. 11. 2016
- Microbes, Nutrients and Climate Change
COST Action Meeting Climani, Poznan, Poland 28. 09. 2015
- CUE and NUE of microbial communities: Concepts and emerging techniques
Ecological Society of America Meeting, Baltimore, USA 13. 08. 2015
- Microbial processes and biogeochemistry
University of Stockholm, Sweden 05. 06. 2015
- The Austrian Polar Research
UARctic Annual Meeting, Ulan-Ude, Russia 13. 06. 2015
- Microbial carbon use efficiency and P cycling
Imbalance-P Meeting, Barcelona, Spain 14. 01. 2015
- What Controls Decomposition of Organic Matter in Permafrost Soils?
Carbon Pools in Permafrost Regions, Conference, Stockholm, Sweden. 13. 05. 2014
- Decomposition of organic matter arctic permafrost soils (Key Note
Lecture) Polar Ecology Conference, Ceske Budejovice, Czech Republic. 22. 09. 2014
- Why is soil organic matter so persistent in permafrost soils? Colloquium
ETH Zürich, Environmental System Science, Switzerland. 17. 11. 2014
- Carbon and Nutrient Limitation of Microbial Decomposition of Organic
Matter in Permafrost Soils. AGU Fall Meeting (Session: Vulnerability of
Permafrost Carbon to Climate Change), San Francisco, USA 18. 12. 2014
- What controls the decomposition of organic matter in permafrost soils?
Hawkesbury Institute for the Environment, Sydney, Australia 09. 12. 2014
- Priming of soil organic matter decomposition in permafrost soil.
Workshop on priming of soil organic carbon, Copenhagen, Denmark. 09. 09. 2013
- How can we measure microbial process rates in soil?
Challenges in the Applications of Stable Isotopes Across Disciplines and
Scales, Wroclaw, Poland. 20. 05. 2013
- Microbial element use efficiencies and the stoichiometry of
mineralization processes. 27th New Phytologist Symposium:
Stoichiometric flexibility in terrestrial ecosystems under global change. 27. 09. 2011
- Stoichiometric and intrinsic controls of microbial N and P cycling.
School of Earth & Environment, University of Western Australia. 19. 04. 2011
- Stable carbon isotope analysis of low-molecular-weight carbohydrates:
the state of the art. Workshop on Compound Specific Isotope Analysis
and Post-Photosynthetic Fractionation. Barcelona, Spain. 14. 10. 2010
- The effect of tree girdling on belowground processes.
Institute of Plant Sciences, ETH Zürich, Switzerland. 21. 04. 2009
- The Arctic Carbon Cycle.
Naturhistorisches Museum, Vienna, Austria. 19. 05. 2009

- Linking microbial diversity and functions across scales and ecosystems, Federal Research Centre for Forests and Landscape, Vienna, Austria. 19. 02. 2009
- Cryoturbations and long-term C storage in Arctic soils. 11. 2008
Polar Symposium, Peyer-Weyprecht Gesellschaft, Innsbruck, Austria.
- Effects of plant carbon input on soil microbial communities and ecosystem processes, University of Kyoto, Japan 14.07.2008
- Effects of plant carbon input on soil microbial communities and ecosystem processes, University of Tokyo, Japan 18.07.2008
- Belowground plant-microbe interactions: lessons from a beech girdling experiment. 4th International Symposium on Physiological Processes in Woody Roots (Satellite Meeting). Bangor, U.K. 18. 09. 2007
- Belowground plant-microbe interactions and ecosystem processes: from temperate forests to arctic tundra. BOKU University, Vienna, Austria 12. 2007
- Das Ende der sibirischen Kälte? Klimafolgenforschung in der sibirischen Arktis. Zoologisch-Botanische Gesellschaft, Vienna, Austria 01. 2007
- Global Change in Arctic and Alpine Ecosystems. Interaction of ecosystem productivity and C and N cycling. University of Melbourne, Australia 02. 2007
- Soil Organic Matter Development and Nutrient Cycling. 21. 04. 2005
Institute of Geography, Chinese Academy of Sciences, Beijing, China
- Soil Organic Matter Development and Nutrient Cycling in a Glacier Foreland. Max Planck Institute for Biogeochemistry, Jena, Germany 17.11.2004
- Isotopic Composition of Starch Analysed by α -Amylase Digestion. 15.11.2004
SIBAE Workshop on Isotopes in Carbohydrates, Germany
- Natural ¹⁵N Abundance of Plants and Soils at the Alpine-Nival Ecotone in the Austrian Alps. 4th Conference on Biochemistry, Ecophysiology and Population Biology of Alpine and Polar Plants, Trins, Austria, 10. 07. 2003
- Nitrogen mineralization at the Oedenwinkelkees Glacier Foreland. 08. 07. 2003
NERC Meeting on "Soil Organic Matter Development", Glasgow, U.K.
- Global Warming and Arctic Ecosystems. 04.2003
Austrian Academy of Sciences, Vienna, Austria.
- Raffinose Oligosaccharides and Cyclitol Galactosides in Seeds. 16. 04. 2002
University of Agriculture, Piracaba, Sao Paulo, Brazil.
- Biosynthesis of RFO in Seeds. 08. 04. 2002
Institute of Botany, University of Sao Paulo, Brazil,
- Induction of Raffinose Oligosaccharide Synthesis by Abscisic Acid in Somatic Embryos of *Medicago sativa*. VII International Workshop on Seed Biology, Salamanca, Spain. 16. 05. 2002
- Raffinose Oligosaccharides in Seeds: What we know and what we don't know. Plant Forum, University of Zürich, Switzerland. 12. 2002

Teaching

(a) Course Development

- *Master in Environmental Sciences*

I was significantly involved in the development of a new joint Master Curriculum between the Faculty of Life Sciences and the Faculty of Earth Sciences since 2005, which led to the establishment of the interdisciplinary Master curriculum for “Environmental Sciences” in October 2011.

- *Master Ecology and Ecosystems*

I was co-chairing the working group for the Master Curriculum Ecology and Ecosystems. The Master started in October 2014.

(b) Courses

Average teaching load of 6.5 and 9.0 hours a week in the winter term and summer term (2011-2015), respectively, at the Bachelor and Master level (see online course directory of the University of Vienna).

- *Bachelor Biology/Ecology*
- *Master Ecology & Ecosystems*
- *Master Environmental Sciences*

(c) International Courses

- International ESF MOLTER Summer School

“Molecular and structural complexity of soil organic matter formation and turnover”, 25-30 March 2012, TU Munich, Freising-Weihenstephan, Germany

Lecturer (Effects of plants on soil organic matter decomposition)

- Marie Curie-iLEAPS Training Course

“Integrated measurements over land ecosystem atmosphere boundaries”, 7-12 May 2007, University of Helsinki, Hyytiälä field station, Finland

Lecturer (Stable Isotopes in Ecology)

- International SIBAE Spring School

“Stable Isotopes in Ecology”, 2-13 April 2007, University of Vienna, Austria. Organiser/Convenor/Lecturer.

- Joint NitroEurope/ESF NinE Summer School

“Methods to study microbial nitrogen turnover and the formation of greenhouse gases”, 2-13 October 2006, Federal Research and Training Centre for Forests, Natural Hazards and Landscape, Vienna, Austria

Lecturer (The Use of Stable Isotopes in Ecology)

- Joint International Stable Isotope Course

Technical University Munich, Germany and University of Southern Bohemia, Czech Republic,

(23.-29. April 2006 and 24.-25. April 08), University of South Bohemia, Budejovice, Czech Republic.

Lecturer (Nitrogen Isotopes in Soils and Ecosystems)

- University Course

“Gas-chromatography mass spectrometry of low-molecular-weight carbohydrates and polyols”

3-12 April 2002, University of Sao Paulo, Brazil. Lecturer.

(d) Ph.D. and Master Students

I have supervised a total of 72 students (bachelor, diploma, master and Ph.D. level) since 2001, 59 of which have already successfully completed their studies.

My group currently consists of two PostDocs, four PhD students and four Master students.