

Curriculum Vitae

Univ.-Prof.ⁱⁿ Dr.ⁱⁿ Christine Moissl-Eichinger

Position in CoE: Deputy Director of Research

Personal Details

Place of birth	Vilsbiburg, Germany
Nationality	German
Children	2 (2008, 2012)
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List of publications	ORCID: 0000-0001-6755-6263
Academic age	16 years since PhD



Research Institution

I am working at the *Diagnostic and Research Institute for Hygiene, Microbiology and Environmental Medicine* at the Medical University of Graz. The Institute is embedded in the Diagnostic and Research Center for Molecular Biomedicine. Beyond the facilities at the Center (including a high-end sequencing facility with NovaSeq und GridION instruments), I have full access to the Center for Medical Research (ZMF), a 4000 m² laboratory space equipped with cutting-edge basic and applied biomedical research facilities and instrumentation. I am currently heading a group of three PostDocs, seven PhD students, one technician and a number of diploma, Master's and Bachelor's students. Our research activities take place under the umbrella of the research area "Microbiome and Infection".

Academic Career and Positions Held

I earned a **diploma** degree in **microbiology** in **2000** (grade "very good") from the **University of Regensburg**, Germany. I received my Dr. rer. nat. from the same University in 2005 (*summa cum laude*). Subsequently, I worked as a PostDoc at the University clinics in Regensburg (rheumatology) and joined afterwards (2005-2006) the **CALTECH/ NASA Jet Propulsion Laboratory in California**, US. I returned as a **junior group leader** to the University of Regensburg, Chair for Microbiology and Archaea Center, where I obtained my **habilitation (*venia docendi*) in 2014**. Also in 2014, I accepted an offer from the **Medical University of Graz** as university professor on "**Interactive Microbiome Research**". I acted as **head of the Center for Microbiome Research**, which was recently turned into a designated *research field* "**Microbiome and Infection**" of the Medical University of Graz, of which I am acting as speaker (since 2021). Further, I am coordinator of the extension study program "*Medical Research*".

Main Research Areas and Most Important Research Achievement

Research field. To date, I have authored > **100 publications**, which mostly appeared in leading interdisciplinary and disciplinary journals. As a trained microbial ecologist and researcher focused on the third domain of life, archaea, my expertise focuses on (human) microbiome research. Our major expertise lies in the understanding of the contribution of the **archaeome (community of all archaea) to human health and disease**. Furthermore, we have a strong record of accomplishment in **environmental** (e.g., Bashir et al., 2019) and **indoor** microbiomes. The latter activities span the description of a novel phylum of archaea from deep subsurface (*Ca. Altiarchaeum hamiconexum*; see Probst et al., 2014), and the microbiome characterization in confined indoor

environments, such as the **International Space Station** (Mora et al., 2019), the **Mars500 mission**, and others. With the work on confined indoor microbiomes, we could show that the abundance and diversity of antibiotic resistances in e.g., hospital environments are caused by increased hygiene and cleaning activities, compared to less-maintained indoor environments (Mahnert et al., 2019; Austrian Hygiene Award).

Scientific achievements. By detecting **archaeal signatures on human skin** in 2013, we opened the window to a completely new area in human microbiome research: the archaeome. We were able to describe the diversity of archaeal species associated with the human body (across different body locations), determined the role of **archaea in high-methane producing individuals** (and their connection to diet and vitamin B12 uptake), identified a variety of novel, archaea-associated metabolites, and recently described **> 1,000 archaeal genomes from human gastrointestinal tract** (in press, Nature Microbiology). In that recent publication, we were able to identify numerous additional archaeal players in the human gut, and recognized that the most abundant archaeon therein, *Methanobrevibacter smithii*, is actually representing a cluster of two species (*Ca. M. intestini* was proposed). To date, not a single archaeal pathogen has been identified, despite their high prevalence (almost 100%) and abundance (1.2% on average in the gut microbiome, Chibani et al., 2021) in and on the human body. We are highly interested in understanding the **interplay of the archaeome, the microbiome, and the host**, and are driven by the question on involvement of the archaea in human disease and health.

General achievements. The research published by my team is very well recognized nationally and internationally, as also visible in a number of invited reviews on the human archaeome topic (incl. Nature Reviews Microbiology and Nature Reviews Gastroenterology & Hepatology). My h-index is 46 (based on [google scholar](#), September 2022), with almost **6,000 citations**. I generated more than **3 million € from third parties** to support my research, including support from the European Commission, DFG, FWF, FFG and others. Since 2014, I was PI or Co-PI of 29 projects, of which 9 are currently active (four FWF (2x PI, 2x Co-PI), two doctoral programs (2x Co-PI), one EC (Co-PI), one FWF-SFB (Co-PI), 2 industry-supported projects (2x PI)). I received a number of [awards](#), including the **ESF Award for the discovery of a top 10 New Species** (2014), or the **Austrian Hygiene Award** (2019). Since 2018, I am ordinary member of the European Academy of Sciences and Arts ([EASA](#)). Furthermore, I am committee member of the Austrian Microbiome Initiative ([AMICI](#)), and speaker of the special groups Archaea and Microbiome of the [VAAM](#) (Association for General and Applied Microbiology). I am organizer of a yearly international Microbiome conference (Theodor Escherich Symposium on Medical Microbiome Research) since 2015.

Scientific outreach. I am very active in science dissemination to the public and scientific community, by social media (e.g., Twitter), television (e.g., Arte/[3sat](#)/ORF), press releases and print media, as well as radio contributions. I am providing lectures for elderlies, children and general interested public, through e.g., the **MINIMED/MEINMED lecture** series. To date, I have held or contributed to almost 300 conference presentations, including various invited lectures in the US, UK, Switzerland, Poland, Italy, Germany, Austria and others.

Contribution to CoE. With this expertise, I will scientifically contribute to our cluster, by leading and contributing research projects focusing on the understudied **archaeomes**. One project will focus on the **small intestine** (where Archaea are involved in small intestinal “bacterial” overgrowth syndrome, SIBO), others on the effect of medication on the gastrointestinal archaeome, and the influence of **archaeal metabolites** (incl. indole derivatives) on host and gastrointestinal environment. Moreover, I will add my knowledge on archaea in a project dealing with permafrost, and my knowledge on the microbiome on a variety of other projects.

10 Most Important Publications (*relevant for the CoE)

1. *Chibani, C. M.; Mahnert, A.; Borrel, G.; Almeida, A.; Werner, A.; Brugère, J.-F.; Gribaldo, S.; Finn, R. D.; Schmitz, R. A.; **Moissl-Eichinger, C.** A Catalogue of 1,167 Genomes from the Human Gut Archaeome. *Nat Microbiol* **2022**, *7* (1), 48–61. <https://doi.org/10.1038/s41564-021-01020-9>.
2. *Kumpitsch, C.; Fischmeister, F. Ph. S.; Mahnert, A.; Lackner, S.; Wilding, M.; Sturm, C.; Springer, A.; Madl, T.; Holasek, S.; Högenauer, C.; Berg, I. A.; Schoepf, V.; **Moissl-Eichinger, C.** Reduced B12 Uptake and Increased Gastrointestinal Formate Are Associated with Archaeome-Mediated Breath Methane Emission in Humans. *Microbiome* **2021**, *9* (1), 193. <https://doi.org/10.1186/s40168-021-01130-w>.
3. *Borrel, G.; Brugère, J.-F.; Gribaldo, S.; Schmitz, R. A.; **Moissl-Eichinger, C.** The Host-Associated Archaeome. *Nat Rev Microbiol* **2020**, *18* (11), 622–636. <https://doi.org/10.1038/s41579-020-0407-y>.
4. *Koskinen, K.; Pausan, M. R.; Perras, A. K.; Beck, M.; Bang, C.; Mora, M.; Schilhabel, A.; Schmitz, R.; **Moissl-Eichinger, C.** First Insights into the Diverse Human Archaeome: Specific Detection of Archaea in the Gastrointestinal Tract, Lung, and Nose and on Skin. *mBio* **2017**, *8* (6), e00824-17. <https://doi.org/10.1128/mBio.00824-17>.
5. *Bagga, D.; Reichert, J. L.; Koschutnig, K.; Aigner, C. S.; Holzer, P.; Koskinen, K.; **Moissl-Eichinger, C.**; Schöpf, V. Probiotics Drive Gut Microbiome Triggering Emotional Brain Signatures. *Gut Microbes* **2018**, 1–11. <https://doi.org/10.1080/19490976.2018.1460015>.
6. *Bashir, A. K.; Wink, L.; (25 authors); **Moissl-Eichinger, C.** Taxonomic and Functional Analyses of Intact Microbial Communities Thriving in Extreme, Astrobiology-Relevant, Anoxic Sites. *Microbiome* **2021**, *9* (1), 50. <https://doi.org/10.1186/s40168-020-00989-5>.
7. *Mahnert, A.; **Moissl-Eichinger, C.**; Zojer, M.; Bogumil, D.; Mizrahi, I.; Rattei, T.; Martinez, J. L.; Berg, G. Man-Made Microbial Resistances in Built Environments. *Nat Commun* **2019**, *10* (1), 968. <https://doi.org/10.1038/s41467-019-08864-0>.
8. Mora, M.; Wink, L.; Kögler, I.; Mahnert, A.; Rettberg, P.; Schwendner, P.; Demets, R.; Cockell, C.; Alekhova, T.; Klingl, A.; Krause, R.; Zolotariof, A.; Alexandrova, A.; **Moissl-Eichinger, C.** Space Station Conditions Are Selective but Do Not Alter Microbial Characteristics Relevant to Human Health. *Nat Commun* **2019**, *10* (1), 3990. <https://doi.org/10.1038/s41467-019-11682-z>.
9. *Probst, A. J.; Weinmaier; (19 authors); **Moissl-Eichinger, C.** Biology of a Widespread Uncultivated Archaeon That Contributes to Carbon Fixation in the Subsurface. *Nat Commun* **2014**, *5* (1), 5497. <https://doi.org/10.1038/ncomms6497>.
10. *Probst, A. J.; Auerbach, A. K.; **Moissl-Eichinger, C.** Archaea on Human Skin. *PLoS ONE* **2013**, *8* (6), e65388. <https://doi.org/10.1371/journal.pone.0065388>.