

Curriculum vitae

Amelia-Elena Rotaru

Associate Professor of Microbial Physiology

Department of Biology, University of Southern Denmark

[Lab website](#), [Nordcee](#), [Department website](#), [ORCID](#)

Education

- 2009 **PhD in Marine Microbiology (Dr. Rer. Nat.)**
University of Bremen, Max Planck Research School for Marine Microbiology, Germany
Topic: microbial interspecies interactions involved in hydrocarbon degradation
- 2005 **MSc in Marine Microbiology**
University of Bremen, Max Planck Research School for Marine Microbiology, Germany
Topic: symbiosis, interspecies interactions between marine microbes and marine worms

Professional experience

- 2018 – present **Associate Professor, Department of Biology, University of Southern Denmark.**
Research on methane-cycling microorganisms of interest for biotech and climate adaptations. Research topics include (1) exploring how methanogens and their syntrophic partners interact with conductive mineral particles and their role in methane emissions in engineered and natural environments; (2) discovering how methanogens use electrons from electrodes to make methane/ electromethanogenesis and finding the best way toward developing a power-to-gas technology.
- 2017 (6 mo.) **Guest Assistant Professor, Department of Microbiology, University of Massachusetts Amherst, USA**
- 2015 – 2018 **Assistant Professor, Department of Biology, University of Southern Denmark.**
Research on methanogen interactions with solid electron donors. Explored the role of environmental methanogens in iron corrosion and their interspecies relationships at the iron surface. Demonstrated that certain methanogens can use electricity directly, feeding on cathodic electrons to convert CO₂ to a valuable fuel – methane. Discovered they did not rely on typical cell constituents associated with extracellular electron transfer like multiheme c-type cytochromes.
- 2013 – 2015 **FNU Postdoctoral Fellow, Department of Biology, University of Southern Denmark.**
“Hunting” for interspecies cross-feeding interactions in the marine environment. Discovered a strict dependency on conductive particles between syntrophic acetate oxidizers and methanogens from marine and lake environments. This is now known as conductive particle mediated interspecies electron transfer.
- 2010 – 2013 **Postdoc. Department of Microbiology, University of Massachusetts Amherst, USA**
Discovered the first interspecies interactions relying on direct electron transfer between a bacteria and archaeal methanogens. This is now known as direct interspecies electron transfer.
- 2009 – 2010 **Postdoc. Interdisciplinary Nanoscience Center, University of Aarhus, Denmark**
Discovered how nanosized metal catalyst nucleate in the periplasm of bacterial cells.

Other positions

- Editor, ASM Microbiology Spectrum (2022-present)
Associate Editor, Frontiers in Microbiology, Microbial Physiology (2022-present)
Researcher at the Biochemistry Institute of the Romanian Academy of Science (2002)

Research leadership. Grants, awards & fellowships

At SDU, I attracted ca. **9 million € in external funding**, over the last 8 years

- 2022 – 2027 **PI, ERC Consolidator grant (2 million €)** by the European Research Council
Exploring the impact of anthropogenic conductive particles on syntrophic partnerships involved in methane cycling in coastal sediments and their impact on methane emissions
- 2021 – 2026 **PI, Ascending Investigator grant (1.308.000 €)** by the Novo Nordisk Foundation
Exploring how methanogens store electricity and capture CO₂ into a fuel - methane
- 2021 – 2025 **PI, DFF Research project 2 grant (832.486 €)** an interuniversity collaborative grant by the Danish Research Council.

- Exploring the reversibility of electron transfer between archaea and bacteria typically involved in methane oxidation in the seabed
- 2015 – 2020 **PI, Sapere Aude Starting grant (941.336 €)** by the Danish Research Council
Studied how methanogens and associated microbes convert metallic iron to gas
- 2019 EMBO-Breathless Microbes invited lecturer travel grant, Uni. Wageningen, Netherlands
- 2014 – 2019 WP leader, Co-I, Innovations Fond grant (2.689.532 €) for the grant Electrogas, my team studied cathodic electron uptake by methanogens of relevance for a power-to-gas technology
- 2015 – 2018 PI, Novo Nordisk postdoc fellowship (336.191€) by the Novo Nordisk Foundation.
Studied how acetogens capture cathodic electrons to synthesize acetate
- 2016 Fyens Stiftidsende researcher prize (3400 €), awarded by Fyens Stiftidsende for excellence in research, Fyn, Denmark**
- 2013 – 2015 PI, postdoc fellowship FNU MOBILEX (268.953 €), Danish Research Council
Studied conductive particle mediated interspecies electron transfer in aquatic sediments
- 2013 – 2016 PI, postdoc fellowship Dale T. Mortensen, AIAS, AU (322.743 €, *declined*). Proposed to study electromethanogenesis via direct electron uptake from cathodes, the idea was recycled in a consortium grant - *Electrogas*, funded from 2014 to 2019 (see above)
- 2006 Teaching award, International Max Planck Research School/ Germany
- 2003 – 2005 MSc fellowship, International Research School, Max Planck Society/ Germany
- 1998 – 2002 Excellence study fellowship, 3rd best of ~1000 at admission exam, Uni. Bucharest/ Romania

Memberships

- American Society of Microbiology (ASM)
Danish Microbiological Society (DMS)
International Society of Microbial Electrochemical Technologies (ISMET)

Professional workshops and training

- 2020 Leadership Training with personal coach, ½ year SDU/ DK
2019 Ph.D. supervision course, SDU/ DK
2016 – 2017 University Lecturer Training Program incl. courses in active learning and teaching (2016); interactive lecturing (2016), Questioning for learning and assessment (2017)/ SDU/ DK
2014 Career development course/ SDU/ DK

Service (in addition to “other positions” on page 1)

University service

- . *Ad hoc* committee chair for 3 PhD defenses at Nordcee, Department of Biology, SDU (2020-2022)
- . *Ad hoc* committee chair for Hiring 2 tenure track assistant professors at DIAS (Danish Institute for Advanced Studies) or the Department of Biology, SDU (2021-2022)
- . *Ad hoc* committee chair for Promotion and Tenure review, Department of Biology, SDU (2021-2022)
- . Sustainability Committee, Natural Science Faculty, Uni. Southern Denmark/ DK (2020 - present)

Departmental service

- . Curriculum Design Committee, Department of Biology, SDU/ DK (2020 - present)
- . Departmental Council (elected auxiliary member), Department of Biology, SDU/ DK (2020 - present)
- . Organizer Departmental Lecture Series, Dept. of Biology, SDU/ DK (2019 - present)
- . Website Redesign, responsible for the overhaul of the Nordcee-section website, SDU/DK (2019-2020)

Peer review

- . Guest Editor, *Frontiers in Microbiology, Microbial Physiology and Geomicrobiology* (2012-2021)
- . Tenure Evaluation external examiner Aarhus University (1 candidate, 2022)
- . *Ad hoc* reviewer for international funding agencies: European Research Council (2017, 2020), Dutch Research Council (2020), Helmholtz Society in Germany (2020), National Science Foundation USA (2019), German Research Foundation, DFG (2019).
- . *Ad hoc* external referee for Ph.D. defenses in Denmark (4 DTU, 1 AU) and 3 abroad (1 Uni. Queensland, AU; 1 Uni. Helsinki, FI; and 1 Radboud Uni., NL).
- . *Ad hoc* reviewer for 23 journals, including Science, PNAS, ISME Journal ([Publons](#))

Other service

- . Session convener Gordon Research Conference (2022)
- . External Ph.D. advisory committee member, 2 PhD students:

- 1 at Uni. Cincinnati/ USA (2020 - present) and
- 1 at DOME, University of Vienna/Austria (2022 - present)
- Conference committee and organizer for Electromicrobiology-2022 with the Center for Electromicrobiology, Aarhus University / Denmark (2020 - 2022)

Research Expeditions

Baltic Sea transect (Bornholm Basin), Denmark (1 week, 2022 - scheduled)

Baltic Sea transect (Bothnian Bay), Sweden (2 weeks, 2014)

Lago La Cruz, Spain (2 weeks, 2014)

Teaching

Student and postdoctoral training

Below is the list of the 13 trainees I had since 2015 when I started as PI at SDU.

In addition to the list below, prior to establishing my own lab, I co-supervised or trained: 3 lab-rotations students (MPI, DE), 1 visiting PhD student (iNANO, AU), 2 visiting PhD students and 2 postdocs (UMASS, USA), 3 bachelor students on research projects and 1 B.Eng. honors (UMASS, USA)

Current lab members (including impending hires)

- **Satoshi Kawaichi.** Staff Scientist (planned start 9/2022)
- **Rhithu Kotoky.** Postdoc (planned start 7/2022)
- **Danijel Jovicic.** 3-year Ph.D. program, SDU (2021 - present)
- **Abdalluh Jabaley.** 3-year Ph.D. program, SDU (2021 - present)
- **Malene Arreborg.** M.Eng. Co-supervised with SDU-TEK (2021-2022); PhD student (planned start 9/2022).
- **Casper Krog Pedersen.** M. Sc. program, SDU (2021 - 2022)
- **Lasse Ørum Smidt.** Lab Technician (2016 - present)

Former graduate students and postdoctoral mentees (main supervision only)

- **Mon Oo Yee.** Ph.D. 2019. Upon graduation accepted a 2-year postdoc position with Romy Chackraborty at Laurence Berkley National Lab, USA. Then she returned to SDU for a postdoc position with Beate Kraft. As of April 2022, she is a permanent hire as R&D staff microbiologist at Nature Energy, Odense, Denmark.
- **Paola Andrea Palacios.** Ph.D. 2019. Upon graduation, she continued with a 3-month postdoc in my lab, and then a 1-year postdoc with Warren Francis at Nordcee/SDU. She is now a postdoc at the Faculty of Engineering, Aarhus University.
- **Satoshi Kawaichi.** Postdoc. 2016 – 2019. Left for a 2-year postdoc position at Uni. Ohio/ USA and then returned as postdoc at the Dept. of Engineering, SDU/ DK. He will be rehired as staff scientist/ATAP in my team at SDU from Sept. 2022.
- **Xiaochen Yang.** Postdoc intern. 2 months, 2018. Left for a job as senior scientist at WuXi AppTec, China
- **Oona Snoeyenbos-West.** Postdoc. 2016-2018. Left for a 1-year postdoc in the lab of Gemma Reguerra, Uni. Michigan, then a 1-year scientist job at the Swedish Museum of Natural History, and recently joined the lab of Poul Carini at Uni. Arizona, USA as staff scientist.

Visiting students and postdocs in my lab at SDU

- Tetyana Gilevska. Visiting postdoc. 2022-2024. Secondment of Marie Currie with Gotheborg Uni, Sweden
- Alyssa Socolov. Visiting Ph.D. student. 2022. From DOME, Uni. Vienna, Austria
- Kelsey Rogers. Visiting postdoc. 2019-2020. From Posth lab., Uni. Copenhagen.

Other contribution to student training

- Co-supervised 1 M.Eng. thesis AU/SDU
- Supervised three B.Sc. theses at SDU
- Research mentor for six undergraduate student independent research activities (3-month research projects) at SDU; and a lab technician thesis project

Courses

At the University of Southern Denmark/DK

2021 – now	Lecturer – (Pharmacy undergrads)/ Topic: Molecular biology, Biochemistry, Evolution
2015 – now	Lecturer – (Biology undergrads), 2021- present: course responsible/ Topic: molecular biology, biochemistry, evolution
2018 – 2020	Lecturer – (Natural Science undergrads)/ Topic: evolution
2016 – now	Lecturer – (Biology undergrads)/ Topic: electromicrobiology
2015	Lectures – (Biology undergrads)/ Topic: toxic algal blooms
2013 – 2015	Instructor – (Pharmacy undergrads)/ Topic: Pharmaceutical toxicology

International Max Planck Research School for Marine Microbiology-Marmic/ MPI, Bremen/ DE

2005 – 2009 Instructor – (yearly MSc lab courses Marmic)/ Topic: general prokaryotic biology
 Tutor – (yearly MSc lab courses Marmic)/ Topic: thermodynamics for microbiologists
 Guest lecturer – (yearly MSc lab courses Marmic)/ Topic: syntrophic interactions

Conferences and outreach

35+ invited talks at conferences & universities, of which **6 keynotes**

Conference discussion leader: Gordon Research Conference “Molecular Basis of One-Carbon Metabolism” 2022.

Invited lecturer: international Ph.D. summer school EMBO Breathless Microbes (2019)

Outreach: author of a behind the paper blog for the *Nature Research Community*; invited public lecture for the Fyens Stiftstidende award; interviews with media and featured on various media outlets; manager of the Nordcee Twitter account, promoting new publications.

Selected invited/keynote talks at conferences:

2023: (scheduled): Gordon Res. Conf.: appl. & environ. microbiology (USA) Invited speaker
 2022: (scheduled) Applied Synthetic Biology in Europe conference; Edinburgh (UK) Invited speaker
 2022: (scheduled) ISMET-global conference; Crete (GR) **Keynote speaker**
 2022: New Topics in Mineralogy 2: The mineral–microbe interface; (online, UK) Invited speaker
 2022: Microenergy Workshop; Aarhus (DK) Invited speaker
 2022: ICBM-4; Braga (PT) **Keynote speaker**
 2022: KNVM Scientific Spring meeting; Arnhem (NL) Invited speaker
 2021: Electromicrobiology-2; Aarhus (DK) Invited speaker (and organizer)
 2019: IWA-16 Congress on Anaerobic Digestion; Delft (NL) Invited Speaker
 2019: SAME-16 Symposium of Aquatic Microbial Ecology, Potsdam (DE) **Keynote speaker**
 2019: Electromicrobiology-1; Aarhus (DK) Invited speaker
 2018: ISMET-NA, St. Poul Minnesota (USA) Invited speaker
 2018: Gordon Res. Conf.: molecular basis of microbial 1C metabolism; Maine (USA) Invited speaker
 2017: SFB987 Survival Artists Workshop; MPI Marburg (DE) Invited speaker
 2017: Redox Active Minerals Meeting; Manchester (UK) **Keynote speaker**
 2017: Geomicrobiology Network Meeting; Manchester (UK) Invited speaker
 2016: KNVM meeting; Nijmegen (NL) **Keynote speaker**
 2016: ASM meeting; Boston (USA) Invited speaker
 2016: JAMS; Sydney (AUS) Invited speaker
 2015: DMS meeting; Copenhagen (DK) **Keynote speaker**

Selected invited talks at universities and research institutes:

2023: (scheduled) University of Tubingen (DE)
 2022: (scheduled) Max Planck Institute for Marine Microbiology 30-year anniversary (DE)
 2021: (online) Radboud University, Radboud (NL)
 2018: Wageningen Evolution and Ecology Seminars, University of Wageningen, Wageningen (NL)
 2018: Microbiology Lecture Series; University of Southern Denmark, Odense (DK)
 2017: Stanford University, Paolo Alto (USA)
 2017: Marburg spotlight on Microbiology (LOWE graduate school invited speaker), MPI Marburg (DE)
 2017: University of California Dana and Dornsife, Los Angeles (USA)
 2017: Danish Technological University, Lyngby (DK)
 2016: University of Oldenburg, Oldenburg (DE)
 2016: University of New Castle, New Castle (UK)
 2016: University of New South Wales, Sydney (AU)
 2016: Helmholtz Center for Environmental Research, Leipzig (DE)
 2016: Radboud University, Radboud (NL)
 2015: Departmental Lecture Series; Dept. Biology, University of Southern Denmark, Odense (DK)
 2014: Aarhus University, Aarhus (DK)

Major collaborations (as of 2022)

- . Bo Barker Jørgensen, Kasper Urup Kjeldsen, Hans Røy, Thomas Bosen. University of Aarhus / DK
- . Per Morgen, Prof. Emeritus, SDU Chem Eng./ DK
- . Federico Aulenta, Stefano Fazi. Water Research Institute/ Italy
- . Niculina Musat, Florin Musat. Helmholtz-Centre for Environmental Research / Germany
- . Gilberio Martin, Madalena Alves. Uni. Minho/ Portugal
- . Lotta Purkamo. Geological Survey of Finland/ Finland
- . Stefano Bonaglia. University Gotheborg/ Sweden
- . Daniel Chevrier, Damien Faivre. Atomic Energy and Alternative Energies Commission/ France