

POSTH, NICOLE RITA ELISABETH (Dr. rer. Nat.)

ORCID: 0000-0002-6695-6115

Date of Birth: 15-05-1977; **Family:** married, 3 children, age 10, 5, 5

Nationality: German, USA

Contact: Dept of Geosciences & Natural Resource Management (IGN), Geology
University of Copenhagen, Øster Voldgade 10, 5230, Denmark
Email: nrep@ign.ku.dk, Web: www.posthlab.com



RESEARCH AREA

Geomicrobiology, sediment biogeochemistry, microbial ecology and physiology, geobiology, microbial element cycling, cell-mineral(-plastic) interactions, environmental fate of plastic

EMPLOYMENT

- 10/2017- **Assistant Professor, Tenure-tracked, VILLUM Young Investigator**
Geology, Dept of Geoscience & Natural Resource Management, University of Copenhagen
- 5-9/2017 **Assistant Professor, VILLUM Young Investigator**
Nordcee-Dept of Biology, University of Southern Denmark (SDU)
- 2016-2017 **Research funding advisor**
University of Southern Denmark, Support Office, Science (6 months)
- 2013-2016 **Marie Skłodowska-Curie Fellow (IEF)**
NordCEE-Biology-SDU, Host: DE Canfield
- 2011-2013 **DFG (German Research Council) Postdoctoral Fellow**
NordCEE-Biology-SDU, Host: DE Canfield
- 2009-2011 **Post-doctorate researcher, BMBF**
Center for Applied Geosciences (ZAG) University of Tübingen, Germany, Host: A Kappler
- 2000-2001 **Fulbright Teaching Scholar**
Austrian Fulbright Commission, Höhere Technische Bundeslehranstalt, Linz, Austria

EDUCATION

- 2009 (3/19) **Doctorate, summa cum laude** Geomicrobiology, Center for Applied Geosciences (ZAG), University of Tübingen, Germany; Supervisor: A Kappler
- 2004 **MSc, cum laude** Applied and Environmental Geosciences, Helmholtz Center for Health & the Environment (GSF), Munich / ZAG Tübingen; Supervisors: RU Meckenstock, C Griebler
- 2001-2002 **Law Merit Scholar** University of Miami School of Law, Florida, USA
- 2000 **BSc, cum laude** Environmental Science, Tufts University, Massachusetts, USA

HONORS/FUNDING [TOTAL FUNDED RESEARCH] ~16 mill DKK

- DHRTC Radical Innovation Sprint, **Co-PI** 2020
Reviving the Dead: Nanocatalytic microbial methanation of the N. Sea abandoned oil
- Geocenter Danmark Grant, **Co-PI** [4 mill DKK] 2020-2023
Plastics from source to sink: Exploring transport pathways & fate of plastics in coastal waters (TRACE)
- Geocenter Danmark Grant, **Co-PI** [1 mill DKK; 134 000 €] 2019-2021
Plastic Debris Hotspots: societal & physical drivers of massive plastic pollution (PlasticHotspot)
- VILLUM Young Investigator Programme Grant, **PI** [9.7 mill DKK; 1.3 mill €] 2017-2024
Cycling in the Plastisphere: the biogeochemical fate of marine (micro)plastics

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| Marie Skłodowska-Curie Individual Fellowship (IEF), <i>BioCTrack</i> PI [230 810 €] | 2013-2016 |
| German Research Foundation Postdoctoral Research Fellowship, PI [78 250 €] | 2011-2013 |
| University of Tübingen Young Researcher Prize, funded by Commerzbank, recipient [5 000 €] | 2009 |
| Wilhelm Schuler Foundation Research Grant, PI [5 500 €] | 2009 |
| <i>Organic compounds as potential biomarkers of life on early earth</i> | |
| Paul Scherrer Institute, Swiss Light Source, TOMCAT proposal | 2007-2008 |

FIELD RESEARCH EXPERIENCE:

Environmental fate of plastic: Myanmar (in planning), Umeå Marine Science Center Mesocosm Facility (in planning), Vietnam (2019-present), Svanemøllen Harbor, Copenhagen (current); *Microbial element cycling:* Lake La Cruz, Spain (2014), Milos Island, Greece (2014), Lake Cadagno, Switzerland (2012-13)

TEACHING & SUPERVISION

Formal Training: University Pedagogy certified-KU 2019; Fulbright Teaching Scholarship-Linz, Austria (2000-01); UCPH Leading Research (2020), UCPH PhD Supervision (2021)

Current courses: Intro to Geomicrobiology (MSc), Marine Geology (MSc), Lab Methods in the Geosciences (BSc)

Thesis supervision to date: BSc (2), MSc (5), PhD (2), Post-doc (2)

POSITIONS OF TRUST

Joint Head of Research Group - Sedimentary Systems (Since 2019); Head of Geomicrobiology Lab (since 2017)

Guest Editor: Marine Biological Laboratory (MBL) - Biological Bulletin virtual symposium “Current knowledge in marine microplastics – pollution down to the nano scale”, co-ed Posth & Garm.

Session convener: Gordon GRS Origins of Life 2008, 2010; Goldschmidt- Life in Ferruginous Settings 2013; Danish Marine Researcher Meeting – Microplastics 2019.

Reviewer: Nature Geoscience, Nature Communications, Scientific Reports, FEMS Microbiol Letters, Geobiology, GCA, Geology, FEMS Microbial Ecology, Astrobiology, Frontiers in Microbiology

PROFESSIONAL ENGAGEMENT/PUBLIC OUTREACH (select)

Member: European Assoc for Geochemistry since 2007 (EAG), Danish Microbiological Soc (DMS), Earth Science Women’s Network, Intl Soc for Microbial Ecology (ISME), Soc of Envir Toxicology & Chem (SETAC), Association for the Sciences of Limnology & Oceanography (ASLO), DANWISE (Danish Women in Science), Ocean Plastics Forum.

Invited seminars: Goldschmidt 2013; GRC Origins of Life 2006; Arsen 2009-UFZ; Unis Wien, Konstanz, Erlangen, Stockholm, Lund; Nordic Geologic Winter Meeting 2018; Danish Marine Research 2019

Media/Outreach: Nano3Sat *Eisen könnte dem Leben Energie verliehen haben* 2009; TV2, NyViden *Microbes in the Plastisphere* 2017, UCPH Science Inspiration for teachers: *Secrets of Water* speaker 2019, SEP Climate KIC outreach on *Plastics in the Marine Environment* 2020; Junior Geologerne (<https://junior-geologerne.dk/>)

PUBLICATIONS:

Publication statistics: 21 peer-reviewed (1036/1404 citations), including 9 first authored and 1 last authored. 8 in prep/revision, 1 co-editor. H-index = 12/14. Average citations per item: 54/74. Stats: ISI Web of Science / Google Scholar.

1. **Posth NR** & Garm AL (2021) Introduction to the series on “Current knowledge in Marine Microplastics – Pollution down to the Nanoscale.” *Biological Bulletin* 240, DOI: 10.1086/713624. *In Print*.
2. Rogers KL, Carreres Calabuig JA, Gorokhova E, **Posth NR** (2020) Micro-by-Micro Interactions: How microorganisms influence the fate of marine microplastics. *Limnology & Oceanography Letters*. doi: 10.1002/lol2.10136.

3. Maximenko N, Corradi P, Law KL, Van Sebille E, Garaba SP, Lampitt RS, Galgani F, Martinez-Vicente V, Goddijn-Murphy L, Veiga JM, Thompson RC, Maes C, Moller D, Löscher CR, Addamo AM, Lamson MR, Centurioni LR, **Posth NR**, Lumpkin R, Vinci M, Martins AM, Pieper CD, Isobe A, Hanke G, Edwards M, Chubarenko IP, Rodriguez E, Aliani S, Arias M, Asner GP, Brosich A, Carlton JT, Chao Y, Cook A-M, Cundy AB, Galloway TS, Giorgetti A, Goni GJ, Guichoux Y, Haram LE, Hardesty BD, Holdsworth N, Lebreton L, Leslie HA, Macadam-Somer I, Mace T, Manuel M, Marsh R, Martinez E, Mayor DJ, Le Moigne M, Molina Jack ME, Mowlem MC, Obbard RW, Pabortsava K, Robberson B, Rotaru A-E, Ruiz GM, Spedicato MT, Thiel M, Turra A and Wilcox C. et al. (2019) Towards the integrated marine debris observing system. *Frontiers in Marine Science* 6, 447.
4. Luedin SM, Liechti N, Cox RP, Danza F, Frigaard N-U, **Posth NR**, Pothier JF, Roman S, Storelli N, Wittwer M, Tonolla M. (2019) Draft genome sequence of *Chromatium okenii* isolated from the stratified Alpine Lake Cadagno. *Scientific Reports* 9 (1936), 1-14. DOI: 10.1038/s41598-018-38202-1.
5. Rotaru A-E, **Posth NR**, Löscher CR, Miracle MR, Vicente E, Cox RP, Thompson J, Poulton S, Thamdrup B (2019) Interspecies interactions mediated by conductive minerals in the sediments of iron-rich Lake La Cruz. *Limnetica*- Special issue for Maria-Rosa Miracle, 38(1), 21-40. DOI: 10.23818/limn.38.10.
6. Chi Fru E, Callac N, **Posth NR**, Argyraki A, Ling Y-C, Ivarsson M, Broman C, Kiliyas SP (2018). Arsenic and high affinity phosphate uptake gene distribution in shallow submarine hydrothermal sediments. *Biogeochemistry*. <https://doi.org/10.1007/s10533-018-0500-8>
7. **Posth NR**, Bristow LA, Cox RP, Habicht KS, Danza F, Tonolla M, Frigaard N-U, Canfield DE (2017) Carbon isotope fractionation by anoxygenic phototrophic bacteria in euxinic Lake Cadagno. *Geobiology*, 15 (6), 798-816.
8. Callac N, **Posth NR**, Weich A, Rattray JE, Afrifa YKK, Wiech A, Ivarsson M, Hemmingsson C, Kiliyas SP, Argyraki A, Broman, C, Skogby H, Smittenberg RH, Chi Fru E (2017) Modes of carbon fixation in an arsenic and CO₂-rich shallow hydrothermal ecosystem. *Scientific Reports*, 7, 14708.
9. Tonolla M, Storelli N, Danza F, Ravasi D, Peduzzi S, **Posth NR**, Cox RP, Jørgensen MF, Gregersen LH, Daugbjerg N, Frigaard N-U (2017) Lake Cadagno: Microbial life in Crenogenic Meromixis. In R.D. Gulati, E.S. Zadereev, A.G. Degermendzhi, (Eds.) *Ecology of Meromictic Lakes, Ecological Studies*, Vol. 228, Springer Verlag, 155-186. DOI 10.1007/978-3-319-49143-1_7
10. **Posth NR**, Canfield DE, Kappler A (2014) Biogenic Fe(III) minerals: From formation to diagenesis and preservation in the rock record. *Earth-Science Reviews*, 135, 103-121.
11. **Posth NR**, Koehler I, Swanner ED, Schroeder C, Wellmann E, Binder B, Konhauser KO, Neumann U, Berthold C, Nowak M, Kappler A (2013) Simulating Precambrian banded iron formation diagenesis. *Chemical Geology* – Special Issue for Dick Holland, 362, 66-73.
12. **Posth NR**, Konhauser KO, Kappler A (2013) Microbiological processes in BIF deposition. *Sedimentology*, 60, 1733-1754.
13. **Posth NR**, Konhauser KO, Kappler A (2011) Banded Iron Formations. In Encyclopedia of Geobiology (eds. V. Thiel, J. Reitner). *Encyclopedia of Earth Sciences Series*, Springer Verlag. ISBN: 978-1-4020-9211-4.
14. Kleinert S, Muehe EM, **Posth NR**, Dippon U, Daus B, Kappler A (2011) Biogenic Fe(III) minerals lower the efficiency of iron-mineral-based commercial filter systems for arsenic removal. *Envir Sci Tech* 45 (17), 7533-7541.
15. **Posth NR**, Huelin S, Konhauser KO, Kappler A (2010) Size, density and composition of cell-mineral aggregates formed during anoxygenic phototrophic Fe(II) oxidation: Impact on modern and ancient environments. *GeochimCosmochim Acta* 74, 3476-3493.
16. Kersten M, Bahr C, Daus B, Driehaus W, Kappler A, Karabacheva S, Kolbe F, **Posth N**, Reich TY, Schurk K, Stanjek H, Wennrich R (2010) MicroActiv – Optimization of water purification technology for arsenic and antimony scavenging by microbially-activated Fe-oxide minerals. *Geotechnologien*, Scientific Report No. 16, 170-181.
17. Miot J, Benzerara K, Morin G, Kappler A, Bernard S, Obst M, Férard C, Skouri-Panet F, Guigner J-M, **Posth NR**, Galvez M, Brown Jr. GE (2009) Iron biomineralization by neutrophilic iron-oxidizing bacteria. *GeochimCosmochim Acta* 73, 696-711.

18. Pecoits E, **Posth NR**, Konhauser KO, Kappler A (2009) Petrography and trace element geochemistry of Dales Gorge Banded Iron Formation: Paragenetic sequence, source and implications for the Palaeo-ocean chemistry. *Precamb Res* 172(1-2), 163-187.
19. **Posth NR** (2008) Recreating Rocks. *Nature Geosci* 1(10), E17.
20. **Posth NR**, Hegler F, Konhauser KO, Kappler A (2008) Alternating Si and Fe deposition caused by temperature fluctuations in Precambrian oceans. *Nature Geoscience* 1(10), 703-708.
21. Hegler F, **Posth NR**, Jiang J, Kappler A (2008) Physiology of phototrophic iron(II)-oxidizing bacteria-implications for modern and ancient environments. *FEMS Microbiol Ecol* 66(2), 250-260.
22. Konhauser KO, Amskold L, Lalonde SV, **Posth NR**, Kappler A, Anbar A (2007) Decoupling photochemical Fe(II) oxidation from shallow-water BIF deposition. *Earth Planet Sci Let* 258, 87-100.