

## Qualifications & Research Interests

- Seven years of research experience in organic geochemistry, geobiology, biogeochemistry
  - Major research interests: 1) Proxy development (organic biomarkers and their C & H isotopes) and application to the reconstruction Mesozoic-Cenozoic climate and ocean geochemistry. 2) Co-evolution of biosynthetic pathways and environment. 3) Modern ocean biogeochemistry and microbial ecology.
  - Expertise in lipid biomarker analysis via high-resolution mass spectrometry (lipidomics), compound-specific stable isotopic analysis, microbial cultivation, and genetic analysis.
  - 24 peer-reviewed publications, 10 as first author.
  - Raised over 1,8 M € in external research funding.
  - Advised 5 thesis students and 6 research students.
  - Experience in teaching (2h/week, 3 semesters) a wide range of geoscience topics (introductory geology, geobiology, geochemistry, and oceanography).
  - Extensive experience in departmental administration and outreach.
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## Research Experience

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| Since 2016 | <b>Postdoctoral Fellow</b><br>Department of Earth and Planetary Sciences, Harvard University.<br>Advisor: Ann Pearson                  |
| 2015       | <b>Postdoctoral Researcher</b><br>Center for Marine Environmental Sciences (MARUM), University of Bremen.<br>Advisor: Kai-Uwe Hinrichs |
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## Education

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| 2012-2015 | <b>PhD in Geosciences</b> (highest honors), MARUM, University of Bremen<br>Thesis: <i>Factors controlling the lipid composition in marine planktonic Thaumarchaeota</i> . Advisor: Kai-Uwe Hinrichs            |
| 2009-2012 | <b>M. Sc. Marine Geosciences</b> , University of Bremen<br>Thesis: <i>Microbial carbon cycling in the hypersaline, anoxic Orca Basin, northern Gulf of Mexico</i> . Advisor: Kai-Uwe Hinrichs                  |
| 2010      | <b>Study abroad</b> at University Centre of Svalbard/University of Bergen (Norway).                                                                                                                            |
| 2006-2009 | <b>B. Sc. Geosciences</b> , University of Bremen<br>Thesis: <i>Changes in the stress field of the Western Alps - Structural &amp; Geological Mapping in the Upper Rhône Valley</i> . Advisor: Cornelia Spiegel |

## Grants

- 2020 **Deutsche Forschungsgemeinschaft, Emmy Noether research group #441217575** (1,888,396 €). Topic: *Novel hydrological and carbon cycle constraints from the isotopic composition of archaeal lipid biomarkers.*
- 2018 **Deutscher Akademischer Austauschdienst RISE Fellowship #US-ES-4055** (~3,200 €). Topic: *Novel applications of archaeal lipid isotopic analysis.* Providing 3 months of funding for an undergraduate lab assistant.
- 2017 **National Science Foundation award OCE-1702262** (\$332,460). Topic: *Beyond ocean temperature: Extracting new dimensions of paleoclimatic information from archaeal lipids and their isotopic compositions.* Equal co-author, but employment designation prevented listing both Elling and Pearson as Co-PIs. PI: Ann Pearson.
- 2017 **DAAD RISE Fellowship #US-ES-2997** (~3,200 €). Topic: *Lipid-based reconstruction of the Paleocene-Eocene carbon isotope excursion.* Providing 3 months of funding for an undergraduate lab assistant.
- 2015 **MARUM Extension Funding** (~8,150 €)  
Award for conclusion of manuscripts resulting from outstanding PhD theses.
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## Awards

- 2020 **Certificate of Distinction in Teaching, Harvard University.** Awarded for achieving >90% positive evaluations for teaching undergraduate courses.
- 2018 **Thomas Hoopes Prize, Harvard University.** Awarded for “*excellence in the art of teaching*” in supervising an outstanding senior thesis.
- 2016 **MARUM Research Award for Marine Science.** Awarded for best PhD dissertation in marine sciences.
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## Teaching Experience

I am strongly engaged in teaching geosciences at Harvard University and have **taught three semester-long courses** (2 hours/week) as well as a laboratory section (6 hours) for a summer school at the University of Bremen. For these classes, ***I have developed new class materials, designed and held lectures, and led laboratory exercises, field trips, group discussions*** and review sessions. I have completed training in teaching and mentoring at Harvard University's Bok Center for Teaching and Learning (two-day seminars in 2017, 2018, 2019). Courses taught:

- 2019 **Teaching fellow** for GenEd1018 *How to Build a Habitable Planet* (36 students). History of the universe, earth, and life; sustainability and global change. Course head: Charles Langmuir.
- 2018 **Teaching fellow** for EPS50 *The Fluid Earth: Atmospheres and Oceans* (19 students). Introductory course on oceanography and climatology. Course head: Ann Pearson.

- 2017      **Teaching fellow** for SPU14 *How to Build a Habitable Planet* (13 students). History of the universe, earth, and life; sustainability and global change. Course head: Charles Langmuir.
- 2014      **Laboratory demonstrator** for European Consortium for Ocean Research Drilling summer school *Subseafloor Biosphere Current Advances and Future Challenges* (22 students).
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## Mentoring Experience

I have **advised five thesis students (2 M.Sc., 3 B.Sc.) and six research students** at Harvard University and the University of Bremen. Two thesis advisees continued to pursue a PhD. Three advisees have first-authored/co-authored their first publication under my supervision.

### Supervision of B.S. and M.S. thesis students

- 2018      Sebastian Gfellner (M.Sc.). Project: *Lipid recycling by energy-stressed archaea*
- 2017      Catherine Polik (B.Sc.). Project: *Effects of microbial ecology on paleotemperature records during Mediterranean sapropel formation*. Now: Lab manager at University of Michigan, Department of Earth & Environmental Sciences, USA.
- 2017      Louise Kip (M.Sc.). Project: *Miocene-Holocene history of ocean temperature and biological productivity of the East Equatorial Pacific*. Now: Junior Soil Specialist Oil & Gas at Arcadis, Netherlands.
- 2014      Andreas Greve (B.Sc.). Project: *Membrane lipid adaptation mechanisms to pH in Thaumarchaeota*. Now: PhD student at the Max-Planck-Institute for Marine Microbiology, Bremen, Germany.
- 2013      Nadine Smit (B.Sc.). Project: *Temperature adaptation mechanisms in Thaumarchaeota*. Now: PhD student at the Royal Netherlands Institute of Sea Research (NIOZ), Texel, Netherlands.

### Supervision of undergraduate research students

Sophie Webster (2019), Laura Kattein (2018), Claire Jasper (2017), Samuel McNichol (2017), Katiana Doeana (2017), Mirko Lange (2014).

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## Academic Service

### Service in departmental committees (Department of Geosciences, University of Bremen):

Elected graduate student representative (2 years) • Elected member of department board (3 years) • Member of PhD admissions board (2 years) • Elected undergraduate student representative (3 years) • Member of committee for re-designing curricula of Geosciences BSc (2009) and MSc (2011) programs • Member of search committee (Professorship in Marine Geology).

### Conference session co-chair:

*Honoring John Hayes: Molecular and isotopic biogeochemistry across time and space, Goldschmidt Conference 2018, Boston*

### Manuscript reviewer (35 reviews in 2015-2020):

*Biogeosciences • Chemical Geology • Climate of the Past • Deep Sea Research • Environmental Microbiology • Environmental Earth Sciences • Frontiers in Earth Science • Frontiers in Microbiology • Geochimica et Cosmochimica Acta • Geology • ISME Journal • Journal of Geophysical Research - Biogeosciences • Limnology & Oceanography • Marine Chemistry • Organic Geochemistry • Palaeogeography, Palaeoclimatology, Palaeoecology • Scientific Reports*

**Proposal reviewer:** *US National Science Foundation (Geobiology & Low Temp. Geochemistry)*

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### Outreach Activities

I am engaged in science outreach through museums and science festivals. I use these opportunities to reach a diverse public audience, including underserved groups and children, and promote science literacy and foster enthusiasm for earth sciences.

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| 2019      | <b>U.S. Intrepid Sea, Air &amp; Space Museum</b> , New York (USA) Kids Week: Hands-on activities on marine sediments and microfossils as paleoclimate archives.                                                                                                         |
| 2019      | <b>Cambridge Festival of Science</b> , Hands-on activities promoting beneficial aspects of microbes. Cambridge (USA)                                                                                                                                                    |
| 2018-2019 | <b>Microbial Life Exhibition</b> , Harvard Museum of Natural History, Cambridge (USA): 4 hours/month visitor interaction and experimental demonstrations on microbiology (e.g., microscopy of live microbes from fermented foods & soil).                               |
| 2018      | <b>Microbial Science Short Talk</b> , Harvard Museum of Natural History, Cambridge (USA): <i>What microbes can tell us about past climate</i> .                                                                                                                         |
| 2013      | <b>University of Bremen Open Day</b> , showcasing paleoclimate research performed at MARUM using sediment cores and microfossils.                                                                                                                                       |
| 2011      | <b>Organizer of the academic open day</b> , Department of Geosciences, University of Bremen (Germany): lectures and social activities focused on geoscience career perspectives for students.                                                                           |
| 2010      | <b>Co-organizer of paleoclimate project for secondary school students</b> , Cooperation between University of Bremen and Secondary School Wittstock (Germany) entitled: "Paleoclimate research enters the classroom: Drilling Lake El'gygytyn" (two days, 60 students). |
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### Expeditions & Field Work

I am experienced in planning, performing, and leading ship- and land-based expeditions in collaboration with international scientists. Previous field work included geological mapping as well as geochemical and microbiological sampling campaigns at sea and on land.

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| 2021 | <b>International Ocean Discovery Program, Expedition 388</b> , RV <i>JOIDES Resolution</i> , (9 weeks). Cretaceous-Paleogene paleoceanography of the Equatorial Atlantic Gateway. Role: Organic geochemist. SCHEDULED. |
| 2019 | <b>Black Sea</b> , RV <i>Poseidon</i> cruise POS539 (2 weeks). Biogeochemistry of the marine nitrogen cycle. Role: Organic geochemistry team leader.                                                                   |

- 2010      **Gulf of Mexico**, RV *Atlantis* cruise AT18-2 (4 weeks). Biogeochemistry of seafloor brine pools. Role: Organic geochemist & starboard observer during DSV *Alvin* dive 4658
- 2010      **Svalbard**, Central Tertiary Basin (4 weeks). Sampling of bentonites as stratigraphic markers for the Paleocene-Eocene. Role: Sedimentologist & trip leader.
- 2009      **Western Alps**, Switzerland (3 weeks). Tectonic history of the Aiguilles Rouges external massif. Role: Geologist & trip leader.
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## Publications

I have authored 24 peer-reviewed, published articles; 10 as first/co-first author, 1 as corresponding author of my advisee first-author; total citations (Google Scholar): 645; *h*-index: 14. Two first-author articles appeared in high-impact journals (*PNAS*, *Nature Communications*). Three first-author and one co-author manuscript are currently under review.

Google Scholar profile: <http://scholar.google.com/citations?user=RVNhsHMAAAAJ>

\*Asterisks denote shared first-authorship. Advisees are underlined.

### Peer-reviewed, published articles

24. Nigro, L.M., **Elling, F.J.**, Hinrichs, K.-U., Joye, S.B., Teske, A. (2020). Microbial diversity and biogeochemistry of hypersaline sediments in Orca Basin. *Plos One* 15(4), e0231676. doi: <https://doi.org/10.1371/journal.pone.0231676>
23. Probst, A.J.\*, **Elling, F.J.\***, Castelle, C., Zhu, Q., Elvert, M., Birarda, G., Holman, H.-Y., Ladd, B., Ryan, M. C., Hinrichs, K.-U., Banfield, J.F. (2020). Lipid analysis of CO<sub>2</sub>-rich subsurface aquifers suggests an autotrophy-based deep biosphere with lysolipids enriched in CPR bacteria. *ISME Journal* 14, 1547-1560. doi: <https://doi.org/10.1038/s41396-020-0624-4>.
22. **Elling, F.J.**, Gottschalk, J., Doeana, K.D., Kusch, S., Hurley, S.J., Pearson, A. (2019) Archaeal lipid biomarker constraints on the Paleocene-Eocene carbon isotope excursion. *Nature Communications* 10, 4519. doi: [10.1038/s41467-019-12553-3](https://doi.org/10.1038/s41467-019-12553-3).
21. Zhou, A., Chiu, B.K., Cobban, A.B., Weber, Y., **Elling, F.J.**, Pearson, A., Leavitt, W.D. Electron donor flux controls GDGT cyclization in the model thermoacidophile *Sulfolobus acidocaldarius*. *Environmental Microbiology* 22, 343-353. doi: [10.1111/1462-2920.14851](https://doi.org/10.1111/1462-2920.14851)
20. Hurley, S.J., Close, H.G., **Elling, F.J.**, Jasper, C.E., Gospodinova, K., McNichol, A.P., Pearson, A. (2019). CO<sub>2</sub>-dependent carbon isotope fractionation in Archaea, Part II: The marine water column. *Geochimica et Cosmochimica Acta* 261, 383-395. doi: [10.1016/j.gca.2019.06.043](https://doi.org/10.1016/j.gca.2019.06.043)
19. Pearson, A., Hurley, S.J., **Elling, F.J.**, Wilkes, E.B. (2019). CO<sub>2</sub>-dependent carbon isotope fractionation in Archaea, Part I: Modeling the 3HP/4HB pathway. *Geochimica et Cosmochimica Acta* 261, 368-382. doi: [10.1016/j.gca.2019.06.042](https://doi.org/10.1016/j.gca.2019.06.042)
18. Polik, C.A., **Elling, F.J.\***, Pearson, A. (2018). Impacts of paleoecology on the TEX<sub>86</sub> sea surface temperature proxy in the Pliocene-Pleistocene Mediterranean Sea. *Paleoceanography and Paleoclimatology* 33, 1472-1489. doi: [10.1029/2018PA003494](https://doi.org/10.1029/2018PA003494)

17. Becker, K.W. \*, **Elling, F.J. \***, Schröder, J.M., Lipp, J.S., Goldhammer, T., Zabel, M., Elvert, M., Overmann J., Hinrichs, K.-U. (2018). Isoprenoid quinones resolve the stratification of microbial redox processes in a biogeochemical continuum from the photic zone to deep anoxic sediments of the Black Sea. *Applied and Environmental Microbiology* 84, e02736-17. doi: [10.1128/AEM.02736-17](https://doi.org/10.1128/AEM.02736-17)
16. Hemingway, J.D., Kusch, S., Shah Walter, S.R., Polik, C.A, **Elling, F.J.**, Pearson, A. (2018). A novel method to measure the <sup>13</sup>C composition of intact bacteriohopanepolyols. *Organic Geochemistry* 123, 144–147. doi: [10.1016/j.orggeochem.2018.07.002](https://doi.org/10.1016/j.orggeochem.2018.07.002)
15. **Elling, F.J.**, Könneke, M., Nicol, G.W., Stieglmeier, M., Bayer, B., Spieck, E., de la Torre, J.R., Becker, K.W., Thomm, M., Prosser, J.I., Herndl, G.J., Schleper, C., Hinrichs, K.-U. (2017). Chemotaxonomic characterisation of the thaumarchaeal lipidome. *Environmental Microbiology* 19, 2681-2700. doi: [10.1111/1462-2920.13759](https://doi.org/10.1111/1462-2920.13759)
14. Hurley, S.J.\*, **Elling, F.J. \***, Könneke, M., Buchwald, C., Wankel, S.D., Santoro, A.E., Lipp, J.S., Hinrichs, K.-U., Pearson, A. (2016). Influence of ammonia oxidation rate on thaumarchaeal lipid composition and the TEX<sub>86</sub> temperature proxy. *Proceedings of the National Academy of Sciences of the United States of America* 113, 7762-7767. doi: [10.1073/pnas.1518534113](https://doi.org/10.1073/pnas.1518534113)
13. Zhu, C., Wakeham, S.G., **Elling, F.J.**, Basse, A., Mollenhauer, G., Versteegh, G.J.M., Könneke, M., Hinrichs, K.-U. (2016). Stratification of archaeal membrane lipids in the ocean and implications for adaptation and chemotaxonomy of planktonic archaea. *Environmental Microbiology* 18, 4324-4336. doi: [10.1111/1462-2920.13289](https://doi.org/10.1111/1462-2920.13289)
12. Becker, K.W., **Elling, F.J.**, Yoshinaga, M.Y., Söllinger, A., Urich, T., Hinrichs, K.-U. (2016). Unusual butane- and pentanetriol-based tetraether lipids in *Methanomassiliicoccus luminyensis*, a representative of the seventh order of methanogens. *Applied and Environmental Microbiology* 82, 4505-4516. doi: [10.1128/AEM.00772-16](https://doi.org/10.1128/AEM.00772-16)
11. **Elling, F.J. \***, Becker, K.W.\*, Könneke, M., Schröder, J.M., Kellermann, M.Y., Hinrichs, K.-U. (2016). Respiratory quinones in *Archaea*: phylogenetic distribution and application as biomarkers in the marine environment. *Environmental Microbiology* 18, 692-707. doi: [10.1111/1462-2920.13086](https://doi.org/10.1111/1462-2920.13086)
10. Zhuang, G.-C.\*, **Elling, F.J. \***, Nigro, L.M., Samarkin, V., Joye, S.B., Teske, A., Hinrichs, K.-U. (2016). Multiple evidence for methylotrophic methanogenesis as the dominant methanogenic pathway in deep-sea hypersaline sediments. *Geochimica et Cosmochimica Acta* 187, 1-20. doi: [10.1016/j.gca.2016.05.005](https://doi.org/10.1016/j.gca.2016.05.005)
9. Liu, X.-L., Birgel, D., **Elling, F.J.**, Sutton, P.A., Lipp, J.S., Zhu, R., Zhang, C., Könneke, M., Peckmann, J., Rowland, S.J., Summons, R.E., Hinrichs, K.-U. (2016). From ether to acid: a plausible degradation pathway of glycerol dialkyl glycerol tetraethers. *Geochimica et Cosmochimica Acta* 183, 138-152. doi: [10.1016/j.gca.2016.04.016](https://doi.org/10.1016/j.gca.2016.04.016)
8. Widderich, N., Czech, L., **Elling, F.J.**, Könneke, M., Stöveken, N., Pittelkow, M., Riclea, R., Dickschat, J.S., Heider, J., Bremer, E. (2016). Strangers in the archaeal world: osmostress-responsive biosynthesis of ectoine and hydroxyectoine by the marine thaumarchaeon *Nitrosopumilus maritimus*. *Environmental Microbiology* 18, 1227-1248. doi: [10.1111/1462-2920.13156](https://doi.org/10.1111/1462-2920.13156)

7. Yao, M., **Elling, F.J.**, Jones, C., Sulung, N., Long, C.P., Crowe, S.A., Antoniewicz, M.R., Hinrichs, K.-U., Maresca, J.A. (2016). Heterotrophic bacteria from an extremely phosphate-poor lake have conditionally reduced phosphorus demand and utilize diverse sources of phosphorus. *Environmental Microbiology* 18, 656-667. doi: [10.1111/1462-2920.13063](https://doi.org/10.1111/1462-2920.13063)
6. **Elling, F.J.**, Spiegel, C., Estrada, S., Davis, D.W., Reinhardt, L., Henjes-Kunst, F., Allroggen, N., Dohrmann, R., Piepjohn, K., Lisker, F. (2016). Origin of bentonites and detrital zircons of the Paleocene Basilika Formation, Svalbard. *Frontiers in Earth Science* 4, 73. doi: [10.3389/feart.2016.00073](https://doi.org/10.3389/feart.2016.00073)
5. **Elling, F.J.**, Könneke, M., Mußmann, M., Greve, A., Hinrichs, K.-U. (2015). Influence of temperature, pH, and salinity on membrane lipid composition and TEX<sub>86</sub> of marine planktonic thaumarchaeal isolates. *Geochimica et Cosmochimica Acta* 171, 238-255. doi: [10.1016/j.gca.2015.09.004](https://doi.org/10.1016/j.gca.2015.09.004)
4. Lü, X., Liu, X.-L., **Elling, F.J.**, Yang, H., Xie, S., Song, J., Li, X., Yuan, H., Li, N., Hinrichs, K.-U. (2015). Hydroxylated isoprenoidal GDGTs in China coastal seas and their potential as paleotemperature proxy in mid-to-low latitude marginal seas. *Organic Geochemistry* 89-90, 31-43. doi: [10.1016/j.orggeochem.2015.10.004](https://doi.org/10.1016/j.orggeochem.2015.10.004)
3. Coban, H., Miltner, A., **Elling, F.J.**, Hinrichs, K.-U., Kästner, M. (2015). The contribution of biogas residues to soil organic matter formation and CO<sub>2</sub> emissions in an arable soil. *Soil Biology & Biochemistry* 86, 108-115. doi: [10.1016/j.soilbio.2015.03.023](https://doi.org/10.1016/j.soilbio.2015.03.023)
2. **Elling, F.J.**, Könneke, M., Lipp, J.S., Becker, K.W., Gagen, E.J., Hinrichs, K.-U. (2014). Effects of growth phase on the membrane lipid composition of the thaumarchaeon *Nitrosopumilus maritimus* and their implications for archaeal lipid distributions in the marine environment. *Geochimica et Cosmochimica Acta* 141, 579-597. doi: [10.1016/j.gca.2014.07.005](https://doi.org/10.1016/j.gca.2014.07.005)
1. Meador, T.B., Zhu, C., **Elling, F.J.**, Könneke, M., Hinrichs, K.-U. (2014). Identification of isoprenoid glycosidic glycerol dibiphytanol diethers and indications for their biosynthetic origin. *Organic Geochemistry* 69, 70-75. doi: [10.1016/j.orggeochem.2014.02.005](https://doi.org/10.1016/j.orggeochem.2014.02.005)

## Selected Conference Contributions

- 2019 **Elling, F.J.**, Hemingway, J.D., Evans, T.W., Kharbush, J.J., Spieck, E., Summons, R.E., Pearson, A. Cobalamin-dependent biosynthesis of 2-methylhopanoids in nitrite-oxidizing bacteria: Implications for the geologic record of hopanoids. *AGU Fall Meeting*, San Francisco, USA. *Oral presentation*
- 2019 **Elling, F.J.**, Hemingway, J.D., Polik, C.A., Pearson, A. Nitrogen loss and carbon cycle feedbacks during past marine anoxia. *Goldschmidt Conference*, Barcelona, Spain. *Oral presentation*
- 2019 **Elling, F.J.**, Gottschalk, J., Doeana, K., Kusch, S., Hurley, S. J., Pearson, A. Archaeal lipid biomarker constraints on the Paleocene-Eocene carbon isotope excursion. 13<sup>th</sup> International Conference on Paleoceanography, Sydney, Australia. *Poster presentation*

- 2018 **Elling, F.J.**, Doeana, K., Kusch, S., Pearson, A. Magnitude of the marine carbon isotope excursion during the Paleocene-Eocene Thermal Maximum constrained through archaeal biomarkers. *Goldschmidt Conference*, Boston, USA. *Oral presentation*
- 2016 **Elling, F.J.**, Kusch, S., Pearson, A. Constraining the magnitude of the Paleocene-Eocene marine carbon isotope excursion using intact GDGTs. *Gordon Research Conference on Organic Geochemistry*, Holderness, USA. *Poster presentation*
- 2015 **Elling, F.J.**, Könneke, M., Hurley, S., Lipp, J.S., Mußmann, M., Pearson, A., Hinrichs, K.-U. The influence of temperature and other factors on membrane lipid composition and TEX<sub>86</sub> in thaumarchaeal pure cultures. *27<sup>th</sup> International Meeting on Organic Geochemistry*, Prague, Czech Republic. *Oral presentation*
- 2015 **Elling, F.J.**, Becker, K.W., Könneke, M., Schröder, J.M., Hurley, S.J., Mußmann, M., Pearson, A., Hinrichs, K.-U. Physiological and ecological constraints on TEX<sub>86</sub> and GDGT provenance revealed by pure culture experiments and quinone biomarkers. *Goldschmidt Conference*, Prague, Czech Republic. *Oral presentation*
- 2014 **Elling, F.J.**, Könneke, M., Lipp, J.S., Hinrichs, K.-U. Influence of growth phase, temperature and salinity on the membrane lipid composition in the marine ammonia-oxidizing archaeon *Nitrosopumilus maritimus*. *GDGT Workshop 2014*, Texel, Netherlands. *Oral presentation*
- 2014 **Elling, F.J.**, Könneke, M., Lipp, J.S., Mußmann, M., Hinrichs, K.U. Effect of environmental and physiological parameters on the membrane lipid composition of marine ammonia-oxidizing archaea. *Gordon Research Conference on Organic Geochemistry*, Holderness, USA. *Poster presentation*
- 2013 **Elling, F.J.**, Könneke, M., Lipp, J.S., Gagen, E., Thomm, M., Hinrichs, K.-U. Response of membrane lipid composition to growth conditions in the marine ammonia-oxidizing archaeon *Nitrosopumilus maritimus*. *26<sup>th</sup> International Meeting on Organic Geochemistry*, Costa Adeje, Spain. *Poster presentation*
- 2013 **Elling, F.**, Könneke, M., Lipp, J.S., Hinrichs, K.-U. Growth phase-dependent membrane lipid composition of the marine ammonia-oxidizing archaeon *Nitrosopumilus maritimus*. *Annual Conference of the Association for General and Applied Microbiology*, Bremen, Germany. *Poster presentation*