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RESEARCH AND TEACHING INTERESTS

Microbial physiology and metabolism, microbiomes, symbiosis, diet-microbiota interactions, plant-microbe interactions, intra- and interspecies microbe-microbe interactions, genomics and metagenomics, proteomics and metaproteomics, environmental microbiology, computational biology, method and software development, evolution, horizontal gene transfer, the role of bacteriophages in horizontal gene transfer, microbial ecology, marine microbiology, renewable resources, and origins of life.

CURRENT POSITION

8/2023 Associate Professor and University Faculty Scholar, Chancellor's Faculty Excellence Program Cluster on Microbiomes and Complex Microbial Communities, NC State University

EDUCATION AND PROFESSIONAL EXPERIENCE

8/2017-8/2023 Assistant Professor and University Faculty Scholar, Chancellor's Faculty Excellence Program Cluster on Microbiomes and Complex Microbial Communities, NC State University

9/2014 – 8/2017 Banting **Postdoc**toral Fellow, University of Calgary
Energy Bioengineering Group, Marc Strous (advisor)

1/2013 – 8/2017 **Guest Faculty**, Lora Hooper's Laboratory, UT Southwestern Medical Center, Dallas

1/2013 – 8/2014 **Postdoc**toral Scientist, Max Planck Institute for Marine Microbiology, Bremen, Germany

2012 **Ph.D.**, summa cum laude, Max Planck Institute for Marine Microbiology, Bremen, Germany
Symbiosis Group, Nicole Dubilier (advisor)
Dissertation title: "Metabolism and evolutionary ecology of chemosynthetic symbionts from marine invertebrates."

2008/2009 Postgraduate research year: Visiting fellow in the labs of James Reilly, Indiana University, Bloomington, IN and Nathan VerBerkmoes, Oak Ridge National Laboratory, Oak Ridge, TN

2008 **Diplom** in Biology, University of Greifswald, Germany (4 years of classes + 1 year thesis work in the groups of Michael Hecker and Thomas Schweder)
Grade: 1.0 (best possible grade, best student in class)
Major: Microbial Physiology / Molecular Biology
Minors: Microbial Ecology and Computer Science
Thesis title: "Metaproteomics of the bacterial symbionts of the marine oligochaete worm *Olavius algarvensis*."

PUBLICATIONS

(***** = contributed equally, **^** = corresponding authorship, **$** = student/postdoc supervised by MK)

Publication overview available at
https://scholar.google.com/citations?hl=en&user=4O7OP3wAAAAJ&view_op=list_works

Garrell, A.-K.$, J. Cheadle, N. Crook, G. Pal$, A. N. Septer, M. R. Wagner, A. E. Beck, M. Kleiner^ (2025). Differential metaproteomics of bacteria grown in vitro and in planta reveals functions used during growth on maize roots. bioRxiv https://www.biorxiv.org/content/10.1101/2025.06.02.657423v1.abstract

Hinzke, T.$, B. J. Kunath, J. A. Blakeley-Ruiz$, A. Korenek$, S. Vintila, P. Wilmes, **M. Kleiner** (2026). Comprehensive evaluation of statistical approaches for differential metaproteomics. bioRxiv https://www.biorxiv.org/content/10.64898/2025.12.10.693402v3

Rajczewski, A. T., S. Mehta, R. Wagner, W. Gabriel, J. Johnson, K. Do, S. Vintila, M. Wilhelm, **M. Kleiner**, B. C. Searle, T. J. Griffin, P. D. Jagtap (2026). Comparative performance of Scribe and database search engines in metaproteomic profiling of a ground truth microbiome dataset. Journal of Proteomics 322: 105549

Clouse, K. M., M. L. Ellis, N. E. Ford, R. Hostetler, P. J. Balint-Kurti, **M. Kleiner**, M. R. Wagner (2025). The interactions between abiotic and biotic soil factors modulates heterosis expression in maize. Phytobiomes First Look Published Online

Schultz, D. L., C. M. Stouthamer, S. E. Kelly, O. L. Mathieson$, **M. Kleiner**, M. S. Hunter, S. Schmitz-Esser (2025). Comparative genomics of the endosymbiont *Cardinium* causing reproductive manipulation in *Encarsia* parasitoid wasps. MicrobiologyOpen 14(6): e70084

Pal, G.$, M. R. Wagner, **M. Kleiner^** (2025). Root-secreted proteins: an underexplored component of root exudates. Trends in Plant Science 30(11): P1197-1200

Mordant, A.$, J. A. Blakeley-Ruiz$, **M. Kleiner^** (2025). Metaproteomics-based stable isotope fingerprinting links intestinal bacteria to their carbon source and captures diet-induced substrate switching. The ISME Journal 19(1):wraf127

Awan, A.$, A. Bartlett$, J. A. Blakeley-Ruiz$, T. Richie$, C. M. Theriot, **M. Kleiner^** (2025). Dietary protein from different sources escapes host digestion and is differentially modified by microbiota. Food & Function 16:7154

Mathieson, O. L.$, D. L. Schultz, M. S. Hunter, **M. Kleiner**, S. Schmitz-Esser, M. R. Doremus (2025). The ecology, evolution, and physiology of *Cardinium*: a widespread heritable endosymbiont of invertebrates. FEMS Microbiology Reviews fuaf031

Wagner, M. R. and **M. Kleiner** (2025). How thoughtful experimental design can empower biologists in the omics era. Nature Communications 16:7263

Wilson, N. J., C. M. Smith-Moore, Y. Xu, B. Edwards, C. La Hovary, K. Li, D. Aslett, M. Ji, X. Lin, S. Vintila$, **M. Kleiner**, D. Xie, Y. Shachar-Hill, A. Grunden, and H. Sederoff (2025). In vitro demonstration and in planta characterization of a condensed, reverse TCA (crTCA) cycle. Frontiers in Plant Science 16:1556957

Cortés-Martín, A., C. Buttimer, J. L. Maier$, C. A. Tobin, L. A. Draper, R. P. Ross, **M. Kleiner**, C. Hill, A. N. Shkoporov (2025). Adaptations in gut Bacteroidales facilitate stable co-existence with their lytic bacteriophages. Gut Microbes 17(1):2507775

Van Den Bossche, T., J. Armengaud, D. Benndorf, J. A. Blakeley-Ruiz$, M. Brauer, [25 co-authors in alphabetical order including **M. Kleiner**], L. Li, The Metaproteomics Initiative (2025). The microbiologist's guide to metaproteomics. iMeta e70031

Rajczewski, A. T., J. A. Blakeley-Ruiz$, A. Meyer, S. Vintila, M. R. McIlvin, T. Van Den Bossche, B. C. Searle, T. J. Griffin, M. A. Saito, **M. Kleiner^**, P. D. Jagtap (2025). Data-Independent Acquisition Mass Spectrometry as a Tool for Metaproteomics: Interlaboratory Comparison Using a Model Microbiome. Proteomics 25(9-10):e202400187

Bartlett, A.$, A. Blakeley-Ruiz$, T. Richie$, C. M. Theriot, **M. Kleiner^** (2025). Large quantities of bacterial DNA and protein in common dietary protein source used in microbiome studies. Proteomics 25(17-18):43-50

Blakeley-Ruiz, J. A.$, A. Bartlett$, A. S. McMillan, A. Awan$, M. V. Walsh$, A. K. Meyerhoffer$, S. Vintila, J. L. Maier$, T. G. Richie$, C. M. Theriot, **M. Kleiner^** (2025). Dietary protein source alters gut microbiota composition and function. The ISME Journal 19(1): wraf048

Best Manuscript Award from the Metaproteomics Initiative (award talk delivered by Kleiner Lab Postdoc Alfredo Blakeley-Ruiz in Oslo in Jan 2025)

Petrone, B. L., A. Bartlett$, S. Jiang, A. Korenek$, S. Vintila, C. B. Tenekjian, W. S. Yancy Jr., L. A. David, **M. Kleiner^** (2025). A pilot study of metaproteomics and DNA metabarcoding as tools to assess dietary intake in humans. Food & Function 16, 282 – 296

Violette, J. M.$, E. Hyland, L. Burgener, A. Ghosh, B. M. Montoya, **M. Kleiner^** (2024). Meta-omics reveals role of photosynthesis in microbially induced carbonate precipitation at CO_2-rich geyser. ISME Communications 4(1):ycae139

Salvato, F.$, M. Kleiner (2024). A complete metaproteomic workflow for *Arabidopsis* roots inoculated by synthetic bacteria. In: Salerno, C. (eds) Metaproteomics. Methods in Molecular Biology, vol 2820: 57-65. Humana, New York, NY

Sheriff, E. K., F. Salvato$, S. E. Andersen, A. Chatterjee, **M. Kleiner**, B. A. Duerkop (2024). Enterococcal quorum-controlled protease alters phage infection. FEMS Microbes 5:xtae022

Award for the best article published in FEMS Microbes in 2024

Northen, T. R., **M. Kleiner**, M. Torres, A. T. Kovács, M. H. Nicolaisen, [16 authors], R. Garrido-Oter (2024). Community standards and future opportunities for synthetic communities in plant-microbiota research. Nature Microbiology 9:2774-2784

Ratinskaia, L., S. Malavin, T. Zvi-Kedem, S. Vintila, **M. Kleiner**, M. Rubin-Blum (2024). Metabolically-versatile Ca. Thiodiazotropha symbionts of the deep-sea lucinid clam *Lucinoma kazani* have the genetic potential to fix nitrogen. ISME Communications 4(1): ycae076

Maier, J. L.$, C. Gin, B. J. Callahan, E. K. Sheriff, B. A. Duerkop, **M. Kleiner^** (2024). Pseudo-pac site sequences used by phage P22 in generalized transduction of *Salmonella*. Plos Pathogens 20(6): e1012301

Hornstein, E. D., M. Charles, M. Franklin, B. Edwards, S. Vintila, **M. Kleiner**, H. Sederoff (2024). *IPD3*, a master regulator of arbuscular mycorrhizal symbiosis, affects genes for immunity and metabolism of non-host *Arabidopsis* when restored long after its evolutionary loss. Plant Molecular Biology 114 (2): 21

Parnell, J. J.$, G. Pal$, A. Awan$, S. Vintila, G. Houdinet, C. V. Hawkes, P. Balint-Kurti, M. R. Wagner, **M. Kleiner^** (2024). Effective seed sterilization methods require optimization across maize genotypes. Phytobiomes 8(4):418-424

Kleiner, M.^, L. Polerecky, C. Lott, C. Bergin, S. Haeusler, M. Liebeke, C. Wentrup, N. Musat, M. M. M. Kuypers, N. Dubilier (2023). Mechanism of high energy efficiency of carbon fixation by sulfur-oxidizing symbionts revealed by single-cell analyses and metabolic modeling. bioRxiv https://www.biorxiv.org/content/10.1101/2023.11.25.568684v1

González Porras, M. Á., A. Assié, M. Tietjen, M. Violette$, **M. Kleiner**, H. R. Gruber-Vodicka, N. Dubilier, N. Leisch (2024). An intranuclear bacterial parasite of deep-sea mussels expresses apoptosis inhibitors acquired from its host. Nature Microbiology 9:2877-2891

Parnell, J. J.$, S. Vintila, C. Tang$, M. R. Wagner, **M. Kleiner^** (2024). Evaluation of ready-to-use freezer stocks of a synthetic microbial community for maize root colonization. Microbiology Spectrum e02401-23

Swift, J. F., M. R. Kolp, A. Carmichael, N. E. Ford, P. M. Hansen, B. A. Sikes, **M. Kleiner**, M. R. Wagner (2024). Drought stress homogenizes maize growth responses to diverse natural soil microbiomes. Plant and Soil

Michellod, D., T. Bien, D. Birgel, M. Violette$, **M. Kleiner**, S. Fearn, C. Zeidler, H. R. Gruber-Vodicka, N. Dubilier, M. Liebeke (2023). De novo phytosterol synthesis in animals. Science 380(6644): 520-526.

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Bartlett, A.$ and **M. Kleiner^** (2022). Dietary protein and the intestinal microbiota: An understudied relationship. iScience 25: 105313.

Salvato, F.$, S. Vintila, O. M. Finkel, J. L. Dangl, **M. Kleiner**^ (2022). Evaluation of protein extraction methods for metaproteomic analyses of root-associated microbes. Molecular Plant-Microbe Interactions 35(11): 977-988.

Beck, A. E., **M. Kleiner**, A.-K. Garrell$ (2022). Elucidating plant-microbe-environment interactions through omics-enabled metabolic modelling using synthetic communities. Frontiers in Plant Science 13: 910377

Mankowski, A., **M. Kleiner**, C. Erséus, N. Leisch, Y. Sato, J.-M. Volland, B. Hüttel, C. Wentrup, T. Woyke, J. Wippler, N. Dubilier, and H. Gruber-Vodicka (2021). Highly variable fidelity drives symbiont community composition in an obligate symbiosis. bioRxiv https://www.biorxiv.org/content/10.1101/2021.04.28.441735v1.full

Sato, Y., J. Wippler, C. Wentrup, R. Ansorge, M. Sadowski, H. R. Gruber-Vodicka, N. Dubilier, **M. Kleiner^** (2022). Fidelity varies in the symbiosis between a gutless marine worm and its microbial consortium. Microbiome 10:178.

Blakeley-Ruiz, J. A.$ and **M. Kleiner**^ (2022). Considerations for constructing a protein sequence database for metaproteomics. Computational and Structural Biotechnology Journal 20: 937-952.

Mordant, A.$ and **M. Kleiner**^ (2021). Evaluation of sample preservation and storage methods for metaproteomics analysis of intestinal microbiomes. Microbiology Spectrum 9(3): e01877-21.

Ataeian, M., A. Vadlamani, M. Haines, D. Mosier, X. Dong, **M. Kleiner**, M. Strous and A. K. Hawley (2021). Proteome and strain analysis of cyanobacterium *Candidatus* "Phormidium alkaliphilum" reveals traits for success in biotechnology. iScience 24(12): 103405.

Smith, S., F. Salvato$, A. Garikipati, **M. Kleiner** and Alecia Septer (2021). Activation of the type VI secretion system in the squid symbiont *Vibrio fischeri* requires the transcriptional regulator TasR and the structural proteins TssM and TssA. Journal of Bacteriology 203(21): e00399-21.

Jensen, M.$, J. Wippler and **M. Kleiner**^ (2021). Evaluation of RNA*later* as a field-compatible preservation method for metaproteomic analyses of bacterium-animal symbioses. Microbiology Spectrum 9(2):e01429-21.

Sogin, E. M., **M. Kleiner**, C. Borowski, H. R. Gruber-Vodicka and N. Dubilier (2021). Life in the dark: Phylogenetic and physiological diversity of chemosynthetic symbioses. Annual Review of Microbiology 75: 695-718.

Van Den Bossche, T., B. J. Kunath, K. Schallert, S. S. Schäpe, [38 co-authors in alphabetical order including M. Jensen$, **M. Kleiner**], L. Martens and T. Muth (2021). Critical Assessment of MetaProteome Investigation (CAMPI): a multi-laboratory comparison of established workflows. Nature Communications 12: 7305.

Salvato, F.$, R. L. Hettich and **M. Kleiner**^ (2021). Five key aspects of metaproteomics as a tool to understand functional interactions in host-associated microbiomes. PLOS Pathogens 17(2): e1009245.

Hinzke, T.$, **M. Kleiner**, M. Meister, R. Schlüter, C. Hentschker, J. Pané-Farré, P. Hildebrandt, H. Felbeck, S. M. Sievert, F. Bonn, U. Völker, D. Becher, T. Schweder and S. Markert (2021). Bacterial symbiont subpopulations have different roles in a deep-sea symbiosis. eLife 10:e58371.

Sato, Y., J. Wippler, C. Wentrup, T. Woyke, N. Dubilier and **M. Kleiner** (2020). High-quality draft genome sequences of the uncultured Delta3 endosymbiont (Deltaproteobacteria) assembled from metagenomes of the gutless marine worm *Olavius algarvensis*. Microbiology Resource Announcements 9:e00704-20.

Wagner, M. R., C. Tang$, F. Salvato$, K. M. Clouse, A. Bartlett$, S. Vintila, L. Phillips, S. Sermons, M. Hoffmann, P. J. Balint-Kurti and **M. Kleiner^** (2021). Microbe-dependent heterosis in maize. Proceedings of the National Academy of Sciences 118(30): e2021965118.

Sato, Y., J. Wippler, C. Wentrup, N. Dubilier and **M. Kleiner** (2020). High-quality draft genome sequences of two deltaproteobacterial endosymbionts, Delta1a and Delta1b, from uncultured Sva0081 clade, assembled from metagenomes of the gutless marine worm *Olavius algarvensis*. Microbiology Resource Announcements 9:e00276-20.

Kleiner, M.^, B. Bushnell, K. E. Sanderson, L. V. Hooper and B. A. Duerkop (2020). Transductomics: sequencing based detection and analysis of transduced DNA in pure cultures and microbial communities. Microbiome 8:158.

Speare, L., S. Smith, F. Salvato$, **M. Kleiner** and A. N. Septer (2020). Environmental viscosity modulates interbacterial killing during habitat transition. mBio 11(1): e03060-19.

Ponnudurai, R., S. E. Heiden, L. Sayavedra, T. Hinzke, **M. Kleiner**, C. Hentschker, H. Felbeck, S. M. Sievert, R. Schlueter, D. Becher, T. Schweder and S. Markert (2020). Comparative poteomics of related symbiotic mussel species reveals high variability of host-symbiont interactions. ISME Journal 14(2): 649-656.

Assié, A., N. Leisch, D. V. Meier, H. Gruber-Vodicka, H. E. Tegetmeyer, A. Meyerdirks, **M. Kleiner**, T. Hinzke$, S. Joye, M. Saxton, N. Dubilier and J. M. Petersen (2020). Horizontal acquisition of a patchwork Calvin cycle by symbiotic and free-living Campylobacterota (formerly Epsilonproteobacteria). ISME Journal 14(1): 104-122.

Hinzke, T., **M. Kleiner**, C. Breusing, H. Felbeck, R. Häsler, S. M. Sievert, R. Schlüter, P. Rosenstiel, T. B. H. Reusch, T. Schweder and S. Markert (2019). Host-microbe interactions in the chemosynthetic *Riftia pachyptila* symbiosis. mBio 10(6): e02243-19.

Zorz, J. K.$, C. Sharp, **M. Kleiner**, P. M. K. Gordon, R. T. Pon, X. Dong and M. Strous (2019). A shared core microbiome in soda lakes separated by large distances. Nature Communications 10:4230.

Seah, B. K. B., C. P. Antony, B. Huettel, J. Zarzycki, L. S. v. Borzyskowski, T. J. Erb, A. Kouris, **M. Kleiner**, M. Liebeke, N. Dubilier and H. R. Gruber-Vodicka (2019). Sulfur-oxidizing symbionts without canonical genes for autotrophic CO_2 fixation. mBio 10(3): e01112-19.

Gruber-Vodicka, H. R., N. Leisch, **M. Kleiner**, T. Hinzke$, M. Liebeke, M. McFall-Ngai, M. G. Hadfield and N. Dubilier (2019). Two intracellular and cell type-specific bacterial symbionts in the placozoan *Trichoplax* H2. Nature Microbiology 4:1465–1474.

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Kleiner, M^., X. Dong, T. Hinzke**$**, J. Wippler**$**, E. Thorson**$**, B. Mayer and M. Strous (2018). Metaproteomics method to determine carbon sources and assimilation pathways of species in microbial communities. Proceedings of the National Academy of Sciences 115(24): E5576-E5584.

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Ponnudurai, R., L. Sayavedra, **M. Kleiner**, S. E. Heiden, A. Thürmer, H. Felbeck, R. Schlüter, S. M. Sievert, R. Daniel, T. Schweder and S. Markert. (2017). Genome sequence of the sulfur-oxidizing Bathymodiolus thermophilus gill endosymbiont. Standards in Genomic Sciences 12:50.

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Wippler, J.* **$**, **M. Kleiner*^**, C. Lott, A. Gruhl, P. Abraham, R. Giannone, J. C. Young, R. L. Hettich and N. Dubilier. (2016). Transcriptomic and proteomic insights into innate immunity and adaptations to a symbiotic lifestyle in the gutless marine worm *Olavius algarvensis*. BMC Genomics 17(1): 942.

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This paper was featured on the BacterioFiles Podcast (#240)

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Kleiner, M.^, J. M. Petersen and N. Dubilier (2012). Convergent and divergent evolution of metabolism in sulfur-oxidizing symbionts and the role of horizontal gene transfer. Current Opinion in Microbiology 15(5): 621-631.

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Markert, S., A. Gardebrecht, H. Felbeck, S. M. Sievert, J. Klose, D. Becher, D. Albrecht, A. Thürmer, R. Daniel, **M. Kleiner**, M. Hecker and T. Schweder (2011). Status quo in physiological proteomics of the uncultured *Riftia pachyptila* endosymbiont. Proteomics 11(15): 3106-3117.

PATENTS

Kleiner, M. and Bartlett, A. 2020. Prediction of diet by metaproteomic analysis of stool samples. U.S. Patent Application 63/088,532, filed October 2020. Patent Pending.

SOFTWARE AND CODE

1. **Kleiner M**, Strous M, Dong X (2023). **Calis-p** a software for protein-based stable isotope fingerprinting (Protein-SIF) and probing (Protein-SIP).
   The java version (2.1) software is available from https://sourceforge.net/projects/calis-p/ and https://doi.org/10.5281/zenodo.5619585, and the python version (3.0) software is available from https://github.com/kinestetika/Calisp.
2. Maier J#, Rabasco J, Gin C, Callahan B, **Kleiner M**. (2024). TrIdent 0.99.2 an R package for the automated analysis of read coverage patterns indicative of potential transduction events in transductomics datasets. Zenodo [Software]. https://zenodo.org/records/14590593 and https://bioconductor.org/packages/TrIdent
3. Maier J#, **Kleiner M**. (2025). ProActive 0.0.1 an R package for the automated detection of gaps and elevations in mapped sequencing read coverages indicative of prophage induction and movement of mobile genetic elements. Zenodo [Software]. https://zenodo.org/records/14590605 and https://cran.r-project.org/web/packages/ProActive/index.html

BROADER IMPACTS AND DISSEMINATION OF RESEARCH FINDINGS

Continuous	Press releases about all scientific findings of potential interest to the public (linked on https://kleinerlab.cals.ncsu.edu/news-and-events/)
6 Mar 2026	The Science That Feeds Us Podcast https://open.spotify.com/episode/7yWsYrMZ7ShxuDJdeLq68H https://units.cals.ncsu.edu/food-systems-comm-hub/the-science-that-feeds-us/
10 Apr 2025	Interview on Matters Microbial Podcast, Episode #87, (>1,500 views) (https://www.microbe.tv/mm/mm-087/ and https://www.youtube.com/watch?v=a4DmJ3Qvlnc)
2020 – 2023	As part of the NSF IOS Collaborative Research project on insect symbioses we developed the Book "Unseen Jungle: The Microbes That Secretly Control Our World" with Dr. Eleanor Spicer Rice.

AWARDS, HONORS AND RESEARCH SUPPORT

2025 – 2026	NC State, Animal Health & Nutrition Consortium (Co-PI, $50,000)
2024 – 2028	NIH R01, Transductomics (PI with B. Duerkop, $2,760,181, To Kleiner Lab: $1,119,971)
2024 – 2028	NSF-BSF EDGE CMT (Co-PI, $1,573,562, To Kleiner Lab: $532,143)
2024 – 2028	NSF IOS Collaborative Research (PI, $521,993)
2024 – 2028	NIH R01 (Co-PI, Total: $3,577,829, To Kleiner Lab: $434,517)
2023	University Faculty Scholar (https://provost.ncsu.edu/ofe/awards-and-honors/university-faculty-scholars/)
2023 – 2026	NIH R01 (Co-PI, Total: $2,717,702, To Kleiner Lab: $334,552)
2022 – 2025	DOE BER (Co-PI, Total: $2,894,700, To Kleiner Lab: $705,000)
2022 – 2024	USDA NIFA (PI, Total: $849,000, To Kleiner Lab: $460,000)
2022 – 2023	NC State Data Science Academy, Seed Grant (PI, $41,712)
2021 – 2024	Goodnight Early Career Innovator (PI, $66,000)
2020 – 2023	NSF PGRP (Co-PI, Total: $900,000, To Kleiner Lab: $310,000)
2020 – 2023	USDA NIFA (Co-PI, Total: $740,000, To Kleiner Lab: $570,000)

2020 – 2025	NIH R35 MIRA (PI, $1,831,430)
2020 – 2022	BSF (PI, Total: $150,000, To Kleiner Lab $75,000)
2020 – 2023	NSF IOS Collaborative Research (PI, $440,281)
2019 – 2025	Novo Nordisk Foundation, InROOT (Co-PI, Total: $9,600,000, To Kleiner Lab: $300,000)
2019 – 2025	Novo Nordisk Foundation, INTERACT (Co-PI, Total: $9,600,000, To Kleiner Lab: $340,000)
2019 – 2021	NSF Growing Convergence Research (Co-PI, Total: $630,000, To Kleiner Lab: $140,000)
2019/20	Center for Gastrointestinal Biology and Disease (CGIBD) Pilot Grant (PI, $30,791)
2019 – 2021	Foundation for Food and Agriculture Research (FFAR) New Innovator Award (PI, $600,000)
2019	Plant Soil Microbial Community Consortium (PSMCC, Co-PI, $84,965)
2018	NCSU internal seed funding, NC Agricultural Research Service, (NCARS, $24,000)
2018	PSMCC (PI, $60,000)
2015	Banting Postdoctoral Fellowship Award, NSERC ($140,000; considered the most prestigious postdoctoral fellowship in Canada)
2014	Eyes High Postdoctoral Fellowship Award, University of Calgary ($100,000)
2014	Friedrich Hirzebruch PhD thesis award of the German National Academic Foundation for outstanding work in the fields of Mathematics, Natural Sciences and Engineering (5000 Euro)
2013	Finalist for the Society in Science Branco Weiss Fellowship
2012	Sequencing grant from the Community Sequencing Program of the US Department of Energy Joint Genome Institute for the sequencing of 20 bacterial genomes and metagenomes (PI): "*Understanding novel pathways for energy and carbon use in bacterial symbionts of gutless marine worms*."
2011	MarMic (International Max Planck Research School for Marine Microbiology) teaching excellence award (best tutorial)
2009 - 2012	PhD scholarship award from the German National Academic Foundation (Studienstiftung des deutschen Volkes) for academically gifted students
2009	Poster Award at the Gordon Research Conference for Applied and Environmental Microbiology
2008/09	Hölderlin-scholarship from the German National Academic Foundation for a postgraduate research year in the USA
2007	Travel scholarship from the German National Academic Foundation for a research internship in the Laboratory of Gregory Velicer, Indiana University
2005	Travel grant of the International Society for the Study of the Origin of Life (ISSOL) to attend its conference in Bejing
2005 - 2012	Scholarship from e-fellows.net supplying fast internet access for academically gifted students
2001 – 2008	Graduate scholarship award from the German National Academic Foundation (Studienstiftung des deutschen Volkes) for academically gifted students

SERVICE – UNIVERSITY, DEPARTMENT AND GRADUATE PROGRAMS

Only selected, major service contributions are listed:

1/2022 – 7/2024	Chair: Microbiology Graduate Curriculum Committee. Lead complete curriculum re-design.

2019 – 2024	Member: Microbiology Graduate Program Steering Committee for Admissions and Recruiting
6/2022 – present	Director of Microscope Facility for the interdepartmental microbiology program
2018 – present	Administrator microbiome listserv for NCSU
2018 – present	Organizer of the Microbiome Monthly Meetup (M^3) seminar series at NCSU
2017 – present	Member of mass spectrometry user committee METRIC (Molecular Education, Technology, and Research Innovation Center) at NCSU

Graduate Programs: Microbiology, Genetics and Genomics, Plant Biology, Comparative Biomedical Sciences, and Biotechnology Minor
Graduate and Postdoc Training Grants: NIH/NCSU Molectular Biotechnology Training Program (MBTP), NIH T32 Chemistry of Life (CLPT) Comparative Medicine Institute, UNC Basic Science GI (gastrointestinal) T32 Fellowship, and NIH T32 Comparative Molecular Medicine Training Program (CMMTP) Comparative Medicine Institute.
Undergraduate Training Grants: NIH T34 Young Scholars Program (YSP) Comparative Medicine Institute, NSF REU Integrative Microbial and Plant Systems, and USDA REEU BeeMORE – Bees and Microbes.

SERVICE - DISCIPLINE

4/2015 – 6/2022	**Associate Editor**, Frontiers in Microbiology: Microbial Physiology and Metabolism
10/2020 – 12/2023	**Senior Editor**, ISME Communications, Advanced Approaches in Microbial Ecology
1/2024 - present	**Editorial Board,** ISME Communications, Advanced Approaches in Microbial Ecology
6/2025 – present	**Member,** NIH F12A Study Section, Fellowships and Mentored Training: Gastroenterology and related disciplines

Manuscript Reviewer: ACS Omega, BMC Microbiome, Bioinformatics, Cell Reports, Communications Biology, Critical Reviews in Food Science and Nutrition, Environmental Microbiome, Molecular Systems Biology, mBio, mSystems, Environmental Microbiology, Food & Function, Gut Microbes, Marine Ecology, Microbiomes, Nature Communications, Pedosphere, Proteomes, Trends in Microbiology, PLoS Genetics, Science, ISME J, Genome Biology, Biological Reviews, PeerJ, Computational Structural Biotechnology Journal, Journal of Advanced Research, Trends in Food Science & Technology, and Symbiosis.
Grant Reviewer/Review Panels: Czech Science Foundation (GACR), National Science Foundation (NSF), German Research Foundation (DFG), National Institutes of Health (NIH), Swiss National Science Foundation (SNSF), US Army DEVCOM, and Austrian Science Fund (FWF).

I am currently a member of **15 PhD Thesis Committees** at NC State University, Duke University, and the Max Planck Institute in Bremen.

CONFERENCES AND INVITED TALKS

Jan 2026	Invited Talk, Faculty of Natural Sciences, Ben Gurion University, Be'ersheba, Israel
Jan 2026	Invited Talk, Department of Plant & Environmental Sciences, Hebrew University, Jerusalem, Israel

Jan 2026	Invited Talk, University of Haifa, Department of Marine Biology, Israel
Oct 2025	Invited Talk, Phytobiomes Alliance Webinar Series
May 2025	Invited Talk, Chinese American Food Society annual online webinar
Mar 2025	Invited Talk, Synmikro, University of Marburg, Germany
Feb 2025	Invited Talk, German Collection of Microorganisms and Cell Cultures (DSMZ), Braunschweig, Germany
Jan 2025	Invited Talk, 6th International Metaproteomics Symposium, Oslo, Norway
Oct 2024	Invited Seminar Talk, Dept. of Biochemistry, NC State, Raleigh, NC
Oct 2024	Invited Seminar Talk, Dept. of Microbiology, Oregon State University, Corvallis, OR
Apr 2024	Invited Keynote Talk, Congress on Gastrointestinal Function, Urbana, IL, USA
Apr 2024	Invited Seminar Talk, Dept. of Biology, Appalachian State University, NC
Feb 2024	Invited Seminar Talk, Div. of Biology, Kansas State University, KS
Jan 2024	Invited Seminar Talk, Dept. of Mol. Genetics & Microbiology, Duke University, NC
Nov 2023	Invited Virtual Talk, Israeli Association for Aquatic Sciences
Nov 2023	Invited Talk, Microbiome Data Congress, Boston, MA
Jun 2023	Gordon Research Conference Animal-Microbe Symbioses, Lucca, Italy
May 2023	Invited Virtual Talk, Dutch Microbiome Initiative (MiCRop) Seminar Series, Netherlands
Nov 2022	Talk, Plant-Microbe Interactions Conference, Copenhagen, Denmark
Sep 2022	Invited Talk, CGIBD Seminar Series, UNC Chapel Hill, NC
Jun 2022	Invited Virtual Talk, DSMZ (German Collection of Microorganisms)
Mar 2022	Invited Seminar Talk, Marine Biological Laboratories, Woods Hole, MA
Mar 2022	Invited talk, US Human Proteome Organization (HUPO), Charleston, NC
Feb 2022	Invited talk, Microbiome Movement AgBiotech Summit, Durham, NC
Nov 2021	Invited Virtual Talk, Nature Conference on Reshaping the Microbiome Through Nutrition
Jun 2021	Invited Virtual Talk, Collaborative Crop Resilience Program
Jun 2021	Invited Virtual Talk, American Society for Microbiology Conference
Jun 2021	Invited Virtual Talk, International Symbiosis Seminar Series
Apr 2020	Invited Virtual Talk, University of Ottawa, Canada
Dec 2019	Invited Talk, Plants for Human Health Institute, Kannapolis, NC
Nov 2019	Invited Talk, Food Systems, Nutrition and the Microbiome Symposium, Duke, NC
Nov 2019	Invited Talk, METRIC Symposium, NCSU
Nov 2019	Invited Talk, Thermal Biology Institute, Montana State University
Jun 2019	Invited Talk, Gordon Research Conference Animal-Microbe Symbioses, Mt. Snow, VT. "Assessing metabolism and interspecies interactions in microbial symbioses via metaproteomics."
Apr 2019	Invited Talk, UNC Greensboro, NC
Mar 2019	Invited Talk, AgBiome, Durham, NC
Feb 2019	Invited Talk, 3rd Microbiome AgBioTech Summit, Durham, NC
Dec 2018	Invited Talk, International Metaproteomics Symposium, Leipzig, Germany
Nov 2018	Invited Talk, UT Knoxville Microbiology Seminar
Oct 2018	Invited Talk, Triangle Microbial Interactions Meeting, Cary, NC
Aug 2018	Invited Talk, BASF, Durham, NC
May 2018	Invited Talk, Center for Integrated Fungal Research, NC State
May 2018	Talk on Viral Metagenomics, Microbiome Monthly Meetup, NC State
Apr 2018	Invited talk, Novozymes, Durham, NC
Apr 2018	Invited talk, Microbiome Seminar Series, UNC Chapel Hill, NC
Mar 2018	Talk, DOE JGI Genomics of Energy and Environment Meeting, San Francisco

Feb 2018	Invited talk, Ag Biotech Summit, NC Biotechnology Center, Chapel Hill, NC
Dec 2017	Invited talk, Dangl Lab, UNC Chapel Hill, NC
Dec 2017	Invited talk, Computational Biology Seminar Series, Veterinary Medicine, NC State
Oct 2017	Invited talk, Biology Seminar Series, Georgia Institute of Technology
Oct 2017	Invited talk, Marine Sciences Seminar Series, UNC Chapel Hill, NC
Sep 2017	Invited talk, Biochemistry Seminar Series, NC State University
Sep 2017	Invited talk, Dept. of Symbiosis, Max Planck Institute for Marine Microbiology
2017	Invited talk, ASM Microbe conference, New Orleans. "Assessing the metabolism, physiology and interspecies interactions in microbial symbioses via metaproteomics."
2016	Talk, International Society for Microbial Ecology (ISME) conference, Montreal, Canada. "Assessing species biomass contributions in microbial communities via metaproteomics."
2016	Attendee, DOE Joint Genome Institute User Meeting, Walnut Creek, CA
May 2015	Invited talk, Seminar Series, Bermuda Institute of Ocean Sciences, Bermuda
2015	Poster, DOE Joint Genome Institute User Meeting, Walnut Creek, CA
2014	Poster, DOE Joint Genome Institute User Meeting, Walnut Creek, CA
Feb 2014	Invited talk, Biology Seminar Series, Baylor University, TX
2013	Talk, American Society for Microbiology (ASM) General Meeting in Denver, Colorado. "Novel metabolic pathway for the massive assimilation of host waste products into carbon storage by the chemolithoautotrophic symbiont of a gutless marine worm."
2012	Poster, Gordon Research Seminar and Conference on the Molecular Basis of Microbial One-Carbon Metabolism at the Bates College, ME, USA. "Proposal of a pyrophosphate-dependent, more energy efficient version of the Calvin cycle."
2012	Poster, EU-US Environmental Biotechnology Workshop on Microbial Community Dynamics: Cooperation and Competition in St. Louis, MO, USA.
2011	Invited talk, MIMAS (Microbial interactions in marine systems) Symposium in Greifswald, Germany. "Metaproteomics of a gutless marine worm and its symbiotic microbial community: Discovery of novel pathways for carbon and energy use."
2011	Attendee, NanoSIMS user meeting, Warnemünde, Germany
2010	Talk and poster, Symbiotic interactions meeting in Würzburg, Germany
2010	Talk, International Society for Microbial Ecology conference in Seattle, Washington, USA. "A symbiosis fueled by carbon monoxide: novel insights in the microbial community of a gutless marine worm."
2009	Poster, Gordon Research Conference on Applied & Environmental Microbiology at the Mount Holyoke College, USA. "Metaproteomics of a gutless marine worm and its symbiotic microbial community."
2009	Talk, International Symbiosis Society Congress in Madison, Wisconsin, USA. "Metaproteomics of a gutless marine worm and its symbiotic microbial community: Novel insights into host and symbiont metabolism and interactions."

RESEARCH EXPERIENCE AND LEADERSHIP TRAINING

Fall 2025	2-day Hands-on Training for AI/LLM Applications for Research
Fall 2024	Crucial Conversations workshop (2x 4 hour sessions)
Spring 2022	Mentoring Makes a Difference workshop series, (3 sessions), NCSU
Fall 2018	ALLI – Agricultural Leadership Learning Institute, (8 sessions), NCSU
Feb 2015	One day communication skills workshop, Mitacs Inc., University of Calgary
Jan 2014	Two day science communication workshop, Klaus Tschira Foundation, Heidelberg

Sep 2013	Microbial Genomics & Metagenomics workshop (one week), DOE Joint Genome Institute, Walnut Creek, California
July 2013	Three day course on the R software environment for statistical computing and graphics
Sep 2011	Two day grant application training workshop, Max Planck Institute
Mar 2011	Two day scientific writing course, Max Planck Institute
Feb 2011	Two day course on leadership skills for scientists, Max Planck Institute
Dec 2010	Two weeks of training to become a NanoSIMS operator, Max Planck Institute
Nov 2010	RAST workshop at the Argonne National Laboratory. 'Genome annotation, comparison and metabolic modeling'
May 2010	Biosand workshop 2010 at the Hydra Institute for Marine Sciences, Elba, Italy
2008/09	Postgraduate research year, Indiana University and Oak Ridge National Laboratory: Additional training in Proteomics and Mass spectrometry.
2007	Three months research internship in the group of Gregory Velicer, Indiana University. 'Developing a mutant screen for *Myxococcus xanthus* showing special fruiting body development'.
2006/07	Three month research internship in the bioinformatics group at the Max Planck Institute for Marine Microbiology. 'Developing software for combined analyses of proteome and genome data'.
2006	Two month research internship in the group of Michael Thomm at the University of Regensburg. 'Heterologous expression of archaeal proteins in *Escherichia coli*'.
2006	Five week research internship at the Institute for Marine Biotechnology in Greifswald. 'Proteomics of the *Riftia pachyptila* symbionts'.
2005 – 2007	Extracurricular 'Life Sciences Academy' of the Studienstiftung des dt. Volkes on Evolution and Development taught by Andrei Lupas, MPI Tübingen
2005/06	Research Assistant in the Molecular Biology Department of the University of Greifswald. 'Analyzing codon usage in stress specific *Bacillus subtilis* proteins and developing methods for absolute protein quantification'.
Sept 2004	Summer academy of the Studienstiftung des dt. Volkes "Extra solar planets and extraterrestrial life".

TEACHING EXPERIENCE

Jan 2026	Taught three-day workshop on "Metaproteomics in the Service of Microbial Ecology" at Ben Gurion University, Israel
Fall 2025	Taught three credit course on "Microbial Symbiosis & Microbiomes" (MB479/579), NC State University (14 Students)
Fall 2024	Taught guest lecture in Doctoral Microbial Research Presentations (MB880), NC State University
Spring 2024	Guest lecture in Advances in Gastrointestinal Pathophysiology (CBS764), NC State University
Spring 2024	Guest lecture in Microbiomes (BIOL701), University of Kansas
Fall 2023	Taught three credit course on "Microbial Symbiosis & Microbiomes" (MB479/579), NC State University (16 Students)
Fall 2023	Taught guest lecture in Doctoral Microbial Research Presentations (MB880), NC State University
Spring 2023	Guest lecture in Cell and Molecular Biology (BIOL 4444/5544), Idaho State Univ.
Fall 2022	Taught three credit course on "Microbial Symbiosis & Microbiomes" (MB479/579), NC State University (22 Students)

Fall 2022	Guest lecture on the future of microbiomes (ENG590 – Exploring Mosaic Narrative), NC State University
Fall 2021	Taught three credit course on "Microbial Symbiosis & Microbiomes" (MB479/579), NC State University
Fall 2020	Taught three credit course on "Microbial Symbiosis & Microbiomes" (BSC495/MB590), NC State University
Fall 2020	Taught guest lecture in Symbiosis Seminar Course, Gettysburg College
Fall 2020	Taught guest lecture in Microbial Community Engineering (CHE 596-037), NC State University
Fall 2019	Taught three credit course on "Microbial Symbiosis & Microbiomes" (BSC495/MB590), NC State University
Spring 2019	Taught guest lecture in Aquatic Microbiology (MEA 493/593), NC State University
Fall 2018	Taught three credit course on "Microbial Symbiosis & Microbiomes" (BSC495/MB590), NC State University
Spring 2018	Taught guest lectures in Aquatic Microbiology (MEA 493) and Meet Your Microbes (LSC 170), NC State University
Fall 2016	Taught workshop on Negotiation Skills in Geoscience Graduate Skills course (GLGY 699.56), University of Calgary
Fall 2016	Taught lectures on the origins of life in a course for geologists on the "Evolution of Earth through Life and Time" (GLGY 493), University of Calgary
Spring 2016	Taught lectures on the origins of life in a course for geologists on the "Evolution of Earth through Life and Time" (GLGY 493), University of Calgary
Fall 2015	Taught part of Microbial Physiology course (CMMB 443), University of Calgary
2014	Teaching faculty at the SYMBIOMICS field workshop on Elba, Italy. Mix of lectures, seminars and laboratories for a group of 20 international MSc and PhD students (two weeks).
2012	Teaching faculty at the SYMBIOMICS field workshop on Elba, Italy (two weeks).
2011	Instructor for tutorials accompanying lectures on metagenomics (Group of 20 MSc students)
2011	Design of and sole instructor for a two day workshop on 'Genome annotation, comparison and metabolic modeling using RAST, the SEED and Model-SEED' for a group of 15 graduate students and postdocs. The workshop consisted of lectures, demonstrations and hands on exercises. I received teaching evaluations above faculty average.
2011	Instructor for tutorials accompanying lectures on symbiosis for 20 MSc students. I received the MarMic teaching excellence award for the best tutorial.

INDIVIDUAL GUIDANCE AND MENTORSHIP

Current

2026 – pres.	Research Technician (Rayna Garcia), Kleiner Lab, NCSU
2026 – pres.	Research Technician (Matteo Rios), Kleiner Lab, NCSU
2026 – pres.	Part-time Scientist (Rachel Moser), Kleiner Lab, NCSU
2020 – pres.	Senior Research Scientist & Laboratory Manager (Simina Vintila), Kleiner Lab, NCSU
2026 – pres.	Postdoc (Anna Garrell), Kleiner Lab, NCSU
2024 – pres.	Postdoc (Shaked Uzi), Kleiner Lab, NCSU
2024 – pres.	Postdoc (Samiksha Saxena), Kleiner Lab, NCSU
2023 – pres.	Postdoc (Solomon Samuel), Kleiner Lab, NCSU

2022 – pres. Postdoc (Gaurav Pal), Kleiner Lab, NCSU
2020 – pres. Postdoc (J. Alfredo Blakeley-Ruiz), Kleiner Lab, NCSU

2025 – pres. PhD student (Edeline Anthoniraj), Kleiner Lab, NCSU
2025 – pres. MS student (Darren Bertin), Kleiner Lab, NCSU
2022 – pres. PhD student (Ayesha Awan), Kleiner Lab, NCSU
2021 – pres. PhD student (Olivia Mathieson), Kleiner Lab, NCSU
2021 – pres. PhD student (Jessie Maier), Kleiner Lab, NCSU

2026 – pres. Undergraduate research student (Megan Lockhart), Kleiner Lab, NCSU
2026 – pres. Undergraduate research student (Hope Chronis), Kleiner Lab, NCSU
2025 – pres. Undergraduate research student (Kayla Garcia), Kleiner Lab, NCSU
2024 – pres. Undergraduate research student (Clara Griggs), Kleiner Lab, NCSU
2024 – pres. Undergraduate research student (Wynter Spencer), Kleiner Lab, NCSU
2024 - pres. Undergraduate research student (Avery Bass), Kleiner Lab, NCSU
2024 – pres. Undergraduate research student (Dhanush Kondabathini), Kleiner Lab, NCSU
2023 – pres. Undergraduate research student (Namita Deshmukh), Kleiner Lab, NCSU

Since 2021 Official NC State Program called **Future Microbiologists** to provide several months long, hands-on lab experiences for High School students in the Kleiner Lab
Participants: Namita Deshmukh (2021/22), Saicharan Karthikeyan (2025)

Past

2023 – 2025 Laboratory Manager (Rachel Moser), Kleiner Lab, NCSU
2021 – 2023 Research Scholar (Jacob Parnell), Kleiner Lab, NCSU
2021 – 2022 Postdoc (Lisa David), Kleiner Lab, NCSU
2020 – 2021 Postdoc (Nicole Parsley), Kleiner Lab, NCSU
2019 – 2021 Postdoc (Gitanjali Nanda Kafle), Kleiner Lab, NCSU
2018 – 2021 Postdoc (Fernanda Salvato), Kleiner Lab, NCSU
2024 Research Technician (Nicole Rideout), Kleiner Lab, NCSU
2022 – 2024 Laboratory Manager (Molly DuBois), Kleiner Lab, NCSU

2024 – 2025 MS student (Matteo Rios), Kleiner Lab, NCSU (MS received 2025)
2020 – 2025 PhD student (Anna Garrell), Kleiner Lab, NCSU (PhD received 2025)
2020 – 2025 PhD student (Clara Tang), Kleiner & Grunden Lab, NCSU (PhD received 2025)
2020 – 2023 MS student (Marlene Jensen), Kleiner Lab, NCSU (MS received 2023)
2016 – 2021 PhD student (Jackie Zorz), Energy Bioengineering Group, University of Calgary
2018 – 2021 MS student (Angie Mordant), Kleiner Lab, NCSU (MS received 2021)
2020 – 2021 Research Assistant (Alexandria Bartlett), Kleiner Lab, NCSU
2018 – 2020 MS student (Alexandria Bartlett), Kleiner Lab, NCSU (MS received 2020)
2011 - 2016 PhD student (Juliane Wippler), Department of Symbiosis, Max Planck Institute for Marine Microbiology (PhD received in 2016)
2010/11 MSc student (Juliane Wippler), Symbiosis Group, Max Planck Institute for Marine Microbiology

2024 – 2025 Undergraduate research student (Rayna Garcia), Kleiner Lab, NCSU
2025 Undergraduate NSF REU student (Skylar Francis), Kleiner Lab, NCSU
2022 – 2024 Undergraduate research student (Porter Richardson), Kleiner Lab, NCSU
2024 Undergraduate NSF REU student (Frank Schaeffer), Kleiner Lab, NCSU

2023 – 2024	Undergraduate research student (Julian Perez Velasquez), Kleiner Lab, NCSU
2022 – 2024	Undergraduate research student (Aisha Mahmood), Kleiner Lab, NCSU
2021 – 2023	Undergraduate research student (Nicole Rideout), Kleiner Lab, NCSU
2022 – 2023	Undergraduate research student (Nathan Ring), Kleiner Lab, NCSU
2023	Undergraduate USDA REEU BeeMORE student (Micah Lohr), Kleiner Lab, NCSU
2020 – 2023	Undergraduate research student (Abigail Korenek), Kleiner Lab, NCSU
2021 – 2023	Undergraduate research student (Alissa Meyerhoffer), Kleiner Lab, NCSU
2021 – 2023	Undergraduate research student (Andrea Ward), Kleiner Lab, NCSU
2022	Undergraduate research student (Mary May), Kleiner Lab, NCSU
2021 – 2022	Undergraduate research student (Maggie Cook), Kleiner Lab, NCSU
2020 – 2021	Undergraduate research student (Ty Grewell), Kleiner Lab, NCSU
2017 – 2021	Undergraduate research student (Jessie Maier), Kleiner Lab, NCSU
2020	Undergraduate research student (Rowan Roskam), Kleiner Lab, NCSU
2019 – 2020	Undergraduate research student (Tanner Russ), Kleiner Lab, NCSU
2019 – 2020	Undergraduate research student (Sophia Miller), Kleiner Lab, NCSU
2019	Undergraduate research student (Mariska Thayagan), Kleiner Lab, NCSU
2018 – 2019	Undergraduate research student (Rebekah Lim), Kleiner Lab, NCSU
2018 – 2019	Undergraduate research student (Amani Albrecht), Kleiner Lab, NCSU

2024	One week, visiting potdoc (Susanne Meile), from UC Denver, Kleiner Lab, NCSU
2024	Two weeks, visiting postdoc (Netsai Mhlanga), from NIAB, UK, Kleiner Lab, NCSU
2024	Two months, visiting postdoc (Tjorven Hinzke), from U of Greifswald, Kleiner Lab
2023 – 2024	Twelve months, visiting student (Laura Winkler) from Germany, Kleiner Lab, NCSU
2023	Eight months, visiting PhD student (Yejin Son) from Cornell University, Kleiner Lab, NCSU
2022	Six months, visiting Postdoc (Benoit Kunath) from the University of Luxembourg, Kleiner Lab, NCSU
2022	Six months, visiting student (Tariq Shah), Kleiner Lab, NCSU
2021	Six months, visiting PhD student (Grace D'Angelo) from the Max Planck Institute for Marine Microbiology, Kleiner Lab, NCSU
2021	Three months, visiting MS student (Amit Barkai) from the Israel Limonological and Oceanographic Research Institute, Kleiner Lab, NCSU
2021	Four months, visiting PhD student (Marie Aggerbeck) from Aarhus University, Kleiner Lab, NCSU
2019	Summer NSF-REU undergraduate researcher (Jameson Ehret), Kleiner Lab, NCSU
Feb – Jul 2019	Visiting Student from the Hochschule Bremen, Germany (Marlene Jensen), Kleiner Lab, NCSU. Official member of Bachelor Thesis Committee.
2017	Six months, visiting PhD student (Tjorven Hinzke), Energy Bioengineering Group, University of Calgary
2016/17	Project student (Erin Thorson), Energy Bioengineering Group, University of Calgary
2016	Four months summer student (Erin Thorson), Energy Bioengineering Group, University of Calgary
2011	Guest PhD student (Ruby Ponnudurai) doing a 4 week project, Symbiosis Group, Max Planck Institute for Marine Microbiology
2011	Six week Lab Rotation MSc student (Lizbeth Sayavedra), Symbiosis Group, Max Planck Institute for Marine Microbiology
2010	Research intern for 8 weeks (MSc student Johannes Boetschi from the University of Greifswald), Symbiosis Group, Max Planck Institute for Marine Microbiology

FIELD EXPERIENCE

2026	Carrie Bow Cay Field Station, Smithsonian, Belize. Collection of marine sediments, chemosynthetic symbioses, and corals, for metagenomics and metaproteomics.
2018	NCSU Center for Marine Sciences and Technology, North Carolina. Collection of chemosynthetic symbioses from marine sediments (multiple trips).
2015	Bermuda Institute of Ocean Sciences, Bermuda. Collection of marine sediments and symbionts from gutless marine oligochaetes for metagenomics, metatranscriptomics and metaproteomics.
2013	Little Darby Island, Bahamas. Collection of marine sediment and symbiotic Meiofauna for metagenomics and metaproteomics.
2012*	Heron Island Research Station, Australia. Collection of symbiotic Meiofauna for metagenomics and metaproteomics.
2012	Hydra Institute for Marine Sciences, Elba, Italy. Collection of gutless oligochates, *in situ* measurements and physiological incubation experiments.
2011*	Hydra Institute for Marine Sciences, Elba, Italy. Collection of gutless oligochaetes.
2010*	Hydra Institute for Marine Sciences, Elba, Italy (Two Trips). Collection of gutless oligochates, *in situ* measurements and physiological incubation experiments.
2009*	Bermuda Institute of Ocean Sciences, Bermuda. Collection of marine sediment and symbionts from gutless marine oligochaetes for metaproteomics and metagenomics.
2007*	Hydra Institute for Marine Sciences, Elba, Italy. Collection of symbionts from gutless marine oligochaetes for metaproteomics.

*For these sampling trips I was the main coordinator of the research team - consisting of three to five scientists - and was in charge of equipment and sample logistics.

PROFESSIONAL MEMBERSHIPS

2009 -	International Symbiosis Society
2010 -	International Society for Microbial Ecology
2013 -	American Society for Microbiology (ASM)
2020 -	American Society for Mass Spectrometry (ASMS)
2021 -	International Society for Molecular Plant-Microbe Interactions (IS-MPMI)