

Elizabeth N. Rudzki, PhD.

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Education

- PhD at Biological Sciences Department
Dietrich School of Arts and Sciences
University of Pittsburgh
3.946 Cumulative GPA
Fall 2018 – Spring 2025
- B.S. Biology at Edinboro University of PA
Minors in Chemistry and Communication Studies
3.89 Cumulative GPA
2011 – Spring 2016

Awards and Funding

- National Science Foundation Graduate Research Fellowship
2018 Spring – 2022 Fall
- Provost's Dissertation Completion Fellowship
2025 Spring

Nominations

- HHMI Gilliam Fellowship – Nominee from the
University of Pittsburgh
2022 Fall
- Dolores Zohrab Liebmann Fund Fellowship
Internal candidate from Dietrich School of Arts
and Sciences
2022 Fall
- Andrew W. Mellon Predoctoral Fellowship
Internal candidate from Dietrich School of Arts
and Sciences
2023 Winter

Research Experience

Post Doctoral Research Associate Spring 2025 – Current
Department of Biological Sciences, University of Pittsburgh, Pittsburgh, PA.

- Studying the impacts of host phylogeny and differential gene expression on the host's acquisition of the bacterial gut microbiome during early host development in the lab of Dr. Kevin D. Kohl.
- Developing a multiplex PCR sex genotyping protocol for four species of *Peromyscus* mice.
- Actively mentoring undergraduate, post-baccalaureate, and graduate students.
- Compiling and analyzing a systemic literature review of microbiome methodology across four main disciplines and five years of publications.

Graduate Researcher

Fall 2018 – Spring 2025

Department of Biological Sciences, University of Pittsburgh, Pittsburgh, PA.

- Studying the impacts of host genetics and environmental exposure in the host's acquisition of the bacterial microbiome during early host development. Host organisms of focus include amphibians (*Lithobates clamitans*), avians (brood parasitic *Molothrus ater* and one of its hosts *Protonotaria citrea*), and rodents (*Peromyscus spp.*) in the lab of Dr. Kevin D. Kohl.
- Conducting a meta-analysis of statistical techniques used in the microbiome field, with specific interest in studies focusing on non-model and non-human organisms.
- Actively mentoring undergraduate and post-baccalaureate students, with many being members of underrepresented minorities.

Research II Technician

Summer 2016 – Summer 2018

Department of Biological Sciences, University of Pittsburgh, Pittsburgh, PA.

- Studying host-pathogen interactions and utilizing CRISPR Cas9 genetic manipulation of the apicomplexan parasites *Toxoplasma gondii*, *Neospora caninum*, and *Hammondia hammondi* in the lab of Dr. Jon P. Boyle.
- Determine the role of *Toxoplasma gondii* in the induction of CCL22 chemokine in primary human trophoblasts; identifying the parasite and host effector(s) involved.
 - Compare expression differences between *T. gondii*, its nearest extant relative *H. hammondi*, and another close relative *N. caninum*, and identify candidate genes for the CCL22 effector(s).
 - Apply CRISPR site directed gene mutagenesis to disable candidate genes in the *Toxoplasma gondii* parasite, using qPCR, RNA-seq, and ELISAs to observe any disruption of CCL22 induction during infection.
- Mentor of undergraduate students, rotating graduate students, lab assistants, and members of collaborating laboratories. Mentored two individuals of underrepresented minorities, both are now holding industry jobs.
- Maintaining human foreskin fibroblast cell culture passages for the lab, overseeing live animal research as the direct contact point with DLAR, ordering supplies, and managing repairs of equipment.

Research Assistant

2015 Summer – 2016

Department of Biology and Health Services, Edinboro University of Pennsylvania, Edinboro, PA.

- Study angiogenesis of bovine endothelial cells in the lab of Dr. Matthew Foradori.
- Determine if hemolymph isolated from *Lariniodes cornutus* contains antiangiogenic proteins with the ability to inhibit both proliferation and migration of bovine endothelial cells.
 - Utilize sepharose anion exchange columns and gradient pumps to fractionate the proteins from the hemolymph.
 - Challenge bovine endothelial cells with individual fractions, conduct proliferation assays and conduct migration assays using modified Boyden chamber plates.
- Maintain bovine endothelial cell passage for the lab.

Field Research

2013 & 2015 Summers

Collaboration of Tuli Conservation Project in Botswana, Africa and the Department of Biology and Health Services, Edinboro University of Pennsylvania, Edinboro, PA.

- Study of game animal migration and population in Botswana, Africa with Dr. Cynthia Rebar.
 - Determine if populations of game animals on the research reserve are declining. Observe if populations are migrating to new areas of the reserve, or off the reserve completely.
 - Assist in developing a method using a combination of dental plasters to preserve and lift prints of large game animals to facilitate the identification of individuals.

Publications**Published Manuscripts**

- **Rudzki, E. N., et al. (2024).** Host avian species and environmental conditions influence the microbial ecology of brood parasitic Brown-headed Cowbird nestlings: What rules the roost? *Molecular Ecology*, 33(6):e17289. <https://doi.org/10.1111/mec.17289>.
- **Rudzki, E. N., and Kohl, K. D. (2023).** Deficits in Accessibility across Field Research Stations for Scientists with Disabilities and/or Chronic Illness, and Proposed Solutions. *Integrative and Comparative Biology*, 63(1), 114-127.
- **Rudzki, E. N., et al. (2022).** A guide for developing a field research safety manual that explicitly considers risks for marginalized identities in the sciences. *Methods in Ecology and Evolution*, 13, 2318- 2330. <https://doi.org/10.1111/2041-210X.13970>.
- **Rudzki, E. N., et al. (2021).** *Toxoplasma gondii* GRA28 is Required for Placenta-Specific Induction of the Regulatory Chemokine CCL22 in Human and Mouse. *mBio* 6:e01591-21.
- **Ander, S. B., E. N. Rudzki, N. Arora, Y. Sadovsky, C. Coyne, J. Boyle.** “Human Placental Syncytiotrophoblasts Restrict *Toxoplasma gondii* Attachment and Replication and Respond to Infection by Producing Immunomodulatory Chemokines.” *MBio*, vol. 9, no. 1, 9 Jan 2018, doi:10.1128/mbio.01678-17.

University Invited Speaker (*Presenter)

- **Rudzki, E. N.* 2024.** Writing a Field Research Safety Manual with Specific Considerations for Marginalized Scientists. Division of Biology and Medicine, Department of Ecology, Evolution, and Organismal Biology: Brown University. Providence, RI. October 22, 2024.
- **Rudzki, E. N.* 2025.** Addressing exacerbated field risks and deficits in accessibility for marginalized students. Department of Biology: Wilfrid Laurier University. Waterloo, Ontario. October 22, 2024.

Conference Invited Symposium Speaker (*Presenter)

- **Rudzki, E. N.*** 2023. Field Safety Manuals: Addressing Exacerbated Field Risks for Marginalized Scientists. Society for Integrative and Comparative Biology (SICB). Austin, TX.

Conference Invited Panel Speaker (*Speaker)

- Barlow, H., **E. N. Rudzki***, J. Duvall*, R. D. Kramp*, and E. S. Gawalt*. 2024. Science for All: Addressing and Overcoming Disability-Related Challenges. Annual Biomedical Research Conference for Minoritized Scientists (ABRCMS). Pittsburgh, PA.

Conference Oral Presentations (*Presenter)

- **Rudzki, E. N.***, K. Kohl. 2024. Combining Comparative and Developmental Approaches Towards the Mammalian Microbiome: Signatures of Phyllosymbiosis are Detectable Across *Peromyscus* Mice During the Early Weaning Period. Beneficial Microbes. Madison, WI.
- **Rudzki, E. N.***, K. Kohl, and J. F. Stephenson. 2020. Skin Microbiome Significantly Predicts Susceptibility to Ectoparasite Infection in Trinidadian Guppies, *Poecilia reticulata*. Society for Integrative and Comparative Biology (SICB). Austin, TX.

Conference Poster Presentations (*Presenter)

- **Rudzki, E. N.***, et al. 2022. Water source matters: How housing tadpoles (*Lithobates clamitans*) in varying concentrations of lab- and pond-waters affects host physiology and survival. Beneficial Microbes. Madison, WI.
- **Rudzki, E. N.***, et al. 2021. Phylogeny does not always rule the roost: High similarity in the fecal microbiome of obligate brood parasitic *Molothrus ater* nestlings and their host *Protonotaria citrea* nestmates. Society for Integrative and Comparative Biology (SICB). Online.
- Kramp, R. D.*, **E. N. Rudzki**, K. Kohl, and J. F. Stephenson. 2021. Examining skin microbiome of Trinidadian guppy and ectoparasite infection dynamics. Society for Integrative and Comparative Biology (SICB). Online.
- **Rudzki, E. N.***, S. Ander, C. Coyne, and J. Boyle. 2018. *Toxoplasma gondii* induces placental production of the immunomodulatory chemokine CCL22 by MYR1-dependent secretion of dense granule protein 28. Gordon Research Conference on the Biology of Host-Parasite Interactions. Newport, RI.
- **Rudzki, E. N.***, C. Coyne, and J. Boyle. 2017. The Search for the Parasite Effector Responsible for the Induction of CCL22 during *Toxoplasma gondii* Infection. Joint IMM/MMG Departmental Conference. Pittsburgh, PA.
- **Rudzki, E. N.***, and M. Foradori. 2016. The Search for Inhibitors of Angiogenesis in the Hemolymph of the Corn Furrow Spider, *Larinioides cornutus*. Edinboro University of Pennsylvania Celebration of Scholarship. Edinboro, PA.
 - *First place award in the College of Science and Health Professions*

- **Rudzki, E. N.***, and M. Foradori. 2016. Preliminary Examination of the Hemolymph of the Corn Furrow Spider, *Larinioides cornutus*, for Antiangiogenic Agents. Penn State Behrend Sigma Xi Undergraduate Research Conference. Erie, PA.

Non-peer-reviewed manuscripts

- Kuebbing *et al.* 2021. Field Safety Manual. Department of Biological Sciences: University of Pittsburgh. Pittsburgh, PA.
https://www.ple.pitt.edu/sites/default/files/Documents/pitt_biological_sciences_field_safety_manual.pdf

Teaching and Mentoring

Teaching Assistant (Microbiology Lab)

2022 Fall

Department of Biological Sciences, Dietrich School of Arts and Sciences, University of Pittsburgh, Pittsburgh, PA.

Prepared samples and materials for lab classes, graded assignments, advised students. Assisted students with learning common microbiology lab techniques. Developed and presented two short lectures: (1) An overview of my research project from which they would be using samples for the class, and how their own work could be used for future directions, and (2) how Illumina 16S rRNA gene sequencing works, what you can do with the data, and how you would analyze it.

Mentorship (Sex Genotyping)

Fall 2024 – Spring 2025

Department of Biological Sciences, Dietrich School of Arts and Sciences, University of Pittsburgh, Pittsburgh, PA.

Taught and supervised a student on how to use multiplex PCR to sex genotype *Peromyscus* pups. The undergraduate student was tasked with testing primer sets, running gels, and extracting DNA from tail snips using a hotshot protocol. The goal of her project is to prove whether the method I developed would work for all four species of *Peromyscus* (*maniculatus*, *californicus*, *polionotus*, and *leucopus*) used in our laboratory.

Mentee:

Shreena Patel

Mentorship (Anaerobic Culturing)

Spring 2023

Department of Biological Sciences, Dietrich School of Arts and Sciences, University of Pittsburgh, Pittsburgh, PA.

Taught students how to use and maintain an anaerobic chamber. Supervised and assisted in their anaerobic culturing projects where their goal was to isolate at least twenty bacterial taxa from a mouse gut sample and conduct biochemical tests in order to evaluate characteristics of each microbial isolate.

Mentees:

Cindy Huang
Karam Elahi
Emily Roda
Anna Kelly

Mentorship (Data Science)

Fall 2022 – Spring 2023

Department of Biological Sciences, Dietrich School of Arts and Sciences, University of Pittsburgh, Pittsburgh, PA.

Taught and assisted a student in learning data science topics such as R coding, network analyses, and how to create preliminary graphs for large data sheets. Student was tasked with finding a solution to a complex issue (what type of network analysis could be applied to an abnormal dataset comprised of a mix of data types) and met with weekly to discuss new findings and guidance on next steps.

Mentee:

Anna Kelly

Mentorship (Literature Surveys)

Spring 2021 – Spring 2023

Department of Biological Sciences, Dietrich School of Arts and Sciences, University of Pittsburgh, Pittsburgh, PA.

Students assisted in the testing of a Qualtrics survey that would be utilized to conduct a methodological review of Microbiome literature (Spring 2020). During this the Spring 2020 semester, I remotely taught undergraduate students a crash course in graduate-level statistics and microbiome methodology such that they could identify information in published manuscripts and answer survey questions accurately. I then created a Qualtrics survey with over 90 questions that students assisted with testing survey logic and trouble-shooting problems.

I then created a literature search to identify 400 manuscripts to be queried and supervised and assisted a subset of students over the course of multiple semesters and summer sessions where the students were tasked with completing a survey for every manuscript.

Mentees:

Arya Patel	Spring 2021
Bhaavna Peri	Spring 2021
Liangge Yu	Spring 2021
Vikram Sundar	Spring 2021
Emily Yeager	Spring 2021
Sarth Shah	Spring 2021
Luke Scafidi	Spring 2021 & Spring 2022
Rachael Cook	Spring 2021 – Fall 2022
Claire Chiang	Spring 2021 – Spring 2023