

Emily R. Davenport

Assistant Professor – Pennsylvania State University

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Education

- 2009 - 2014 Ph.D in Human Genetics
 Certificate in University Teaching
 University of Chicago; Chicago, IL
 Advisor: Yoav Gilad (supported by NIH training grant)
- 2003 - 2007 B.S. in Bacteriology (with comprehensive honors)
 University of Wisconsin – Madison; Madison, WI
- 2005 International Study Program, selected participant
 National University of Ireland, Galway; Galway, Ireland

Academic, Research, and Industry Experience

- 2019 - **Assistant Professor.** Department of Biology, Huck Institutes of the Life Sciences, Institute for Computational and Data Sciences; The Pennsylvania State University; University Park, PA.
- 2018 - 2019 **Visiting Post-doctoral Fellow.** Supervisor: Ruth Ley (supported by NIH NRSA) Department of Microbiome Science, Max Planck Institute for Developmental Biology; Tübingen, Germany.
- 2014 - 2019 **Post-doctoral Fellow.** Advisor: Andrew Clark (supported by NIH NRSA) Department of Molecular Biology and Genetics, Cornell University; Ithaca, NY.
- 2008 - 2009 **Sequence Capture Technician.** Supervisor: Mindy Bennett. Roche NimbleGen; Madison, WI.
- 2007 - 2008 **Forensic Scientist – DNA Analyst.** Supervisor: Sherry Culhane. DNA Unit, Department of Justice - Wisconsin State Crime Lab; Madison, WI.
- 2004 - 2007 **Undergraduate Research Assistant/Independent Research.** Advisor: Steven Barclay Department of Bacteriology, University of Wisconsin – Madison; Madison, WI.
- 2006 **International Research Experience for Students (IRES) in Microbiology Summer Research Program Participant.** Advisor: Sukathida Ubol Department of Microbiology, Mahidol University; Bangkok, Thailand.

Publications – peer reviewed

* denotes equal contribution

Underlined denotes mentee author

Submitted

38. Ramachandran SL*, Pasupuleti N*, Abdil RJ†, Adikari G†, Ahlawat B†, Blekhman R†, Burgo V†, Davenport ER†, Dwivedi A†, Gupta S†, Ijnu TP†, Jamir T†, Karu R†, Kaushik A†, Komarabthini JM†, Laithangpui†, Lalzarliana J†, Norbu T†, Pautu T†, Pawar K†, Raman AS†, Ramaswamy R†, Ranasinghe R†, Rashmi†, Sasidharan SP†, Saheesh T†, Shaji S†, Shapiro JW†, Singh E†, Singson V†, Sundararajan A†, Tennekoon KH†, Tetso D†, Urban Aragon JA†, Welikala AHJ†, Yhome RR†, Rai N, and Raghavan M. *Gut microbial markers of lifestyle transition across 575 diverse South Asians*. [submitted]

† These authors listed alphabetically

37. Tian Y, Koo I, Anderson BD, Vairagkar A, Anitha M, Santos A, Tian S, Antonian EA, Paudel D, Oldro KJ, Patel AD, Mullins CE, Sallam L, Koshkin S, Yennawar HP, Fecko JA, Cutler T, Gray JL, Ning G, Hyun Cho S, Zhao J, Swencki-Underwood B, Imchen M, Nichols RG, Hao F, Weiss AS, **Davenport ER**, Zackular JP, Bordenstein SR, Walker DI, Yennawar NH, Alderete TL, Weinert EE, Peters JM, Bisanz JE, and Patterson AD. *PFAS drive gut dysbiosis and antibiotic resistance*. [submitted]
36. Nichols RG, Boyle N, Hao F, Anitha M, Tian Y, Peters JM, **Davenport ER**, and Patterson AD. *Short-term chlorpyrifos exposure alters gut microbiome and metabolome in mice*. [submitted]
35. Tikhonova P, Mekonnen Z, Belanger KD, Ay A, **Davenport ER**, and Taye B. *Microbiome responses to anthelmintic treatment depend on pre-treatment helminth infection status in young Ethiopian children: A longitudinal study*. [submitted]

2025

34. Kelliher JM, Mirzayi C, Bordenstein SR, Oliver A, Kellogg CA, Hatcher EL, Berg M, Baldrian P, Aljumaah M, Maria Luz Miller C, Mungall C, Noval V, Palucki A, Smith E, Tabassum N, Bonito G, Brister JR, Chain PSG, Chen M, Degregori S, Pabo Dundore-Arias J, Emerson JB, Moreira C, Fernandes V, Flores R, STREAMS Consortium, and Eloë-Fadrosch EA [**Davenport ER** part of STREAMS Consortium]. *STREAMS guidelines: standards for technical reporting in environmental and host-associated microbiome studies*. *Nature Microbiology*. 2025;10(3059-3068)
33. Van Syoc EP, Gomez A, **Davenport ER**, and Bordenstein SR. *Gut fungal profiles reveal phyllosymbiosis and codiversification across humans and nonhuman primates*. *PLoS Biology* 23(9):e3003390
32. Van Syoc EP, Gomez A, **Davenport ER**, and Bordenstein SR. *Gut fungi are associated with human genetic variation and disease risk*. *PLoS Biology* 23(9):e3003339

31. Cappas V, **Davenport ER**, and Sykes D. *The microbiome and volatile organic compounds reflect the state of decomposition in an indoor environment*. Science & Justice. 2025;65(5):101302
30. Chilkina M, Tran H, Uribe G, McAninch S, McAninch C, Seideneck A, He B, Khanipov K, Golovko G, Powell DW, **Davenport ER**, Pinchuk IV. *MyD88-mediated signaling in intestinal fibroblasts regulates macrophage antimicrobial defense and prevents dysbiosis in the gut*. Cell Reports. 2025;44(5):115553
29. Litichevskiy L, Considine M, Gill J, Shandar V, Cox TO, Descamps HC, Wright KM, Amses KR, Dohnalova L, Liou MJ, Tetlak M, Galindo-Fiallos MR, Wong AC, Lundgren P, Kim J, Uhr GT, Rahman RJ, Mason S, Merenstein C, Bushman FD, Raj A, Harding F, Chen Z, Prateek GV, Mullis M, Deighan AG, Robinson L, Tanes C, Bittinger K, Chakraborty M, Bhatt AS, Li H, Barnett I, **Davenport ER**, Broman KW, Cohen RL, Botstein D, Freund A, Di Francesco A, Churchill GA, Li M, and Thaiss CA. *Interactions between the gut microbiome, dietary restriction, and aging in genetically diverse mice*. Nature Microbiology. 2025;10,1240-1257
28. Liu S, Rodriguez J, Munteanu V, Ronkowski C, Kumar Sharma N, Alser M, Andreade F, Blekhman R, Błaszczuk D, Chikhi R, Crandall KA, Libera KD, Francis D, Frolova A, Gancz AS, Huntley NE, Jaiswal P, Kosciolk T, Łabaj P, Łabaj W, Luan T, Mason C, Moustafa AM, Muralidharan HS, Mutlu O, Ghiasi NM, Rahnavard A, Sun F, Tian S, Tierney BT, Van Syoc E, Vicedomini R, Zackular JP, Zelikovsky A, Zielińska, Ganda E, **Davenport ER**, Pop M, Koslicki D, Mangul S. *Analysis of metagenomic data*. Nature Reviews Methods Primers. 2025;5(5)

2024

27. Nichols RG and **Davenport ER**. *Clade-specific long-read sequencing increases the accuracy and specificity of the gyrB phylogenetic marker gene*. mSystems. 2024;10:e01480-24
26. Ryu EP, Gautam Y, Proctor DM, Bhandari D, Tandukar S, Gupta M, Prasad Gautam G, Relman DA, Shibl AA, Bahadur Sherchand J, Jha AR, and **Davenport ER**. *Nepali oral microbiomes reflect a gradient of lifestyles from traditional to industrialized*. Microbiome. 2024;12,228
25. Nichols RG, Rimal B, Hao F, Peters JM, **Davenport ER**, and Patterson AD. *Chlorpyrifos modulates the mouse gut microbiota and metabolic activity*. Environment International. 2024;192:109022
24. Taye B, Mekonnen Z, Belanger KD, and **Davenport ER**. *Gut-microbiome profiles among Soil-Transmitted Helminths (STHs) infected Ethiopian children enrolled in the school-based mass deworming program*. PLoS Neglected Tropical Diseases 18(10), e0012485

2023

23. Gancz AS, Farrer AG, Nixon M, Arriola L, Adler C, **Davenport ER**, Gully N, Cooper A, Britton K, Dobney K, Silverman J, Weyrich L. *Ancient dental calculus reveals novel oral microbiome diversity in pre-Industrialized British people*. Nature Microbiology. 2023;8,2315-2325

22. Kelliher JM, Rudolph M, Vangay P, Abbas A, Borton MA, Santistevan C, **Davenport ER**, Davenport DW, Erazo NG, Herman C, Karstens L, Kocurek B, Lutz HL, Myers KS, Ockert I, Rodriguez FE, Saunders JK, Smith ML, Vogtmann E, Windsor A, Wood-Charlson EM, Woodley L, Elloe-Fadrosh EA. *Promoting cohort-based learning for community standards in microbiome research*. Nature Microbiology. 2023;8, 751-753

2022

21. Ryu EP and **Davenport ER**. *Host genetic determinants of the microbiome across animals: from C. elegans to cattle*. Annual Reviews of Animal Biosciences. 2022 10:1, 203-226

2021

20. Jeganathan NA, **Davenport ER**, Yochum GS, Koltun WA. *The microbiome in diverticulitis*. Current Opinion in Physiology. 2021;22
19. Amato KR, Arrieta M, Azad M, Bailey MT, Broussard JL, Bruggeling C, Claud EC, Costello EK, **Davenport ER**, Dutilh BE, Swain Ewald HA, Ewald P, Hanlon EC, Julion WA, Keshavarzian A, Maurice CF, Miller GE, Preidis GA, Ségurel L, Singer BH, Subramanian S, Zhao L, Kuzawa CW. *The Human Microbiome and Health Inequities*. PNAS. 2021;118(25)
18. Marderstein AR, **Davenport ER**, Kulm S, Van Hout C, Elemento O, Clark AG. *Leveraging phenotypic variability to identify genetic interactions in human phenotypes*. American Journal of Human Genetics. 2021;108(1)

2020

17. Nichols RG and **Davenport ER**. *The relationship between the gut microbiome and host gene expression: A review*. Human Genetics. 140(5), 747-760 DOI: 10.1007/s00439-020-02237-0

2019

16. Gong X, **Davenport ER**, Wang D, Clark AG. *Lack of spatial and temporal genetic structure of Anguilla japonica populations*. Conservation Genetics. 2019;20:467
15. Kachoo P*, Eraso JM*, Beres SB, Olsen RJ, Zhu L, Nasser W, Bernard PE, Cantu CC., Ojeda Saavedra M, José Arredondo M, Strobe B, Do H, Kumaraswami M, Vuopio J, Gröndahl-Yli-Hannuksela K, Kristinsson KG, Gottfredsson M, Pesonen M, Pensar J, **Davenport ER**, Clark AG, Corander J, Caugant DA, Gaini S, Magnusses MD, Porter AR, DeLeoFR, and Musser JM. *Integrated analysis of population genomics, transcriptomics and virulence provides novel insights into Streptococcus pyogenes pathogenesis*. Nature Genetics. 2019;51 548-559

2018

14. Jha AR, **Davenport ER**, Gautam Y, Bhandari D, Tandukar S, Ng K, Holmes S, Prasad Gautam G, Bahadur Sherchand J, Bustamante CD, and Sonnenburg JL. *Gut microbiome transition across a life gradient in Himalaya*. PLoS Biology. 2018;16(11):e2005396 (epub 2018 Nov 15)

2017

13. **Davenport ER***, Sanders JG*, Song SJ, Amato KR, Clark AG, and Knight R. *The human microbiome in evolution*. BMC Biology. 2017. 15:127
12. Goodrich JK, **Davenport ER**, Clark AG, and Ley RE. *The relationship between the human genome and microbiome comes into view*. Annual Reviews Genetics. 2017. 51(1)
11. Igartua C, **Davenport ER**, Gilad Y, Nicolae DL, Pinto J, and Ober C. *Host genetic variation in mucosal immunity pathways influences the upper airway microbiome*. Microbiome. 2017 Feb 1;5:16

2016

10. **Davenport ER**, Goodrich JK, Bell JT, Spector TD, Ley RE, Clark AG. *ABO antigen and secretor statuses are not associated with gut microbiota composition in 1,500 twins*. BMC Genomics. 2016 Nov 21;17:941
9. Beaumont M, Goodrich JK, Jackson MA, Yet I, **Davenport ER**, Vieira-Silva S, Debelius J, Pallister T Mangino M, Raes J, Knight R, Clark AG, Ley RE, Spector TD, and Bell JT. *Heritable components of the human fecal microbiome are associated with visceral fat*. Genome Biology. 2016 Sep 26;17:189
8. Goodrich JK, **Davenport ER**, Beaumont M, Jackson MA, Knight R, Spector TD, Bell JT, Clark AG, and Ley RE. *Genetic determinants of the gut microbiome in UK twins*. Cell Host and Microbe. 2016: 19(5), 731-743
7. Goodrich JK*, **Davenport ER***, Waters JL*, Clark AG, and Ley RE. *Cross-species comparisons of host genetic associations with the microbiome*. Science. 2016: 352(6285), 532-535
6. **Davenport ER**. *Elucidating the role of the host genome in shaping microbiome composition*. Gut Microbes. 2016: 7(2), 178-184
5. Blischak JD, **Davenport ER**, and Wilson G. *A quick introduction to version control with Git and GitHub*. PLoS Computational Biology. 2016;12(1):e1004668 (epub 2016 Jan 19)

2015

4. **Davenport ER**, Cusanovich DA, Michelini K, Barrerio LB, Ober C, and Gilad Y. *Genome-wide association studies of the human gut microbiota*. PLoS One. 2015;10(11):e0140301 (epub 2015 Nov 3)

-----> *An Editor's Pick for the PLoS Microbiology special collection:*

<http://collections.plos.org/microbiology-picks>

-----> *An Editor's Pick for the PLoS Experimental Biology special collection:*

<http://collections.plos.org/experimental-biology>

2014

3. Zhou X, Cain CE, Myrthil M, Lewellen N, Michelini K, **Davenport ER**, Stephens M, Pritchard JK, and Gilad Y. *Epigenetic modifications are associated with inter-species gene expression variation in primates*. Genome Biology. 2014 Dec 3;15(12):547
2. **Davenport ER**, Mizrahi-Man O, Michelini K, Barreiro LB, Ober C, and Gilad Y. *Seasonal variation in human gut microbiome composition*. PLoS One. 2014;9(3):e90731 (epub 2014 Mar 11)

2013

1. Mizrahi-Man O, **Davenport ER**, and Gilad Y. *Taxonomic classification of bacterial 16S rRNA genes using short sequencing reads: Evaluation of effective study designs*. PLoS One. 2013;8(1):e53608 (epub 2013 Jan 7)

Publications – non-peer reviewed

4. Chen YY, Evavold CL, Mann M, **Davenport ER**, McFall-Ngai M, Bienko M, Ueda HR, Tian L, Tjahjono N, Anikeeva P, Gogo Liu J, Deans TL, and Shen X. *What tool or method do you wish existed?* Cell. 2024;187(17)
3. Ryu EP and **Davenport ER**. *Microbiome: Taming the beasts inside*. eLife 2021;10:e67634
2. **Davenport ER**. *Genetic variation shapes murine gut microbiota via immunity*. Trends in Immunology. 2020;41(1)
1. **Davenport ER**. *Tooth be told, genetics influence oral microbiome*. Cell Host & Microbe. 2017;22(3)

Presentations

Invited Plenary Platform Presentations

2020 **Davenport, ER.** *Role of host genetics in shaping the gut microbiota.* Gut Microbiome for Health World Summit. Madrid, Spain [note: presented remotely due to COVID-19]

Invited Platform Presentations

2027 **Davenport, ER.** *What shapes and shatters host-microbiome phylosymbiosis.* Society for Integrative and Comparative Biology (SICB); Symposium: Feedback between host phenotypes and the microbiome: Physiological mechanisms and behavioral outcomes. Pittsburgh, PA

2025 **Davenport, ER.** *Gaining insights into host-microbiome physiology via multi-omics integration.* Multi-Omics at Scale: Leveraging Penn State's Expertise for Future Interdisciplinary Opportunities workshop at the Institute of Computational and Data Science (ICDS) Symposium. Pennsylvania State University, University Park, PA

2025 **Davenport, ER.** NYU Abu Dhabi Center in Genomics & Systems Biology Symposium. Abu Dhabi, UAE.

2024 **Davenport, ER.** *Associations between host gut epithelial gene expression and the mucosal microbiome along the lower GI tract.* Inflammatory Bowel Disease (IBD) Research Symposium. Pennsylvania State University College of Medicine. Hershey, PA

2023 **Davenport, ER.** Career Development in Quantitative Genetics and Genomics Mentorship Session. Quantitative Genetics and Genomics Gordon Research Seminar. Ventura, CA

2023 **Davenport, ER.** *Associations between microbes and host gene expression reveal physiological insights into host-microbiome interactions.* Quantitative Genetics and Genomics Gordon Research Conference. Ventura, CA

2022 **Davenport, ER.** Using human genetics to understand the physiological basis of host microbiome interactions. Inflammatory Bowel Disease (IBD) Research Symposium. Pennsylvania State University College of Medicine. Hershey, PA

2022 **Davenport, ER.** *Using the microbiome as a proxy for the environment in genome-wide association studies.* Human Genetic Variation and Disease Gordon Research Conference (HGVD GRC). Manchester, NH [*meeting cancelled]

2020 **Davenport, ER.** *Using human genetics to understand the physiological basis of host microbiome interactions.* The Vanderbilt Institute for Infection, Immunology, and Inflammation (VI4) Annual Symposium [*virtual due to COVID-19]

2020 **Davenport, ER.** *Using human genetics to understand the physiological basis of host microbiome interactions.* Workshop: Cultivating communities: Making sense of host-

microbiome interactions through the lens of genetics. The Allied Genetics Conference (TAGC). Washington DC [*virtual due to COVID-19]

- 2019 **Davenport, ER.** *Causes and consequences of human gut microbiome variation.* One Health Workshop. Pennsylvania State University. State College, PA
- 2019 **Davenport, ER,** Spector TD, Ley RE, and Clark AG. *Simultaneously modeling host genetics and microbiome impact on immune-related traits.* Pennsylvania State University Bioinformatics and Genomics Annual Retreat. State College, PA
- 2018 **Davenport, ER,** Spector TD, Ley RE, and Clark AG. *Simultaneously modeling host genetics and microbiome composition reveals the heritability and proportion of variance explained due to the microbiome for immune-related traits.* Probabilistic Modeling in Genomics (ProbGen). Cold Spring Harbor Labs, NY
* Co-chair of "Cancer, the microbiome, and beyond" session
- 2017 **Davenport ER.** *Role of host genetics in shaping the gut microbiota.* The Human Capital and Economic Opportunity (HCEO) Working Group Conference on The Gut Microbiome in Human Biology and Health: New Opportunities for the Study of Health Disparities. Chicago, IL
- 2017 **Davenport ER.** *The role of host genetics in determining human gut microbiome composition.* The American Association of Physical Anthropologists Annual Meeting. Wiley Invited Podium Symposium - Humans as Holobionts: The Microbiome as a Biological System in Human Evolution. New Orleans, LA.
- 2016 **Davenport ER.** *The role of host genetics in determining human gut microbiome composition.* The 2016 Nordic-North American Symposium on Antimicrobial Resistance and Molecular Population Genomics in Houston, TX.

Platform Presentations

- 2023 **Davenport ER,** Spector TD, Ley RE, and Clark AG. *Using the microbiome as a proxy for host environmental influences in genome-wide association studies.* Microverse Symposium in Jena, Germany
- 2022 **Davenport ER,** Spector TD, Ley RE, and Clark AG. *Using the microbiome as a proxy for host environmental influences in genome-wide association studies.* CSHL Microbiome in Cold Spring Harbor, NY.
- 2017 **Davenport ER,** Spector TD, Ley RE, and Clark AG. *Co-occurrence network modeling reveals disease-specific configurations of microbiome community structure across 2,500 twins.* American Society of Human Genetics Annual Meeting (ASHG) in Orlando, FL.

- 2017 **Davenport ER**, Spector TD, Ley RE, and Clark AG. *Modeling human gut microbiome community structure across healthy and diseased states in 2,500 twins*. Society of Molecular Biology and Evolution Annual Meeting (SMBE) in Austin, TX.
- 2017 **Davenport ER**, Spector TD, Ley RE, and Clark AG. *Modeling human gut microbiome community structure across healthy and diseased states in 2,500 twins*. Biology of Genomes (BoG) in Cold Spring Harbor, NY.
- 2012 **Davenport ER**, Mizrahi-Man O, Barreiro LB, Ober C, and Gilad Y. *Examining the roles of diet, age, and sex on the composition of the human fecal microbiome*. University of Chicago Molecular Biosciences Cluster Retreat in Galena, IL.

Poster presentations

- 2023 **Davenport ER**, Kirven K, and Tran H. *SCiMS: Sex calling from metagenomic samples*. American Society of Human Genetics Annual Meeting (ASHG) in Washington, DC.
- 2015 **Davenport ER**, Goodrich JK, Bell JT, Spector TD, Ley RE, and Clark AG. *ABO antigen and secretor status are not associated with gut microbiota composition*. American Society of Human Genetics Annual Meeting (ASHG) in Baltimore, MD.
- 2014 **Davenport ER**, Mizrahi-Man O, Michelini K, Barreiro LB, Ober C, and Gilad Y. *poopQTLs: Genome-wide associations of the human gut microbiota*. Society for Molecular Biology and Evolution Annual Meeting (SMBE) in San Juan, PR.
- 2013 **Davenport ER**, Mizrahi-Man O, Michelini K, Barreiro LB, Ober C, and Gilad Y. *Temporal variation in human gut microbiome composition in the Hutterites*. American Society of Human Genetics Annual Meeting (ASHG) in Boston, MA.
- 2013 **Davenport ER**, Mizrahi-Man O, Michelini K, Barreiro LB, Ober C, and Gilad Y. *Examining the temporal stability of the fecal microbiome in an isolated, founder population*. Cell Symposium: the Microbiome and Host Health in Lisbon, Portugal.
- 2012 **Davenport ER**, Mizrahi-Man O, Barreiro LB, Ober C, and Gilad Y. *Examining the roles of diet, age, and sex on the composition of the human fecal microbiome*. American Society of Human Genetics Annual Meeting (ASHG) in San Francisco, CA.
- 2012 **Davenport ER**, Mizrahi-Man O, Barreiro LB, Ober C, and Gilad Y. *Examining the genetic basis of interindividual variation in the human fecal microbiome*. International Human Microbiome Conference in Paris, France.
- 2011 Yao T, **Davenport ER**, Poroyko V, Liu D, Lemanske R, Gern J, Ober C, Jackson D, Gilad Y, Pinto J. *The nasal microbiome and development of asthma in a birth cohort*. Biology of Genomes (BoG) in Cold Spring Harbor, NY.

Invited Seminars

- 2025 Department of Human Genetics, University of Pittsburgh
Department of Medicine Grand Rounds, The Pennsylvania State University Milton S. Hershey College of Medicine
Division of Gastroenterology and Hepatology, The Pennsylvania State University Milton S. Hershey College of Medicine
- 2024 Society for Epidemiologic Research (SER) Webinar Series (online)
- 2023 Department of Biology, Brigham Young University
Department of Biology, University of Utah
Department of Biology, West Chester University
Rutgers University Microbiome Program, Rutgers University
Balance of the Microverse Cluster of Excellence, Friedrich Schiller University Jena, Germany
MCIBS Graduate Program Retreat, Pennsylvania State University
Center of Genetic Epidemiology, University of Southern California
- 2022 ProK Seminar Series, University of Pennsylvania
Your Researcher Live, Researcher (online)
- 2021 MCIBS Graduate Program Retreat, Pennsylvania State University
UGA Interdepartmental Health Disparities Working Group, University of Georgia
Department of Biology, Trinity University
Department of Human Genetics, University of Chicago
Department of Cellular and Molecular Medicine, University of Arizona
Gut Interest Group, Penn State University College of Medicine
Microbiome Seminar Series, Penn State Microbiome Center, PSU
- 2020 Department of Public Health Sciences, Penn State College of Medicine
Department of Biology, Vanderbilt University [cancelled because of COVID-19]
Department of Human Genetics, UCLA [cancelled because of COVID-19]
Department of Human Genetics, University of Chicago [cancelled because of COVID-19]
- 2019 Penn State Microbiome Center Exchange, Penn State College of Medicine
Department of Biology, Duke University
Department of Nutrition, Pennsylvania State University
Department of Biology, University of New Mexico
Department of Biology, Marquette University

	Department of Biology, Auburn University
	Department of Biology, Pennsylvania State University
2018	Max Planck Institute for Developmental Biology
	Department of Biology, Bucknell University
	Department of Biology, Barnard College
	Department of Biology, Smith College
2017	Department of Biology, Wake Forest University
2016	The Huck Institutes of the Life Sciences, Pennsylvania State University
2013	Department of Biology, Chicago State University
2013	Emory University and Yerkes National Primate Research Center

Funding

Current

2022 – 2027 **R35 NIGMS/NIH (Award #R35GM146980)** (\$1,938,350)
Characterizing human-microbiome interactions via molecular and functional genomic approaches
 Role: PI
 Supplement awarded (2023): **3R35GM146980-02S1** (\$105,819)
 Supplement awarded (2024): **3R35GM146980-02S2** (\$24,752)

Trainee-led

2024 – 2026 **T32 (Award #T32GM152354)**
 Eukaryotic Gene Regulation (EGR) Training Program
 Appointee: Hanh Tran; Molecular, Cellular, and Integrative Biosciences (MCIBS) PhD Program
 Role: Mentor

2024 – 2025 **TL1 (Awards TL1TR002016, UL1TR002014)**
 Translational Research (TL1) Training Program
 Appointee: Polina Tikhonova; Bioinformatics and Genomics (BG) PhD Program
 Role: Mentor

2021 – 2023 **T32 (Award #T32GM102057)**
 Computation, Bioinformatics, and Statistics (CBIOS) Training Program

Appointee: Nicholas Locatelli, Biology PhD Program

Role: Co-mentor; Primary Mentor: Ilana Baums

2021 – 2023 **T32 (Award #T32GM102057)**

Computation, Bioinformatics, and Statistics (CBIOS) Training Program

Appointee: Erica Ryu, Biology PhD Program

Role: Mentor

2020 – 2023 **USDA NIFA (Award #2020-67034-31764)** (\$165,000)

Investigating the effects of chronic, dietary, and environmentally relevant doses of chlorpyrifos on the gut microbiome of mice

PI: Robert Nichols

Role: Co-sponsor. Sponsor: Andrew Patterson

Completed

2022 – 2023 **Interdisciplinary Innovation Fellowship**, Microbiome Center, Penn State (\$5000)

2023 **Microbiome Center Shared Resource Proposal**; total: \$30,000

Microbiome Center, Penn State

Unique dual indexes to drive microbiome sequencing at PSU

PIs: Jordan Bisanz, Justin Silverman, Erika Ganda, and Emily Davenport

2022 **USDA Conference Grant (Award #2022-67019-36985)**; total: \$50,000

Changing Microbiomes: A symposium hosted by the Microbiome Center at the Pennsylvania State University

PI: Liana Burghardt

Role: Co-investigator

2022 **DOE Conference Grant (Award #DE-SC0022552)**; total: \$10,000

Changing Microbiomes: A symposium hosted by the Microbiome Center at the Pennsylvania State University

PI: Estelle Couradeau

Role: Co-investigator

2016 – 2019 **F31 NIDDK/NIH (Award #F32DK109595)**; total: \$173,089

NIH Ruth L. Kirschstein National Research Service Award (NRSA)

Modeling human gut microbiome community structure in healthy and disease states

Role: PI

2017 Genetics Society of America (GSA) DeLill Nasser Travel Award for Professional Development in Genetics; total: \$1,000

2014 University of Chicago Biological Sciences Division Travel Award; total: \$1,000

2010 – 2012 NIH Genetics and Regulation Training Grant T32 appointee (University of Chicago – 2 years of stipend support and tuition)

2011 University of Chicago Digestive Diseases Research Core Center (DDRCC) Pilot and Feasibility award (written by ER Davenport to support dissertation research, submitted by Y. Gilad); total: \$20,000

Teaching Experience

University Courses – Instructor of Record

2020 – Penn State University, Department of Biology, *BIOL439: Practical Bioinformatics* (~25-30 students per semester)
2020 – Penn State University, Department of Biology, *PSU16: First Year Seminar* (~30-40 students per semester)

Teaching Assistantships

2014 University of Chicago, Biological Sciences Division: *HGEN 47300: Genomics and Systems Biology* (Taught 6 lectures)
2011 University of Chicago, Biological Sciences Division: *HGEN 47000: Human Genetics I*
2011 University of Chicago, Biological Sciences Division: *HGEN 47300: Genomics and Systems Biology*
2010 University of Chicago, Biological Sciences Division: *MGCB 31400: Genetic Analysis of Model Organisms*

Guest Lectures

2020; 2022 Penn State University, Anthropology *ANTH497: Microbial Insights into Anthropology – “Microbiome studies in the Hutterites”*
2016 Cornell University, Molecular Biology and Genetics: *BIOMG 4870: Human Genomics – “Cystic Fibrosis and PKU”*
2016 Cornell University, Biological Sciences: *BIOMI 3210: Human Microbes and Health – “Microbiome studies in the Hutterites”*
2016 Pennsylvania State University, Biochemistry and Molecular Biology: *BMB 484: Functional Genomics – “Introduction to Population Genetics”*
2015 Cornell University, Molecular Biology and Genetics: *BIOMG 4870: Human Genomics – “Linkage disequilibrium mapping, or Genome-wide Association Studies (GWAS)”*
2011 University of Chicago, Biological Sciences Division: *HGEN 47000: Human Genetics I – “Human genome structure and variation”*

Workshops

2024 –	Co-organizer – “Microbiome Center Kick-Start Workshop”, Penn State, Huck Institutes of the Life Sciences, Microbiome Center
2020 –	Instructor – “Microbiome Center Kick-Start Workshop”, Penn State, Huck Institutes of the Life Sciences, Microbiome Center
2023	Instructor – “Git and GitHub”, Penn State, Huck Institutes of the Life Sciences, Microbiome Center
2022	Instructor – “NMDC Metadata Standards Workshop”, Changing Microbiomes Symposium, Penn State
2021	Instructor – “Git and GitHub”, Penn State, Huck Institutes of the Life Sciences, Microbiome Center
2019	Instructor – “Introduction to Statistics with R”, Max Planck Institute for Developmental Biology; Tübingen, Germany
2016	Instructor – “Learn about Git and Github”, Cornell University, CPGSA
2016	Instructor – “Introduction to R”, University of Chicago, Biological Sciences Division

Software Carpentry Workshops [content I taught]

2017	Lead Instructor , TGen, Phoenix, AZ (June) [R and version control with Git]
2016	Instructor , University of Chicago, Biological Sciences Division (September) [review of shell and R, writing reproducible reports, and version control with Git]
2016	Lead Instructor , Cornell University, Department of Molecular Biology and Genetics (August) [version control with Git]
2015	Instructor , University of Chicago, Biological Sciences Division (September) [review of shell and R, writing reproducible reports, and version control with Git]
2015	Instructor , Pennsylvania State University (June) [shell and version control with Git]
2014	Instructor , University of Chicago, Biological Sciences Division (September) [version control with Git]
2014	Lead Instructor , University of Toronto (July) [version control with Git]
2013	Instructor , University of Chicago, Biological Sciences Division (September) [shell]
2013	Instructor , University of Chicago. (June) [shell]

Data Carpentry Workshops [content I taught]

2016	Instructor , Cornell University (June) [reproducible reports with Rmarkdown and R programming]
2015	Instructor , Cornell University (January) [automating repetitive tasks with command line shell]

Mentorship and Advising

Undergraduate Student Advising (Primary Advisor)

Years	Name	Institution	Program
2025 –	Chris Kuetché	PSU	Biology
2025 –	Joshua Miller	PSU	Biochemistry
2025 –	Eliana Garza	PSU	Biochemistry
2025 –	Anwi Tadzong	PSU	Biomedical Engineering
2025 –	Katerina Novic	PSU	Biology
---> Awarded an Eberly College of Science Research Award (2026)			
2024 –	Luscinia Quance	PSU	Biology
2023 –	Jack Stevenson	PSU	Biology
2023 –	Patricia Brocious	PSU	Schreyer Honor's College; Biology
---> Awarded an Eberly College of Science Research Award (2025, 2026)			
---> Awarded an Undergraduate Research Conference Presentation Travel Support award (2025)			
---> Awarded a Schreyer Honors College Travel Award (2025)			
2022 – 2025	Maria Lovallo	PSU	Microbiology
---> NASA Pennsylvania Space Grant Consortium Awardee (2022)			
---> Profiled by the Huck Institute of the Life Sciences in 2025: https://www.huck.psu.edu/news/graduating-senior-reflects-on-undergraduate-research-experiences-at-penn-state			
2023	Muhammad Rujhan Najib Bin Fauzi Najib	PSU	Computer Science
2023	Evan Lloyd	PSU	Biology
2021 – 2023	Meera Gupta	PSU	Accelerated Premedical-Medical Program
---> Awarded an Eberly College of Science Research Award (2022)			
2023	Steven Kadavil	PSU	Computer Science
2022 – 2023	Shivani Kumar	PSU	Biology
2021 – 2023	Aureo Zanon	PSU	Biology and Statistics, minor in Math
---> Awarded an Erickson Discovery Grant (2022)			
2022	Mansi Chandra	Juniata	Bioinformatics
2022	Shanisha McGuire	PSU	Biochemistry and Molecular Biology
2021	Kyrach Williams	PSU	Biology, Millennium Scholar
2021 – 2022	Jovial Joseph	PSU	Accelerated Premedical-Medical Program
---> Awarded an Eberly College of Science Research Award (2021)			
2021	Yiyan Zhang	PSU	Statistics – Biostats, Math – Systems Analysis
2021	Sean O'Rourke	PSU	Biology – Neuroscience

2018	Adon Chowdhury	Cornell	Biometry and Statistics
2017 – 2018	Trang Dau	Cornell	Human Biology, Health, & Society
2015 – 2017	Monica Guardado	PSU	Biology
---> <i>Awarded an American Society of Microbiology (ASM) Research Capstone Fellowship (2017)</i>			

Graduate Student Advising (Primary Advisor)

Years	Name	Institution	Program
2024 –	Hanh Tran	PSU	MCIBS
---> NIH T32 EGR Training Grant Appointee (2024 - 2026)			
---> <i>Awarded an NSF GRFP Honorable Mention (2025)</i>			
2022 –	Naomi Huntley	PSU	Biology
---> <i>Awarded the Microbiome Center Data Analysis Leadership Fund (2022)</i>			
---> OHMC-Qiagen Internship selectee (2025)			
2022 –	Polina Tikhonova	PSU	Bioinformatics and Genomics
---> NIH TL1 Translational Research Training Program Appointee (2024 - 2025)			
2020 – 2025	Erica Ryu	PSU	Biology
---> <i>Awarded the Dr. John Randall Shuman Troxell Memorial Scholarship in Biology (2022)</i>			
---> <i>Awarded the J. Ben and Helen D. Hill Memorial Fund Award (2022)</i>			
---> <i>Awarded an NSF GRFP Honorable Mention (2021)</i>			
---> NIH T32 CBIOS Training Grant Appointee (2021 - 2022)			
2022 – 2024	Nicholas Locatelli	PSU	Biology *co-advised with Iliana Baums
---> NIH T32 CBIOS Training Grant Appointee (2021 - 2022)			
---> <i>Awarded the Dr. John Randall Shuman Troxell Memorial Scholarship in Biology (2023)</i>			

Postdoc and Scientist Advising (Primary Advisor)

Years	Name	Type	Institution	Program
2023 –	Robert Nichols	Asst. Research Professor	Penn State	Biology
2020 – 2023	Robert Nichols	Postdoc	Penn State	Biology
---> <i>Awarded a USDA NIFA Postdoctoral Fellowship (2020)</i>				
2020 – 2022	Nur Shahir	Postdoc	Penn State	Biology
2016 – 2017	Xiaoling Gong	Scientist	Cornell	MBG

Rotation Advisor

Year	Program	Name(s)
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2023	Molecular, Cellular, & Integrative Biosciences Biology	Hanh Tran, Jiwoo Kim Stephanie Won
2022	Biology	Naomi Huntley, Nicholas Locatelli
2021	Bioinformatics and Genomics Biology Molecular, Cellular, & Integrative Biosciences Biochemistry, Microbiology, and Molec. Biology	Kobie Kirven, Polina Tikhonova Annamaria Calderon Cassandra Whitmoyer Anh Pham
2020	Bioinformatics and Genomics	Kyle McGovern
2019	Biology	Erica Ryu

Other

Year	Name	Position
2023	Bineyam Taye	Visiting Professor from Colgate University

Dissertation Committee Member

Defended	Deg.	Name	University	Department/Program
In progress	Ph.D.	Jessica Buchser	Penn State	Biology
In progress	Ph.D.	Jennifer Lausch	Penn State COM	Biomedical Sciences
In progress	Ph.D.	Anastasia Lucas	University of Pennsylvania	Genomics & Computational Biology
In progress	Ph.D.	Udeshi Wickramarachchi	Penn State	MCIBS
In progress	Ph.D.	Daisy Noe	Penn State	Biology
In progress	Ph.D.	Dina Memar Moshrefi	Penn State	Biology
In progress	Ph.D.	Yao Tu	Penn State	MCIBS
In progress	Ph.D.	Tayyaba Alvi	The Leibniz Institute on Aging – (FLI)	Leibnitz Graduate School on Aging
In progress	Ph.D.	Shreya Ramachandran	University of Chicago	Human Genetics
In progress	Ph.D.	Jennifer Harris	Penn State	Ecology
In progress	Ph.D.	Susan Tian	Penn State	BMMB
2025	M.S.	Shriya Gangakhedkar	Penn State COM	Biomedical Sciences
2024	Ph.D.	Sterling Wright	Penn State	Anthropology
2024	Ph.D.	Lan-Nhi Phung	Penn State	Biology
2024	Ph.D.	Scott Eckert	Penn State COM	Bioinfo. and Genomics
2023	M.S.	Julia Stewart	Penn State	Biology
2023	Ph.D.	Jeremy Sutherland	Penn State	Bioinfo. and Genomics
2022	M.S.	Miranda DePriest	Penn State	Plant Path. and Env. Micro.
2022	MPS	Veronica Cappas	Penn State	Forensic Science
2022	Ph.D.	Lixiang Zhang	Penn State	Statistics
N/A	Ph.D.	Katrin Peterson	Penn State	BMMB

N/A M.S. Nellie Heitzman Bucknell University Biology

Qualifying Exam Committee Member

Year	Program	Students
2025	Bioinformatics and Genomics	Nikol Chantzi, Tram Ha
2023	Bioinformatics and Genomics	Salaar Khan
2022	Bioinformatics and Genomics	Avantika Diwadkar
2021	Bioinformatics and Genomics	Corrine Smolen
	MCIBS	Sofia Kenney
2020	Bioinformatics and Genomics	Jeremy Sutherland, Shaopeng Liu

Undergraduate Thesis Reader

Year	Program	Students
2026	Science Distinction Certificate	Noah Liang

Academic Honors

2025	PSU One Health Microbiome Center Rising Star Research Award
2024	Applied Microbiology Internationals WH Pierce Prize for Global Impact in Microbiology (to PSU One Health Microbiome Center)
2007	Graduated with comprehensive honors: honors in Bacteriology and the liberal arts (University of Wisconsin – Madison)
2004	Dean's List (University of Wisconsin – Madison)
2003	William F. Vilas Scholarship (University of Wisconsin – Madison)

Professional Development

2025	PSU T32 Mentor-Mentee Summit – Mentor training
2024	PSU T32 Mentor-Mentee Summit – Mentor training
2024	COMPASS Scholars Program – NIH R25GM143346 funded program based at Washington University in St. Louis that offers national training and mentoring program for early career faculty
2021	Safer People Safer Places Transgender and Gender Inclusion 101 – Penn State University

- 2020 **Becoming an Active Witness who Hears, Sees, Feels, and Does** active bystander training – Penn State University
- 2019 **Mentoring Matters Workshop** – Eberly College of Science, Penn State University
- 2017 – 2018 **Cornell Center for Teaching Excellence GET SET teaching and learning workshops completed:**
- An Integrated Course Design Approach to Planning Your Class
 - Tips on Writing a Strong Teaching Philosophy Statement
 - Integrating Technology into Your Classroom
 - Developing Service-Learning in the Disciplines
 - Flipping the Classroom as a TA
 - Using Your Research Experience to Improve Your Teaching
 - Holding Effective Office Hours
 - Teaching and Mentoring Across Differences
 - Leading a Discussion in an Online Classroom
- 2017 **Assessing Learning and Teaching certificate** – Cornell University Center for Teaching Innovation. Workshops included:
- Designing Learning Outcomes for Your Course
 - Utilizing Classroom Assessment Techniques to Evaluate Student Learning
 - Developing Rubrics for Effective Grading
- 2017 **Creating an Engaging Classroom certificate** – Cornell University Center for Teaching Innovation
- Building a Collaborative Learning Environment
 - Using Theater Techniques to Enhance Your Teaching
 - Engaging Students in Quantitative Courses
- 2016 **The Practice of Inclusive Teaching in STEM certificate** – Cornell University Center for Teaching Excellence
- 2016 **Building Mentoring Skills for an Academic Career certificate program** – Cornell University Center for the Integration of Teaching and Learning (CU-CIRTL)
- 2015 - 2016 **Postdoc Leadership Certificate Program** – Cornell University
- 2014 **Certificate in University Teaching** – University of Chicago Center for Teaching and Learning
- 2013 **Software Carpentry Instructor training** – Software Carpentry

Professional Affiliations

- 2017 – Genetics Society of America (GSA)
- 2014 – Society for Molecular Biology and Evolution (SMBE)
- 2012 – American Society of Human Genetics (ASHG)

2017, 2022 – American Society for Microbiology (ASM)
 2019 – 2022 Society for Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS)
 2017 American Association of Physical Anthropologists (AAPA)
 2016 – 2019 National Postdoc Association (NPA)
 2011 – 2018 American Association for the Advancement of Science (AAAS)

Outreach

Speaker (2025) "Causes and consequences of human gut microbiome composition"; SSP International Genomics Summer Science Program; Lehigh University
Speaker (2023) "Unlocking the Hidden Universe Within: Exploring the Astonishing World of the Human Microbiome"; Foxdale Village Retirement Community
Speaker (2022) Investigating Careers and Networking (iCAN) Speaker Series-"Establishing your Academic Research Career"; Johns Hopkins University
Interview (2022) Penn State's Center for Human Evolution and Diversity Tracking traits podcast: *A Geneticists Approach to Human Microbiomes*:
<https://trackingtraits.buzzsprout.com/1762618/11778386-a-geneticist-s-approach-to-human-microbiomes?t=0>
Panelist (2021) Microbiome Center Consortium Seminar Series NMDC Ambassadors Forum
Advocate (2021) American Society of Human Genetics Hill Day advocate
Interview (2020) Eberly College of Science "Hey! I Got a Question About That" podcast on the microbiome: <https://www.youtube.com/watch?v=960zTLUD7VU&t=881s>
Advocate (2019) Rally for Medical Research Hill Day advocate, representing American Society of Human Genetics
Reviewer (2015 -) American Society of Human Genetics (ASHG) DNA Day Essay Judge
Member (2015 - 2018) Genetics Education and Outreach Network (GEON)

Leadership and Service

Departmental

2023 – **Member** – Biology Climate and Diversity Committee, Department of Biology, PSU
 2020 – **Member** - Biology Seminar Series Organizing Committee, Department of Biology, PSU
 2020 - 2023 **Member** - Biology Graduate Admissions Committee, Department of Biology, PSU
 2010 - 2013 **Representative** - Molecular Biosciences organizational committee: student Representative from the Department of Human Genetics on orientation week,

annual molecular biosciences retreat, and recruitment organizing committees,
Department of Human Genetics, University of Chicago

Institutional

2026	Member – AC-14 Review Committee, Eberly College of Science
2025	Member – Eukaryotic Gene Regulation (EGR) training grant selection committee
2024	Poster Session Judge – One Health Microbiome Center Symposium
2023 – 2025	Member – MCIBS Qualifying Exam Committee
2021 – 2022	Member – Institute for Computational and Data Sciences (ICDS) Coordinating Committee
2021 – 2022	Co-chair – “Changing Microbiomes” Conference Organizing Committee
2021	Member – Microbiome Center Director Search Advisory committee, Huck Institutes of the Life Sciences, PSU
2021	Invited Panelist - “First Years as Faculty in STEM” GRADUCon, University of Chicago
2020 – 2021	Grant reviewer - Penn State and University at Buffalo Clinical and Translational Science Pilot Award Program
2018	Member - Consensual Relationships Policy Committee – Postdoc representative, Cornell University. See http://theuniversityfaculty.cornell.edu/news/consensual-relationships-policy-committee/ for details.
2017 – 2018	Cofounder & Organizer - Postdoc Fellow Invited Lecture in Research and Career Development series. Department of Molecular Biology, Cornell University
2016 – 2018	Member - Cornell University Postdoctoral Advisory Council
2016 – 2017	Reviewer - Sigma Xi Grants-In-Aid of Research, Cornell University

National/International

2015 –	Reviewer -	Cell Host & Microbe	Genes
	Annals of Applied Statistics	Cell Multi-Journal Submission	Genome Biology
	American Journal of Primatology	Cell Reports	Genome Research
	Applied and Environmental Microbiology (AEM)	Communications Biology	Genomics, Proteomics, and Bioinformatics
	Biology Letters	Critical Reviews in Microbiology	Gut Microbes
	BMC Genomics	Diabetologia	Journal of Allergy and Clinical Immunology (JACI)
	Cell	eLife	Journal of Evolutionary Biology
		Environmental Microbiology	

JoVE	Nature Communications	PNAS
Microbial Ecology	Nature Microbiology	Science
Microbial Pathogenesis	npj Biofilms and Microbiomes	Scientific Reports
Microbiome		Thorax
Microorganisms	PLoS Genetics	Trends in Genetics
mSystems	PLoS ONE	Trends in Immunology

2025 –	Letter Writer for Promotion and Tenure cases – ETH Zurich (1)
2023	Member – NIH MRAF study section
2023	Member – National Microbiome Data Collaborative (NMDC) Ambassador Selection Committee
2022 – 2025	Member – Genetics Society of America DeLill Nasser Award Selection Committee
2022	Grant Reviewer – Swiss National Science Foundation
2021	Grant Reviewer – NIH GCAT study section, Early Career Reviewer Program
2021 – 2022	Ambassador – National Microbiome Data Collaborative (NMDC)
2020 – 2021	Co-chair - American Society of Human Genetics (ASHG) Career Development Committee (CDC)
2019 – 2021	Abstract Reviewer - SACNAS research presentation abstracts (Life Sciences)
2019 – 2021	Abstract Reviewer - SACNAS Travel Scholarships (Life Sciences)
2019 –	Board Member - Cards Against Humanity Science Ambassador Scholarship Program
2018 –	Member - Federation of American Societies for Experimental Biology (FASEB) Training & Career Opportunities Subcommittee
2015 –	Judge – ASHG DNA Day Essay Contest
2020 – 2022, 2024, 2025	Grant Reviewer - National Science Foundation (NSF)
2018, 2020	Grant Reviewer - Wellcome Trust Investigator Award in Science
2020	Moderator - The Allied Genetics Conference (TAGC) platform session: Disease Models and Aging (Mammal) *TAGC 2020 was held virtually due to COVID-19
2019	Incoming Chair - American Society of Human Genetics (ASHG) Training and Development Committee
2019	Moderator - American Society of Human Genetics (ASHG) Annual Meeting platform session: Gene Expression Variation Across Diverse Global Populations
2019	Abstract Reviewer - ASHG Annual Meeting abstracts (Bioinformatics and Computational Approaches)
2017 – 2019	Member - American Society of Human Genetics (ASHG) Training and Development (TDC) Committee
2017	Moderator - Academic Career Panel at the American Society of Human Genetics Annual Meeting (ASHG)
2011, 2012, 2014	Judge - Annual Chicago Public Schools Student Science fair

2011 - 2014 **Judge** - Annual Chicago Area Undergraduate Research Symposium (CAURS)