

ANDREW H. MOELLER

DEPARTMENT OF ECOLOGY AND EVOLUTIONARY BIOLOGY • CORNELL UNIVERSITY • E345
CORSON HALL • ITHACA, NY 14850
email: andrew.moeller@cornell.edu website: moellerlab.com

PROFESSIONAL EXPERIENCE

Aug. 2018 Assistant Professor, Department of Ecology and Evolutionary Biology,
Cornell University
2015-2018 Miller Research Fellow, Department of Integrative Biology,
University of California, Berkeley
2013–2015 Visiting Scholar, Department of Integrative Biology,
University of Texas, Austin

EDUCATION

PhD 2015 Yale University, New Haven, CT, USA
PhD in Ecology and Evolutionary Biology, December 2015
BSc 2010 University of South Carolina, Columbia, SC, USA
BSc in Biological Sciences, May 2010

FELLOWSHIPS, GRANTS, & AWARDS

2022 Cornell University's College of Agriculture and Life Sciences Research and
Extension Award for Early Achievement (\$1,000)
2020 USDA-NIFA Hatch Grant (\$90,000) (PI)
2020 NIH R35 MIRA for Early Stage Investigators (\$1,960,380) (PI)
2015 Miller Research Fellowship (\$230,908)
2015 John Spangler Nicholas prize for best dissertation in Yale EEB (\$500)
2014 NSF Doctoral Dissertation Improvement Grant (\$11,500)
2014 Travel award, "The Causes of Genome Evolution Conference",
Mishima, Japan (\$1,200)
2012 NSF Graduate Research Fellowship (\$126,000)
2010 NIH Genetics Training Grant, Trainee (\$60,000)
2007 Howard Hughes Undergraduate Research Fellowship (\$3,000)
2007 South Carolina Honors College Research Fellowship (\$3,000)
2006 South Carolina Undergraduate Research Fellowship (\$3,000)
2005 Cooper Scholars Award / School of Music Scholarship, University of South
Carolina, Columbia, SC (\$70,000)

PUBLICATIONS

Google Scholar Profile: tinyurl.com/nbked64

Reviews are marked with asterisks (*). Superscripts denote graduate student¹, postdoc², and undergraduate³ co-authors.

- Trevelline, Brian K.², Daniel D. Sprockett², William V. Deluca, Catherine R. Andreadis³, **Andrew H. Moeller**⁴, Christopher Tonra⁴. Convergent remodeling of the gut microbiome is associated with host energetic condition over long-distance migration. (2023): *Under review*. ⁴These authors contributed equally.
- Brunetti, Andrés E., Mariana Lyra, Juliane Monteiro, Juan Zurano, Deigo Baldo, Célio Haddad, and **Andrew H. Moeller**. 2023. Convergence of gut microbiota in myrmecophagous amphibians. *Under review*.
- Moeller, Andrew H.**, Jon G. Sanders², Daniel D. Sprockett², and Abigail Landers¹. 2023. Assessing co-diversification in host-associated microbiomes. *Under review*.
- Sprockett, Daniel D.², Jeffrey D. Price, Anthony F. Juritsch, Robert J. Schmaltz, Madalena V. F. Real¹, Samantha L. Goldman¹, Michael J. Sheehan, Amanda E. Ramer-Tait, and **Andrew H. Moeller**. 2023. Home-site advantage for host-species specific gut microbiota. *In revision*.
- Sanders, Jon G.², Daniel D. Sprockett², Yingying Li, Deus Mjungu, Elizabeth V. Lonsdorf, Jean-Bosco Ndjango, Alexander V. Georgiev, John H. Hart, Crickette Sanz, David Morgan, Martine Peeters, Beatrice H. Hahn, **Andrew H. Moeller**. 2023. Widespread extinctions of co-diversified gut bacterial symbionts from humans. *In revision*.
- Caleb C. Vogt, Matthew Zippel², Daniel D. Sprockett², Caitlin H. Miller, Summer Hardy, Matthew Arthur, Adam Greenstein, Melanie Colvin, **Andrew H. Moeller**, and Michael J. Sheehan. 2023. Spatial and social structure of rewilded laboratory mice. *In revision*.
- Sanders, Jon G.², Weiwei Yan, Deus Mjungu, Elizabeth V. Lonsdorf, John A. Hart, Crickette M. Sanz, David B. Morgan, Martine Peeters, Beatrice H. Hahn, **Andrew H. Moeller**. 2022. A low-cost genomics workflow enables isolate screen and strain-level analyses within microbiomes. *Genome Biology*. 23: 212.
- Moeller, Andrew H.** 2022. Metagenomic signatures of balancing selection in the human gut. *Molecular Ecology*. <https://doi.org/10.1111/mec.16474> **Highlighted by Faculty Opinions**
- Dillard, Brian A.¹, Albert K. Chung, Alex R. Gunderson, Shane Campbell-Staton, **Andrew H. Moeller**. 2022. Humanization of wildlife gut microbiota in urban environments. *eLife*. 11: e76381.
- Goldman, Samantha L.¹, Jon G. Sanders², Weiwei Yan, Anthony Denice, Margaret Cornwall, Kathleen N. Ivey, Emily N. Taylor, Alex Gunderson, Michael J. Sheehan, Deus Mjungu, Elizabeth V. Lonsdorf, Anne E. Pusey, Beatrice H. Hahn, **Andrew H. Moeller**. 2022. Culture-enriched molecular profiling improves resolution of the vertebrate gut microbiota. *Molecular Ecology Resources*. 22: 122–136.
- Hernandez, Christopher J., **Andrew H. Moeller**. 2022. The microbiome: a heritable contributor to bone morphology? *Seminars in Cell and Developmental Biology*. 123: 82–87. *
- Trevelline, Brian K.², **Andrew H. Moeller**. 2022. Robustness of mammalian gut microbiota to humanization in captivity. *Frontiers in Ecology and Evolution*. 9: 889.
- Sarkar, Amar, Siobhán Harty, **Andrew H. Moeller**, Sabra L. Klein, Susan E. Erdman, Karl J.

- Friston, Rachel N. Carmody. 2021. The gut microbiome as a biomarker of differential susceptibility to SARS-CoV-2. *Trends in Molecular Medicine*. 27: 1115–1134. *
- Moeller, Andrew H.** 2021. Genomic expansions in the human gut microbiome. *Genome Biology and Evolution*. 13: evab156.
- Houtz, Jennifer L.¹, Jon G. Sanders², Anthony Denice, **Andrew H. Moeller**. 2021. Predictable and host-species specific humanization of the gut microbiota in captive primates. *Molecular Ecology*. 30: 3677–3687.
- Moeller, Andrew H.**, Jon G. Sanders². 2020. Roles for the gut microbiome during the adaptive evolution of mammalian species. *Philosophical Transactions of the Royal Society B*. 375: 20190597. *
- Moeller, Andrew H.**, Kathleen Ivey, Margaret B. Cornwall, Kathryn Herr¹, Jordan Rede¹, Emily N. Taylor, Alex R. Gunderson. 2020. Lizard gut microbiome changes with temperature and predicts heat tolerance. *Applied and Environmental Microbiology*. 86: e01181-20. **Highlighted by AEM editors as one of five top-cited articles from 2020–2022.**
- Sarkar, Amar, Siobhán Harty⁴, Katerina V.-A. Johnson⁴, **Andrew H. Moeller**⁴, Rachel N. Carmody, Elizabeth A. Archie, Robin I. M. Dunbar, Philip W. J. Burnet. 2020. Microbial transmission in animal social networks and the social microbiome. *Nature Ecology and Evolution*. 4: 1020–1025. ⁴These authors contributed equally. *
- Sarkar, Amar, Siobhán Harty, Katerina V. A. Johnson, **Andrew H. Moeller**, Rachel N. Carmody, Soili M. Lehto, Susan E. Erdman, Robin I. M. Dunbar, Philip W. J. Burnet. 2020. The role of the microbiome in the neurobiology of social behavior. *Biological Reviews*. 95: 1131–1166. *
- Juan Sepulveda³, **Andrew H. Moeller**. 2020. The effects of temperature on animal gut microbiomes. *Frontiers in Microbiology* 11: 384. *
- Moeller, Andrew H.**, João C. Gomes-Neto, Sara Mantz, Hatem Kittana, Rafael R. Segura Munoz, Robert J. Schmaltz, Amanda E. Ramer-Tait, and Michael W. Nachman. 2019. Experimental evidence for adaptation to species-specific gut microbiota in house mice. *mSphere* 4: e00387-19.
- Moeller, Andrew H.**, Taichi A. Suzuki, Megan Phifer-Rixey, Michael W Nachman. 2018. Transmission modes of the mammalian gut microbiota. *Science* 362: 453–457.
- Sarkar, Amar, Siobhán Harty, Soili M. Lehto, **Andrew H. Moeller**, Timothy G. Dinan, Robin IM Dunbar, John F. Cryan, and Philip WJ Burnet. 2018. The microbiome in psychology and cognitive neuroscience. *Trends in Cognitive Sciences* 22: 611–636. *
- Barbian, Hannah J., Yingying Li, Miguel Ramirez, Zachary Klase, Iddi Lipende, Deus Mjungu, **Moeller, Andrew H.**, Micahel L. Wilson, Anne E. Pusey, Elizabeth V. Lonsdorf, Frederic D. Bushman, and Beatrice H. Hahn. 2018. Destabilization of the gut microbiome marks the end-stage of Simian Immunodeficiency virus infection in wild chimpanzees. *American Journal of Primatology* 80: e22515.
- Moeller, Andrew H.**, Taichi Suzuki, Dana Lin, Eileen A. Lacey, Samuel K. Wasser, Michael W.

- Nachman. 2017. Dispersal limitation promotes the diversification of the mammalian gut microbiota. *Proceedings of the National Academy of Sciences* 52: 13768–13773.
- Moeller, Andrew H.** 2017. The shrinking human gut microbiome. *Current Opinion in Microbiology* 38: 30–35. *
- Raymann, Kasie T., **Andrew H. Moeller**, Andrew L. Goodman, Howard Ochman. 2017. Unexpected archaeal diversity in the great ape gut microbiome. *mSphere* 2: e00026-17.
- Moeller, Andrew H.**, Alejandro Caro-Quintero, Deus Mjungu, Alexander V. Georgiev, Elizabeth V. Lonsdorf, Martin N. Muller, Anne E. Pusey, Martine Peeters, Beatrice H. Hahn, and Howard Ochman. 2016. Cospeciation of gut microbiota with hominids. *Science* 353: 380–382.
- Moeller, Andrew H.**, Steffen Foerster, Michael L. Wilson, Anne E. Pusey, Beatrice H. Hahn, and Howard Ochman. 2016. Social behavior shapes the chimpanzee pan-microbiome. *Science Advances* 2: e1500997.
- Moeller, Andrew H.**, Martine Peeters, Ahibjo Ayouba, Eitel Mpoudi Ngole, Amadine Esteban, Beatrice H. Hahn, and Howard Ochman. 2015. Stability of the gorilla microbiome despite SIV infection. *Molecular Ecology* 24: 690–697.
- Waldor, Matthew K., Gene Tyson, Elhanan Borenstein, Howard Ochman, **Andrew H. Moeller**, B. Brett Finlay, Heidi H. Kong, et al., 2015. Where next for microbiome research? *PLOS Biology* 13: e1002050. *
- Moeller, Andrew H.**, Yingying Li, Eitel Mpoudi Ngole, Steve Ahuka-Mundeke, Elizabeth V. Lonsdorf, Anne E. Pusey, Martine Peeters, Beatrice H. Hahn, and Howard Ochman. 2014. Rapid changes in the gut microbiome during human evolution. *Proceedings of the National Academy of Sciences* 111: 16431–16435. **Highlighted by Faculty Opinions**
- Moeller, Andrew H.**, Martine Peeters, Jean-Basco Ndjango, Yingying Li, Beatrice H. Hahn, and Howard Ochman. 2013. Sympatric chimpanzees and gorillas harbor convergent gut microbial communities. *Genome Research* 23: 1715–1720.
- Moeller, Andrew H.**⁴, Meghan Shilts⁴, Yingying Li, Rebecca S. Rudicell, Elizabeth V. Lonsdorf, Anne E. Pusey, Michael L. Wilson, Beatrice H. Hahn, and Howard Ochman. 2013. SIV-induced instability of the chimpanzee gut microbiome. *Cell Host & Microbe* 14: 340–345. ⁴These authors contributed equally.
- Moeller, Andrew H.** and Howard Ochman. 2013. Factors that drive variation among gut microbial communities. *Gut Microbes* 4: 403–408. *
- López-Giráldez, Francesc, **Andrew H. Moeller**, and Jeffrey P. Townsend. 2013. Evaluating phylogenetic informativeness as a predictor of phylogenetic signal for metazoan, fungal, and mammalian phylogenomic data sets. *BioMed Research International* 2013.
- Moeller, Andrew H.** and Jeffrey P. Townsend. 2013. Response to: The relative utility of sequence divergence and phylogenetic informativeness profiling in phylogenetic study design. *Molecular Phylogenetics and Evolution* 66: 436–436. *
- Moeller, Andrew H.**, Patrick H. Degnan, Anne E. Pusey, Michael L. Wilson, Beatrice H. Hahn, and Howard Ochman. 2012. Chimpanzees and humans harbour compositionally similar gut enterotypes. *Nature Communications* 3: 1179.

Moeller, Andrew H. and Jeffrey P. Townsend. 2011. Phylogenetic informativeness profiling of 12 genes for 28 vertebrate taxa without divergence dates. *Molecular Phylogenetics and Evolution* 60: 271–272.

INVITED COMMENTARIES

Moeller, Andrew H. 2022. Loyal gut microbes. *Science* 377: 1263–1264. *

Sprockett, Daniel D.², **Andrew H. Moeller.** 2021. Microbiomes: Infant chimps crawling with bacteria. *Current Biology*. 31:R124–R126.

Moeller, Andrew H. and Howard Ochman. 2014. Microbiomes are true to type. *Proceedings of the National Academy of Sciences* 111: 9372–9373. *

MENTEES

2023–present Mohamed Aldhuhoori, Microbiology thesis committee, Cornell University
2022, summer Joshua Tucker, NSF REU, Clemson University/Cornell University
2021–present Abigail Landers, Microbiology Ph.D. student, GRFP Fellow, Cornell University
2021–present Matthew Zipple, Clarman Postdoctoral Fellow (co-advised), Cornell University
2020–present Brian Trevelline, Rose Postdoctoral Fellow, Cornell University
2020–present Daniel Sprockett, Postdoctoral Associate, Cornell University
2020–present Brian Dillard, EEB Ph.D. student, Cornell University
2020–present Madalena Real, EEB Ph.D. student, Cornell University
2020–present Catherine Kagemann, MGB thesis committee, Cornell University
2020–present Jordan Reede, Microbiology thesis committee, Cornell University
2020–present Kathryn Herr, Microbiology thesis committee, Cornell University
2020–2023 Jennifer Houtz, EEB thesis committee, Cornell University
2019–present Samantha Goldman, EEB Ph.D. student, Cornell University
2019–2021 Shanya Mitchell, CIHMID undergraduate researcher, Cornell University
2019–2022 Kyra Kwok, undergraduate researcher, Cornell University
2019–2021 Ahmed Eltahir, undergraduate researcher, Cornell University
2019–2021 Annie Li, undergraduate researcher, Cornell University
2018–2020 Diego Burga, CIHMID undergraduate researcher, Cornell University
2018–2021 Jessica Ferber, undergraduate researcher, Cornell University
2018–2021 Juan Sepulveda, undergraduate researcher, Cornell University
2018–2022 Jon Sanders, CIHMID Postdoctoral Fellow, Cornell University
2017 Trey Tang, undergraduate researcher, University of California, Berkeley
2014 Grace Shim, undergraduate researcher, University of Texas at Austin

TEACHING

2023, Spring BIOEE 4940, Evolutionary Genomics, Lead Professor, Cornell University, Lead Professor
2022, Fall BIOEE 1180, Evolution for Non-majors, Lead Professor, Cornell University
2022, Spring BIOEE 1780, An Introduction to Evolutionary Biology and Diversity, Lead Professor, Cornell University

2021, Fall BIOEE 1780, An Introduction to Evolutionary Biology and Diversity, Instructor: Speciation, Adaptation and Population Genetics Modules, Cornell University

2021, Spring BIOEE 1780, An Introduction to Evolutionary Biology and Diversity, Instructor: Population Genetics Module, Cornell University

2020, Fall BIOEE 1780, An Introduction to Evolutionary Biology and Diversity, Instructor: Phylogenetics Module, Cornell University

2020, Fall BIOEE 4940, Evolutionary Genomics, Lead Professor, Cornell University, Lead Professor

2020, Spring BIOEE 1780, An Introduction to Evolutionary Biology and Diversity, Lead Professor, Cornell University

2019, Fall BIOEE 1780, An Introduction to Evolutionary Biology and Diversity, Instructor: Speciation and Adaptation Module, Cornell University

2019, Fall BIOEE 4500, Mammalogy, Nov. 25 Lecture, Cornell University

2019, Spring BIOEE 1780, An Introduction to Evolutionary Biology and Diversity, Human Evolution Module, Cornell University

2018, Fall BIOEE 2070, Evolution for Non-Majors, Oct. 30 Lecture, Cornell University

2012, Fall Teaching Fellow, EEB 225: Evolutionary Biology, Yale University
 Profs. Nancy Moran and Paul Turner

2012, Spring Teaching Fellow, EEB 190: Introductory Statistics, Yale University
 Prof. Gunter Wagner

2011, Fall Teaching Fellow, EEB 122: Principles of EEB, Yale University
 Prof. Stephen Stearns

PROFESSIONAL SERVICE

Service at Cornell:

2023 EEB Admissions Committee

2023 Microbiology Admissions Committee

2022-present EEB Executive Advisory Committee

2021-2022 EEB Director of Graduate Studies Advisory Committee

2020-present First Year Advisor, Office of Undergraduate Biology

2020-present Seminar Planning Committee, Department of Ecology and Evolutionary Biology, Cornell University

2021 Reviewer, Cole Award, Department of Ecology and Evolutionary Biology, Cornell University

2021 Ad Hoc Reviewer, NSF Symbiosis, Infection, and Immunity Program

2020-2021 Social Organization Committee, Department of Ecology and Evolutionary Biology, Cornell University

2020-2021 Diversity, Equity, Inclusion, Justice and Belonging (DEIJB) Seminar Committee, Department of Ecology and Evolutionary Biology, Cornell University

2019-present Lab Guidelines Committee, Department of Ecology and Evolutionary Biology, Cornell University

2019-2020 EEB Diversity Preview Weekend, Faculty Participant

2019 Review Committee, Kieckhefer/Mellon Student Research Grants

2018-present Faculty Curator of Mammals, Cornell University Museum of Vertebrates, Cornell University

2018 Graduate Admissions Committee, Department of Ecology and Evolutionary Biology, Cornell University

Reviewer: *Nature*, *Science*, *PNAS*, *Current Biology*, *Nature Ecology & Evolution*, *PLOS Biology*, *Ecology Letters*, *Molecular Ecology*, *Genome Biology*, *Molecular Biology and Evolution*, *Genome Biology and Evolution*, *ISME J*, *Proceedings B*, *Biology Letters*, *Journal of Animal Ecology*, *Functional Ecology*, *Environmental Microbiology*, *Applied and Environmental Microbiology*, *mSystems*, *Microbiome* and others

Memberships: *Society for the Study of Evolution*, *Society for Molecular Biology and Evolution*, *International Society for Microbial Ecology*

Society Service: 2020, 2023 Reviewer for the Rosemary Grant SSE Advanced Awards.

Grant Agency Service: 2020 Panelist, National Science Foundation, Integrative Organismal Systems Core Program.

INVITED SEMINARS AND CONFERENCES

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| Upcoming | Department of Human Evolutionary Biology, Harvard University.
Invited Seminar |
| Upcoming | Department of Biology, Syracuse University.
Invited Seminar |
| Upcoming | Research Centre for Evolutionary Hologenomics, University of Copenhagen.
Invited Seminar |
| 2023 | Department of Ecology and Evolutionary Biology, Princeton University.
Invited Seminar |
| 2022 | Department of Molecular and Cell Biology, University of Connecticut.
Invited Seminar |
| 2022 | <i>Keystone Symposia on The Human Microbiome & Antimicrobial Resistance</i> , Banff, Alberta, Canada.
Invited Seminar |
| 2022 | <i>American Society for Microbiology Microbe</i> , Washington, DC, USA.
Invited Seminar |
| 2021 | Department of Biology, University of Florida.
Invited Seminar |
| 2019 | Department of Biology, University of Pittsburgh.
Invited Seminar |
| 2019 | Department of Biology, University of Rochester.
Invited Seminar |
| 2019 | Ecology, Evolutionary Biology, and Behavior Program, Michigan State University. |

Invited Seminar

- 2018 School of Public Health, University of Michigan.
Invited Seminar
- 2018 Department of Biology, University of San Francisco.
Invited Seminar
- 2017 Metaorganisms Institute, Kiel University.
Invited Seminar
- 2017 Department of Ecology and Evolutionary Biology, Cornell University.
Invited Seminar
- 2017 Department of Biology, University of Maryland, College Park.
Invited Seminar
- 2017 Laboratory of Genetics, University of Wisconsin, Madison.
Invited Seminar
- 2017 BioSciences, Rice University.
Invited Seminar
- 2016 *Exploring the Microbiome and Disease on the International Space Station*. Cleveland, Ohio, USA.
Invited participant
- 2016 *Bay Area Population Genetics XIV*. San Francisco, California.
Selected oral presentation
- 2016 *Evolution*. Austin, Texas, USA.
Selected oral presentation
- 2016 *Darwin Day*. Charleston, Illinois, USA.
Invited Seminar
- 2015 *SMBE*. Vienna, Austria.
Selected oral presentation
- 2014 *SMBE Satellite Meeting*. Mishima, Shizuoka, Japan.
Poster presentation
- 2013 *SMBE*. Chicago, Illinois, USA.
Poster presentation
- 2012 *ISME*. Copenhagen, Denmark.
Selected oral presentation

SCIENCE OUTREACH (SELECTED)

Cornell University (2022)

Consultation to Mann Library for the Guild of Natural Science Illustrators/Finger Lakes Region 'Symbiosis' Exhibit

Cornell University (2020)

Consultation to National Public Radio's *Invisibilia* podcast

University of California, Berkeley (2016, 2017)
Public presentations at Cal Day in the Museum of Vertebrate Zoology

University of Texas, Austin (2015)
Public presentation at The Campaign for Texas

Yale University (2012-2013)
Volunteer at New Haven Science Fair

University of South Carolina (2009-2010)
Volunteer in ScienceLab

PRESS (SELECTED)

- 2022 “Urban gut spillover” *Science*
- 2022 “Modern city dwellers have lost about half of their gut microbes” *Science*
- 2021 “The gut microbiome's role in host evolution” *The Scientist*
- 2019 “Planet You: The mysterious world of the microbiome” Canadian Broadcasting Corporation
- 2018 “Mouse microbes are mostly inherited” *The Scientist*
- 2017 “The ‘dark matter’ of the microbial world” *The Atlantic*
- 2016 “Research provides new insight into the evolution of human microbes.” *All Things Considered*, National Public Radio
Listen: tinyurl.com/zrclptf
- 2016 “Some bacteria have lived in the human gut since before we were human” *Point of Discovery*, Podcast
Listen: tinyurl.com/oqgub88
- 2016 “Some microbes have been with us since before we existed.” *The Atlantic*
- 2016 “Our gut bugs evolved with us as we split from chimps.” *New Scientist*
- 2016 “How your social life changes your microbiome.” *The Atlantic*
- 2016 “Sociable chimps get richer gut microbiomes.” *Scientific American*
Listen: tinyurl.com/qxnsfvw
- 2014 “Spilling our guts: decreased diversity in the human microbiome.” *Science Friday*, National Public Radio
Listen: tinyurl.com/qzz9zdl
- 2013 “Gut bacteria disruption in AIDS” *Yale Scientific*
- 2012 “Chimps' gut bugs look similar to human ones” *USA TODAY*
- 2012 “What do chimps and humans have in common? Gut bacteria” *NBC News*
- 2012 “Chimpanzee enterotypes” *Deutschlandfunk*, German Public Radio