

Curriculum Vitae (August 2023)**Zachary David Blount**

Research Assistant Professor
 Department of Microbiology and Molecular Genetics
 Michigan State University
 East Lansing, MI 48824

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Appointments

- 01/2024 – Present** **Director of Graduate Education Innovation**
 Department of Microbiology and Molecular Genetics
 Michigan State University, East Lansing, MI
- 10/2023 – Present** **Senior Honorary Research Fellow**
 Department of European and International Social and Political Studies
 University College London, London, UK
- 01/2020 – Present** **Research Assistant Professor**
 Department of Microbiology and Molecular Genetics
 Michigan State University, East Lansing, MI
- 05/2018 – 12/2019** **Senior Research Associate**
 Department of Microbiology and Molecular Genetics
 Michigan State University, East Lansing, MI
- On leave 07/2018 – 06/2019
- 07/2018 – 06/2019** **Visiting Assistant Professor of Biology**
 Department of Biology
 Kenyon College, Gambier, OH
- 05/2011 – 04/2018** **Research Associate**
 Department of Microbiology and Molecular Genetics
 Michigan State University, East Lansing, MI

Education

- 2003 – 2011** **Ph.D. in Microbiology and Molecular Genetics**
 Department of Microbiology and Molecular Genetics, Michigan State University,
 East Lansing, MI
Mentor: Dr. Richard E. Lenski
Dissertation: The Evolution of a Key Innovation in an Experimental Population of *Escherichia coli*: A Tale of Opportunity, Contingency, and Co-option. Defended March 16, 2011.
Defense Video: <https://youtu.be/rnXZ9IIXQ8I>
- 2000 – 2003** **M.S. in Biological Sciences**
 Department of Biological Sciences, University of Cincinnati, Cincinnati, OH
Mentor: Dr. Dennis W. Grogan
Thesis: Isolation and Characterization of Insertion Sequence Elements from Natural Isolates of the Hyperthermophilic Archaeon *Sulfolobus*

1995 – 1999

B.S. in Applied Biology, with High Honor

School of Biology, Georgia Institute of Technology, Atlanta, GA
Minors: Health Science, History, Personality/Social Psychology,
 Industrial/Organizational Psychology

Research Interests

Microbial Evolution, Microbial Speciation, Experimental Evolution, Historical Contingency, Evolutionary Historicity, Evolutionary Novelty, Evolutionary Potential, Niche Discovery

Peer-Reviewed Publications (16, 3011 total citations as of August 31, 2023)

16. Turner CB, Blount ZD, Mitchell DH, Lenski RE. Evolution of a cross-feeding interaction following a key innovation in a long-term evolution experiment with *Escherichia coli*. *Microbiology*. 169: 001390. <https://doi.org/10.1099/mic.0.001390>
15. Barrick JE, **Blount ZD**, Lake DM, Dwenger JH, Chavarria-Palma JE, Izutsu M, Wisner MJ (2023). Daily Transfers, Archiving Populations, and Measuring Fitness in the Long-Term Evolution Experiment with *Escherichia coli*. *Journal of Visualized Experiments (JoVE)*, e65342. <https://dx.doi.org/10.3791/65342>
14. Jagdish T, Morris JJ, Wade BD, **Blount ZD**. Probing the Deep Genetic Basis of a Novel Trait in *Escherichia coli*. Pp. 107 – 122 in Banshaf W, Cheng B, Deb K, Holekamp K, Lenski R, Ofria C, Pennock R, Punch B, Whittaker D (eds). *Evolution in Action: Past, Present, and Future*. New York, NY: Springer Nature. 2020.
 - Citations: 3 as of August 31, 2023.
13. **Blount ZD**, Maddamsetti R, Grant NA, Ahmed ST, Jagdish T, Sommerfeld BA, Tillman A, Baxter JA, Moore J, Slonczewski JL, Barrick JE, Lenski RE. (2020) Genotypic and Phenotypic Evolution of *Escherichia coli* in a Novel Citrate-Only Resource Environment. *eLife* 2020;9:e55414. <https://doi.org/10.7554/eLife.55414>
 - Citations: 20 as of August 31, 2023.
12. **Blount ZD**, Lenski RE, Losos JB. (2018) Contingency and Determinism in Evolution: ‘Replaying the Tape of Life’. *Science*, **362**: eaam5979. <https://doi.org/10.1126/science.aam5979>
 - Citations: 424 as of August 31, 2023.
11. Bajić D, Vila JCC, **Blount ZD**, Sánchez A. (2018) On the deformability of an empirical fitness landscape by microbial evolution. *Proceedings of the National Academy of Sciences of the United States of America*, **115**: 11286 – 11291.
 - Citations: 53 as of August 31, 2023.
10. **Blount ZD** (2017). Replaying Evolution. *American Scientist*, **105**: 157 – 165.
 - Cover article: http://www.americanscientist.org/issues/popup_onthecover.aspx?id=126
 - Citations: 9 as of August 31, 2023.
9. **Blount ZD** (2016). History’s Windings in a Flask: Microbial Experiments into Evolutionary Contingency. Pp. 244 – 263 in Ramsey G and Pence C (ed.) *Chance and Evolution*, Chicago, IL: University of Chicago Press. <https://doi.org/10.7208/chicago/9780226401911.003.0011>
 - Citations: 9 as of August 31, 2023.
8. **Blount ZD** (2016). A Case Study in Evolutionary Contingency. *Studies in History and Philosophy of Biological and Biomedical Sciences*, **58**: 82 – 92. <https://doi.org/10.1016/j.shpsc.2015.12.007>
 - Citations: 27 as of August 31, 2023.
7. Lenski RE, Wisner MJ, Ribbeck N, **Blount ZD**, Nahum JR, Morris JJ, Zaman L, Turner CB, Wade BD, Maddamsetti R, Burmeister AR, Baird EJ, Bundy J, Grant N, Card KJ, Rowles M, Weatherspoon K, Papoulis SE, Sullivan R, Clark C, Mulka JS, Hajela N (2015). Sustained Fitness Gains and Variability in

- Fitness Trajectories in the Long-Term Evolution Experiment with *Escherichia coli*. *Proceedings of the Royal Society B*, **282**: 20152292. <https://doi.org/10.1098/rspb.2015.2292>
- Citations: 152 as of August 31, 2023.
6. Turner CB, **Blount ZD**, Lenski RE (2015). Replaying Evolution to Test the Cause of Extinction of One Ecotype in an Experimentally Evolved Population. *PLOS One*, **10**: e0142050.
 - Citations: 32 as of August 31, 2023. <https://doi.org/10.1371/journal.pone.0142050>
 5. Quandt EM, Gollihar J, **Blount ZD**, Ellington AD, Georgiou G, Barrick JE (2015). Fine-Tuning Citrate Synthase Flux Potentiates and Refines Evolution of a Metabolic Innovation in *Escherichia coli*. *eLife* 2015;10.7554/eLife.09696. <https://doi.org/10.7554/eLife.09696>
 - Citations: 85 as of August 31, 2023.
 4. **Blount ZD** (2015). The Unexhausted Potential of *E. coli*. *eLife*, 2015;4:e05826.
 - Citations: 499 as of August 31, 2023. <https://doi.org/10.7554/eLife.05826>
 3. **Blount ZD**, Barrick JE, Davidson CJ, Lenski RE (2012). Genomic Analysis of a Key Innovation in an Experimental *E. coli* Population. *Nature*, **489**: 513 – 518. <https://doi.org/10.1038/nature11514>
 - Citations: 627 as of August 31, 2023.
 - Faculty of 1000 recommendation
 - Listed by *Science News* as one of the top 25 science stories of 2012
 2. **Blount ZD**, Borland CZ, Lenski RE (2008). Historical Contingency in the Evolution of a Key Innovation in an Experimental Population of *Escherichia coli*. *Proceedings of the National Academy of Sciences (USA)*, **105**: 7899 - 7906. <https://doi.org/10.1073/pnas.0803151105>
 - Citations: 1022 as of August 31, 2023.
 - Faculty of 1000 recommendation
 1. **Blount ZD**, Grogan DW (2005). New Insertion Sequences of *Sulfolobus*: Functional Properties and Implications for Genome Evolution in Hyperthermophilic Archaea. *Molecular Microbiology*, **55**: 312 – 325. doi: 10.1111/j.1365-2958.2004.04391.x.
 - Citations: 49 as of August 31, 2023.

Other Publications (7)

1. **Blount ZD**, Barrick JE (2023). The LTEE: Copying Archived LTEE Samples. Protocols.io.
2. Chavarria-Palmer JE, **Blount ZD**, Barrick JE (2022). The LTEE: LTEE Media Recipes. Protocols.io. <https://dx.doi.org/10.17504/protocols.io.81wgbyr31vpk/v1>
3. **Blount ZD** (2022). Exploring the Evolution of Complex Features. In Pennock, R. and Meade, L. (Eds). Avida-ED Lab Book. East Lansing, MI: BEACON Center for the Study of Evolution in Action.
4. Izutsu M, **Blount ZD**, Lenski RE (2022). Exploring the Effects of Population Size on Evolution. In Pennock R and Mead L (Eds), Avida-ED Lab Book. East Lansing, MI: BEACON Center for the Study of Evolution in Action.
5. Bundy JN, **Blount ZD**, Lenski RE (2022). Exploring the Effects of History on Evolution. In Pennock, R and Mead L (Eds). Avida-ED Lab Book. East Lansing, MI: BEACON Center for the Study of Evolution in Action.
6. **Blount ZD** (2016). Bacterial Evolution. Pp.97 – 101 in Marsh TL and Viswanathan P *Introductory Laboratory for General and Allied Health Microbiology, MMG 302*. East Lansing, MI: Michigan State University Department of Microbiology and Molecular Genetics, Internal publication.
7. **Blount ZD**, Grogan DW (2002). *Laboratory Exercises for Microbiology: Biology 552*. Cincinnati, OH: University of Cincinnati Department of Biological Sciences, Internal Publication.

Research Funding

3. **Blount ZD**, Lenski RE. “Eco-Evolutionary Consequences of Alternate Versions of a Novel Trait in *E. coli*.” BEACON Center for the Study of Evolution in Action: 2020 – 2021, \$38,200.
2. Barrick JE, Marx CJ, **Blount ZD**. “Mechanistic Basis of Mutations Potentiating the Evolution of Citrate Utilization in the LTEE”. BEACON Center for the Study of Evolution in Action: 2013 – 2015, \$134,571
1. Lenski RE, **Blount ZD**. “Mystery of Mysteries: A Study of Incipient Speciation in the Lab”. John Templeton Foundation, Foundational Questions in Evolutionary Biology: 2012 – 2014, \$198,000

Invited Talks (27)

- 2023** “How History, Inertia, and Innovation Interact in Evolution: Perspectives from a Long-Term Experiment with *E. coli*.” 10th Annual Toulouse Economics and Biology Workshop: Inertia in Biological and Cultural Systems. University of Toulouse Department of Economics, Toulouse, France.
- “An Interesting Tape of Life and It’s Alternatives: Lessons on Historical Contingency from a Long-Term Experiment, and the Promise of Making Counterfactuals Real.” ASU History of Biology Seminar: Replaying Life’s Tape: Historical Contingency in the Life Sciences. Marine Biological Laboratory, Woods Hole, MA.
- “Explorations of Historical Contingency, Novel Traits, Speciation, and More with a Microbial Time Machine”. Towson University, Department of Biological Sciences, Towson, MD.
- “Explorations of Historical Contingency, Novel Traits, Speciation, and More with a Microbial Time Machine”. Kent State University, Department of Biological Sciences, Kent, OH.
- 2022** “Lessons on Adaptation from Experimental Microbial Evolution: Life Continues to Find Improvements, but Probably not an Optimum”. Army Research Office-Sponsored Workshop to Assess Observed Optimization Efficiency in Multiple Domains of the Sciences, Princeton, NJ.
- “Exploring the Evolution of Complex Features with Avida-ED”. Active LENS Congress, East Lansing, MI.
- “Explorations of Historical Contingency, Novel Traits, Speciation, and More with a Microbial Time Machine”. Illinois State University, Department of Biological Sciences, Normal, IL.
- “Explorations of Historical Contingency, Novel Traits, Speciation, and More with a Microbial Time Machine”. Texas A & M University, Department of Biology, College Station, TX.
- “Explorations of Historical Contingency, Novel Traits, Speciation, and More with a Microbial Time Machine”. Towson University, Department of Biological Sciences, Towson, MD.
- 2021** “Explorations of Historical Contingency, Novel Traits, Speciation, and More with a Microbial Time Machine”. Microbiology Seminar Series, Wageningen University, Wageningen, Netherlands.
- “History’s Role in Evolution: Lessons from Experimental Evolution Studies with a Microbial Time Machine”. Leidse Biologen Club “The Test of Time Symposium”, Leiden, Netherlands.
- “Eco-evolutionary Consequences of a Novel Trait in *E. coli*”. Ecology and Evolutionary Biology Symposium, Ekoloji ve Evrimsel Biyoloji Derneği, Turkey.
- “Explorations of Historical Contingency, Novel Traits, Speciation and More with a Great Microbial Model System.” University of New Hampshire, Department of Biological Sciences, Durham, NH.
- “Explorations of Historical Contingency, Novel Traits, Speciation and More with a Great Microbial Model System.” Arkansas State University Department of Biology, Jonesboro, AR.

- “Explorations of Historical Contingency, Novel Traits, Speciation and More with a Great Microbial Model System.” Kennesaw State University, Department of Molecular and Cellular Biology, Kennesaw, GA.
- 2020** “Explorations of Historical Contingency, Novel Traits, Speciation and More with a Great Microbial Model System.” Brock University, Department of Biological Sciences, St. Catharines, ON, Canada.
- 2019** “Tales of a Novel Trait in a Long-Term Population of *E. coli*.” Michigan State University, Department of Microbiology and Molecular Genetics, East Lansing, MI.
- “The Consequences and Opportunities of the Evolution of a Novel Trait in a Long-Term Population of *E. coli*”. Appalachian State University, Department of Biology, Boone, NC.
- 2017** “A Big Ball of Evolvey-Wolvey Stuff: The Interplay of Ecology, Physiology, Evolution, Innovation, and Incipient Speciation in an Experimental Population of *E. coli*”. Kenyon College, Department of Biological Sciences Seminar Series, Gambier, OH.
- 2016** “The *E. coli* Long-Term Evolution Experiment 66,000 Generations (And Counting) of Evolution in Action”. University of Wisconsin, Oshkosh Biology and Microbiology Journal Club Seminar Series, Oshkosh, WI.
- “Richard E. Lenski: The Man, the Career, the Legend, and His Place in Science”. Keynote Address, BEACON Congress Symposium in Honor of Richard Lenski’s 60th Birthday, East Lansing, MI.
- Video: <https://youtu.be/VX9n8sIMXXs>
- “Ecological Specialization and Incipient Speciation in an Experimental Population of *Escherichia coli* (The Cit⁺ Story is Even More Complicated than We Thought)”. EvoAct: Evolution in Action with Living and Artificial Organisms, Autrans, France.
- 2014** “Examining the Evolution of a Novel Trait in a Long-Term Experiment with *E. coli*.” Invited Speaker, National Association of Biology Teachers Professional Development Conference, Cleveland, OH.
- Video: <https://youtu.be/qpnwLdh6ftg>
- 2013** “The Evolution of Aerobic Citrate Utilization in an Experimental Population of *E. coli*: A Case Study in Evolutionary Contingency”. Templeton Foundation Workshop on Order and Contingency in Science and the Humanities. Oxford, UK.
- 2012** “Historical Contingency and the *E. coli* Long-Term Evolution Experiment”. ALife 13, East Lansing, MI.
- 2011** “Watching Evolution Innovate in the Lab”. Santa Fe Institute Workshop on Innovation, San Jose, CA.
- 2009** “History 200: Darwin, *E. coli*, and Evolution”. Science University for Alumni of the MSU College of Natural Sciences, East Lansing, MI.

Contributed Presentations

Posters (26)

- 2023** Halliday M, Spender C, Lake DM, **Blount ZD**. Ecological Divergence and Incipient speciation During Adaptation to a Complex Niche in *E. coli*. 2023 Mid-Michigan Symposium for Undergraduate Research Experiences (Mid-SURE), East Lansing, MI.
- Blount ZD** and Lenski RE. Repetitions or Rhymes? Counterfactual Evolution Experiments to Examine the Eco-Evolutionary Equivalence of Convergent Features. 2023 Gordon Conference in Microbial Population Biology, Andover, NH.

- 2022** Clark M., **Blount ZD**, Lenski RE. Can You Go Home Again? Assessing how the Potential of *E. coli* to Re-Adapt to Glucose Changes During Ecological Specialization on Citrate in a Long-Term Evolution Experiment. Michigan State University Undergraduate Research Forum, East Lansing, MI.
- 2019** **Blount ZD**, Maddamsetti R, Grant N, Jagdish T, Quandt EM, Sommerfeld BA, Baxter JA, Ahmed S, Tillman A, Barich D, Moore J, Slonczewski JL, Barrick JE, Lenski RE. Genome Instability and Cell Death During Adaptation of *E. coli* to a Citrate-only Resource Environment. Gordon Research Conference in Microbial Population Biology, Andover, NH.
- 2017** **Blount ZD**, Weatherspoon KM, Rowles MO, Sommerfeld BA, Turner CB, Lenski RE. Learning to Walk and Chew Gum at the Same Time: The Complexities of Incipient Speciation by a Citrate-Using Lineage of *E. coli*. 2017 BEACON Congress, East Lansing, MI.
- Blount ZD**, Weatherspoon KM, Rowles MO, Sommerfeld BA, Turner CB, Lenski RE. Learning to Walk and Chew Gum at the Same Time: The Complexities of Incipient Speciation by a Citrate-Using Lineage of *E. coli*. Gordon Research Seminar and Conference in Microbial Population Biology, Andover, NH.
- Blount ZD**, Weatherspoon KM, Rowles MO, Sommerfeld BA, Wright JT, Turner CB, Lenski RE. Adaptation to Discovered and Self-Constructed Niches during Incipient Speciation in an Experimental Population of *E. coli*. Evolution 2017, Portland, OR.
- 2016** **Blount ZD**, Weatherspoon KM, Rowles MO, Sommerfeld BA, Wright JT, Turner CB, Lenski RE. Adaptation to Discovered and Self-Constructed Niches during Incipient Speciation in an Experimental Population of *E. coli*. Second ASM Conference on Experimental Microbial Evolution, Washington, DC.
- 2015** **Blount ZD**, Weatherspoon KM, Rowles MO, Wright JT, Lenski RE. Two Tales of a Key Innovation. Gordon Research Seminar and Conference in Microbial Population Biology, Andover, NH.
- Blount ZD**, Weatherspoon KM, Rowles MO, Wright JT, Lenski RE. Two Tales of a Key Innovation. 2015 BEACON Congress, East Lansing, MI.
- Blount ZD**, Weatherspoon, KM, Rowles MO, Quandt EM, Lenski RE. Incipient Speciation in an Experimental Population of *E. coli*. Gordon Research Conference on Speciation, Ventura, CA.
- Turner CB, **Blount ZD**, Mitchell DH, Lenski RE. Evolution of Stable Coexistence in Response to a Key Innovation in a Long-Term Evolution Experiment with *E. coli*. American Society for Microbiology, 115th General Meeting, New Orleans, LA.
- Weatherspoon KM, **Blount ZD**, Wright JT, Lenski RE. Evidence of Self-Cross Feeding in Niche Specialization in an Experimental Population of *E. coli*. American Society for Microbiology, 115th General Meeting, New Orleans, LA.
- Rowles MO, **Blount ZD**, Wright JT, Lenski RE. Phenotype and Fitness Value of a Novel Trait-Confering Mutation Vary with Genetic Background in *E. coli*. American Society for Microbiology, 115th General Meeting, New Orleans, LA.
- 2014** **Blount ZD**, Weatherspoon KM, Rowles MO, Quandt EM, Lenski RE. Genetic Basis of Ecological Specialization and Incipient Speciation in an Experimental Population of *E. coli*. American Society for Microbiology 114th General Meeting, Boston, MA.
- Blount ZD**, Weatherspoon KM, Rowles MO, Quandt EM, Lenski RE. Genetic Basis of Ecological Specialization and Incipient Speciation in an Experimental Population of *E. coli*. BEACON Congress, East Lansing, MI.

- 2013** **Blount ZD**, Lenski RE. Incipient Speciation in an Experimental Population of *E. coli*. Gordon Research Conference on Microbial Population Biology, Andover, NH.
- 2011** **Blount ZD**, Lenski RE. Proposed Tests of Speciation in an Experimental Population of *E. coli* Following the Evolution of a Key Innovation. Gordon Research Conference on Microbial Population Biology, Andover, NH.
- 2009** **Blount ZD**, Barrick JE, Sleight SC, Lenski RE. Gene Amplification, Molecular Exaptation, and the Evolution of a Key Innovation in an Experimental Population of *Escherichia coli*. MSU Council of Graduate Students Graduate Academic Conference, East Lansing, MI.
- Blount ZD**, Barrick JE, Sleight SC, Lenski RE. Gene Amplification, Molecular Exaptation, and the Evolution of a Key Innovation in an Experimental Population of *Escherichia coli*. Midwest Ecology and Evolution Conference, Lincoln, NE.
- Blount ZD**, Barrick JE, Lenski RE. Long-term Co-existence of Distinct Ecotypes in an Experimental Population of *E. coli* Following after Evolution of a Key Innovation: A Case of Incipient Speciation? American Society for Microbiology, 109th General Meeting, Philadelphia, PA.
- Blount ZD**, Barrick JE, Lenski RE. Phylogenetic History of a Long-Term Experimental Population of *E. coli*: Indications of Incipient Speciation. Gordon Research Conference on Microbial Population Biology, Andover, NH.
- 2008** **Blount ZD**, Barrick JE, Sleight SC, Lenski RE. Amplification of a Genetic Segment Containing a Citrate Transporter Gene Underlies Evolution of Aerobic Citrate Utilization in a Long-Term Population of *Escherichia coli*. American Society for Microbiology, 108th General Meeting, Boston, MA.
- 2007** **Blount ZD**, Borland CZ, Lenski RE. Historical Contingency in the Evolution of a Novel Metabolic Capacity in a Population of *Escherichia coli*. Gordon Research Conference on Microbial Population Biology, Andover, NH.
- 2005** **Blount ZD**, Borland CZ, Lenski RE. Maintenance of Ecological Diversity after Spontaneous Evolution of Citrate Utilization in a Population of *E. coli*. American Society for Microbiology, 105th General Meeting, Atlanta, GA.
- 2003** **Blount ZD**, Grogan DW. Active Insertion Sequences in Geographically Separated Populations of *Sulfolobus*. American Society for Microbiology, 103rd General Meeting, Washington, D.C.

Talks (16)

- 2016** Adaptation to Discovered and Self-Constructed Niches during Incipient Speciation in an Experimental Population of *E. coli*. Evolution 2016, Austin, TX.
- Adaptation to Discovered and Self-Constructed Niches during Incipient Speciation in an Experimental Population of *E. coli*. BEACON Congress, East Lansing, MI.
- 2015** Incipient Speciation in an Experimental Population of *E. coli*. Gordon Research Conference on Speciation, Ventura, CA.
- 2014** Ecological Specialization and Incipient Speciation in an Experimental Population of *E. coli*. Society for Molecular Biology and Evolution 2014 Conference, San Juan, Puerto Rico.
- Ecological Specialization and Incipient Speciation in an Experimental Population of *E. coli*. American Society for Microbiology First Meeting on Microbial Experimental Evolution, Washington, D.C.
- Ecological Specialization and Incipient Speciation in an Experimental Population of *E. coli*. Evolution 2014, Raleigh, NC.

- Ecological Specialization and Incipient Speciation in an Experimental Population of *E. coli*. EMBO Conference on Experimental Approaches to Evolution and Ecology using Yeast and Other Model Systems, Heidelberg, Germany.
- 2013** Adaptation of Experimental *E. coli* Populations to a Citrate-only Medium. Young Investigator Speaker, American Society for Microbiology General Meeting, Denver, CO.
Adaptation of Experimental *E. coli* Populations to a Citrate-only Medium). Evolution 2013 Conference, Snowbird, UT.
Incipient Speciation in an Experimental Population of *E. coli*. Gordon Research Symposium, Andover, NH.
- 2012** Evidence of Niche-Specific Adaptive Mutation Accumulation in a Novel Ecotype in an Experimental Population of *E. coli* Following the Evolution of a Key Adaptation. Young Investigator Speaker, American Society for Microbiology General Meeting, San Francisco, CA.
Evidence of Speciation in an Experimental Population of *E. coli* Following the Evolution of a Key Adaptation. Evolution 2012 Conference, Ottawa, Ontario, Canada.
Evidence of Speciation in an Experimental Population of *E. coli* Following the Evolution of a Key Adaptation. BEACON Congress, East Lansing, MI.
Evidence of Speciation in an Experimental Population of *E. coli* Following the Evolution of a Key Adaptation. ALife 13, East Lansing, MI.
- 2008** Evolution of a Key Innovation in an Experimental Population of *E. coli*: A Tale of Contingency and Cooption. Evolution 2008, St. Paul, MN.
- 2007** Historical Contingency in the Evolution of a Key Adaptive Innovation in *Escherichia coli*. Ecology, Evolutionary Biology, and Behavior Program Student Speaker, Michigan State University, East Lansing, MI.

Teaching Experience

Instructor of Record

- 2023** **MMG 491: Current Topics in Microbiology and Molecular Genetics** (Michigan State University)
- This is a capstone course for senior undergraduates in the Microbiology and Molecular Genetics, Genomics, and Molecular Biology programs. It is designed to improve student skills in performing journal-based research and public presentation of complex scientific information. The course covers how to do research, define questions, present effectively, write for a general audience, read and analyze primary literature, and manage research materials, as well as basics of the nature and practice of science, how the primary literature publication process works, and what academic science is really like. Additionally, there is coverage of select topics on career development and mental health challenges.
- 2019** **Biol 239: Introduction to Experimental Microbiology** (Kenyon College)
- I developed this course to introduce students to basic techniques in microscopy, bacteriological culturing, identification of microbes, and environmental microbiology. Proper data collection and scientific writing were also covered.
- Biol 238: Microbiology** (Kenyon College)
- A lecture-based introductory course that I developed to cover all aspects of basic microbiology, including scope, history, historical importance of microbes, methods, origins, cell physiology, genetics, metabolism, origin, evolution, speciation, experimental microbial

evolution, the microbiome, virology, immunology, and infectious disease. I explicitly used evolution as a unifying concept to both tie the field together and link it to other parts of biology, and incorporated strong elements of philosophy of science and liberal arts approaches to learning.

Bio 110: Introduction of Experimental Biology, Part II (Kenyon College)

- The second course in the freshman biology lab series. It focused on further development of scientific and writing skills, in part through the performance of independent research projects on which the students later presented.

2018 Biol 191: Not Just Darwin, a History of Evolutionary Thought (Kenyon College).

- Lecture-based course I developed to introduce students to the history of evolutionary theory from the Greeks through the modern day. The course content included examination of the history and nature of science, the place of biology within science, the role of Darwin in the birth of evolutionary theory, its development since Darwin, its misuse to support social or political agendas like scientific racism, sexism, and classism, as well as the history, tactics, and diversity of the creationist movement.

Biol 109: Introduction to Experimental Biology (Kenyon College)

- The first in a year-long freshman biology lab series, this course focused on development of skills in data analysis, experimental design, and scientific writing.

Teaching Assistantships

2004 MMG 408: Advanced Microbiology Lab (Michigan State University)

2003 Biol 271: Elementary Microbiology Lab (University of Cincinnati)

2002 Biol 552: Microbiology Lab (University of Cincinnati)

- Developed and wrote new lab manual, developed and instituted new curriculum

Biol 271: Elementary Microbiology Lab (University of Cincinnati)

2001 Biol 552: Microbiology Lab (University of Cincinnati)

Biol 113: Freshman Biology Lab III (University of Cincinnati)

Elementary Microbiology Lab (University of Cincinnati)

2000 Biol 552: Microbiology Lab (University of Cincinnati)

Guest Teaching Lectures (13)

2021 “The Long-Term Evolution Experiment with *E. coli*: Evolution, Ecology, Innovation, Speciation, and More in Action”, Biol 650, Microbial Biology (University of Wisconsin at Oshkosh)

2019 “Studying Evolution with *E. coli*: 73,000* Generations of Evolution in Action (*and Counting)”, Dewitt High School Honors Biology Visit to BEACON (Michigan State University)

2017 “A Big Ball of Evolvey-Wolvey Stuff: The Interplay of Ecology, Physiology, Evolution, Innovation, and Incipient Speciation in an Experimental Population of *E. coli*”, Biology 650, Microbial Biology (University of Wisconsin at Oshkosh)

“Studying Evolution with *E. coli*: 68,000* Generations of Evolution in Action (*and Counting)”, Dewitt High School Honors Biology Visit to BEACON (Michigan State University)

- 2016** “A Big Ball of Evolvey-Wolvey Stuff: The Interplay of Ecology, Physiology, Evolution, Innovation, and Incipient Speciation in an Experimental Population of *E. coli*”, Biology 650, Microbial Biology (University of Wisconsin at Oshkosh)
 “The *E. coli* Long-Term Evolution Experiment: 65,500* Generations of Evolution in Action (*and counting)”, ISB (Michigan State University)
- 2015** “Examining the Evolution of a Novel Trait in a Long-Term Experiment with *E. coli*”, LB492, DNA Sequencing Technology and Applications (Michigan State University)
 “Studying Evolution with *E. coli*: 62,500 Generations of Evolution in Action”, Dewitt High School Honors Biology Visit to BEACON (Michigan State University)
- 2014** “Studying Evolution with *E. coli*: 61,500 Generations of Evolution in Action”, Dewitt High School Honors Biology Visit to BEACON (Michigan State University)
 “Studying Evolution with *E. coli*”, BEACON Center and NESCent Darwin Day Road Show (Hesperia High School and Mason County Easter Middle and High School). Given eight times over two days to a total of ~400 middle and high school students.
- 2013** “Making the New from the Old: The Evolution of a Novel Trait in an Experimental Population of *E. coli*”, BEACON and BioQUEST Summer Workshop for High School Teachers, Kellogg Biological Station, Hickory Corners, MI.
- 2012** “Making the New from the Old: The Evolution of a Novel Trait in an Experimental Population of *E. coli*”, Think Evolution Summer Institute for Science Educators, Berkley, California.
- 2011** “The *E. coli* Long-Term Evolution Experiment: 50,000 Generations of Evolution in Action”, Evolution in Action (Michigan State University)

Mentoring

Michigan State University

Undergraduate Students

- **Marwa Adawe:** January – May 2007
- **Kiyana Weatherspoon:** January 2013 – October 2015
- **Maia Rowles:** January 2013 – November 2015
- **Jacob Wright:** September 2014 – April 2016
- **Brooke Sommerfeld:** September 2015 – July 2018
- **Tanush Jagdish:** November 2015 – August 2018 (Kalamazoo College, mentored at Michigan State University)
- **Jessica Baxter:** May 2018 – May 2020
- **Maximo Clark:** September 2021 – present
- **Max Halliday:** March 2023 – present

Graduate Students

- **Nkrumah Grant:** Fall 2014 (Rotation Student)
- **Kyle Card:** Winter 2015 (Rotation Student)
- **Sarah Antaki:** Spring 2022 – present (American University, informal)

High School Science Teachers

- **Fred Hingst:** Summer 2015, Summer 2016
- **Richard Schultz:** Summer 2015, Summer 2016
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Kenyon College**Undergraduate Students**

- **Sumaya Ahmed:** January – July 2019
- **Alice Tillman:** February – May 2019
- **Joanna Van Dyk:** February – May 2019
- **April Murphy:** February – May 2019
- **Emma O’Shaughnessy:** February – May 2019
- **Mark Lang:** February – May 2019
- **Samuel Casad:** February – May 2019
- **Michael Madritch:** February – May 2019

Research Advisory Committees Served On

- **Lazaro López:** (PhD Student, Universidad San Francisco de Quito, Ecuador)

Fellowships, Awards, Scholarships, and Honors

- 2018** **Ralph Evans Award for Excellence in Microbial Evolution** – Michigan State University
- 2014** **Advanced Training Centre Corporate Partnership Programme Fellowship** – European Molecular Biology Laboratory
- 2012** Blount et al 2012 chosen by *Science News* magazine as among top science stories of 2012.
- 2011** **Ronald M. and Sharon Rogowski Fellowship** – Michigan State University
- 2009** **DuVall Award** – Michigan State University
- 2008** **Barnett Rosenberg Fellowship** – Michigan State University
- 2008** **Rudolf Hugh Fellowship** – Michigan State University
- 2007** **Ecology, Evolutionary Biology, and Behavior Graduate Student Speaker Award** – Michigan State University
- 2006** **Ecology, Evolutionary Biology, and Behavior Summer Fellowship** – Michigan State University
- 2007** **Ecology, Evolutionary Biology, and Behavior Summer Fellowship** – Michigan State University
- 2002** **Wieman Memorial Fellowship** – University of Cincinnati.
- 2001 – 2003** **University Scholarship** – University of Cincinnati
- 1995 – 1999** **Georgia HOPE Scholarship** – Georgia Institute of Technology

Professional Memberships

- American Association for the Advancement of Science
- American Society for Microbiology
- Applied Microbiology International (Formerly Society for Applied Microbiology)
- Society for the Study of Evolution
- National Center for Science Education
- American Society of Naturalists

- Society for Molecular Biology and Evolution
- National Association of Biology Teachers

Service

- **Co-Editor** (with Alain Pave – Claude Bernard University, Lyon, France – and Sandrine Charles – Claude Bernard University, Lyon, France)
 - *Frontiers in Ecology and Evolution*, Special Issue: Modeling, Data Handling, and Analysis: Practical and Fundamental Consequences in Ecology and Evolution, *In progress*.
- **Reviewer for 35 Journals:** *Applied and Environmental Microbiology*, *Biology Letters*, *Biological Reviews*, *BioScience*, *BMC Evolutionary Biology*, *Communications Biology*, *Current Biology*, *Current Opinion in Microbiology*, *Ecology and Evolution*, *Ecology Letters*, *eLife*, *Environmental Microbiology and Environmental Microbiology Reports*, *Evolution*, *Genome Biology and Evolution*, *Heliyon*, *Heredity*, *IEEE Access*, *Interface Focus*, *Journal of Molecular Evolution*, *The ISME Journal*, *mBio*, *Microbial Ecology*, *Microbiology Open*, *Microbiology Spectrum*, *Molecular Biology and Evolution*, *Molecular Phylogenetics and Evolution*, *Nature*, *Nature Communications*, *PeerJ*, *Philosophy Theory and Practice in Biology*, *PLoS ONE*, *Proceedings of the Royal Society B*, *Science*, *Scientific Reports*, *Trends in Ecology and Evolution*.
- **Ad Hoc Grant Proposal Reviewer:** European Research Council, The Marsden Fund, Medical Research Council (UK), National Science Centre (Poland), National Science Foundation, NASA Postdoctoral Program, University of Central Oklahoma
- **Ad Hoc Publication/Book Proposal Reviewer:** The John Templeton Foundation, Oxford University Press
- **Member, Long-Term Evolution Experiment Leadership Team (2021 – present):** I am a part of a select group from the broader LTEE community that seeks to develop a robust and useful infrastructure for the ongoing use of the LTEE as a research and teaching resource as it transitions from the Lenski Lab to that of Jeffrey Barrick at The University of Texas at Austin. A major goal of this team is to develop a webpage that will act as a central node for research and teaching resources that will facilitate collaboration and communication within the community and encourage its ongoing expansion. We are also working to develop clear guidelines and policies for the community.

Organizational Positions Held:

- Long-Term Evolution Experiment with *E. coli* Coordinating Committee, 2021 - present
- President, Biology Graduate Students Association, University of Cincinnati: 2002 – 2003
- Treasurer, Biology Graduate Students Association, University of Cincinnati: 2001 – 2002

Departmental Committees:

- Michigan State University College of Natural Sciences Dean's Student Advisory Committee, Microbiology and Molecular Genetics Graduate Representative: 2005 - 2007
- Michigan State University, Department of Microbiology and Molecular Genetics Graduate Committee, Graduate Representative: 2007 – 2008
- Michigan State University, Department of Microbiology and Molecular Genetics Curriculum Committee, Graduate Representative: 2008 – 2009

Public Outreach

2009 – 2021 – Volunteer for MSU Museum's "Darwin Discovery Day" Educational Event

General Volunteer Coordinator: 2015 – 2018

Planning Committee: 2015 – 2020

2016 – Volunteer for BEACON Center Science Fair displays and demonstrations at local schools

2014, 2015 – MSU Science Festival Presentation with professors Sarah Gibbons, Kate Fedewa, and Brian Holcomb of MSU Dept. of Writing, Rhetoric, and American Culture: “Science, Fiction, and the Real Monsters of Our Imagination.”

2014 – Participant for the 2014 BEACON Center and NESCent Darwin Day Road Show, in which I gave a talk on my path to becoming a scientist, research, and the use of *E. coli* to study evolution to eight high school classes in two schools over the course of two days, speaking to a total of ~400 students.

2013 – Volunteer for September 26 Educators’ Night at the Museum, MSU Museum

2012 – November 11 Meet-up Speaker for the Michigan Skeptics Association

2012 – WAMC Academic Minute Podcast Speaker, November 19, 2012, *Evolving Bacteria*

Media Coverage

- “A New Step in Evolution”, *The Loom*, 6/02/2008.
- “History Restricts and Guides the Evolution of Innovations”, *Not Exactly Rocket Science*, 6/02/2008.
- “Tracking Adaptation as Bacteria Evolve”, *Ars Technica*, 6/04/2008.
- “*E. coli* Evolution Follow-up”, *The Loom*, 6/05/2008.
- “A New Step in Evolution, continued: Read the Paper”, *The Loom*, 6/05/2008.
- “Bacteria Make Major Evolutionary Shift in the Lab”, *The New Scientist*, 6/09/2008.
- “Historical Contingency in the Evolution of *E. coli*”, *Pharyngula*, 6/10/2008.
- “Hitting the Redo Button for Evolution”, *Science News for Kids*, 2/11/2009.
- “Evolution in Action”, *BBC Knowledge*, April 2009 Issue.
- Dawkins, R. *The Greatest Show on Earth*. (Free Press, New York, New York, 2009), discussed in Chapter 5.
- “Postdoctoral Researcher Zachary Blount Discusses Discovering the Processes of *E. coli* Evolution”, *NSF News Release Interview*, 2012.
- “Evolution is as Complicated as 1, 2, 3”, *MSU News*, 9/20/2012.
- “Evolutionary Innovation Caught in the Act”, *Washington Post*, 9/19/2012.
- “Bacteria Learn New Trick”, *Science News for Kids*, 10/12/2012.
- “Evolving Bacteria”, *WAMC Academic Minute*, 11/19/2012.
- “Top 25 Science Stories of 2012: Evolving *E. coli*”, *Science News*, 12/13/2012.
- “Lenski’s Long-Term Evolution Experiment: The Evolution of Bacteria that can use Citrate as a Carbon Source”, *The Sandwalk*, 12/03/2013.
- “Cradle of Creation: Evolution Shapes Up New Ecosystem in the Lab”, *The New Scientist*, 6/19/2015.
- “Top 25 Science Stories of 2015: Fluke Extinction Surprises Lab”, *Science News*, 12/15/2015.
- Losos, JB. *Improbable Destinies*. (Riverhead Books, New York, New York, 2017). Discussed in Chapter 10.
- “The Longest-Running Evolution Experiment”, Veritasium (YouTube science series), 6/16/2021. <https://youtu.be/w4sLAQvEH-M>

References

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