Emily R. Davenport

Postdoc - Cornell 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

2018 - **Visiting Post-doctoral Fellow**. Supervisor: Ruth Ley
Department of Microbiome Science, Max Planck for Developmental Biology; Tübingen, Germany.

2014 - **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

2019

16. Gong X, **Davenport ER**, Wang D, Clark AG. *Lack of spatial and temporal genetic structure of Anguilla japonica populations*. Conservation Genetics. 2019

15. Kachoo P*, Eraso JM*, Beres SB, Olsen RJ, Zhu L, Nasser W, Bernard PE, Cantu CC., Ojeda Saavedtra M, José Arredondo M, Strope 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

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

1. **Davenport ER**. *Tooth be told, genetics influence oral microbiome*. Cell Host & Microbe. 2017;22(3)

Presentations

Invited Platform Presentations

2018 **Davenport, ER**. *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

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

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

2019 **Davenport ER**. *The causes and consequences of human gut microbiome composition*. Department of Biology. Duke University

2018 **Davenport ER**. *Exploring microbiome, genotype, and phenotype interactions in the TwinsUK*. Max Planck Institute for Developmental Biology

2016 **Davenport ER**. *The role of host genetics in determining gut microbiome composition*. The Huck Institutes of the Life Sciences, Pennsylvania State University

2013 **Davenport ER**. *Seasonal variation in human gut microbiome composition*. Chicago State University

2013 **Davenport ER**. *Seasonal variation in human gut microbiome composition*. Emory: Yerkes National Primate Research Center

Teaching Experience

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

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

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

Adon Chowdhury – Undergraduate @ Cornell University, Lab of Andrew Clark (2018 -)

Adon is a Biometry and Statistics major who became interested in combining his interests in biology and data science by studying the microbiome. He is currently leading a project examining whether the dynamics of microbial community assembly in the gut are influenced by host genetics, using samples from the large TwinsUK cohort. Adon's background has proven perfect for this project, as it requires strong statistical and computational skills, along with broad biological understanding.

Trang Dau – Undergraduate @ Cornell University, Lab of Andrew Clark (2017 -)

Trang is a Human Biology, Health, and Society major who became interested in the two-way relationship between the microbiome and the human host after taking courses in microbiology and ecology at Cornell. She has contributed to a number of projects during her time in lab,

including examining the role of host genetics in microbial community assembly and the role of microbial networks in health and disease.

Xiaoling Gong – Visiting scientist @ Cornell University, Lab of Andrew Clark (2016 - 2017)

Xiaoling is a mid-career investigator on a two-year fellowship from the Chinese Academy of Science visiting the Clark lab to expand the analysis of population structure of Japanese Eels, an important aquaculture species in Asia. During her time as a visiting scientist in the Clark Lab, I mentored her on the use of bioinformatics tools for analyzing RADseq data and the application of population genetic statistics to answer the open question of whether Japanese Eels are panmictic.

-----> *The manuscript describing this work,* "Lack of spatial and temporal genetic structure of Anguilla japonica populations" *is accepted by Conservation Genetics*

Monica Guardado – Undergraduate @ Penn State University, Lab of George Perry (2015 - 2017)

Monica became interested in host-microbiome dynamics during coursework for her Biology major. During her time in the Perry Lab, she's been examining whether termite-eating behavior in chimpanzees results in the transfer of termite microbiota into the chimpanzee gut. I've mentored her on both the wet lab and computational aspects of analyzing 16S rRNA sequencing data.

-----> *Awarded an American Society of Microbiology (ASM) Research Capstone Fellowship (2017)*

-----> *Now a Clinical Lab Associate at uBiome (a microbiome start-up)*

Academic Honors and Funding

2017	Genetics Society of America (GSA) DeLill Nasser Travel Award for Professional Development in Genetics ($1000)
2016 - 2019	NIH Ruth L. Kirschstein National Research Service Award (NRSA) – F32DK109595 ($173,079)
2014	University of Chicago Biological Sciences Division Travel Award ($500)
2011	University of Chicago Digestive Diseases Research Core Center (DDRCC) Pilot and Feasibility award ($20,000, written by E.R. Davenport to support dissertation research, submitted by Y. Gilad)
2010 - 2012	NIH Genetics and Regulation Training Grant (University of Chicago – 2 years of stipend support and tuition)
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

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)

2016 - National Postdoc Association (NPA)

2014 - Society for Molecular Biology and Evolution (SMBE)

2012 -	American Society of Human Genetics (ASHG)
2011 -	American Association for the Advancement of Science (AAAS)
2017	American Society for Microbiology (ASM)
2017	American Association of Physical Anthropologists (AAPA)

Outreach

Reviewer	(2015 -) American Society of Human Genetics (ASHG) DNA Day Essay Judge
Member	(2015 - 2018) Genetics Education and Outreach Network (GEON)

Leadership and Service

Reviewer

- Applied and Environmental Microbiology (AEM)
- BMC Genomics
- Cell
- Cell Host & Microbe
- Communications Biology
- Diabetologia
- Environmental Microbiology
- Genes
- Gut Microbes
- Genomics, Proteomics, and Bioinformatics
- Journal of Allergy and Clinical Immunology (JACI)
- Microbiome
- mSystems
- Nature Communications
- PLoS Genetics
- PLoS ONE
- PNAS
- Scientific Reports
- Trends in Genetics
- Trends in Immunology

Reviewer	(2019) SACNAS research presentation abstracts (Life Sciences)
Reviewer	(2019) SACNAS Travel Scholarships (Life Sciences)
Reviewer	Wellcome Trust Investigator Award in Science
Member	(2018 -) Federation of American Societies for Experimental Biology (FASEB) Training & Career Opportunities Subcommittee
Incoming Chair	(2019) American Society of Human Genetics (ASHG) Training and Development Committee
Member	(2017 -) American Society of Human Genetics (ASHG) Training and Development Committee
Representative	(2018) Consensual Relationships Policy Committee – Postdoc representative, Cornell University. See http://theuniversityfaculty.cornell.edu/news/consensual-relationships-policy-committee/ for details.
Cofounder & Organizer	(2017 - 2018) Postdoc Fellow Invited Lecture in Research and Career Development series. Department of Molecular Biology, Cornell University

Member	(2016 - 2018) Cornell University Postdoctoral Advisory Council
Organizer & Moderator	(2017) Academic Career Panel at the American Society of Human Genetics Annual Meeting (ASHG)
Reviewer	(2016 - 2017) Sigma Xi Grants-In-Aid of Research, Cornell University
Judge	(2011, 2012, 2014) Annual Chicago Public Schools Student Science fair (for district fair winners)
Judge	(2011 - 2014) Annual Chicago Area Undergraduate Research Symposium (CAURS)
Member	(2010 - 2013) Molecular Biosciences organizational committee: student representative from the Department of Human Genetics on orientation week, annual molecular biosciences retreat, and recruitment organizing committees