The University of Texas at Austin
Department of Integrative Biology
2500 Speedway, A4800
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Adam J. Hockenberry

Career Objectives

My long-term academic career interest is to develop computational evolutionary methods that leverage and combine natural sequence variation with increasingly abundant genome-scale phenotypic measurements. Ultimately, my goal is to apply these tools to better understand the principles governing microbial genome organization and environmental adaptation.

Education

2010-2017: Northwestern University
PhD in Interdisciplinary Biological Sciences
Cumulative GPA: 4.0

2008-2010: University of Pennsylvania
Post-baccalaureate courses in Mathematics and Biology
Cumulative GPA: 3.74

2003-2008: Temple University
B.A. in Anthropology, *summa cum laude*
Cumulative GPA: 3.83, Major GPA: 4.0

Research Experience

2017-current: University of Texas at Austin
Post-doctoral Researcher
Advised in the lab of Dr. Claus Wilke

2010-2017: Northwestern University
Graduate Research
Jointly advised in the labs of Professors Luis Amaral and Michael Jewett. Thesis title: "Sequence Determinants of Translation Efficiency"

2008-2010: University of Pennsylvania
Research Technician
Independent and collaborative research projects in the Molecular Neuroengineering lab of Dr. David Meaney.

2007: Temple University
Undergraduate Research
Summer research program in behavioral neuroscience under Dr. Edward Gruberg.

Teaching Experience

2018: The University of Texas at Austin
Instructor (Spring 2018)
Department of Statistics and Data Science: Biostatistics (328M)

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2010-2017: Northwestern University

Co-Instructor, Teaching Assistant, Course Developer (Fall 2014, Spring 2015, Fall 2015)
Introduction to Computer Programming Bootcamp (5 days), led by Professor Luis Amaral.

Guest Lecturer (Spring 2015, Spring 2016)
Cell Biology for Engineers, taught by Professor Abigail Bellis Stringer

Teaching Assistant (Winter 2015)
Software Carpentry Workshop (2 days): Fundamentals of Python Programming, organized by Professor Mark Mandel.

Teaching Assistant (Winter 2011)
Biochemistry, taught by Professor Thomas Meade.

Teaching Assistant (Spring 2010)
Genetics and Molecular Biology, taught by Professor Robert Holmgren.

Writing Mentor (Winter 2010)
Taught English grant-writing skills to non-native English speakers on a one-on-one basis.

2010: 4th World Love, Lombok Indonesia
Volunteer teacher
Taught English and computer skills at a community center (adult learners) and elementary school as part of a volunteer program.

2008: Temple University
Undergraduate Diamond Peer Teaching Scholar
Fundamentals of Biological Anthropology, taught by Professor Christine Rockwell.

Fellowships/Awards/Honors

2019-current: **Ruth L. Kirschstein National Research Service Award (NRSA) Individual Postdoctoral Fellowship (Parent F32)**

2016, 2015: **Northwestern University Presidential Fellowship**

2016, 2015, 2014: Student Travel Awards from IBiS Graduate Program

2014, 2013: Student Travel Awards from Graduate School

2014, 2013, 2012: **National Institutes of Health Institutional Training Grant: Cellular and Molecular Basis of Disease**

2013: McCormick School of Engineering Student Organization Grant for graduate student book club

2012, 2011: Professional Development Grant Award for graduate student book club

2010: National Science Foundation Graduate Research Fellowship Program, Honorable Mention

2008: University Honors Program, Honors in Major

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2008: Diamond Peer Teacher Scholar

2007: Alliance for Minority Participation Poster Award, 1st Place

2007: American Chemical Society Research Poster Award, 1st Place

2002: William F. Brossman Charitable Trust: Undergraduate Fellowship

2002: Citizens' Scholarship Foundation of Lancaster County: Undergraduate Scholarship

2002: Academic Scholarship, Temple University

Publications

Manuscripts currently under review/revision/preprint

Hockenberry AJ, & Wilke CO (2018). Evolutionary couplings detect side-chain interactions. *bioRxiv* doi:10.1101/447409

Lin L*, Kightlinger W*, **Hockenberry AJ**, Jewett MC, & Mrksich M. Sequential glycosylation of proteins with substrate-specific N-glycosyltransferases.

Refereed journals (***** denotes co-first author, † denotes undergraduate co-author)

14. Aleksashin NA*, Leppik M*, **Hockenberry AJ*,** Klepacki D, Vázquez-Laslop N, Jewett MC, Remme J & Mankin AS (2019). Assembly and functionality of the ribosome with tethered subunits. *Nature Communications.* doi: 10.1038/s41467-019-08892-w

13. Caglar MU, **Hockenberry AJ**, & Wilke CO (2018). Predicting bacterial growth conditions from mRNA and protein abundances. *PLoS One.* doi: 10.1371/journal.pone.0206634

12. Quillin S, **Hockenberry AJ**, Jewett MC, & Seifert H (2017). *Neisseria gonorrhoeae* exposed to sublethal levels of hydrogen peroxide mounts a complex transcriptional response. *mSystems.* doi:10.1128/mSystems.00156-18

11. **Hockenberry AJ**, Jewett MC, Amaral LAN, & Wilke CO (2017). Within-gene Shine–Dalgarno sequences are not selected for function. *Molecular Biology and Evolution.* doi: 10.1093/molbev/msy150

10. Liu SS*, **Hockenberry AJ***, Lancichinetti A, Jewett MC, & Amaral LAN (2018). A novel framework for evaluating the performance of codon usage bias metrics. *Journal of the Royal Society Interface.* doi:10.1098/rsif.2017.0667

9. **Hockenberry AJ**, Stern A†, Jewett MC, & Amaral LAN (2017). Diversity of translation initiation mechanisms across bacterial species is driven by environmental conditions and growth demands. *Molecular Biology and Evolution.* doi:10.1093/molbev/msx310

8. Pah AR, Jennings AL, Hagan J, Jain A, Albrecht K, **Hockenberry AJ**, & Amaral LAN (2017). Economic insecurity and the rise in gun violence at US schools. *Nature Human Behavior.* doi:10.1038/s41562-

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016-0040

7. **Hockenberry AJ**, Pah AR, Jewett MC, & Amaral LAN (2017). Leveraging genome-wide datasets to quantify the functional role of the anti-Shine-Dalgarno sequence in regulating translation efficiency. *Open Biology*. doi:10.1098/rsob.160239

6. Liu SS, **Hockenberry AJ**, Lancichinetti A, Jewett MC, & Amaral LAN (2016). NullSeq: a tool for generating random coding sequences with desired amino acid and GC contents. *PLoS Computational Biology*. 12(11): e1005184

5. Yang C*,†, **Hockenberry AJ***, Jewett MC, & Amaral LAN (2016). Depletion of Shine-Dalgarno sequences within bacterial coding regions is expression dependent. *G3: Genes, Genomes, Genetics*. 6(11): 3467-3474

4. **Hockenberry AJ***, Sirer MI*, Amaral LAN, & Jewett MC (2014). Quantifying position-dependent codon usage bias. *Molecular Biology and Evolution*. 31(7): 1880-1893.

3. Choo A, Geddes-Klein D, **Hockenberry A**, Scarsella D, Mesfin MN, Singh P, Patel T, & Meaney DF (2012). NR2A and NR2B subunits differentially mediate MAP kinase signaling and mitochondrial morphology following modest excitotoxic insult. *Neurochemistry International*. 60(5): 506-516.

2. Singh P, Doshi S, Spaethling JM, **Hockenbery AJ**, Patel TP, Geddes-Klein DM, Lynch DR, & Meaney DF (2012). N-methyl-D-aspartate receptor mechanosensitivity is governed by the C-terminus of NR2B subunit. *The Journal of Biological Chemistry*, 287(6): 4348-4359.

1. Singh P, **Hockenberry AJ**, Tiruvadi VR, & Meaney DF (2011). Computational investigation of the changing patterns of subtype specific NMDA receptor activation during physiological glutamatergic neurotransmission. *PloS Computational Biology*, 7(6): e1002106.

Review articles

1. **Hockenberry AJ** & Jewett MC (2012). Synthetic *in vitro* Circuits. *Current Opinion of Chemical Biology*. 16(3): 253-259.

Conference presentations

9. **Hockenberry AJ**, Wilke CO. "Evolutionary couplings between amino acid residues are determined by side-chain interactions"; presented at BEACON 2018 Congress, August 2018, East Lansing, MI

8. **Hockenberry AJ**, Stern A, Jewett MC, Amaral LAN. "Growth rate demands shape variation in translation initiation mechanisms between bacterial species"; presented at International Society for Microbial Ecology, August 2016, Montreal, QC, Canada

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7. **Hockenberry AJ**, Pah AR, Jewett MC, Amaral LAN. "Defining the anti-Shine-Dalgarno sequence and quantifying its functional role in regulating translation efficiency"; presented at Synthetic Biology: Engineering, Evolution, and Design (SEED), July 2016, Chicago, IL

6. **Hockenberry AJ**, Jewett MC, Amaral LAN. "Resolving a paradox on the importance of the Shine-Dalgarno sequence to translation efficiency"; presented at RNA Society, May 2015, Madison, WI

5. **Hockenberry AJ**, Jewett MC, Amaral LAN. "Resolving a paradox on the importance of the Shine-Dalgarno sequence to translation efficiency"; presented at the Howard Hughes Medical Institute, Mar. 2015, Bethesda, MD

4. **Hockenberry AJ**, Sirer MI, Amaral LAN, Jewett MC. "Quantifying position-dependent codon usage bias"; presented at the Society for Molecular Biology and Evolution, Apr. 2014, San Juan, PR

3. **Hockenberry AJ**, Sirer MI, Amaral LAN, Jewett MC. "A spatial generalization of the codon adaptation index"; presented at Winter-Quantitative Biology, Feb. 2013, Honolulu, HI

2. **Hockenberry AJ**, Scarsella D, Choo AM, Meaney DF. "Activation of NR2B containing NMDA receptors causes mitochondrial calcium accumulation and acute changes in shape"; presented at International Neurotrauma Society, September 2009, Santa Barbara CA

1. **Hockenberry AJ**, Amin H, Gruberg ER. "Recovery of visual function following optic nerve transection"; presented at Undergraduate Biology Research Session; Temple University, August 2008, Philadelphia PA

Other writings

1. **Hockenberry AJ** (October 2012). Decoding dialects key to understanding the language of DNA. *Helix Magazine*

Leadership / Outreach

2016, 2015: Presidential Society of Fellows Social Chair, Northwestern University

2015: Judge; Computational Research Day, Northwestern University

2014, 2013, 2012: IBiS Student Organization Social Chair, Northwestern University

2013: Global Analysis of Protein Dynamics Workshop Co-organizer, Northwestern University

2011-2014: Founder of "Binding Affinity"; popular-science book club, Northwestern University

2011: Bioethics Symposium Co-organizer; part of One Book, One Northwestern, Northwestern University

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Mentorship

The University of Texas at Austin:

Undergraduate students:

1) Lee Rao (2018-present)
2) Oren Bullock (2018-present)

Northwestern University

Graduate students:

1) Sophia Liu (2015-2017)
2) Zhiheng Bai (2015-2017)

Undergraduate students:

1) Chuyue Yang (2013-2016)
2) Aaron Stern (2014-2015)
3) Matt Hong (2013-2014)
4) Samantha Crowe (2015)

High-school students:

1) Paige Adams (2013)
2) Cary Li (2015)
3) Adrian Senar Tejedor (2015)

University of Pennsylvania

Undergraduate students:

1) Linda Le (2009-2010)
2) Minna Zhang (2010)

Manuscript reviewer

Summary: https://publons.com/researcher/1217862/adam-hockenberry/

Bioinformatics
Genetics
Genome Biology and Evolution
Journal of Bacteriology
Molecular Biology and Evolution
Nucleic Acids Research
PeerJ
PLOS Biology
PLOS Computational Biology
PLOS One
Scientific Reports

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References

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Professor Claus O. Wilke
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Thesis Advisor
Professor Michael C. Jewett
m-jewett@northwestern.edu

Thesis Advisor
Professor Luis A.N. Amaral
amaral@northwestern.edu

Mentor, Graduate School Training Grant Director
Professor Jason H. Brickner
j-brickner@northwestern.edu

Collaborator
Professor H. Steven Seifert
h-seifert@northwestern.edu