

The University of Texas at Austin
Department of Integrative Biology
2500 Speedway, A4800
Austin, TX 78712

(267)357-5411
adam.hockenberry@utexas.edu
Twitter: @HockenberryAdam
ORCID: 0000-0001-9476-0104
github.com/adamhockenberry

Adam J. Hockenberry

Career objectives

My long-term scientific interest is in developing and applying computational and statistical tools for complex biological data science and in scientific communication to more broadly disseminate research findings.

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-present: The University of Texas at Austin
Guest lecturer (Spring 2020)
Department of Statistics and Data Science: Computational Biology and Bioinformatics (SDS348). Course taught by Professor Claus O. Wilke

Instructor-of-record (Spring 2018)
Department of Statistics and Data Science: Biostatistics (SDS328M)

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2010-2017: Northwestern University

Co-instructor, Co-course developer (Fall 2014, Spring 2015, Fall 2015)

Introduction to Scientific Programming Bootcamp (5 days)

Teaching assistant (Winter 2015)

Software Carpentry Workshop: Fundamentals of Python Programming,
Course taught by Professor Mark Mandel.

Teaching assistant (Winter 2011)

Biochemistry, Course taught by Professor Thomas Meade.

Teaching assistant (Spring 2010)

Genetics and Molecular Biology, Course 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 for 1 month.

2008: Temple University

Undergraduate Diamond Peer Teaching Scholar

Fundamentals of Biological Anthropology, Course taught by Professor
Christine Rockwell.

Fellowships/Awards /Honors

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

2019: Rom Rhome International Development Fund, travel award

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

2016, 2015, 2014: Student travel awards from IBiS Graduate Program

2014, 2013: Student travel awards from Northwestern 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

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

Preprints

- Shah SB, Hill AM, Wilke CO, & **Hockenberry AJ** (2020). Generating complex patterns of gene expression without regulatory circuits. *bioRxiv*. doi: <https://doi.org/10.1101/2020.11.25.398248>
- Hockenberry AJ**, & Wilke CO (2020). BACPHLIP: Predicting bacteriophage lifestyle from conserved protein domains. *bioRxiv*. doi: 10.1101/2020.05.13.094805

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

18. d'Aquino AE, Azim T, Aleksashin NA, **Hockenberry AJ**, Kruger A, & Jewett MC (2020). Mutational characterization and mapping of the 70S ribosome active site. *Nucleic Acids Research*. doi:10.1093/nar/gkaa001
17. Lin L, Kightlinger W, Prabhu SK, **Hockenberry AJ**, Li C, Wang L, Jewett MC & Mrksich M (2020). Sequential Glycosylation of Proteins with Substrate-Specific N-Glycosyltransferases. *ACS Central Science*. doi:10.1021/acscentsci.9b00021
16. **Hockenberry AJ**, & Wilke CO (2020). Phylogenetic weighting does little to improve the accuracy of evolutionary coupling analyses. *Entropy*. doi:10.3390/e21101000
15. **Hockenberry AJ**, & Wilke CO (2019). Evolutionary couplings detect side-chain interactions. *PeerJ*. doi:10.7717/peerj.7280
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/s41562-016-0040
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***, Siler 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, **Hockenberry 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.

Selected conference presentations

12. **Hockenberry AJ**, Wilke CO. "Selection for rapid translation of bacteriophage mRNAs is lifestyle dependent"; presented at BEACON 2020 Congress, August 2020, East Lansing, MI (remote)
11. **Hockenberry AJ**, Wilke CO. "Evolutionary couplings detect side-chain interactions"; presented at Society for Molecular Biology and Evolution, July 2019, Manchester, UK
10. **Hockenberry AJ**, Wilke CO. "Constructing principled statistical thresholds for use in evolutionary coupling analyses"; presented at Molecular Mechanisms in Evolution (GRC), June 2019, Easton, MA
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
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**, Sierer 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**, Sierer 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

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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

Mentorship

The University of Texas at Austin:

Undergraduate students:

- 1) Sahil Shah (2019-present)
- 2) Sanjana Mohanty (2019-2020)
- 3) David (Chase) Weaver (2019-2020)
- 4) Lee Rao (2018-2020)
- 5) Oren Bullock (2018-2019)

Northwestern University

Graduate students:

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

Undergraduate students:

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

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4) Matt Hong (2013-2014)

High-school students:

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

University of Pennsylvania

Undergraduate students:

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

Manuscript reviewer

For an up-to-date summary, please see:

<https://publons.com/researcher/1217862/adam-hockenberry/>

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