James Russell Howard, Ph.D.
Assistant Professor of Chemistry

RESEARCH POSITIONS

Assistant Professor of Chemistry — *2026 - present*
University of Louisville

NIH F32 Ruth L. Kirschstein Postdoctoral Fellow — *2024 - 2026*
University of Utah, Salt Lake City, UT
Research Advisor: Professor Matthew S. Sigman
Research: Application of Data-Science Techniques to Biocatalytic Systems

Postdoctoral Research Associate — *2023 - 2024*
University of Utah, Salt Lake City, UT
Research Advisor: Professor Matthew S. Sigman
Research: Application of Data-Science Techniques to Biocatalytic Systems

EDUCATION

PhD, *Organic Chemistry* — *2018 - 2023*
University of Texas at Austin, Austin, TX
Research Advisor: Professor Eric V. Anslyn
Dissertation: High-throughput Experimentation Methods for Enantiomeric Excess Determination

BS, *Chemistry* — *2014 - 2018*
The University of Alabama, Tuscaloosa, AL
Research Advisor: Professor Kevin Shaughnessy
Research: Air-stable Palladium Precatalysts for Suzuki Reactions

AWARDS AND HONORS

1. NIH F32 Ruth L. Kirschstein Postdoctoral Individual National Research Service Award (2024)
2. Bennie F. Walker Endowment Fellowship (2022)
3. Royston M. Roberts Fellowship in Chemistry (2019)
4. Copeland Endowed Fellowship in Chemistry (2019)
5. NSF Graduate Research Fellowship Program, Honorable Mention (2018)
6. Bennie F. Walker Endowment Fellowship (2018)
7. ACS Division of Organic Chemistry Student Award (2018)
8. Provost Graduate Excellence Fellowship (2018)
9. Department of Chemistry Outstanding Chemistry Undergraduate Student Award (2017)

BOOK CHAPTERS

1. "Fluorescent Chemosensors, Chirality Sensing with UV-Visible Absorbance, Fluorescence, and Circular Dichroism Spectroscopy." **J. R. Howard**, J. Lim, S. R. Moor, and E. V. Anslyn, in Fluorescent Chemosensors, ed. L. Wu, A. C. Sedgwick, X. He, and T. D. James, The Royal Society of Chemistry, **2023**, ch. 8, pp. 160-182.

PUBLICATIONS

1. "Catalytically Promiscuous PLP-Dependent Aminotransferases Are Biocatalysts for C–C Bond Formation" Kim, A.T.; **Howard, J. R.**; Cáceres, A. G. C; Chong, K. I.; Aye, W. A.; Sigman, M. S.; Narayan, A. R. H. *ACS Cent. Sci.* **2026**, 12, 7, 1029–1037. DOI: 10.1021/acscentsci.6c00531

2. "Disrupting Pheromone Signaling in Insect: Design, Synthesis, and Evaluation of an Inhibitor" Praikshya, P.; Ray, I.; Al Danoon, O.; **Howard, J. R.**; Maier, J. M.; Moor, S. R.; Anslyn E. V.; Mohanty, S. *ACS Omega*, **2026**, 11, 8, 13052–13061. DOI: 10.1021/acsomega.5c06376

3. "Investigating Reactivity and Selectivity in a Palladium-Catalyzed Heteroleptic Ligand System for Electrophilic Arene Fluorination" Deolka, S.; Samha, M. H.; Garcia Roca, A.; Haugh, G. C.; **Howard, J. R.**; Dalmau D.; Sandres J.; Vasylevskyi S.; VanderLinden R. T.; Paton R. S.; Sigman M. S., *J. Am. Chem. Soc.*, **2025**, 147, 15, 12878-12889. DOI: 10.1021/jacs.5c01738

4. "A Workflow Enabling the Automated Synthesis, Chain-End Degradation, and Rapid Mass Spectrometry Analysis for Molecular Information Storage in Sequence-Defined Oligourethanes" Shuluk, J.; Wight, C.; **Howard, J. R.**; King, M.; Moor, S.; DeHoog, R.; Dahlhauser, S.; Eberlin, L; Anslyn, E. *JACS Au*, **2025**, 5, 3, 1232-1242. DOI: 10.1021/jacs.4c01070

5. "Development of a Deactivation-Resistant Dialkylbiarylphosphine Ligand for Pd-Catalyzed Arylation of Secondary Amines" Feng, K.[†]; Raguram E. K. [†]; **Howard J. R.**, Peters E.; Liu C.; Sigman M. S.; Buchwald S. L. *J. Am. Chem. Soc.*, **2024**, 146, 39, 26609-26615. DOI: 10.1021/jacs.4c09667

6. "Data-science-guided calibration curve prediction of an MLCT-based ee determination assay for chiral amines" **James R. Howard**; Julia R. Shuluk; Arya Bhakare; Eric V. Anslyn. *Chem*, **2024**, 10, 7, 2074-2088. DOI: 10.1016/j.chempr.2024.05.009

7. "Circular Dichroism Sensing: Strategies and Applications." Formen, J. S.; **Howard, J. R.**; Anslyn, E. V.; Wolf, C. *Angew. Chem. Int. Ed.* **2024**, 63, e202400767. DOI: 10.1002/anie.202400767

8. "Biosensor and machine learning-aided engineering of an amaryllidaceae enzyme" d'Oelsnitz, S.; Diaz, D. J.; Kim, W.; Acosta, D. J.; Dangerfield, T. L.; Schechter, M. W.; Minus, M. B.; **Howard, J. R.**; Do, H.; Loy, J. M.; Alper, H. S.; Zhang, Y. J.; Ellington, A. D. *Nat. Commun.*, **2024**, 15, 2084. DOI: 10.1038/s41467-024-46356-y

9. "Determination of Enantiomeric Excess and Diastereomeric Excess via Optical Methods. Application to α-alkyl-β-hydroxy-carboxylic acids." Sarah R. Moor, **James R. Howard**, Brenden T. Herrera, Matthew S. McVeigh, Federico Marini, Adrian T. Keatinge-Clay, and Eric V. Anslyn. *Org. Chem. Front.*, **2023**, 10, 1386-1392. DOI: 10.1039/D2QO01444K

10. "Amines as Activating Ligands for Phosphine Palladium(II) Precatalysts: Effect of Amine Ligand Identity on the Catalyst Efficiency" Jordan K. Pierce, Lindsey D. Hiatt, **James R. Howard**, Huaiyuan Hu, Fengrui Qu, and Kevin H. Shaughnessy. *Organometallics*, **2022**, 41, 24, 3861–3871. DOI: 10.1021/acs.organomet.2c00518

11. "^{11}B-NMR Spectroscopy: Structural Analysis of the Acidity and Reactivity of Phenyl Boronic Acid-Diol Condensations" Stephanie Velenzuela, **James R. Howard**, Hyun Meen Park, Sriranjani Darbha, Eric V. Anslyn. *J. Org. Chem.*, **2022**, 87, 22, 15071–15076. DOI: 10.1021/acs.joc.2c01514

12. "Data-Driven Prediction of Circular Dichroism-Based Calibration Curves for the Rapid Screening of Chiral Primary Amine *ee* Values" **James R. Howard**, Arya Bhakare, Zara Akhtar, Christian Wolf, Eric V. Anslyn. *J. Am. Chem. Soc.*, **2022**, 144, 37, 17269-17276. DOI: 10.1021/jacs.2c08127

13. "High-Throughput Screening of α-Chiral-Primary Amines to Determine Yield and Enantiomeric Excess" Moor, S. R., **Howard, J. R.**, Herrera, B. T., Anslyn, E. V., *Tetrahedron* **2021**, *94*, 132315. DOI: 10.1016/j.tet.2021.132315

14. "A Colorimetric Method for Quantifying Cis and Trans Alkenes Using an Indicator Displacement Assay" Stephanie A. Valenzuela, Hannah S. N. Crory, Chao-Yi Yao, **James R. Howard**, Gabriel Saucedo, A. Prasanna de Silva, Eric V. Anslyn. *Angew. Chem. Int. Ed.*, **2021**. DOI: 10.1002/anie.202101004

15. "Air-Stable $[(R_3P)PdCl_2]_2$ Complexes of Neopentylphosphines as Cross-Coupling Precatalysts: Catalytic Application and Mechanism of Catalyst Activation and Deactivation" Kerry L. Barnett, **James R. Howard**, Colin J. Treager, Adam T. Shipley, Renee M. Stullich, Fengrui Qu, Deidra L. Gerlach, and Kevin H. Shaughnessy. *Organometallics*, **2018**. DOI: 10.1021/acs.organomet.8b00082

SERVICE AND LEADERSHIP

1. *Mentor*, Howard Hughes Medical Institute *2020 - 2023*
   - Led professional development activities for undergraduate researchers
   - Directed efforts of multiple undergraduate researchers towards publication
2. *President*, Student Chapter of the ACS, University of Alabama *2018*
   - Oversaw educational, travel, professional development, and outreach activities
   - Organized chemistry professional and academic help groups for new students
3. *Outreach Chair*, Student Chapter of the ACS, University of Alabama *2017*
   - Organized outreach events and experiments
   - Raised over $1,200 in outreach funding for student ACS chapter

GRADUATE STUDENTS

1. Seth Derscha (2026 – present)

UNDERGRADUATE RESEARCHERS

1. Arya A. Bhakare (2020 - 2022), *Graduate school in Chemistry, Princeton*
2. Zara Akhtar (2020 - 2022), *Medical school*

TEACHING EXPERIENCE

1. *Teaching Assistant*, Organic Chemistry Laboratory (2018-2019)
2. *Teaching Assistant*, Physical Organic Chemistry (2021)
3. *CHEM 675 – Special Topics in Organic Chemistry, Modern Physical Organic Chemistry* (2026)

FINANCIAL SUPPORT

Past support:

Agency/Award #	Project Title	Project Period	Total Project Amount	Annual Project Amount	Role
NIH/1F32GM154442-01A1	A Data-Driven Approach to Protein Engineering of Aminotransferase ARO8	01/01/2025 – 01/01/2027	$148,112	$73,828-$74,248	PI