

Lauren D. Hagler

Curriculum Vitae

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Education

Aug 2015 – May 2020 Ph.D. Chemistry, University of Illinois at Urbana-Champaign, Urbana, IL
Jan 2012 – May 2015 B.S. Chemistry, cum laude, The University of Alabama, Tuscaloosa, AL
Aug 2010 – Dec 2011 Agnes Scott College, Decatur, GA

Research Experience

- 09/2022 – present **HHMI Hanna H. Gray Fellow**, Stanford University School of Medicine
Research Mentors: Prof. Dan Herschlag (Stanford) and Prof. Silvi Rouskin (Harvard Medical School)
- Developed a quantitative method to measure RNA folding thermodynamics in cells using chemical probing
- 07/2020 – 8/2022 **Stanford Propel Postdoctoral Scholar**, Stanford University School of Medicine
Advisor: Prof. Dan Herschlag
- Derived a full thermodynamic model to predict the binding affinity of an RNA-binding protein to any RNA sequence
- 08/2015 - 05/2020 **Graduate Research Assistant**, University of Illinois at Urbana-Champaign
Advisor: Prof. Steven C. Zimmerman
Dissertation Title: Relating Structure and Function: Discovery of Novel Inhibitors of Myotonic Dystrophy
- Developed a simple computational protocol to understand the binding of small molecule ligands to RNA and DNA
 - Established a method to detect multivalent inhibitors from smaller ligand fragments using template-assisted click reactions
 - Discovered novel bidirectional inhibitors of CTG repeat transcription
- 08/2013 - 05/2015 **Undergraduate Research Assistant**, The University of Alabama
Advisor: Prof. Silas C. Blackstock

Teaching Experience

- 2017 **Graduate Teaching Assistant**, University of Illinois at Urbana-Champaign
Discussion Instructor for Organic Chemistry I
- 2015-2016 **Graduate Teaching Assistant**, University of Illinois at Urbana-Champaign
Discussion Instructor for Organic Chemistry II
Teachers Ranked as Excellent, Fall 2015
- 2014 **Student Assistant**, The University of Alabama
Office of Disability Services, General Chemistry I
- 2014 **Grading Teaching Assistant**, The University of Alabama
Organic Chemistry Laboratory

Awards and Honors

- HHMI Hanna H. Gray Fellow, 2022-2028
- Stanford Propel Postdoctoral Scholar, Stanford School of Medicine, 2021-2023
- NIH Research Supplement to Promote Diversity, NIGMS, 2020-2021
- Women in Chemistry (WIC) Inclusive Leadership Award, 2019
- NIH Research Supplement to Promote Diversity, NIAMS, 2018-2020
- Novartis Fellowship, 2018-2019
- Sloan Research Prize Fellowship, 2018-2019
- Ford Foundation Fellowship Program Honorable Mention, 2017
- NIH Chemistry-Biology Interface Training Program Fellowship, 2016-2018
- Alfred P. Sloan Foundation's Minority Ph.D. (MPHD) Program Sloan Scholar, 2015-2016
- American Chemical Society Scholar, 2014-2015

Service and Career Development

- National Organization for the Professional Advancement of Black Chemists and Chemical Engineers President, UIUC, 2019-2020; Graduate Student Liaison, UIUC, 2018-2019
- Diversity Committee, UIUC Department of Chemistry, 2018-2019
- Sylvia M. Stoesser Lecture Committee, UIUC Department of Chemistry, 2018-2019
- Sloan University Center for Exemplary Mentoring Peer Mentor, UIUC, 2016-2019
- Retreat for Graduate Women Committee, UIUC Department of Chemistry, 2018
- Assistant Director for Graduate Diversity and Program Climate Search Committee, UIUC Department of Chemistry, 2017-2018
- Chemistry Poster Judge, Annual Biomedical Research Conference for Minority Students (ABRCMS), 2017-2018
- Bonding with Chemistry Girl's Day Camp Volunteer, Women Chemist Committee, 2015-2019
- Senate Admissions Committee, UIUC, 2016-2017
- Summer Pre-Doctoral Institute Associate Fellow, UIUC Graduate College, 2015

Publications

1. **Hagler, L.D.**; Dülk, S.L.; Grote, S.; Martin, Y.; Herschlag, D.; Rouskin, S. A high-throughput biochemical approach to derive a predictive model of RNA-folding in cells. *Manuscript in preparation*.
2. Martin, Y.; Grote, S.; Allan, M.; **Hagler, L.D.**[‡]; Rouskin, S.[‡] dreemCAT: A practical cloud-based analysis tool for analyzing RNA chemical probing data. ([‡] Co-corresponding authors). *Manuscript in preparation*.
3. Sadée, C.*; **Hagler, L.D.***; Becker, W.R.; Jarmoskaite, I.; Vaidyanathan, P.P.; Denny, S.K.; Greenleaf, W.J.; Herschlag, D. A comprehensive thermodynamic model for RNA binding by the *Saccharomyces cerevisiae* Pumilio protein PUF4. *Nat. Commun.* **2022**, *13*, 4522. (*Authors contributed equally)
4. **Hagler, L.D.**; Krueger, S.B.; Luu, L.M.; Lanzendor, A.M.; Mitchell, N.L.; Vergara, J.I.; Curet, L.D.; Zimmerman, S.C. Versatile Target-guided Screen for Discovering Multivalent, Bidirectional Transcription Inhibitors of a Trinucleotide Repeat Disease. *ACS Med. Chem. Lett.* **2021**, *12*, 935-940.
5. **Hagler, L.D.***; Luu, L.M.*; Tonelli, M.; Lee, J.; Hayes, S.; Serrano, J.F.; Vergara, I.; Bonson, S.E.; Butcher, S.E.; Zimmerman, S.C. Expanded DNA and RNA Trinucleotide Repeats in Myotonic Dystrophy Type 1 Select Their Own Multitarget, Sequence-Selective Inhibitors. *Biochemistry* **2020**, *59*, 3463-3472. (*Authors contributed equally)

6. Chien, C.; Wu, P.; Stange, R.; Chang, C.; Lai, Z.; Hagler, L.D.; Zimmerman, S.C.; Hou, M. Structural Basis for Targeting T:T Mismatch with Triaminotriazine-acridine Conjugate Induces a U-shaped Head to Head Four-Way Junction in CTG Repeat DNA. *J. Am. Chem. Soc.* **2020**, *142*, 11165-11172.
7. **Hagler, L.D.**; Bonson, S.E.; Koechiril, P.; Zimmerman, S.C. Assessing the Feasibility of U-base Flipping in RNA-small Molecule Complexes Using Molecular Dynamics Simulations. *Can. J. Chem.* **2020**, *98*, 261-269.
8. Montemayor, E.J.; Virta, J.M.; Hagler, L.D.; Zimmerman, S.C.; Butcher, S.E. Structure of an RNA Helix with Pyrimidine Mismatches and Cross-strand Stacking. *Acta Cryst.* **2019**, *F75*, 652-656.
9. Serrano, J.F.; Lee, J.; Curet, L.D.; Hagler, L.D.; Bonson, S.E.; Schuster, E.; Zimmerman, S.C. Development of Novel Macrocyclic Small Molecules that Target CTG Trinucleotide Repeats. *Bioorg. Med. Chem.* **2019**, *27*, 2978-2984.
10. Lee, J.; Bai, Y.; Chembazhi, U.V.; Peng, S.; Yum, K.; Luu, L.M.; Hagler, L.D.; Serrano, J.F.; Chan, H.Y.E.; Kalsotra, A.; Zimmerman, S.C. Intrinsically Cell-penetrating Multivalent and Multitargeting Ligands for Myotonic Dystrophy Type 1. *Proc. Natl. Acad. Sci.* **2019**, *116*, 8709-8714.
11. Bai, Y.; Nguyen, L.T.; Song, Z.; Peng, S.; Lee, J.; Zheng, N.; Kapoor, I.; Hagler, L.D.; Cai, K.; Cheng, J.; Chan, H.Y.E.; Zimmerman, S.C. Integrating Display and Delivery Functionality with a Cell Penetrating Peptide Mimic as a Scaffold for Intracellular Multivalent Multitargeting. *J. Am. Chem. Soc.* **2016**, *138*, 9498-9507.

Selected Presentations

- “Helping People through RNA Chemical Biology and Structure” **2nd Annual Future Faculty Symposium**, MIT Department of Chemistry, Cambridge, MA, August 2023.
- “Helping People through RNA Chemical Biology and Structure” **St. Elmo Brady Postdoctoral Inclusive Excellence Symposium**, University of Illinois at Urbana-Champaign, Champaign, IL, June 2023.
- “High-throughput Biochemical Measurements of RNA Folding in Cells” **28th Annual Meeting of the RNA Society**, Singapore May 2023.
- “Discovery of Multivalent, Bidirectional Transcription Inhibitors for Myotonic Dystrophy Type 1 (DM1)” **National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCCChE) 2019 National Meeting**, St. Louis, MO, November 2019.
- “Template-Assisted Click Chemistry as a Therapeutic Strategy for Myotonic Dystrophy Type 1 (DM1)” **258th ACS National Meeting & Exposition**, San Diego, CA, August 2019
- “Discovery of Multivalent, Bidirectional Transcription Inhibitors for Myotonic Dystrophy Type 1 (DM1)” **Bioorganic Chemistry Gordon Research Conference**, Andover, NH, June 2019.
- “Template-Assisted Click Chemistry as a Method for Discovering Small Molecule Therapeutics for Myotonic Dystrophy Type 1 (DM1).” **National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCCChE) 2018 National Meeting**, Orlando, FL, September 2018.
- “Analyzing Base Flip-Out Complexes Between RNA and DNA and Small Molecule Ligands through Docking and Molecular Dynamics Simulation.” **National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCCChE) 2016 National Meeting**, Raleigh, NC, November 2016