

# JEFFREY M LOTTHAMMER

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## EDUCATION

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**Washington University in St. Louis**  
PhD Candidate in Computational Systems Biology  
Department of Biochemistry and Molecular Biophysics

August 2020 - Present

**The Ohio State University**  
B.S. *with Honors Research Distinction* in Biochemistry  
*Thesis: Molecular Dynamics Simulations of the Inner-Ear Hair-Cell Mechanotransduction Apparatus*

2016 - 2020  
*Magna Cum Laude*

## RESEARCH EXPERIENCE

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**Washington University in St. Louis**  
*Graduate Research Fellow*  
Advisor: Dr. Alex S. Holehouse

St. Louis, Missouri  
July 2022 - March 2026 (expected)

**Washington University in St. Louis**  
*Graduate Student*  
Advisor: Dr. Gregory R. Bowman

St. Louis, Missouri  
March 2021 - June 2022

**The Ohio State University University**  
*Undergraduate Research Fellow*  
Advisor: Dr. Marcos Sotomayor

Columbus, Ohio  
2018 - August 2020

## PUBLICATIONS

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\* indicates co-first authors

Novak, B.\*; **Lotthammer, J. M.\***; Emenecker, R. J.; Holehouse, A. S. Accurate Predictions of Conformational Ensembles of Disordered Proteins with STARLING. *bioRxiv*, 2025, 2025.02.14.638373. <https://doi.org/10.1101/2025.02.14.638373>.

**Lotthammer, J. M.**; Holehouse, A. S. Disentangling Folding from Energetic Traps in Simulations of Disordered Proteins. *bioRxiv*, 2024, 2024.11.06.622270. <https://doi.org/10.1101/2024.11.06.622270>

**Lotthammer, J. M.**; Hernández-García, J.; Griffith, D.; Weijers, D.; Holehouse, A. S.; Emenecker, R. J. Metapredict Enables Accurate Disorder Prediction across the Tree of Life. *bioRxiv*, 2024, 2024.11.05.622168. <https://doi.org/10.1101/2024.11.05.622168>

Romero-Pérez, P. S.; Moran, H. M.; Horani, A.; Truong, A.; Manriquez-Sandoval, E.; Ramirez, J. F.; Martinez, A.; Gollub, E.; Hunter, K.; **Lotthammer, J. M.**; Emenecker, R. J.; Boothby, T. C.; Holehouse, A. S.; Fried, S. D.; Sukenik, S. Protein Surface Chemistry Encodes an Adaptive Resistance to Desiccation. *bioRxiv* 2024, <https://doi.org/10.1101/2024.07.28.604841>

DelRosso, N.; Suzuki, P. H.; Griffith, D.; **Lotthammer, J. M.**; Novak, B.; Kocalar, S.; Sheth, M. U.; Holehouse, A. S.; Bintu, L.; Fordyce, P. High-Throughput Affinity Measurements of Direct Interactions between Activation Domains and Co-Activators. *bioRxiv* 2024. <https://doi.org/10.1101/2024.08.19.608698>

Ginell, G. M.; Emenecker, R. J.; **Lotthammer, J. M.**; Usher, E. T.; Holehouse, A. S. Direct Prediction of Intermolecular Interactions Driven by Disordered Regions. *bioRxiv* 2024. <https://doi.org/10.1101/2024.06.03.597104>.

Keeley, A. T.; **Lotthammer, J. M.**; Pelham, J. F. Rhythmidia: A Modern Tool for Circadian Period Analysis of Filamentous Fungi. *PLoS Comput. Biol.* 2024, 20 (8), e1012167. <https://doi.org/10.1371/journal.pcbi.1012167>

**Lotthammer, J. M.\***; Ginell, G. M.\*; Griffith, D.\*; Emenecker, R. J.; Holehouse, A. S. Direct Prediction of Intrinsically Disordered Protein Conformational Properties from Sequence. *Nat Methods* (2024). <https://doi.org/10.1038/s41592-023-02159-5>

Giese, A. P. J.; Weng, W.-H.; Kindt, K. S.; Chang, H. H. V.; Montgomery, J. S.; Ratzan, E. M.; Beirl, A. J.; Rivera, R. A.; **Lotthammer, J. M.**; Walujkar, S.; Foster, M. P.; Zobeiri, O. A.; Holt, J. R.; Riazuddin, S.; Cullen, K. E.; Sotomayor, M.; Ahmed, Z. M. (2023) Complexes of vertebrate TMC1/2 and CIB2/3 proteins form hair-cell mechanotransduction cation channels *eLife* 12:RP89719 <https://doi.org/10.7554/eLife.89719.1>

Lehman, S. J.; Meller, A.; Solieva, S. O.; **Lotthammer, J. M.**; Greenberg, L.; Langer, S. J.; Greenberg, M. J.; Tardiff, J. C.; Bowman, G. R.; Leinwand, L. Divergent Molecular Phenotypes in Point Mutations at the Same Residue in Beta-Myosin Heavy Chain Lead to Distinct Cardiomyopathies. *bioRxiv* 2023. <https://doi.org/10.1101/2023.07.03.547580>.

Meller, A.; **Lotthammer, J. M.**; Smith, L. G.; Novak, B.; Lee, L. A.; Kuhn, C. C.; Greenberg, L.; Leinwand, L. A.; Greenberg, M. J.; Bowman, G. R. Drug Specificity and Affinity Are Encoded in the Probability of Cryptic Pocket Opening in Myosin Motor Domains. *Elife* 2023, 12. <https://doi.org/10.7554/eLife.83602>

Meller, A.; Ward, M.; Borowsky, J.; Kshirsagar, M.; **Lotthammer, J. M.**; Oviedo, F.; Ferres, J. L.; Bowman, G. R. Predicting Locations of Cryptic Pockets from Single Protein Structures Using the PocketMiner Graph Neural Network. *Nat. Commun.* 2023, 14 (1), 1–15. <https://doi.org/10.1038/s41467-023-36699-3>

Lee, L. A.; Barrick, S. K.; Meller, A.; Walklate, J.; **Lotthammer, J. M.**; Tay, J. W.; Stump, W. T.; Bowman, G.; Geeves, M. A.; Greenberg, M. J.; Leinwand, L. A. Functional Divergence of the Sarcomeric Myosin, MYH7b, Supports Species-Specific Biological Roles. *J. Biol. Chem.* 2023, 299 (1), 102657. <https://doi.org/10.1016/j.jbc.2022.102657>

Walujkar, S.\*; **Lotthammer, J. M.\***; Nisler, C. R.; Sudar, J. C.; Ballesteros, A.; Sotomayor, M. In Silico Electrophysiology of Inner-Ear Mechanotransduction Channel TMC1 Models. *bioRxiv*, 2021, 2021.09.17.460860. <https://doi.org/10.1101/2021.09.17.460860>

## SCHOLARSHIPS AND AWARDS

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<b>Travel Award</b> <i>Fellows Biophysical Research Conference at the NIH</i>	September 2024
<b>Best Poster Award</b> <i>Biophysics and Biology of Intrinsically Disordered Proteins Gordon Research Conference</i>	June 2024
<b>Frontera Computational Science Fellowship</b> <i>Texas Advanced Computing Center (TACC)</i>	April 2024
<b>D.E. Shaw Research Fellowship</b> <i>D.E. Shaw Research</i>	March 2024
<b>Student Research Achievement Award (Intrinsically Disordered Proteins)</b> <i>The Biophysical Society</i>	February 2024
<b>68th Annual Biophysical Society Meeting Travel Award</b> <i>The Biophysical Society</i>	November 2023
<b>Biochemistry and Molecular Biophysics Professional Development Grant</b> <i>WUSTL: Department of Biochemistry and Molecular Biophysics</i>	November 2023
<b>NSF Graduate Research Fellowship</b> <i>The National Science Foundation</i>	April 2022
<b>Student Research Achievement Award (Mechanobiology)</b> <i>The Biophysical Society</i>	February 2020
<b>64th Annual Biophysical Society Meeting Travel Award</b> <i>The Biophysical Society</i>	February 2020
<b>Undergraduate Research Scholarship</b> <i>College of Arts and Sciences: Honors Program</i>	August 2019 - May 2020
<b>The Gary Booth Scholarship Fund</b> <i>Department of Chemistry and Biochemistry</i>	August 2019 - May 2020
<b>The Charles W. Medick Scholarship</b> <i>The Ohio State University</i>	August 2019 - May 2020
<b>Mayer's Summer Research Fellowship</b> <i>College of Arts and Sciences: Natural and Mathematical Sciences</i>	May 2019 - August 2019
<b>Mayer's Summer Research Fellowship</b> <i>College of Arts and Sciences: Natural and Mathematical Sciences</i>	May 2018 - August 2018

## ORAL PRESENTATIONS

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<b>38th Gibbs Conference on Biothermodynamics</b> Disentangling folding from energetic traps in simulations of disordered proteins	Carbondale, Illinois
<b>MGG/CSB/HSG/BIDS Retreat 2023</b> Direct Prediction of Intrinsically Disordered Protein Conformational Properties from Sequence	Grafton, Illinois
<b>Chodera Lab Group Meeting - Memorial Sloan Kettering Cancer Center</b> Direct Prediction of Intrinsically Disordered Protein Conformational Properties from Sequence	Manhattan, New York
<b>SMBp Group Meeting - Flatiron Institute</b> Direct Prediction of Intrinsically Disordered Protein Conformational Properties from Sequence	Manhattan, New York
<b>Biochemistry and Molecular Biophysics Science Friday</b> Adaptive Sampling of the Actomyosin Mechanochemical Cycle	St. Louis, Missouri
<b>Autumn Undergraduate Research Festival</b> A Molecular Movie of Auditory Transduction in Inner-Ear Hair Cells	Columbus, Ohio

## POSTERS

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<b>68th Annual Biophysical Society National Conference</b> Direct Prediction of Intrinsically Disordered Protein Conformational Properties from Sequence	Philadelphia, Pennsylvania February 10 <sup>th</sup> - 14 <sup>th</sup> , 2024
<b>MOLSSI: Machine Learning and Chemistry - Are We There Yet?</b> Direct Prediction of Intrinsically Disordered Protein Conformational Properties from Sequence	College Park, Maryland May 31 <sup>st</sup> - June 2 <sup>nd</sup> , 2023
<b>67th Annual Biophysical Society National Conference</b> Quantifying Local Conformational Heterogeneity in Simulations of Disordered Proteins	San Diego, California February 18 <sup>th</sup> - 22 <sup>nd</sup> , 2023
<b>66th Annual Biophysical Society National Conference</b> Exploring the Myosin Active/Auto-inhibited State Equilibrium by Markov State Modeling	San Francisco, California February 18 <sup>th</sup> - 23 <sup>rd</sup> , 2022
<b>64th Annual Biophysical Society National Conference</b> <i>In-Silico</i> Electrophysiology of Inner-Ear Mechanotransduction Channel TMC1 Models	San Diego, California February 15 <sup>th</sup> - 19 <sup>th</sup> , 2020
<b>63rd Annual Biophysical Society National Conference</b> Ion Permeation in Molecular Dynamics Simulations of TMEM16-based TMC1 Homology Models	Baltimore, Maryland March 2 <sup>nd</sup> - 6 <sup>th</sup> , 2019

## TEACHING EXPERIENCE

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<b>Structural Bioinformatics of Proteins</b> Assistant in Instruction for Dr. Craig Smith	August 2022 - Spring 2024
<b>Chemistry and Physics of Biomolecules</b> Assistant in Instruction for Dr. Jay Ponder	August 2021 - December 2021

## COMMUNITY OUTREACH

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<b>Washington University in St. Louis</b> <i>Summer Undergraduate Research Group Experience Committee</i>	St. Louis, Missouri March 2023 - Present
<b>Washington University in St. Louis</b> <i>Diversity, Equity and Inclusion Committee</i>	St. Louis, Missouri March 2023 - Present
<b>Washington University in St. Louis</b> <i>Young Scientists Program</i>	St. Louis, Missouri May 2021 - August 2021

**The Ohio State University**  
*Undergraduate Research Ambassador*

Columbus, Ohio  
August 2019 - May 2020

**The Ohio State University**  
*College of Arts and Sciences: Honors Student Peer Mentor*

Columbus, Ohio  
March 2019 - May 2020

**The Ohio State University**  
*BuckeyeThon Liaison*

Columbus, Ohio  
March 2018 - May 2020

**SeriousFun Children's Network**  
*Student Volunteer*

Columbus, Ohio  
September 2017 - May 2020