

Daniel W Hogan

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EDUCATION

PH.D., APPLIED PHYSICS STANFORD UNIVERSITY
 2020 | Stanford, CA

B.S., PHYSICS, WITH HONOR CALIFORNIA INSTITUTE OF TECHNOLOGY
 2013 | Pasadena, CA

EXPERIENCE

BIOINFORMATICS PROGRAMMER UNIVERSITY OF CALIFORNIA, SAN FRANCISCO
 2020-present | Advised by Prof. James Fraser

- Software development for a structural biology lab
- Development of data analysis pipelines
- Administration of both local and cloud computational infrastructure

GRADUATE RESEARCH DEVELOPMENT OF SINGLE-MOLECULE TECHNIQUES AND THEIR APPLICATION TO BIOPHYSICAL QUESTIONS
 2013-present | Advised by Prof. Steven Block

- Computer simulation of intraflagellar transport
- Characterization of tertiary interactions during ligand binding by the TPP riboswitch
- Design of a combined optical trap and single-molecule FRET instrument
- Design of a single-molecule assay to study RNAP conformational changes during elongation
- Development of data analysis pipelines

UNDERGRADUATE RESEARCH HIGH-PRECISION PHOTOACOUSTIC SPECTROSCOPY AND FREQUENCY-STABILIZED CAVITY RINGDOWN SPECTROSCOPY
 2011-2013 | Advised by Prof. Mitchio Okumura

- Design and construction of photoacoustic and cavity ringdown spectrometers
- Data collection in support of NASA's Orbiting Carbon Observatory mission

TEACHING AND CURRICULUM DEVELOPMENT CALTECH AND STANFORD
 2010-2019 | 14 terms

- Stanford: Advanced Imaging Lab in Biophysics, Science as a Creative Process, and The Science of MythBusters
- Caltech: Physics Laboratory (Electromagnetic Phenomena) and Advanced Physics Laboratory

COMPUTER SYSTEMS ADMINISTRATION INTERNSHIP UNIVERSITY OF UTAH CENTER FOR HIGH PERFORMANCE COMPUTING
 2010

SKILLS

PHYSICAL AND LIFE SCIENCES

- Optical instrument design and construction
- Proficient in molecular biology techniques
- Design and implementation of biophysical assays
- Computer simulation of biological and physical processes

COMPUTER SCIENCE

- Python, with in-depth knowledge of numpy, matplotlib, and scipy (>10 years)

- Administration of Linux systems and web services (>15 years)
- Experience with web design
- Proficient with GNU coreutils, git, and L^AT_EX
- Experience developing for microcontrollers

RELEVANT COURSEWORK

STANFORD UNIVERSITY

- Applied Physics 205: Introduction to Biophysics
- Applied Physics 236: Biophysics by the Numbers
- Applied Physics 232: Advanced Imaging Lab in Biophysics
- Applied Physics 315: Methods in Computational Biology
- Applied Physics 345: Advanced Numerical Methods for Data Analysis and Simulation
- Applied Physics 392: Topics in Molecular Biophysics: Biophysics of Functional RNA
- Computational and Mathematical Engineering 211: Programming for Scientists and Engineers
- Computer Science 371: Computational Biology in Four Dimensions
- Genetics 211: Genomics

CALIFORNIA INSTITUTE OF TECHNOLOGY

- Applied and Computational Mathematics 95/100: Introductory Methods of Applied Mathematics
- Applied and Computational Mathematics 116: Introduction to Stochastic Processes and Modeling
- Chemistry 135: Chemical Dynamics
- Physics 5/105: Analog Electronics for Physicists
- Physics 106: Advanced Mechanics and Electrodynamics
- Physics 125: Quantum Mechanics
- Physics 172: Research in Experimental Physics

PUBLICATIONS

- [1] Thanh Q. Bui, David A. Long, Agata Cygan, Vincent T. Sironneau, Daniel W. Hogan, Priyanka M. Rupasinghe, Roman Ciuryto, Daniel Lisak, and Mitchio Okumura. "Observations of Dicke narrowing and speed dependence in air-broadened CO₂ lineshapes near 2.06 μm". In: *The Journal of Chemical Physics* 141.17 (2014), p. 174301. doi: 10.1063/1.4900502.
- [2] Van K. Duesterberg, Irena T. Fischer-Hwang, Christian F. Perez, Daniel W. Hogan, and Steven M. Block. "Observation of long-range tertiary interactions during ligand binding by the TPP riboswitch aptamer". In: *eLife* 4 (2015), e12362. doi: 10.7554/eLife.12362.
- [3] Bojan Milic, Johan O. L. Andreasson, Daniel W. Hogan, and Steven M. Block. "Intraflagellar transport velocity is governed by the number of active KIF17 and KIF3AB motors and their motility properties under load". In: *Proceedings of the National Academy of Sciences of the United States of America* 114 (2017), E6830. doi: 10.1073/pnas.1708157114.
- [4] Blake T. Riley, Stephanie A. Wankowicz, Saulo H. P. de Oliveira, Gydo C. P. van Zundert, Daniel W. Hogan, James S. Fraser, Daniel A. Keedy, and Henry van den Bedem. "qFit3: protein and ligand multiconformer modeling for X-ray crystallographic and single-particle cryo-EM density maps". In: *Protein Science* 30.1 (2020), pp. 270–285. doi: 10.1002/pro.4001.
- [5] Stephanie A. Wankowicz, Saulo H. de Oliveira, Daniel W. Hogan, Henry van den Bedem, and James S. Fraser. "Ligand binding remodels protein side chain conformational heterogeneity". In: *eLife* 11 (2022), e74114. doi: 10.7554/eLife.74114.