

Amy Wang

CONTACT INFORMATION	Personal E-mail: amywangsci@gmail.com Website: https://amywangsci.github.io	Work E-mail: wanga84@gene.com
PROFESSIONAL SUMMARY	Computational scientist with expertise in combining biophysical frameworks with advanced AI/ML approaches. Extensive experience in wet-lab techniques including protein biochemistry, high-resolution biophysical protein characterization, mouse models, device fabrication, and nanoparticle synthesis. Unique dual background bridges computational methods and applications in therapeutic development.	
EDUCATION	Stanford University , Stanford, CA Ph.D., Chemical Engineering Thesis: Mechanisms governing the force-dependent interactions between α E-catenin and F-actin Advisors: William Weis (Depts. Structural Biology, Molecular and Cellular Physiology) Alexander Dunn (Dept. Chemical Engineering, Biophysics program) Massachusetts Institute of Technology , Cambridge, MA Bachelor of Science in Chemical Engineering, Minor in Polymers and Soft Matter	2018-2023 2014-2018
RESEARCH EXPERIENCE	Genentech, Prescient Design <i>Senior ML Scientist, Large Molecule Drug Discovery</i> • Design training datasets that underlie ML method development, strategically shaping project directions and computational approaches • Develop and implement novel AI/ML frameworks on a wide range of practical problems, from data efficiency in optimization settings to property prediction relevant to therapeutic developability • Collaborate cross-functionally with protein engineers, structural biologists, and computational scientists on active drug discovery portfolio projects Stanford University <i>Graduate Student Researcher</i> Advisors: William Weis & Alexander Dunn • Characterized key structural determinants of force-dependent cell adhesion mechanisms using single molecule force spectroscopy (SMFS) and quantitative biochemical assays • Developed theoretical framework explaining how cooperative molecular interactions generate catch bonds, advancing understanding of adhesion biology mechanics in physiological shear conditions • Devised an pipeline which increased data collection and analysis throughput by 10x • Built a custom single-channel epi-fluorescent microscope Microsoft Research New England <i>BioML Research Intern</i> Advisors: Kevin Yang, Ava Amini & Alex Lu • Conceptualized and implemented integration of biophysical features into graph neural networks for protein property prediction • Presented findings at <i>NeurIPS Machine Learning for Structural Biology</i> Workshop showing Rosetta computed features improve out-of-distribution prediction on two benchmark tasks	South San Francisco, CA March 2023-Present Stanford, CA Apr 2019-March 2023 Cambridge, MA (Virtual) Jun-Sept 2022

Stanford University

Rotation Student

Advisor: Ron Dror

Stanford, CA

Jan-Apr 2019

- Conducted molecular dynamics simulations of membrane protein ion transport, contributing to findings published in Nature

PUBLICATIONS AND PREPRINTS N.C. Frey, I. Hötzel, S.D. Stanton, R. Kelly, R.G. Alberstein, ..., **A. Wang**, ..., A. Regev, Y. Wu, K. Cho, R. Bonneau, V. Gligorijević. Lab-in-the-loop therapeutic antibody design with deep learning. *bioRxiv* 2025.

A.A. Ismail, T. Oikarinen, **A. Wang**, J. Adebayo, S.D. Stanton, H.C. Bravo, K. Cho, N.C. Frey. Concept Bottleneck Language Models For Protein Design. *International Conference on Learning Representations (ICLR)* 2025.

C. Wang, M. Uehara, Y. He, **A. Wang**, A. Lal, T. Jaakola, S. Levine, A. Regev, H. Wang, T. Biancalani. Fine-tuning discrete diffusion models via reward optimization with applications to DNA and protein design. *International Conference on Learning Representations (ICLR)* 2025.

NA Bax*, **A Wang***, DL Huang, S Pokutta, AR Dunn, WI Weis. Multi-level force-dependent allosteric enhancement of α E-catenin binding to F-actin by vinculin. *Journal of Molecular Biology* 2023. [Link]

A Wang, AR Dunn, WI Weis. Mechanism of the cadherin-catenin F-actin catch bond interaction. *eLife* 2022. [Link]

S Bose, LR Volpatti*, D Thiono*, V Yesilyurt, C McGladrigan, Y Tang, A Facklam, **A Wang**, S Jhunjhunwala, O Veisheh, J Hollister-Lock, C Bhattacharya, GC Weir, DL Greiner, R Langer, DG Anderson. A retrievable implant for the long-term encapsulation and survival of therapeutic xenogeneic cells. *Nat. Biomed. Eng.* 2020. [Link]

TA Chew*, BJ Orlando*, J Zhang*, NR Latorraca, **A Wang**, SA Hollingsworth, DH Chen, RO Dror, M Liao, L Feng. Structure and mechanism of the cation-chloride cotransporter NKCC1. *Nature* 2019 572:488-492. [Link]

A Huang, JM Paloni, **A Wang**, AC Obermeyer, HV Sureka, H Yao, BD Olsen. Predicting protein-polymer block copolymer self-assembly from protein properties. *Biomacromolecules* 2019, 20, 10, 3713-3723. [Link]

S Chopra, N Bertrand, J Lim, **A Wang**, O Farokhzad, R Karnik. Design of insulin-loaded nanoparticles enabled by multistep control of nanoprecipitation and zinc chelation. *ACS Applied Materials & Interfaces* 2017 9 (13), 11440-11450. [Link]

WORKSHOP PAPERS **A Wang**, Z. Sang, S.D. Stanton, J.L. Hofmann, S. Izadi, E. Park, J. Ludwiczak, M. Kirchmeyer, D. Davidson, A. Maier, T. Pritsky, N.C. Frey, A.M. Watkins, F. Seeger. A guided design framework for the optimization of therapeutic-like antibodies. *Generative and Experimental Perspectives for Biomolecular Design, ICLR* 2025.

Z. Ma, D. Davidson, **A Wang**, N. Frey, F. Seeger. The effects of structural conditioning on antibody inverse Folding. *Women in ML Workshop, NeurIPS* 2023.

A Wang, AP Amini, AX Lu, KK Yang. Learning from physics-based features improves protein property prediction. *Machine Learning in Structural Biology Workshop, NeurIPS* 2022. [Link]

OTHER WORK EXPERIENCE

Stanford Office of Technology Licensing Stanford, CA
Intern Oct 2021-Oct 2022

- Evaluated invention disclosures, analyzed patent landscape, and prepared marketing abstracts

Merck Research Labs West Point, PA
Discovery Pharmaceutical Sciences Research Intern Jun-Sept 2017

Advisor: Lauren Austin

- Synthesized and characterized nanoparticles for RNA-based vaccine technologies
- Quantified kinetics of peptide and nucleic acid degradation *in-vitro*

Goldman Sachs New York, NY
Structured Credit Trading Analyst Intern Jan 2016

- Performed credit risk analyses and built financial valuation models

Massachusetts Institute of Technology Cambridge, MA
Undergraduate Researcher Jan 2016-Jun 2018

Advisor: Bradley Olsen

- Synthesized protein-polymer materials and quantified kinetics of functionalized proteins

Koch Institute of Integrative Cancer Research Cambridge, MA
Undergraduate Researcher 2014-2016

Advisors: Robert Langer & Rohit Karnik

- Synthesized and characterized nanoparticles to improve insulin encapsulation
- Mentored an undergraduate researcher in biological lab techniques

HONORS AND AWARDS

University Nominee for the Schmidt Science Fellows 2022

8 Stanford students nominated

Valuation of Public Companies in the Life Sciences Pitch Competition - First Place 2020

Stanford Graduate Fellowship in Science & Engineering 2018-2023

NSF Graduate Research Fellowship 2018-2023

ChemH Chemistry/Biology Interface Predoctoral Training Program 2018-2023

Tau Beta Pi Honors Society 2017

MIT Chemical Engineering Departmental BP Academic Achievement Award 2016

INVITED TALKS

Bay Area Cytoskeleton Symposium - Full Talk Oct 2022

Centre for Mechanochemical Cell Biology – Motors in Quarantine Talk Oct 2022

Stanford Chemical Engineering Convocation – Distinguished Graduate Speaker Sept 2022

Stanford Chemistry/Biology Interface Training Program Retreat June 2021

Stanford Molecular & Cellular Physiology – Science Friday Seminar Series March 2021

SERVICE AND LEADERSHIP

Stanford Graduate Life Office, Head Community Associate 2021-2023

Stanford Molecular & Cellular Physiology DEI Committee Liaison 2020-2022

Stanford Graduate Life Office, Community Associate 2019-2021

Bay Area Graduate Pathways to STEM Mentor & Panel Speaker 2018-2020

MIT AICHE Vice President, External Relations 2016-2018

MIT Undergraduate Advising & Academic Programming Steering Committee 2015-2017

SKILLS

Machine Learning

Bayesian optimization, generative modeling, parameter estimation, Monte Carlo simulation

Biophysical Modeling

PyMOL, PyRosetta, AMBER molecular dynamics

Experimental

Biophysical: Optical tweezers, SPR

Molecular biology: Mammalian and bacterial cell culture, FPLC, cloning, western blots, actin pelleting assays