Sonya M. Hanson, Ph.D.

email shanson@flatironinstitute.org **GitHub** sonyahanson **website** sonyahanson.com

EDUCATION

Ph.D. Biochemistry, University of Oxford 2009–2014
PIs: Kenton J. Swartz (NIH), Simon Newstead (Oxford), Mark. S.P. Sansom (Oxford)

B.S. Biophysics, Minor: Screenwriting, University of Southern California, *cum laude* 2005–2009

RESEARCH EXPERIENCE

Research Scientist/Project Leader, Structural and Molecular Biophysics, Flatiron Institute 2021–present

Postdoctoral Fellow, Department of Theoretical Biophysics, Max Planck Institute of Biophysics 2019–2020
PI: Gerhard Hummer.

Postdoctoral Fellow, Department of Biochemistry and Molecular Biophysics, Columbia University 2018
PI: Joachim Frank.

Postdoctoral Fellow, Comp. Biol. Memorial Sloan Kettering Cancer Center and Stony Brook University 2014–2017
PIs: John D. Chodera (MSKCC), Markus A. Seeliger (Stony Brook).

University of Southern California, PI: Lin Chen. 2007–09

Indiana University, PI: Santiago Schnell. 2005–07

ACADEMIC LEADERSHIP EXPERIENCE

Ad hoc reviewer, *Scientific Reports*, *Journal of Molecular Recognition* and *Journal of Theoretical Biology* 2017-18

Biophysical Society 61st Annual Meeting Platform Co-Chair: 'Protein Dynamics and Allostery I' 2017

Course Instructor 'Quantitative and computational biology' at Gerstner Sloan Kettering Graduate School 2016-17

MSKCC Postdoctoral Association Board Member 2015-16

Gordon Research Seminar 'Computer Aided Drug Design' - Discussion Leader 2015

Ad hoc reviewer, *Biochemistry* 2015

Biophysical Society 59th Annual Meeting Platform Co-Chair: 'Protein-Small Molecule Interactions' 2015

AWARDS AND HONORS

Marie Sklodowska-Curie Postdoctoral Fellowship (declined) 2020

Alexander von Humboldt Fellowship for Experienced Researchers 2020

Biophysical Society Committee for Professional Opportunities for Women (CPOW) Travel Award 2016

Materials Computation Center (MCC) Travel Award to attend "Molecular and chemical kinetics" workshop 2015

OXION: Ion Channels and Disease Initiative Day Poster Award 2013

Bursary Award to Attend 2013 4th RSC/SCI symposium on Ion Channels as Therapeutic Targets 2013

NIH-Oxford-Cambridge Biomedical Research Scholar 2009–14

Barry M. Goldwater Scholarship 2008

National Merit Finalist Presidential Scholarship from the University of Southern California 2005–09

SCIENCE COMMUNICATION ACTIVITIES

Facilitator at MozFest, London - *Open science in drug design: Analysis and visualization of an open dataset.* 2016

Volunteer at Rockefeller University's 'Science Saturday' - *Protein biochemistry super station* 2016

General Audience Lecture at Genspace NYC - *How computer programs can help us design better cancer drugs* 2016

Biophysical Society Annual Meeting Guest Blogger 2015-16

Demo Presenter at NYC Media Lab Annual Summit 2015

The Alan Alda Center for Communicating Science Boot Camp 2015

Founding Editor of the Oxbridge Biotech Roundtable Review: Editor in Chief 2011-12, Oxford Editor 2011-13 2011–13

TALKS

What makes a kinase promiscuous for inhibitors? 2019
2019 American Chemical Society National Meeting - San Diego, CA

What makes a kinase promiscuous for inhibitors? 2018
2018 Workshop on Free Energy Methods, Kinetics and Markov State Models in Drug Design - Cambridge, MA

Can we automatically detect biologically relevant order parameters in molecular simulation? 2017
Biophysical Society 61st Annual Meeting - New Orleans, LA

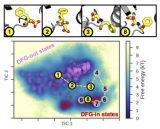
Developing high-throughput fluorescence-based assays for measuring kinase inhibitor free energies of binding 2015
Biophysical Society 59th Annual Meeting - Baltimore, MD

Tackling complex problems in small molecule recognition using computation and automated biophysical experiment 2014
Telluride TSRC 'Molecular Recognition' Workshop - Telluride, CO

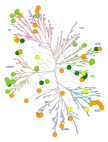
PUBLICATIONS

h-index: 11 / i10-index: 11 / first author: 6

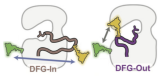
* asterisks denote that marked authors contributed equally



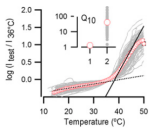
1. **Hanson SM***, Georghiou G*, Miller WT, Rest JS, Chodera JD, and Seeliger MA. What makes a kinase promiscuous for inhibitors? *Cell Chemical Biology* 26(3): 390-399.e5, 2019 · DOI · GitHub



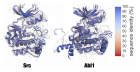
2. Albanese SK*, Parton DL*, Isik M, Rodriguez-Laureano L, **Hanson SM**, Gradia S, Jeans C, Levinson NM, Seeliger MA, and Chodera JD. An open library of human kinase domain constructs for automated bacterial expression. *Biochemistry* 57(31): 4675-4689, 2018 · DOI · GitHub



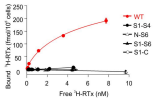
3. Ruff EF, Muretta JM, Thompson AR, Lake EW, Cyphers S, Albanese SK, **Hanson SM**, Behr JM, Thomas DD, Chodera JD, and Levinson NM. A dynamic mechanism for allosteric activation of Aurora kinase A by activation loop phosphorylation. *eLife* 7:e32766, 2018 · DOI · GitHub



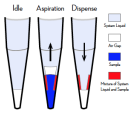
4. Zhang F, Jara-Oseguera A, Chang TH, Bae C, **Hanson SM**, and Swartz KJ. Heat activation is intrinsic to the pore domain of TRPV1. *Proceedings of the National Academy of Sciences* 115(2): E317-24, 2017 · DOI ·



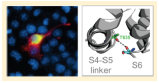
5. Parton DL, Grinaway PB, **Hanson SM**, Beauchamp KA, and Chodera JD. Ensembler: Enabling high-throughput molecular simulations at the superfamily scale. *PLoS Computational Biology* 12(6):e1004728, 2016 · DOI · GitHub



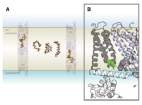
6. Zhang F*, **Hanson SM***, Jara-Oseguera A, Krepkiy D, Bae C, Pearce LV, Blumberg PM, Newstead S, and Swartz KJ. Engineering vanilloid-sensitivity into the rat TRPV2 channel. *eLife* 2016;10.7554/eLife.16409, 2016 · DOI ·



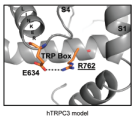
7. **Hanson SM**, Ekins S, and Chodera JD. Modeling error in experimental assays using the bootstrap principle: Understanding discrepancies between assays using different dispensing technologies. *Journal of Computer-Aided Molecular Design* 29(12):1073-86, 2015 · DOI · GitHub



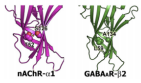
8. **Hanson SM**, Sansom MSP, and Becker EB. Modeling suggests TRPC3 hydrogen bonding and not phosphorylation contributes to the ataxia phenotype of the Moonwalker mouse. *Biochemistry* 54(26):4033-41, 2015 · DOI ·



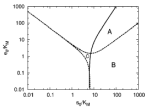
9. **Hanson SM**, Newstead S, Swartz KJ, and Sansom MSP. Capsaicin interaction with TRPV1 channels in a lipid bilayer: Molecular dynamics simulation. *Biophysical Journal*, 108(6):1425-34, 2015 · DOI ·
Selected for 'Best of 2015' reprint collection as one of 12 most-accessed articles in the Biophysical Journal in 2015.



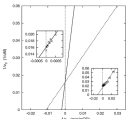
10. Fogel BF, **Hanson SM**, and Becker EB. Do mutations in the murine ataxia gene TRPC3 cause cerebellar ataxia in humans? *Movement Disorders*, 30(2):284–6, 2014 · DOI ·



11. Dellisanti CM, **Hanson SM**, Chen L, and Czajkowski C. Packing of the extracellular domain hydrophobic core has evolved to facilitate pentameric ligand-gated ion channel function. *The Journal of Biological Chemistry*, 286(5):3658–70, 2011 · DOI ·



12. **Hanson SM** and Schnell S. The reactant stationary approximation in enzyme kinetics. *The Journal of Physical Chemistry A*, 112:8654–58, 2008 · DOI ·



13. Schnell S and **Hanson SM**. A test for measuring the effects of enzyme inactivation. *Biophysical Chemistry*, 125:269–74, 2007 · DOI ·

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