

## Jerome M. Fox

Department of Chemical and Biological Engineering  
University of Colorado, Boulder  
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### Education

- Harvard University 2013-2015  
Postdoctoral Fellow, Department of Chemistry and Chemical Biology
- University of California, Berkeley 2012  
Ph.D., Chemical Engineering
- Johns Hopkins University 2007  
B.S., Environmental Engineering (with honors)  
2<sup>nd</sup> Major: Natural Science (concentration in chemistry)  
Minor: Mathematics

### Research and Professional Experience

- Assistant Professor, University of Colorado, Boulder 2016-pres.  
Department of Chemical and Biological Engineering
- Postdoctoral Fellow, Harvard University 2013-2015  
Department of Chemistry and Chemical Biology  
Advisor: George Whitesides  
Molecular recognition, complex systems, optical metamaterials
- Ph.D. Student, University of California, Berkeley 2007-2012  
Department of Chemical and Biomolecular Engineering  
Advisors: Doug Clark and Harvey Blanch  
Molecular-level investigations and mathematical modeling of enzymatic cellulose hydrolysis

### Honor and Awards

- Army-ECASE Award 2018
- ARO Young Investigator Award 2018
- NSF CAREER Award 2018
- NSF Graduate Fellow 2008-2011
- Best Student Poster Award, Symposium on Biotechnology for Fuels and Chemicals 2010
- Lucien Brush Award for Excellence in Environmental Engineering, Johns Hopkins University 2007
- Certificate in the Arts (theater), Johns Hopkins University 2007
- Tau Beta Pi, Engineering Honor Society 2006
- Vredenburg Scholar, University of Sydney, Australia 2006

### Professional Service

- Co-Chair, *Combinatorial Techniques in Protein Engineering*, AIChE Annual Meeting 2018
- Grant Review: NSF, CBET, Reaction Networks (2018); NSF, ad hoc (2017); Kentucky Science and Engineering Foundation (2016)
- Co-Chair and Area Coordinator, *Big Data and Biomanufacturing*, ACS National Meeting 2017
- Advisory panel, Public Policy for Undergraduates Learning and Engineering (PULSE) 2017-pres.
- Reviewer (*Biotechnology and Bioengineering*, *PNAS*, *J. Phys. Chem. B.*, *PLOS ONE*, *FEBS Letters*, *Bioprocess and Biosystems Engineering*, *Mathematical Biosciences*, *Annual Review of Chemical and Biomolecular Engineering*, *J. Med. Chem.*, *Biochemistry*) 2008-pres.
- Member, American Chemical Society 2015-pres.
- Member, American Institute of Chemical Engineers 2013-pres.

- Executive Board Member, *Berkeley Energy and Resources Collaborative* 2009-2011
- Co-Chair, *The Berkeley Energy Symposium*, the largest student-run energy conference on the west coast 2008, 2009  
2010

### Teaching Experience

- Instructor, Synthetic Biology and Biological Control (CHEN 5838-02, CU Boulder, new) 2018
- Instructor, Chemical Engineering Thermodynamics (CHEN 3320, CU Boulder, established) 2016, 2017  
2018
- Instructor, Biochemical Engineering Fundamentals (CHEN 6820, CU Boulder, new) 2016
- Mentor to two high school students, ten undergraduates, four graduate students, one postdoctoral research associate 2008-pres.

### Community Service and Scientific Outreach

- Instructor, *Synthetic Biology, EngiNearMe, University of Colorado Boulder (hands-on educational initiative for high school students underrepresented in STEM)* 2018
- Co-founder, *Microbial Biofuels Idea Lab (monthly meeting for discussions on biofuels science)* 2008
- Team Leader, *Hopkins 4K for Cancer (4,000-mile bicycle ride to raise money for cancer research)* 2007
- Treasurer, *JHU Engineers without Borders, South Africa (public health assessment)* 2007
- Team Member, *JHU Engineers without Borders, South Africa (project to install ram pumps)* 2006

### Invited Presentations

- University of California, Riverside. Riverside, CA. Invited seminar. 2018
- Rowland Institute, Harvard University. Cambridge, MA. Invited seminar. 2015
- Department of Chemical Engineering, Columbia University. New York, NY. Invited seminar. 2015
- Department of Biochemistry and Department of Chemical and Biological Engineering, University of Wisconsin, Madison. Madison, WI. Invited seminar. 2015
- Institute for Molecular Engineering and Institute for Genomics and Systems Biology, University of Chicago. Chicago, IL. Invited seminar. 2015
- Department of Chemical Engineering, Massachusetts Institute of Technology. Cambridge, MA. Invited seminar. 2015
- Department of Chemical and Biological Engineering, University of Colorado, Boulder. Boulder, CO. Invited seminar. 2015
- Biotechnology Institute and Department of Biochemistry, Molecular Biology, and Biophysics, University of Minnesota, Twin Cities. Minneapolis, MN. Invited seminar. 2015
- School of Chemical Engineering, Purdue University. West Lafayette, IN. Invited seminar. 2014
- School of Chemical and Biomolecular Engineering, Georgia Institute of Technology. Atlanta, GA. Invited seminar. 2014
- Genencor, Inc. (now Dupont Industrial Biosciences). Palo Alto, CA. Invited oral presentation 2012

### Contributed Presentations

- Gordon Conference on Biocatalysis. Poster presentation. 2018
- AIChE, Annual Meeting. San Francisco, CA. Oral presentation. 2016
- AIChE Annual Meeting. Atlanta, GA. Oral presentation. 2014
- AIChE, Annual Meeting. San Francisco, CA. Oral presentation. 2013

- Society for Industrial Microbiology (SIM): Symposium on Biotechnology for Fuels and Chemicals. Oral presentation. 2012
- Gordon Conference on Cellulases, Cellulosomes, and Other Carbohydrate Modifying Enzymes. Poster presentation. 2011
- Society for Industrial Microbiology (SIM): Symposium on Biotechnology for Fuels and Chemicals. Poster presentation. 2010
- Society for Industrial Microbiology (SIM): Symposium on Biotechnology for Fuels and Chemicals. Poster presentation. 2009

### Submitted Publications

- Zhao M, Boeszoermerenyi A, **Fox JM**, Kang K, Yau PO, Snyder PW, Coote PW, Robson SA, Wagner G, Arthanari H, and Whitesides GM (2018). Human Carbonic Anhydrase II is Exceptionally Rigid. *Submitted to PNAS: In Revision*.

### Publications

- Ruppe A and **Fox JM** (2018). Analysis of Interdependent Kinetic Controls of Fatty Acid Synthases. *ACS Catalysis*, 8, 11722-11734.
- Hjortness MK, Riccardi L, Zwart PH, Sankaran B, De Vivo M, and **Fox JM** (2018). Evolutionarily Conserved Allosteric Communication in Protein Tyrosine Phosphatases. *Biochemistry*, 57 (45), 6443-6451.
- Hjortness MK, Riccardi L, Hongdusit A, Ruppe A, Zhao M, Kim EY, Zwart P, Sankaran B, Arthanari H, Sousa MC, De Vivo M, and **Fox JM** (2018). Abietane-Type Diterpenoids Inhibit Protein Tyrosine Phosphatases by Stabilizing an Inactive Enzyme Conformation. *Biochemistry*, 57 (40), 5886-5896.
- **Fox JM**, Zhao M., Fink MJ, Kang K, and Whitesides GM (2018). The Molecular Origin of Enthalpy/Entropy Compensation in Biomolecular Recognition. *Annual Review of Biophysics*, 47 (1).
- **Fox JM**, Kang K, Sastry, M, Sherman W, Sankaran B, Zwart P, and Whitesides GM (2017). Water-Restructuring Mutations Can Reverse the Thermodynamic Signature of Ligand Binding to Human Carbonic Anhydrase. *Angewandte Chemie International Edition*, 56 (14), 3833-3837.
- Semenov SN, Kraft LJ, Ainla A, Zhao M, Baghbanzadeh M, Campbell VE, Kang K, **Fox JM**, and Whitesides GM (2016). Autocatalytic, Bistable, Oscillatory Networks of Biologically Relevant Organic Reactions. *Nature*, 537 (7622), 656-660.
- Kang K, Choi J-M, **Fox JM**, Snyder PW, Moustakas DT, and Whitesides GM (2016). Acetylation of Surface Lysing Groups of a Protein Alters the Organization and Composition of Its Crystal Contacts. *Journal of Physical Chemistry B*, 120 (27), 6461-6468.
- **Fox JM**, Kang K, Lockett MR, Baghbanzadeh M, Sherman W, Héroux A, Sastry M, Whitesides GM (2015). Interactions between Hofmeister Anions and the Binding Pocket of a Protein. *Journal of the American Chemical Society*, 137 (11), 3859-3866.
- **Fox JM** and Whitesides GM (2015). Warning Signals for Eruptive Events in Spreading Fires. *Proceedings of the National Academy of Sciences*, 112 (8), 2378-2383.
- Nemiroski A, Gonidec M, **Fox JM**, Jean-Remy P, Turnage E, and Whitesides GM (2014). Engineering Shadows to Fabricate Optical Metasurfaces. *ACS Nano*, 8 (11), 11061-11070.
- **Fox JM**, Jess P, Jambusaria RB, Moo GM, Liphardt J, Clark DS, Blanch HW (2013). A Single-Molecule Analysis Reveals Morphological Targets for Cellulase Synergy. *Nature Chemical Biology*, 9 (6), 356-61.
- **Fox JM**, Levine SE, Blanch HW, and Clark DS (2012). An Evaluation of Cellulose Saccharification and Fermentation with an Engineered *Saccharomyces cerevisiae* Capable of Cellobiose and Xylose Utilization. *Biotechnology Journal*, 7 (3), 351-373.
- **Fox JM**, Levine SE, Clark DS, and Blanch HW (2012). Initial- and Processive-Cut Products Reveal Cellobiohydrolase Rate Limitations and Role of Companion Enzymes. *Biochemistry*, 51 (1), 442-452.

- Levine SE, **Fox JM**, Clark DS, and Blanch HW (2011). A Mechanistic Model for Rational Design of Optimal Cellulase Mixtures. *Biotechnology and Bioengineering*, 108 (11), 2561-2570.
- Levine SE, **Fox JM**, Blanch HW, and Clark DS (2010). A Mechanistic Kinetic Model of the Enzymatic Hydrolysis of Cellulose. *Biotechnology and Bioengineering*, 107 (1), 37-51.

**Patents (CU Boulder)**

- **Fox JM**, Hongdusit A, Sarkar A, and Kim EY (2018). U.S. Provisional Application.

**Patents (Harvard)**

- Nemiroski A, Gonidec M, Whitesides GM, **Fox JM** (2017). “Shadow Sphere Lithography.” U.S. Patent Application 20170097630.

**Research Support**

1. ECASE (PECASE Nom.)      Fox (PI)      12/15/2018-12/14/2023  
\$999,575 total  
Analysis and Design of Nonlinear Processing and Emergent Dynamics in Biocatalytic Networks
2. NSF      Fox (PI)      07/01/2018-06/30/2023  
\$299,823 total  
Minimally Disruptive Optical Interrogation of Intracellular Signaling Networks
3. ARO YIP      Fox (PI)      Original: 05/01/2018-04/30/2021  
Original: \$359,999 total      Revised: 05/01/2018-12/15/2018  
Revised: \$60,000 total (replaced with ECASE)  
Analysis and Design of Nonlinear Processing and Emergent Dynamics in Biocatalytic Networks
4. NSF CAREER      Fox (PI)      04/15/2018-04/14/2023  
\$514,070 total  
CAREER: Biosynthesis and Evolution of Pharmaceutical Leads