

**Adam E. Cohen**  
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Born: 30 May 1979, New York City

### **Research Statement**

My lab develops new physical tools to study molecules and cells, and we apply these tools to make new measurements. We combine protein engineering, optics, microfluidics, electronics, and biochemistry to generate data; and we apply statistics and physical modeling to understand the data. Current projects include: development of fluorescent voltage-indicating proteins for all-optical electrophysiology; studies on the mechanical properties of cell membranes; studies of bioelectrical pattern formation in developing embryos and engineered tissues; and development of tools for simultaneous recording from all neurons in a brain.

### **Employment**

- 2007-present    **Harvard University**  
Chemistry and Chemical Biology and Physics  
Full Professor 2012 –  
John L. Loeb Associate Professor of the Natural Sciences 9/2011 – 6/2012  
Asst. Prof. 2007 – 2011
- 2013-2020    **Howard Hughes Medical Institute**  
Investigator
- 2006-2007    **Stanford University**  
Postdoc in chemistry  
Advisor: W. E. Moerner

### **Education**

- 2003 - 2006    **Stanford University**  
PhD in physics  
Thesis: "Trapping and manipulating single molecules in solution"  
Advisor: W. E. Moerner (Chemistry)
- 2001 – 2003    **Cambridge University**  
PhD in physics  
Thesis: "Nanoscale Mechanics"  
Advisors: Michael Pepper (Semiconductor Physics, Cambridge); Shaul Mukamel (Theoretical Chemistry, UC Irvine); L. Mahadevan (SEAS, Harvard)
- 1997 - 2001    **Harvard University**  
BA *summa cum laude*  
Major: chemistry and physics
- 1991 - 1997    **Hunter College High School** (New York, NY)  
First in a graduating class of 174

## Honors and Awards

- 2023 Sackler Prize in Chemistry  
2018 Vannevar Bush Faculty Fellowship  
2014 ACS Pure Chemistry Award  
2014 NIBIB Nagy New Investigator  
2014 Blavatnik National Laureate in Chemistry  
2012 Popular Science Brilliant 10: 10 most promising young scientists working today  
2012 Dreyfus Teacher-Scholar Award  
2011 Hunter College High School Distinguished Graduate Award  
2010 Sloan Foundation Fellowship  
2010 Presidential Early Career Award for Scientists and Engineers (PECASE)  
2010 NIH New Innovator Award  
2009 Defense Advanced Research Projects Agency Young Faculty Award  
2009 Office of Naval Research Young Investigator Award  
2007 Technology Review TR35: top 35 technology innovators under the age of 35  
2007 Camille and Henry Dreyfus New Faculty Award  
2006 Finalist in Collegiate Inventors Competition (Washington, DC)  
*for invention of a device to trap and manipulate single molecules.*  
2003 5-year Hertz Fellowship to study at Stanford University  
2001 2-year Marshall Fellowship to study at Cambridge University  
2001 Phi Beta Kappa  
1999 2-year Goldwater Scholarship  
1998 Inductee into the National Gallery for America's Young Inventors (Akron Ohio)  
*for invention of a nanoscale patterning technique using an electrochemical STM*  
1997 56<sup>th</sup> Westinghouse Science Talent Search: first place  
*for invention of a nanoscale patterning technique using an electrochemical STM*

## Other Activities

- 2018 - Stanley Center for Psychiatric Research, Advisory Committee  
2018 - Advisory Committee to the Chair, Department of Chemistry and Chemical Biology  
2017 - Harvard Life Lab selection committee: selecting biotech startups for incubator support  
2016 - JASON advisory group. Technical advice to the US Government.  
2013 - Co-founder, **Q-State Biosciences**. Biotechnology startup aimed at developing functional models of human neuropsychiatric, neurodegenerative, and cardiac diseases, using human induced pluripotent stem cells and advanced optical imaging. <http://www.qstate.com/>  
2013 - Head Tutor, Chemical and Physical Biology undergraduate major, Harvard University  
2008 - 2010 Scientific Advisory Board of ION Torrent Systems, <http://www.iontorrent.com/>  
2008 - 2010 Scientific Advisor to Liberian Ministry of Education and the University of Liberia.  
<https://www2.lsddiv.harvard.edu/labs/cohen/Research/LiberianScience/LiberianScience.htm>  
2008 - Co-director Engineering and Physical Biology PhD program, Harvard University

## Book

- Let's Go 2000: Peru & Ecuador

## Patents

1. A. E. Cohen, "Nanoscale photolithography," U.S. patent 5,865,978 issued February 2, 1999
2. A. E. Cohen, Charles Black, Robert Sandstrom, and Chris Murray, "Scanning probe microscopy Tips composed of nanoparticles and method to form same," U.S. patent 7,282,710 issued Oct. 16, 2007
3. A. E. Cohen and W. E. Moerner, "Sub-micron object control arrangement and approach therefor," U.S. patent 8,057,655 issued Nov. 15, 2011
4. A. E. Cohen, J. M. Kralj, A. D. Douglass, "Optogenetic probes of membrane potential," U.S. patent 9,057,734 issued June 16, 2015
5. A. E. Cohen, Joel Kralj, Adam D. Douglass, Daniel Hochbaum, "Systems methods and workflows for optogenetics analysis," U.S. patent 9,207,237 issued Dec. 8 2015.
6. A. E. Cohen, Daniel Hochbaum, Peng Zou, Samouil Farhi, Robert Campbell, Yongxin Zhao, Daniel Jed Harrison, "Optogenetic probes of membrane potential," U.S. patent 9,518,103 issued Dec. 13 2016
7. A. E. Cohen, J. Kralj, A. D. Douglass, D. Hochbaum, "Systems, methods and workflows for optogenetics analysis," U.S. patent 9,702,874 issued Jul. 11, 2017.
8. A. E. Cohen, J. Kralj, A. D. Douglass, "Optogenetic probes for measuring membrane potential," U.S. patent 9,791,455 issued Oct. 17, 2017.
9. A. E. Cohen and Sabrina Leslie, "Convex Lens-Induced Confinement (CLIC) for measuring distributions of molecular sizes," U.S. patent 10,048,193 issued Aug. 14, 2018.
10. A. E. Cohen, M. P. Chien, "Optical selection of cells," U.S. patent 10,077,463 issued Sept. 18, 2018.
11. A. E. Cohen, J. Kralj, A. D. Douglass, D. R. Hochbaum, "Systems, methods and workflows for optogenetics analysis," U.S. patent 10,161,937 issued 25 Dec. 2018.
12. A. E. Cohen, J. Kralj, A. D. Douglass, "Optogenetic probes for measuring membrane potential," U.S. patent 10,352,945 issued Jul. 16, 2019.
13. A. E. Cohen, Daniel Hochbaum, Peng Zou, Samouil Farhi, Robert Campbell, Yongxin Zhao, Daniel Jed Harrison, "Optogenetic probes of membrane potential," U.S. patent 10,457,715 issued Oct. 29, 2019.
14. A. E. Cohen, Vicente Parot, "Widefield, high-speed optical sectioning," U.S. Patent 11,237,109 issued Feb. 1, 2022

## Publications

Most significant publications in [blue](#).

- 109) J. D. Wong-Campos\*, P. Park, H. Davis, Y. Qi, H. Tian, D. G. Itkis, D. Kim, J. B. Grimm, S. E. Plutkis, L. Lavis, A. E. Cohen, "Voltage dynamics of dendritic integration and back-propagation *in vivo*," *bioRxiv* (2023).
- 108) P. Park\*, J. D. Wong-Campos\*, D. G. Itkis, Y. Qi, H. Davis, J. B. Grimm, S. E. Plutkis, L. Lavis, A. E. Cohen, "Dendritic voltage imaging reveals biophysical basis of associative plasticity rules," *bioRxiv* (2023).
- 107) D. Kim, P. Park, X. Li, J. D. Wong-Campos, H. Tian, E. M. Moulton, J. B. Grimm, L. Lavis, A. E. Cohen, "Mapping memories: pulse-chase labeling reveals AMPA receptor dynamics during memory formation," *bioRxiv* (2023).
- 106) C. Scheibner, H. Ori, A. E. Cohen, V. Vitelli, "Spiking at the edge," arXiv (2023).
- 105) R. Frank Hayward, F. P. Brooks III, S. Yang, S. Gao, A. E. Cohen, "Diminishing neuronal acidification by channelrhodopsins with low proton conduction," *eLife* **12**:RP86833 (2023).
- 104) M. Eom, S. Han, G Kim, E. S. Cho, J. Sim, P. Park, K. H. Lee, S. Kim, M. Rozsa, K. Svoboda, M. Choi, C. H. Kim, A. E. Cohen, J. B Chang, Y. G. Yoon, "Statistically unbiased prediction enables accurate denoising of voltage imaging data," *bioRxiv* (2022).

- 103) B. Jia, Y. Qi, J. D. Wong-Campos, S. Megason, A. E. Cohen, "A bioelectrical phase transition patterns the first beats of a vertebrate heart," *bioRxiv* (2022).
- 102) L. Z. Fan, D. K. Kim, J. H. Jennings, H. Tian, S. Randles, C. Ramakrishnan, Y. Sun, E. Thadhani, Y. S. Kim, P. Y. Wang, S. Quirin, L. Giocomo, A. E. Cohen, K. Deisseroth, "All-optical physiology resolves a synaptic basis for behavioral timescale plasticity," *Cell* (2023).
- 101) H. Tian, H. C. Davis, J. D. Wong-Campos, L. Z. Fan, B. Gmeiner, S. Begum, C. A. Werley, G. B. Borja, H. Upadhyay, H. Shah, J. Jacques, P. Park, Y. Qi, V. Parot, K. Deisseroth, A. E. Cohen, "Video-based pooled screening yields improved far-red genetically encoded voltage indicators," *Nature Methods* (2023). See also *bioRxiv* (2021).
- 100) D. Lin, X. Li, E. Moulton, P. Park, B. Tang, H. Shen, J. B. Grimm, N. Falco, B. Jia, D. Baker, L. D. Lavis, A. E. Cohen, "Time-tagged ticker tapes for intracellular recordings," *Nature Biotech* (2023). **Cover story.**
- 99) H. Ori, M. Duque Ramirez, C. Scheibner, V. Vitelli, A. E. Cohen, "Observation of topological action potentials in engineered tissues," *Nature Physics* (2022).
- 98) Z. Shi, S. Innes-Gold, A. E. Cohen, "Membrane tension propagation couples axon growth and collateral branching," *Science Advances* **8**, eabo1297 (2022).
- 97) M. Armbruster, S. Naska, J. P. Garcia, M. Sommer, E. Kim, Y. Adam, P. G. Hadon, E. S. Boyden, A. E. Cohen, C. G. Dulla, "Neuronal activity drives pathway-specific depolarization of peripheral astrocyte processes," *Nature Neuroscience* **25**, 607-616 (2022).
- 96) A. T. Landau, P. Park, J. D. Wong-Campos, H. Tian, A. E. Cohen, B. L. Sabatini, "Dendritic branch structure compartmentalizes voltage-dependent calcium influx in cortical layer 2/3 pyramidal cells," *eLife*, 11:e76993 (2022).
- 95) U. L. Böhm, Y. Kimura, T. Kawashima, M. B. Ahrens, S.-I. Higashijima, F. Engert, A. E. Cohen, "Voltage imaging identifies spinal circuits that modulate locomotor adaptation in zebrafish." *Neuron* **110**, 1-12 (2022).
- 94) J. D. Wong-Campos, J. V. Porto, and A. E. Cohen, "Which way does stimulated emission go?" *J. Phys. Chem. A* 1c07713 (2021).
- 93) W. Bloxham, D. Brinks, S. Kheifets, A. E. Cohen, "Linearly polarized excitation enhances signals from fluorescent voltage indicators" *Biophysical Journal* **120**, 1-10 (2021).
- 92) M.-P. Chien, D. Brinks, G. Testa-Silva, H. Tian, F. P. Brooks, III, Y. Adam, W. Bloxham, B. Gmeiner, S. Kheifets, A. E. Cohen, "Photoactivated voltage imaging in tissue with an archaerhodopsin-derived reporter," *Science Advances* **7.19**, eabe3216 (2021).
- 91) Z. Al Tanoury, J. F. Zimmerman, J. Rao, D. Sieiro, H. M. McNamara, T. Cherrier, A. Rodriguez-de la Rosa, A. Hick-Colin, F. Bousson, C. Fugier-Schmucker, F. Marchiano, B. Habermann, J. Chal, A. P. Nesmith, S. Gapon, E. Wagner, V. A. Gupta, R. Bassel-Duby, E. N. Olson, A. E. Cohen, K. K. Parker, and O. Pourquie, "Prednisolone rescues Duchenne Muscular Dystrophy phenotypes in human pluripotent stem cells-derived skeletal muscle in vitro," *PNAS* **118.28** (2021).
- 90) M. E. Xie, Y. Adam, L. Z. Fan, U. L. Böhm, I. Kinsella, D. Zhou, M. Rozsa, A. Sing, K. Svoboda, L. Paninski, A. E. Cohen, "High-fidelity estimates of spikes and subthreshold waveforms from 1-photon voltage imaging in vivo," *Cell Reports* **35**, 108954 (2021).
- 89) C. A. Werley, S. Boccardo, A. Rigamonti, E. M. Hansson, A. E. Cohen. "Multiplexed Optical Sensors in Arrayed Islands of Cells for multimodal recordings of cellular physiology," *Nature Communications* **11.1**, 1-17 (2020).
- 88) Z. Shi, A. E. Cohen, "Do cell membranes jiggle like Jello or flow like honey?" *BioEssays* **42**, 1900142 (2020).

- 87) L. Z. Fan, S. Kheifets, U. L. Böhm, H. Wu, K. D. Piatkevich, M. E. Xie, V. J. Parot, Y. Ha, K. E. Evans, E. S. Boyden, A. E. Takesian, A. E. Cohen, "Optical electrophysiology reveals the role of lateral inhibition in cortical layer 1," *Cell* **180**, 521 (2020).
- 86) H. M. McNamara, R. Salegame, Z. A. Tanoury, H. Xu, S. Begum, G. Ortiz, O. Pourquie, A. E. Cohen, "Bioelectrical signaling via domain wall migration", *Nature Physics* **16**, 357 (2020).
- 85) Y. Adam, J. J. Kim, S. Lou, Y. Zhao, D. Brinks, H. Wu, M. A. Mostajo-Radji, S. Kheifets, V. Parot, S. Chettih, K. J. Williams, S. L. Farhi, L. Madisen, C. D. Harvey, H. Zeng, P. Arlotta, R. E. Campbell, A. E. Cohen, "All-optical electrophysiology reveals brain-state dependent changes in hippocampal subthreshold dynamics and excitability," *Nature* **569**, 413-417 (2019).
- 84) S. L. Farhi\*, V. J. Parot\*, A. Grama, M. Yamagata, A. S. Abdelfattah, Y. Adam, S. Lou, J.J. Kim, R. E. Campbell, D. D. Cox, and A. E. Cohen, "Wide-area all-optical neurophysiology in acute brain slices," *J. Neurosci.* **39**, 4889-4908 (2019). **Cover story.**
- 83) V. J. Parot, C. Sing-Long, Y. Adam, U. L. Bohm, L. Z. Fan, S. L. Farhi, A.E. Cohen, "Compressed Hadamard microscopy for high-speed optically sectioned neuronal activity recordings," *J. Phys. D: Appl. Phys.* **52**, 144001 (2019).
- 82) Z. Shi, Z.T. Graber, T. Baumgart, H.A. Stone, A.E. Cohen, "Cell membranes resist flow," *Cell* **175**, 1-11 (2018).
- 81) H.M. McNamara, S. Dodson, Y. Huang, E.W. Miller, B. Sandstede, A.E. Cohen, "Geometry-dependent arrhythmias in electrically excitable tissues," *Cell Systems* **7**, 359-370 (2018). **Cover story.**
- 80) L.Z. Fan, R. Nehme, Y. Adam, E.S. Jung, H. Wu, K. Eggan, D.B. Arnold, A.E. Cohen, "All-optical synaptic electrophysiology probes mechanism of ketamine-induced disinhibition," *Nature Methods* **15**, 823-831 (2018).
- 79) E. Kiskinis\*, J. M. Kralj\*, P. Zou\*, E. N. Weinstein\*, H. Zhang, K. Tisoras, O. Wiskow, J. A. Ortega, K. Eggan, A. E. Cohen, "All-optical electrophysiology for high-throughput functional characterization of a human iPSC-derived motor neuron model of ALS." *Stem Cell Reports* **10**, 1991-2004 (2018).
- 78) A. E. Cohen and S. L. Farhi. "Sculpting light to reveal brain function," *Nature Neuroscience* **21.6**, 776 (2018).
- 77) A. H. Squires, A. E. Cohen, W. E. Moerner, "Anti-Brownian Traps," *Encyclopedia of Biophysics*, G. C. K. Robers, A. Watts (eds.), [doi:10.1007/978-3-642-35943-9\\_486-1](https://doi.org/10.1007/978-3-642-35943-9_486-1) (2018)
- 76) M. P. Chien\*, D. Brinks\*, Y. Adam, W. Bloxham, S. Kheifets, A. E. Cohen, "Two-photon photoactivated voltage imaging in tissue with an Archaelhodopsin-derived reporter," *bioRxiv* **1710**, 10080 (2017)
- 75) C. A. Werley, M. P. Chien, A. E. Cohen, "An ultrawidefield microscope for high-speed fluorescence imaging and targeted optogenetic stimulation," *Biomedical Optics Express*, **8.12**, 5794-5813 (2017)
- 74) Y. Xu, P. Zou, and A.E. Cohen. "Voltage imaging with genetically encoded indicators." *Current Opinion in Chemical Biology*, **39**, 1-10 (2017)
- 73) H. Zhang, and A.E. Cohen. "Optogenetic Approaches to Drug Discovery in Neuroscience and Beyond," *Trends in Biotechnology*, **35.7**, 625-639 (2017)
- 72) C.A. Werley, M.P. Chien, J. Gaublot, K. Shekhar, V. Butty, B.A. Yi, J.M. Kralj, W. Bloxham, L.A. Boyer, A. Regev, A.E. Cohen, "Geometry-dependent functional changes in iPSC-derived cardiomyocytes probed by functional imaging and RNA sequencing," *PloS One*, **12.3**, e0172671 (2017)
- 71) K. Ogden, W. Chen, S.A. Swanger, M.J. McDaniel, L.Z.Fan, C. Hu, A. Tankovic, H. Kusumoto, G.J. Kosobucki, A.J. Schulien, Z. Su, J. Pecha, S. Bhattacharya, S. Petrovski, A.E. Cohen, E. Aizenman, S.F. Traynelis, H. Yuan, "Molecular mechanism of disease-associated mutations in the pre-M1 helix of NMDA receptors and potential rescue pharmacology," *PLoS Genetics*, **13**, e1006536 (2017)

- 70) D. Brinks, Y. Adam, S. Kheifets, A.E. Cohen, "Painting with rainbows: patterning light in space, time, and wavelength for multiphoton optogenetic sensing and control," *Accounts of Chemical Research*, **49**, 2518-2526 (2016)
- 69) S. Lou, Y. Adam, E.N. Weinstein, E. Williams, K. Williams, V. Parot, N. Kavokine, S. Liberles, L. Madisen, H. Zeng, A.E. Cohen, "Genetically targeted all-optical electrophysiology with a transgenic Cre-dependent Optopatch mouse," *The Journal of Neuroscience*, **36**, 11059-11073 (2016)
- 68) Y. K. Cho, G. Zheng, G. J. Augustine, D. R. Hochbaum, A. E. Cohen, T. Knopfel, F. Pisanello, F. S. Pavone, I. M. Vellekoop, M. J. Booth, "Roadmap on neurophotonics." *Journal of Optics*, **18.9**, 93007-93032 (2016)
- 67) H. McNamara, H. Zhang, C.A. Werley, A.E. Cohen, "Optically controlled oscillators in an engineered bioelectric tissue," *Phys. Rev. X*, **6**, 031001 (2016)
- 66) H. Zhang, E. Reichert, A. E. Cohen, "Optical electrophysiology for probing function and pharmacology of voltage-gated ion channels," *eLife*, [10.7554/eLife.15202](https://doi.org/10.7554/eLife.15202) (2016)
- 65) G. T. Dempsey, K. W. Chaudhary, N. Atwater, C. Nguyen, B. S. Brown, J. D. McNeish, A. E. Cohen, J. M. Kralj, "Cardiotoxicity screening with simultaneous optogenetic pacing, voltage imaging and calcium imaging," *J. Pharm. Tox. Meth.*, **81**, 240-250 (2016)
- 64) A. E. Cohen, "Optogenetics: turning the microscope on its head," *Biophys. J.*, **110.5**, 997 (2016)
- 63) A. S. Abdelfatta, S. L. Farhi, Y. Zhao, D. Brinks, P. Zou, A. Ruangkittisakul, I. Platisa, V. A. Pieribone, K. Ballanyi, A. E. Cohen, and R. E. Campbell, "A Bright and Fast Red Fluorescent Protein Voltage Indicator That Reports Neuronal Activity in Organotypic Brain Slices." *J. Neurosci*, **36.8**, 2458-2472 (2016)
- 62) M. J. Henderson, H. A. Baldwin, C. A. Werley, S. Boccardo, L. R. Whitaker, X. Yan, G. T. Holt, E. R. Schreier, L. L. Looger, A. E. Cohen, D. S. Kim, B. K. Harvey "A Low Affinity GCaMP3 Variant (GCaMPer) for Imaging the Endoplasmic Reticulum Calcium Store." *PLoS One* **10.10**, e0139273 (2015)
- 61) V. Emiliani, A. E. Cohen, K. Deisseroth, M. Hausser, "All-Optical Interrogation of Neural Circuits." *J. Neurosci.* **35.41**, 13917-13926 (2015)
- 60) H. Lee, D. Brinks, A. E. Cohen, "Two-photon imaging of a magneto-fluorescent indicator for 3D optical magnetometry," *Optics Express* **23**, 28022-28030 (2015)
- 59) D. Brinks, A. J. Klein, A. E. Cohen, "Two-photon lifetime imaging of voltage indicating proteins as a probe of absolute membrane voltage," *Biophys. J.* **109**, 914-921 (2015)
- 58) M. J. Shon, A. E. Cohen, "Nano-mechanical measurements of protein-DNA interactions with a silicon nitride pulley." *Nucleic acids research* **44**, e7 (2016)
- 57) M. P. Chien, C. A. Werley, S. L. Farhi, A. E. Cohen, "Photostick: a method for selective isolation of target cells from culture," *Chem. Sci.* **6**, 1701-1705 (2015)
- 56) V. Venkatachalam, A. E. Cohen, "Imaging GFP-based reporters in neurons with multiwavelength optogenetic control," *Biophys. J.* **107**, 1554-1563 (2014)
- 55) D. Yang, A. E. Cohen, "Chirality-Dependent Friction of Bulk Molecular Solids," *Langmuir* **30**, 9972-9976 (2014)
- 54) J. H. Hou, J. M. Kralj, A. D. Douglass, F. Engert, A. E. Cohen, "Simultaneous mapping of membrane voltage and calcium in zebrafish heart in vivo reveals chamber-specific developmental transitions in ionic currents," *Frontiers in Physiology: Cardiac Electrophysiology* **5**, 344 (2014)
- 53) A. E. Cohen and V. Venkatachalam, "Bringing Bioelectricity to Light," *Annu. Rev. Biophys.* **43**, 211-232 (2014)
- 52) P. Zou, Y. Zhao, A. D. Douglass, D. R. Hochbaum, D. Brinks, C. A. Werley, D. J. Harrison, R. E. Campbell, A. E. Cohen, "Bright and fast multicoloured voltage reporters via electrochromic FRET", *Nature Communications* **5**, 4625 (2014).
- 51) D. Hochbaum\*, Y. Zhao\*, S. Farhi, N. Klapoetke, C. A. Werley, V. Kapoor, P. Zou, J. M. Kralj, D. Maclaurin, N. Smedemark-Margulies, J. Saulnier, G. L. Boulting, C. Straub, Y.K. Cho, M. Melkonian, G. K-S. Wong, D. J. Harrison, V. Murthy, B. Sabatini, E. S. Boyden, R. E. Campbell, A. E. Cohen, "All

optical electrophysiology in mammalian neurons using engineered microbial rhodopsins," *Nature Methods* **11**, 825-833 (2014)

- 50) V. Venkatachalam, D. Brinks, D. Maclaurin, D. Hochbaum, A. E. Cohen, "Flash Memory: photochemical imprinting of neuronal action potentials onto a microbial rhodopsin," *J. Am. Chem. Soc.* **136**, 2529-2537 (2014)
- 49) J. Hou, V. Venkatachalam, A. E. Cohen, "Temporal dynamics of microbial rhodopsin fluorescence reports absolute membrane voltage," *Biophys. J.* **106**, 639-648 (2014)
- 48) J. Park\*, C. A. Werley\*, V. Venkatachalam, S. Dib-Hajj, S. Waxman, A. E. Cohen, "Screening fluorescent voltage indicators with spontaneously spiking HEK cells," *PLoS One* **8**, e85221 (2013)
- 47) A. P. Fields, E. A. Meyer, A. E. Cohen, "Euler buckling and nonlinear kinking of double-stranded DNA," *Nucleic Acids Research* **41**, 9881-9890 (2013)
- 46) A. E. Cohen, D. R. Hochbaum, "Measuring membrane voltage with microbial rhodopsins," *Fluorescent Protein-Based Biosensors: Methods and Protocols*, J. Zhang, Q. Ni, R. H. Newman eds., Springer (2013)
- 45) D. Maclaurin\*, V. Venkatachalam\*, H. Lee, A. E. Cohen (\*Co-first authors), "Mechanism of voltage-sensitive fluorescence in a microbial rhodopsin," *PNAS* **110**, 5939-5944 (2013)
- 44) Y. Tang, L. Sun, A. E. Cohen "Chiroptical hot spots in twisted nanowire plasmonic oscillators," *Appl. Phys. Lett.* **102**, 043103 (2013)
- 43) M. W. Elting, S. R. Leslie, L. S. Churchman, J. Korlach, C. McFaul, J. S. Leight, M. J. Levene, A. E. Cohen, J. A. Spudich, "Single-molecule fluorescence imaging of processive myosin with enhanced background suppression using linear Zero Mode Waveguides (ZMW) and Convex Lens Induced Confinement (CLIC)," *Optics Express* **21**, 1189-1202 (2013)
- 42) A. P. Fields, A. E. Cohen, "Optimal tracking of a Brownian particle," *Optics Express* **20**, 22585-22601 (2012)
- 41) M. J. Shon, A. E. Cohen, "Mass action at the single-molecule level," *J. Am. Chem. Soc.* **134**, 14618-14623 (2012)
- 40) J. Hou, A. E. Cohen, "Motion induced by asymmetric degradation of hydrogels," *Soft Matter* **8**, 4616-4624 (2012)
- 39) J. Kralj\*, A. D. Douglass\*, D. R. Hochbaum\*, D. Maclaurin, A. E. Cohen (\*Co-first authors), "Optical recording of action potentials in mammalian neurons using a microbial rhodopsin," *Nature Methods* **9**, 90-95 (2012)
- 38) H. Bayraktar, A. P. Fields, J. M. Kralj, J. L. Spudich, K. J. Rothschild, A. E. Cohen, "Ultrasensitive measurements of microbial rhodopsin photocycles using photochromic FRET," *Photochem. & Photobiol.* **88**, 90-97 (2012)
- 37) H. Lee, N. Yang, A. E. Cohen, "Mapping nanomagnetic fields using a radical pair reaction," *Nano Letters* **11**, 5367-5372 (2011)
- 36) J. Kralj, D. R. Hochbaum, A. D. Douglass, A. E. Cohen, "Electrical spiking in *Escherichia coli* probed with a fluorescent voltage-indicating protein," *Science* **333**, 345-348 (2011)
- 35) A. E. Cohen and A. P. Fields, "The cat that caught the canary: What to do with single-molecule trapping," *ACS Nano* **5**, 5296-5299 (2011)
- 34) A. P. Fields, A. E. Cohen, "Electrokinetic trapping at the one nanometer limit," *Proc. Natl. Acad. Sci. USA* **108**, 8937-8942 (2011)
- 33) A. E. Cohen and W. E. Moerner, "Anti-Brownian Traps," in *Encyclopedia of Biophysics*, G. C. K. Roberts (Ed.) (Springer, Berlin, Heidelberg, appearing 2012)
- 32) Y. Tang and A. E. Cohen, "Enhanced enantioselectivity in excitation of chiral molecules by superchiral light," *Science*, **332**, 333-336 (2011)
- 31) N. Yang and A. E. Cohen, "Local geometry of electromagnetic fields and its role in molecular multipole transitions," *J. Phys. Chem. B* **115**, 5304-5311 (2011)

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- 29) S. R. Leslie, A. P. Fields, A. E. Cohen, "Convex Lens-Induced Confinement for imaging single molecules," *Anal. Chem.* **82**, 6224-6229 (2010)
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