

KERWYN CASEY HUANG, Ph. D.

DEPARTMENT OF BIOENGINEERING, STANFORD UNIVERSITY

SHRIRAM BUILDING 007 MC:4245 • STANFORD CA 94305

Phone 650-721-2483 • E-mail KCHuang@Stanford.edu

<http://whatislife.stanford.edu>

EDUCATION

Massachusetts Institute of Technology (GPA: 4.9/5.0) Ph.D. in Physics. <i>Thesis:</i> Polaritonic Photonic Crystals, Melting, and Min-Protein Oscillations.	1999–2004
University of Cambridge M.Phil. in Physics. <i>Thesis:</i> <i>Ab initio</i> Determination of Energetics and Forces in Molecules.	1998–1999
California Institute of Technology (GPA: 4.0/4.0) B.S. with Honors in Physics and Mathematics.	1994–1998

EMPLOYMENT AND RESEARCH EXPERIENCE

Stanford University, Biophysics Program, Stanford, CA <i>Director.</i>	2015 – present
Stanford University, Department of Microbiology and Immunology, Stanford, CA <i>Professor of Microbiology and Immunology.</i>	2019 – present
Stanford University, Department of Bioengineering, Stanford, CA <i>Professor of Bioengineering, with courtesy appointments in Biochemistry.</i>	2019 – present
Stanford University, Department of Microbiology and Immunology, Stanford, CA <i>Associate Professor of Microbiology and Immunology.</i>	2014 – present
Stanford University, Department of Bioengineering, Stanford, CA <i>Associate Professor of Bioengineering, with courtesy appointments in Biochemistry.</i>	2014 – present
Stanford University, Department of Microbiology and Immunology, Stanford, CA <i>Assistant Professor of Microbiology and Immunology.</i>	2011 – 2014
Stanford University, Department of Bioengineering, Stanford, CA <i>Assistant Professor of Bioengineering, with courtesy appointments in Biochemistry and Electrical Engineering.</i>	2008 – 2014
Princeton University, Department of Molecular Biology, Princeton, NJ <i>Visiting Research Fellow and Associate Research Scholar, Laboratory of Professor Ned Wingreen.</i>	2004 – 2008
<ul style="list-style-type: none">• Research into the biophysics of cell-shape detection, including polymer formation, lipid localization, and cell-wall synthesis.• Awarded a National Institutes of Health K25 Mentored Quantitative Research Career Development Award, \$625,000 direct costs 2005-2010, to develop a molecular model of Min-protein polymer formation in <i>E. coli</i>.	
Massachusetts Institute of Technology, Department of Physics, Cambridge, MA <i>Graduate student, Laboratory of Professor John Joannopoulos.</i>	1999 – 2004
<ul style="list-style-type: none">• Theoretical and computational studies of field expulsion and reconfiguration phenomena in polaritonic photonic crystals, metamaterials as optical-frequency magnetic sources, and characterization of Bloch states in the presence of dielectric losses.• Density Functional Theory analysis of surface melting in semiconductors, including superheating and induced melting.	
NEC Laboratories, America, Princeton, NJ <i>Intern, Biophysics research group of Dr. Ned Wingreen and Dr. Chao Tang.</i>	2002 – 2004
<ul style="list-style-type: none">• Research into Min-protein oscillations. This work contributed substantially to Wingreen NIH R01 grant at Princeton.	
University of Cambridge, Department of Physics, Cambridge, United Kingdom <i>M. Phil. student, Laboratory of Dr. Gunaretnam Rajagopal.</i>	1998 – 1999
<ul style="list-style-type: none">• Research into all-electron Quantum Monte Carlo calculations of hydrogen-bond energies in water-dimer clusters.	

FELLOWSHIPS AND AWARDS

Science News SN10 Top 10 Scientists to Watch, 2017.

2nd place, Nikon Small World Photomicrography Competition, 2015.

Friedrich Wilhelm Bessel Award, *Humboldt Foundation* (2014-2015).

NSF Early CAREER Award, (2012-2017).

Hellman Foundation Faculty Scholars Award, (2010-2011).

NIH Director's New Innovator Award, (2009-2014).

Frederick E. Terman Fellowship, (2008-2011).

NIH K25 Quantitative Research Career Development Award, (2005-2010).

Helen Hay Whitney Fellowship, (2005-2008).

Pan-American Studies Institute Fellowship, Meeting on Nano- and Biotechnology, Bariloche, Argentina. (2006).

Cold Spring Harbor Fellowship, Advanced Bacterial Genetics course (2004).

NSF Graduate Research Fellowship (1999-2002).

MIT Robert Stockbarger Graduate Research Fellowship (1999-2001).

Churchill Scholarship, University of Cambridge (1998-1999).

Goldwater Academic Scholarship (1996-1998).

Caltech Academic Merit Scholarship (1996-1998).

H. J. Ryser Scholarship, California Institute of Technology, Mathematics Department Top Undergraduate (1996-1997).

PUBLICATIONS

All students and postdocs in Huang lab are underlined below.

1. AI Celis, A Aranda-Díaz, R Culver, K Xue, D Relman, H Shi[†], **KC Huang**[†], "Optimization of the 16S rRNA sequencing analysis pipeline for studying *in vitro* communities of gut commensals," *iScience*, *in press*.
2. EOY Wong, EJE Brownlie, KM Ng, S Kathirgamanathan, FB Yu, B Merrill, **KC Huang**, A Martin, C Tropini, WW Navarre, "The Collection of Inflammation Associated Mouse Intestinal Bacteria (CIAMIB): A strain library to investigate bacterial influences on inflammation," *mBio*, *in press*.
3. R Pálóvics, A Keller, N Schaum, W Tan, T Fehlmann, M Borja, J Webber, A McGeever, L Bonanno, **The Tabula Muris Consortium**, AO Pisco, J Karkaniyas, NF Neff, S Darmanis, SR Quake, T Wyss-Coray, "Molecular hallmarks of heterochronic parabiosis at single cell resolution," *Nature*, *in press*.
4. BD Knapp, **KC Huang**, "The effects of temperature on cellular physiology," *Ann Rev Biophysics*, *in press*.
5. S Cesar, L Willis, **KC Huang**, "Bacterial respiration during stationary phase induces intracellular damage that leads to delayed regrowth," *iScience*, *in press*.
6. J Sun, ST Rutherford[†], TJ Silhavy[†], **KC Huang**[†], "Physical properties of the bacterial outer membrane," *Nat Rev Microbiol*, *in press*.
7. A Aranda-Díaz, KM Ng, T Thomsen, I Real-Ramírez, D Dahan, S Dittmar, CG Gonzalez, T Chavez, KS Vasquez, TH Nguyen, FB Yu, SK Higginbottom, NF Neff, JE Elias, JL Sonnenburg, **KC Huang**, "Stable, diverse, fecal-derived *in vitro* microbial communities that model the intestinal microbiota response to antibiotics," *Cell Host & Microbe*, *in press*.
8. A Aranda-Díaz, CA Rodrigues, J Sun, A Grote, C Schreck, O Hallatschek, A Souslov, **KC Huang**[†], Wolfram Möbius, "Bacterial filamentation drives colony chirality", *mBio*, *in press*.
9. M Silvis*, M Rajendram*, H Shi*, H Osadnik, A Gray, S Cesar, J Peters, CC Hearne, P Kumar, H Todor[†], **KC Huang**[†], C Gross[†], "Morphological and transcriptional responses to CRISPRi knockdown of essential genes in *Escherichia coli*," *mBio* **12** e02561-21 (2021).
10. J Sun, H Shi, **KC Huang**, "Hyperosmotic shock transiently accelerates constriction rate in *Escherichia coli*," *Frontiers in Microbiology* **12** 718600 (2021).

11. M Kamariza, SGL Keyser, A Utz, B Knapp, G Ahn, CJ Cambier, A Pezacki, **KC Huang**, CR Bertozzi, “Towards *Mycobacterium tuberculosis* detection at the point-of-care: a brighter solvatochromic probe permits the detection of mycobacteria within minutes,” *JACS Au* **1** 1368-1379 (2021).
12. KS Vasquez, L Willis, N Cira, KM Ng, MF Pedro, A Aranda-Díaz, M Rajendram, FB Yu, SK Higginbottom, N Neff, G Sherlock, KB Xavier, S Quake, J Sonnenburg, BH Good†, **KC Huang†**, “Quantifying the interplay between rapid bacterial evolution within the mouse intestine and transmission between hosts,” *Cell Host & Microbe* **29** 1454-1468 (2021).
13. PD Odermatt, T Miettinen, J Lemièrre, JH Kang, E Bostan, S Manalis, **KC Huang†**, Fred Chang†, “Variations of intracellular density during the cell cycle arise from tip-growth regulation in fission yeast,” *eLife* **10** e64901 (2021).
14. H Shi*, C Westfall*, J Kao, S Cesar, M Sievert-J Moore, **KC Huang†**, P Levin†, “Metabolic inactivity induces shrinkage of the bacterial cytoplasm,” *PNAS* **118** e2104686118 (2021).
15. D Halladin, FE Ortega, KM Ng, MJ Footer, N Mitic, S Malkov, A Gopinathan, **KC Huang**, J Theriot, “Entropy-driven translocation of disordered proteins through the Gram-positive cell wall,” *Nature Microbiology* **6** 1055-1065 (2021).
16. L Zhu, M Rajendram, **KC Huang**, “Effects of fixation on bacterial cellular dimensions and integrity,” *iScience* **24** 102348 (2021).
17. A Shiver, H Osadnik, JM Peters, RA Mooney, PI Wu, KK Henry, H Braberg, NJ Krogan, JC Hu, R Landick†, **KC Huang†**, CA Gross†, “Chemical-genetic interrogation of RNA polymerase mutants reveals structure-function relationships and physiological tradeoffs,” *Molecular Cell* **81** 2201-2215 (2021).
18. H Shi, Y Hu, PD Odermatt, CG Gonzalez, L Zhang, JE Elias, F Chang, **KC Huang**, “Precise regulation of the relative rates of surface area and volume synthesis in bacterial cells growing in dynamic environments,” *Nature Communications* **12** 1975 (2021).
19. H Liu*, AL Shiver*, MN Price, HK Carlson, Y Chen, J Ray, CJ Petzold, P Turnbaugh, **KC Huang**, AP Arkin, AM Deutschbauer, “Large-scale functional genetics of the human gut commensal *Bacteroides thetaiotaomicron*,” *Cell Reports* **34** 108789 (2021).
20. HA Arjes, L Willis, H Gui, Y Xiao, J Peters, C Gross, **KC Huang**, “Three-dimensional biofilm growth supports a mutualism involving matrix and nutrient sharing,” *eLife* **10** e64145 (2021).
21. HA Arjes, **KC Huang**, “Straightening up for life in a biofilm,” *PNAS* **117** 31573-31574 (2020).
22. E Atolia, S Cesar, HA Arjes, M Rajendram, H Shi, BD Knapp, S Khare, A Aranda-Díaz, RE Lenski, KC Huang, “Environmental and physiological factors affecting high-throughput measurements of bacterial growth,” *mBio*, **11** e01378-20 1-19 (2020).
23. J Grimm*, H Shi*, W Wang, AM Mitchell, NS Wingreen, **KC Huang†**, TJ Silhavy†, “The inner membrane protein YhdP modulates the rate of anterograde phospholipid flow in *Escherichia coli*,” *PNAS* **117** 26907-26914 (2020).
24. BD Knapp*, L Zhu*, **KC Huang**, “SiCTeC: an inexpensive, easily assembled Peltier device for rapid temperature shifting during single-cell imaging,” *PLoS Biology* **18** e3000786 (2020).
25. N Schaum, B Lehallier, O Hahn, R Pálóvics, S Hosseinzadeh, SE Lee, R Sit, DP Lee, PM Losada, ME Zardeneta, T Fehlmann, J Webber, A McGeever, K Calcuttawala, H Zhang, D Berdnik, V Mathur, W Tan, A Zee, M Tan, **The Tabula Muris Consortium**, A Pisco, J Karkanas, NF Neff, A Keller, S Darmanis, SR Quake, T Wyss-Coray, “Ageing hallmarks exhibit organ-specific temporal signatures,” *Nature*, **583** 596-602 (2020).
26. **The Tabula Muris Consortium**, “A single-cell transcriptomic atlas characterizes ageing tissues in the mouse,” *Nature*, **583** 590-595 (2020).
27. S Cesar*, M Anjur-Dietrich*, FB Yu, E Li, E Rojas, N Neff, TF Cooper, **KC Huang**, “Bacterial evolution in high osmolarity environments,” *mBio* **11** e01191-20 (2020).
28. L Willis, H Jönsson, **KC Huang**, “Limits and constraints on mechanisms of cell-cycle regulation imposed by cell size-homeostasis measurements,” *Cell Reports* **32** 107992 (2020).
29. J Werner†, H Shi†, JHsin, **KC Huang**, Z Gitai, EA Klein, “AimB is a small-protein regulator of cell size and MreB assembly,” *Biophysical Journal*, **119** 593-604 (2020).
30. H Shi, **KC Huang**, “Pictures of tongues sticking out,” *Trends Endocrinology Metabolism*, **31** 805-807 (2020).
31. RN Culver, SP Spencer, **KC Huang**, “Colons or semi-colons: punctuating the regional variation of intestinal microbe-immune interactions,” *Nat Rev Gastroenterology Hepatology*, **17** 319-320 (2020).
32. A Aranda-Díaz, B Obadia, R Dodge, T Thomsen, ZF Hallberg, ZT Güvener, WB Ludington, **KC Huang**, “Bacterial interspecies interactions modulate pH-mediated antibiotic tolerance,” *eLife* **9** e51493 (2020).

33. LAJ Koyama, [A Aranda-Díaz](#), E Su, S Balachandra, JL Martin, WB Ludington, **KC Huang**, LE O'Brien, "Bellymount: A technique for longitudinal, intravital imaging of abdominal organs and the gut microbiota in adult *Drosophila*," *PLoS Biology* **18** e3000567 (2020).
34. [HA Arjes](#), [L Vo](#), CM Dunn, [L Willis](#), CA DeRosa, CL Fraser, DB Kearns†, **KC Huang**†, "Biosurfactant-mediated membrane depolarization maintains viability during oxygen depletion in *Bacillus subtilis*," *Current Biology* **30** 1 (2020).
35. [H Shi](#), [D Quint](#), G Grason, A Gopinathan, **KC Huang**, "Flexible twisting regulates the size and orientation of cytoskeletal polymers," *Nature Communications*, **11** 1408 (2020).
36. RA Oliveira, [KM Ng](#), MB Correia, V Cabral, [H Shi](#), JL Sonnenburg, **KC Huang**, KB Xavier, "*Klebsiella michiganensis* transmission enhances resistance to Enterobacteriaceae gut invasion by nutrition competition," *Nat Microbiol* **5** 630-641 (2020).
37. [AL Shiver](#), R Culver, AM Deutschbauer, **KC Huang**, "Rapid ordering of barcoded transposon libraries of anaerobic bacteria," *Nat Protocols*, *in press*.
38. Y Lim, [AL Shiver](#), M Khariton, K Lane, [K Ng](#), SR Bray, J Qin, **KC Huang**, B Wang, "Mechanically resolved imaging of bacteria using expansion microscopy," *PLoS Biology* **17** e3000268 (2019).
39. [KM Ng](#), [A Aranda-Díaz](#), C Tropini, MR Frankel, WWV Treuren, C O'Laughlin, BD Merrill, FB Yu, KM Pruss, RA Oliveira, SK Higginbottom, NF Neff, MA Fischbach, KB Xavier, JL Sonnenburg, **KC Huang**, "Recovery of the gut microbiota after antibiotics depends on host diet and environmental reservoirs," *Cell Host and Microbe* **26** 650 (2019).
40. [BD Knapp](#), [P Odermatt](#), [ER Rojas](#), W Cheng, X He, **KC Huang**†, F Chang†, "Decoupling of rates of protein synthesis from cell expansion leads to supergrowth," *Cell Systems* **9** 434 (2019).
41. [H Shi](#), **KC Huang**, "Making room in a crowd," *Current Biology* **29** R630-632 (2019).
42. [S Khare](#)*, [J Hsin](#)*, N Sorto, G Nepomuceno, J Shaw, [H Shi](#)†, **KC Huang**†, "FtsZ-independent mechanism of division inhibition by the small molecule PC190723 in *Escherichia coli*," *Adv Biosys* 1900021 (2019).
43. I Masuda, R Matsubara, T Christian, [ER Rojas](#), SS Yadavalli, M Goulian, **KC Huang**, Y-M Hou, "TrmD-Mediated tRNA Methylation Controls Bacterial Multi-Drug Resistance," *Cell Systems* **8** 302-314 (2019).
44. G Stankeviciute, [AV Miguel](#), S Chou, **KC Huang**, EA Klein, "Differential modes of crosslinking establishes spatially distinct regions of peptidoglycan in *Caulobacter crescentus*," *Molec Microbiol* **111** 995-1008 (2019).
45. [N Ng](#), [H Shi](#), [A Colavin](#), **KC Huang**, "Conservation of conformational dynamics across prokaryotic actins," *PLoS Comp Biol* **15** e1006683 (2019).
46. MZ Ali, **KC Huang**, NS Wingreen, R Mukhopadhyay, "Domain formation in a multicomponent lipid bilayer pinned to an elastic substrate," *Phys Rev E* **99** 012401 (2019).
47. **KC Huang**, "When a Physicist Wanders Into Biology... : an interview with KC Huang." *BMC Biology* **16** 130 (2018).
48. [P Odermatt](#)†, [HA Arjes](#)†, F Chang, **KC Huang**, "Who's your DadA? D-alanine levels regulate bacterial cell stiffness," *mBio* **9** e02127-18 (2018).
49. The *Tabula Muris* Consortium, "Single-cell transcriptomic characterization of 20 organs and tissues from individual mice creates a *Tabula Muris*," *Nature* **562** 367-372 (2018).
50. [BD Knapp](#), **KC Huang**, "Translating the physical code of life," *Cell* **174** 253-255 (2018).
51. Y Li, J Yu, J Yu, Y Liu, F Guan, L Zhao, H-W Wang, **KC Huang**, Z Chang, S Ye, "Dynamic coupling between FtsZ protofilaments provides structural stability for constriction during bacterial cell division," *eLife* **7** e35578 (2018).
52. A Jacobson, L Lam, [M Rajendram](#), F Tamburini, J Honeycutt, T Pham, W Van Treuren, K Pruss, K Lugo, DM Bouley, JG Vilches-Moure, JL Sonnenburg, AS Bhatt, **KC Huang**, D Monack. "A gut commensal-produced metabolite mediates colonization resistance to *Salmonella* infection," *Cell Host & Microbe* **24** 296-307 (2018).
53. [KS Vasquez](#), [AL Shiver](#), **KC Huang**, "Cutting the Gordian knot of the microbiota," *Molecular Cell* **70** 765-767 (2018).
54. [ER Rojas](#), [G Billings](#), [PD Odermatt](#), GK Auer, [L Zhu](#), [A Miguel](#), F Chang, DB Weibel, JA Theriot, **KC Huang**, "The outer membrane is an essential load-bearing element in Gram-negative bacteria," *Nature* **559** 617-621 (2018). *Profiled in Nature Reviews Microbiology*.

55. C Tropini, EL Moss, K Ng, SK Higginbottom, E Casavant, C Gonzales, B Fremin, JE Elias, AS Bhatt, **KC Huang**, JL Sonnenburg, “Transient osmotic perturbation causes long-term alteration to the gut microbiota,” *Cell* **173** 1742-1754 (2018).
56. H Shi*, B Bratton*, Z Gitait, **KC Huang**†, “How to build a bacterial cell: MreB as the foreman of *E. coli* construction”, *Cell* **172** 1294-1305 (2018).
* these authors contributed equally to this work
† co-corresponding authors.
57. A Colavin*, H Shi*, **KC Huang**, “RodZ modulates geometric sensing of the bacterial actin cytoskeleton”, *Nature Communications* **9** 1 (2018).
* these authors contributed equally to this work
58. ER Rojas, **KC Huang**, “Regulation of bacterial growth by turgor pressure,” *Current Opinion in Microbiology* **42** 62-70 (2018).
59. JL Ochoa, L Sanchez, B-M Koo, J Doherty, M Rajendram, **KC Huang**, CA Gross, RG Linington, “The Marine Mammal Microbiome Yields a Novel Antibiotic with Potent Activity Against *Clostridium difficile*,” *ACS Infectious Diseases* **4** 59-67 (2018).
60. MT Quint, S Sarang, DA Quint, AB Subramaniam, **KC Huang**, A Gopinathan, LS Hirst, S Ghosh, “Plasmon actuated nano-assembled microshells: a multiscale system for optically controlled cargo encapsulation and release,” *Scientific Reports* **7** 17788 (2017).
61. H Shi, A Colavin, M Bigos, C Tropini†, RD Monds†, **KC Huang**†, “Deep mapping of cytoskeletal genotype-phenotype relationships reveals robustness of bacterial physiology to cell size variation,” *Current Biology* **27** 3419-3429 (2017).
† co-corresponding authors.
62. ER Rojas, **KC Huang**†, JA Theriot†, “Membrane tension and depolarization inhibit cell wall synthesis to ensure cell envelope homeostasis in Gram-positive bacteria”, *Cell Systems* **5** 578-590 (2017).
† co-corresponding authors.
63. EY Kim, ER Tyndall, **KC Huang**†, F Tian†, KS Ramamurthi†, “Dash-and-recruit mechanism drives membrane curvature recognition by a small bacterial protein,” *Cell Systems* **5** 518-526 (2017).
† co-corresponding authors.
64. Y-P Hsu, J Rittichier, E Kuru, J Yablonowski, S Tekkam, E Hall, B Murphy, TK Lee, EC Garner, **KC Huang**, YV Brunt†, MS VanNieuwenhze†, “Full color palette of fluorescent D-amino acids for *in situ* labeling of bacterial cell walls,” *Chemical Science* **8** 6313-6321 (2017).
† co-corresponding authors.
65. S Cesar, **KC Huang**, “Thinking big: The tunability of bacterial cell size”, *FEMS Microbiology Reviews* **41** 672-678 (2017).
66. L Willis†, **KC Huang**†, “Sizing up the bacterial cell cycle”, *Nature Rev Micro* **15** 606-620 (2017).
† co-corresponding authors.
67. L Willis, **KC Huang**, “Fat makes cells fat,” *Current Biology* **27** R592-R594 (2017).
68. C Tropini*, K Earle*, **KC Huang**†, J Sonnenburg†, “The Gut Microbiome: Connecting spatial organization to function,” *Cell Host & Microbe* **21** 433-442 (2017).
† co-corresponding authors.
* co-first authors.
69. AD Cunningham, A Colavin, **KC Huang**, Daria Mochly-Rosen, “Coupling between protein stability and catalytic activity determines pathogenicity of G6PD mutations”, *Cell Reports* **18** 2592-2599 (2017).
70. X Yang, Z Lyu*, A Miguel*, R McQuillen, **KC Huang**†, J Xiao†, “GTPase activity-coupled treadmilling of the bacterial tubulin FtsZ directs septal cell-wall synthesis,” *Science* **355** 744-747 (2017). *Featured in Dispatch in Current Biology*.
* equal contributions
† co-corresponding authors
71. RMW Chau, D Bhaya†, **KC Huang**†, “Emergent phototactic responses of cyanobacteria under complex light regimes”, *mBio* **8** e02330-16 (2017).
† co-corresponding authors.

72. T Ursell*, TK Lee*, D Shiomi, H Shi, C Tropini, RD Monds, A Colavin, G Billings, I Bhaya-Grossman, M Broxton, BE Huang, H Niki, KC Huang, “Rapid, precise quantification of bacterial cellular dimensions across a genomic-scale knockout library,” *BMC Biology* **15** 17 (2017).
*co-first authors
73. KC Huang, “Staying in touch while on the go”, *Cell* **168** 15-17 (2017).
74. F Yu, L Willis, RMW Chau, A Zambon, MA Horowitz, D Bhaya†, KC Huang†, SR Quake†, “Tracking growth and lineages of individual *Synechocystis* cells in a high-throughput microfluidic device”, *BMC Biology* **15** 11 (2017).
†co-corresponding authors.
75. H Shi*, A Colavin*, TK Lee, KC Huang, “Strain Library Imaging Protocol: high-throughput, automated single-cell microscopy for large bacterial collections arrayed on multiwell plates”, *Nature Protocols* **12** 429-438 (2017).
76. TM Bartlett, BP Bratton, A Duvshani, A Miguel, Y Sheng, NR Martin, J Nguyen, A Persat, A Geller, S Desmarais, M vanNieuwenhze, KC Huang, J Zhu, J Shaevitz, Z Gitai, “A quorum-regulated periplasmic polymer determines *Vibrio cholerae* cell shape,” *Cell* **168** 172-185 (2017).
77. L Willis*, Y Refahi*, R Wightman, B Landrein, J Teles, C Godin, KC Huang, E Meyerowitz, H Jönsson, “Cell growth and division regulation in the *Arabidopsis thaliana* apical stem cell niche,” *PNAS* **113** E8238-E8246 (2016).
*co-first authors.
78. TK Lee, K Meng, H Shi, KC Huang, “Single molecule imaging reveals the in vivo regulation of the activity of bifunctional cell wall synthesis enzymes,” *Nat Communications* **7** 13170 (2016).
79. AR Pereira, J Hsin, E Krol, AC Tavares, E Hoiczzyk, E Kuru, N Ng, MS VanNieuwenhze, YV Brun, T Roemer, R Carballido-Lopez, D-J Sheffers, KC Huang, MG de Pinho, “FtsZ-dependent morphogenesis of elongated cells in coccoid bacteria,” *mBio* **7** e00908-16 (2016).
80. JM Peters*, A Colavin*, H Shi*, TL Czarny, MH Larson, S Wong, JS Hawkins, CHS Lu, B-M Koo, E Marta, AL Shiver, EH Whitehead, JS Weissman, ED Brown, LS Qi†, KC Huang†, CA Gross†, “A Comprehensive, CRISPR-based Approach to Functional Analysis of Essential Genes in Bacteria,” *Cell* **165** 1-14 (2016).
*co-first authors.
†co-corresponding authors.
81. G Auer, TK Lee, M Ranjendram, S Cesar, A Miguel, KC Huang†, D Weibel†, “Mechanical genomics: identification of regulators of bacterial cell stiffness,” *Cell Systems* **2** 1-10 (2016). *Profiled in ACS Chemical Biology*.
†co-corresponding authors.
82. H Sutterlin*, H Shi*, A Miguel, S Khare, KC Huang†, TJ Silhavy† “Disruptions to bacterial outer membrane synthesis cause mechanical destabilization during cytokinesis”, *PNAS* **113** E1565-E1574 (2016). *Profiled in Nat Rev Microbiol*.
*co-first authors.
†co-corresponding authors
83. SM Desmarais, C Tropini, A Miguel, RD Monds, F Cava, MA de Pedro, KC Huang, “High-throughput, highly sensitive analyses of bacterial cell walls using Ultra-Performance Liquid Chromatography”, *J Biol Chem* **290** 31090-31100 (2015).
84. JS Lichtman, E Alsentzer, M Jaffe, D Sprockett, E Masutani, E Ikwa, GK Fragiadakis, D Clifford, BE Huang, JL Sonnenburg†, KC Huang†, JE Elias†, “The effect of microbial colonization on the host proteome varies by gastrointestinal location”, *ISME J* 1-12 (2015).
†co-corresponding authors.
85. D Ando, N Korabel, KC Huang†, A Gopinathan†, “Design principles for optimal intracellular transport along cytoskeletal networks,” *Biophys J* **109** 1574-1582 (2015).
†co-corresponding authors.
86. KA Earle*, G Billings*, M Sigal, J Lichtman, J Elias, MR Amieva, KC Huang†, JL Sonnenburg†, “Quantitative Imaging of Gut Microbiota Spatial Organization”, *Cell Host & Microbe* **18** 478-488 (2015). *Profiled in Cell Host & Microbe and Science Transl Med*.
*co-first authors.
†co-corresponding authors.
87. KC Huang, “Applications of imaging for bacterial systems biology,” *Curr Opin Microbiol* **27** 114-120 (2015).
88. L Gelens, KC Huang, JE Ferrell, Jr., “How does the *Xenopus laevis* embryonic cell cycle avoid spatial chaos?,” *Cell Reports* **12** 892-900 (2015).
89. KC Huang, “Super symmetry in bacterial cell division,” *Nature Nanotechnology* **10** 655-656 (2015).

90. AN Gray, AJF Egan, IL van't Veer, J Verheul, A Colavin, A Koumoutsis, J Biboy, MAF Altelaar, MJ Damen, **KC Huang**, J-P Simorre, E Breukink, T den Blaauwen, A Typas, CA Gross, W Vollmer, "Coordination of peptidoglycan synthesis and outer membrane constriction during *Escherichia coli* cell division," *eLife* 10.7554/eLife.07118 (2015).
91. K Sundararajan, A Miguel, SM Desmarais, EL Meier, **KC Huang**, ED Goley, "The bacterial tubulin homolog FtsZ requires an intrinsically disordered membrane tether for directing robust cell wall construction", *Nat Comm* **6** 7281 (2015).
92. X Zhou*, DK Halladin*, ER Rojas*, EF Koslover, TK Lee, **KC Huang**, JA Theriot, "Mechanical crack propagation drives millisecond daughter cell separation in *Staphylococcus aureus*", *Science* **348** 574-578 (2015).
93. RL Gill, Jr.* , J-P Castaing*, J Hsin*, IS Tan, X Wang, **KC Huang**†, F Tian†, KS Ramamurthi†, "Structural and mechanistic basis for the geometric cue-driven subcellular localization of a bacterial protein", *PNAS* **112** E1908-E1915 (2015).
*co-first authors.
†co-corresponding authors.
94. A Miguel, J Hsin, T Liu, G Tang, RB Altman, **KC Huang**, "Variations in the binding pocket of an inhibitor of the bacterial division protein FtsZ across genotypes and species", *PLoS Comp Biol* **11** e1004117 (2015).
95. RMW Chau, T Ursell, S Wang, **KC Huang**†, D Bhaya†, "Maintenance of motility bias during cyanobacterial phototaxis", *Biophys J* **108** 1623-1632 (2015).
†co-corresponding authors.
96. Z Zhou, EL Munteanu, J He, T Ursell, M Bathe, **KC Huang**, F Chang, "The contractile ring coordinates curvature dependent septum assembly during fission yeast cytokinesis", *Mol Biol Cell* **26** 78-90 (2015).
97. C Tropini, TK Lee, J Hsin, SM Desmarais, T Ursell, RD Monds†, **KC Huang**†, "Principles of Bacterial Cell-Size Determination Revealed by Cell-Wall Synthesis Perturbations", *Cell Reports* **9** 1520-1527 (2014).
†co-corresponding authors.
98. RD Monds, TK Lee, A Colavin, T Ursell, TF Cooper, **KC Huang**, "Systematic perturbation of cytoskeletal function reveals linear scaling relationships between cell geometry and fitness", *Cell Reports* **9** 1528-1537 (2014).
99. G Billings, N Ouzounov, T Ursell, SM Desmarais, J Shaevitz, Z Gitai†, **KC Huang**†, "De novo establishment of cell shape in bacterial L-forms through curvature-dependent localization of the MreB cytoskeleton", *Molec Microbiol* **93** 883-896 (2014).
†co-corresponding authors.
100. F Chang†, **KC Huang**†, "How and why cells grow as rods", *BMC Biology* **12** 54-64 (2014).
†co-corresponding authors.
101. ER Rojas, JA Theriot†, **KC Huang**†, "The response of *Escherichia coli* growth rate to osmotic shock," *PNAS* **111** 7807-7812 (2014).
†co-corresponding authors.
102. A Colavin, J Hsin, **KC Huang**, "Effects of polymerization and nucleotide hydrolysis on the filament properties of the bacterial actin homolog MreB", *PNAS* **111** 3585-3590 (2014).
103. T Ursell, J Nguyen, RD Monds, A Colavin, G Billings, N Ouzounov, Z Gitai, J Shaevitz, **KC Huang**, "Rod-like bacterial shape is maintained by feedback between cell curvature and cytoskeletal localization", *PNAS* **111** E1025-1034 (2014).
104. TK Lee, C Tropini, J Hsin, SM Desmarais, T Ursell, E Gong, Z Gitai, RD Monds†, **KC Huang**†, "A dynamically assembled cell-wall synthesis machinery buffers cell growth," *PNAS* **111** 4554-4559 (2014).
†co-corresponding authors.
105. S Desmarais, F Cava, M de Pedro, **KC Huang**, "Isolation and preparation of bacterial cell walls for Ultra-Performance Liquid Chromatography," *J Vis Exp* **83** e51183 (2014).
106. TK Lee, **KC Huang**, "The role of hydrolases in bacterial cell-wall growth", *Curr Opin Microbiol* **16** 760-766 (2013).
107. T Ursell*, R Chau*, S Wisen*, D Bhaya†, **KC Huang**†, "Motility enhancement through surface modification is sufficient for cyanobacterial community organization during phototaxis", *PLoS Comp Biol* **9** e1003205 (2013).
* these authors contributed equally to this work.
†co-corresponding authors.
108. J Hsin, R Fu, **KC Huang**, "Physiological role of FtsA polymerization during bacterial cell division", *J Mol Biol* **425** 4415-4426 (2013).

109. Y Li, J Hsin^{*}, L Zhao^{*}, Y Cheng^{*}, **KC Huang**, H-W Wang, S Ye, “Multiple conformations of FtsZ protofilaments provide structural insight into mechanisms of bacterial cytokinesis”, *Science* **341** 392-395 (2013).
* these authors contributed equally to this work.
110. S Desmarais, MA de Pedro, F Cava[†], **KC Huang**[†], “Peptidoglycan at its peaks: how chromatographic analyses can reveal bacterial cell wall structure and assembly”, *Mol Microbiol* **89** 1-13 (2013).
† co-corresponding authors.
111. P Patel, O Shirihai, **KC Huang**, “Optimal dynamics for quality control in spatially distributed mitochondrial networks”, *PLoS Comp Biol* **9** e1003108 (2013).
112. DT Kysela, PJB Brown, **KC Huang**, YV Brun, “Biological Consequences and Advantages of Asymmetric Bacterial Growth”, *Ann Rev Microbiol* **67** 417-435 (2013).
113. K Tsekouras, I Goncharenko, ME Colvin, **KC Huang**[†], A Gopinathan[†], “Optimal Nanocarrier Design for Cancer Cell Targeting”, *PLoS One* **8** e65623 (2013).
† co-corresponding authors
114. G Misra, ER Rojas, A Gopinathan, **KC Huang**, “Mechanical consequences of turnover in the elongation of a Gram-positive bacterium”, *Biophys J* **104** 2342-2352 (2013). *Commentary in Biophysical Journal*.
115. **KC Huang**[†], D Ehrhardt, J Shaevitz[†], “The molecular origins of chiral growth in walled cells”, *Curr Opin Microbiol* **15** 707-714 (2012).
† co-corresponding authors.
116. TS Ursell^{*}, E Trepagnier^{*}, **KC Huang**[†], JA Theriot[†], “Analysis of surface protein expression reveals the growth pattern of the Gram-negative outer membrane”, *PLoS Comp Biol* **8** e1002680 (2012).
* these authors contributed equally to this work.
† co-corresponding authors.
117. C Tropini, N Rabbani, **KC Huang**, “Physical constrains on the establishment of intracellular spatial gradients in bacteria”, *BMC Biophysics* **5:17** (2012). *Commentary in BMC Biophysics*, 5:18.
118. C Tropini, **KC Huang**, “Interplay between the localization and kinetics of phosphorylation in flagellar pole development of the bacterium *Caulobacter crescentus*”, *PLoS Comp Biol* **8** e1002602 (2012).
119. J Cueva, J Hsin, **KC Huang**, M Goodman, “Alpha Tubulin Acetylation Regulates Protofilament Number in Native Microtubules”, *Curr Biol* **22** 1066-1074 (2012).
120. J Hsin, A Gopinathan, **KC Huang**, “Nucleotide-dependent conformations of FtsZ dimers and force generation observed through molecular dynamics simulations”, *PNAS* **109** 9432-9437 (2012).
121. HH Tuson^{*}, GK Auer^{*}, LD Renner, M Hasebe, C Tropini, M Salick, WC Crone, A Gopinathan, **KC Huang**[†], DB Weibelt[†], “Measuring the stiffness of bacterial cells from growth rates in hydrogels of tunable elasticity”, *Molec Microbiol* **84** 874-891 (2012).
* these authors contributed equally to this work.
† co-corresponding authors.
122. S Wang, L Furchtgott, **KC Huang**[†], J Shaevitz[†], “Helical insertion of peptidoglycan produces chiral ordering of the bacterial cell wall”, *PNAS* **109** E595-E604 (2012). *Selected for March 15, 2012 issue of Virtual Journal of Biological Physics Research*.
† co-corresponding authors.
123. TS Ursell and **KC Huang**, “Resolution limits of optical microscopy and the mind”, *Biomed Comp Rev* **7** 27 (2011).
124. **KC Huang**, C Vega, and A Gopinathan, “Conformational changes, diffusion, and collective behavior in monomeric kinesin-based motility”, *J Cond Matt Phys* **23** 374106 (2011).
125. S Teeffelen, S Wang, L Furchtgott, **KC Huang**, Ned S. Wingreen, Joshua W. Shaevitz, and Zemer Gitai, “The bacterial actin MreB rotates and rotation depends on cell-wall assembly”, *Proc Nat Acad Sci USA* **108** 15822-15827 (2011). *Selected for October 1, 2011 issue of Virtual Journal of Biological Physics Research*.
126. RS McIsaac^{*}, **KC Huang**^{*}, A Sengupta, NS Wingreen, “Does the potential for chaos constrain constrain the embryonic cell-cycle oscillator?”, *PLoS Comp Biol*. **7** e1002109 (2011).
* these authors contributed equally to this work.
127. L Furchtgott, NS Wingreen, **KC Huang**, “Mechanisms for maintaining cell shape in rod-shaped Gram-negative bacteria”, *Molec. Microbiol.* **81** 340-353 (2011).
128. KE Daly, **KC Huang**, NS Wingreen, and R Mukhopadhyay, “The mechanics of membrane bulging during cell-wall disruption in Gram-negative bacteria”, *Phys. Rev. E* **83** 041922 (2011). *Selected for May 1, 2011 issue of Virtual Journal of Biological Physics Research*.

129. L Grage, AM Keleshian, T Turdzieladze, AR Battle, WC Tay, RP May, SA Holt, SA Contera, M Haertlein, M Moulin, P Pal, PR Rohde, VT Forsyth, A Watts, **KC Huang**[†], AS Ulrich[†], and B Martinac[†], “Clustering and functional interaction of MscL channels,” *Biophys. J.* **100** 1252-1260 (2011). #6 on *Biophys J's Most Read list on 3/16/11*.
[†] co-corresponding authors.
130. YE Chen*, C Tropini^{*}, **KC Huang**[†], MT Laubi, “A spatial gradient of protein phosphorylation underlies replicative asymmetry in a bacterium,” *Proc Nat Acad Sci USA* **108** 1052-1057 (2011). *Selected for Feb 1, 2011 issue of Virtual Journal of Biological Physics Research*.
 * these authors contributed equally to this work
[†] co-corresponding authors.
131. **KC Huang** and K Ramamurthi, “Macromolecules that like their membranes curvy”, *Molec Microbiol* **76** 822 (2010).
132. T Fleming, E Becker, S Lee, JY Shin, **KC Huang**, C Bustamante, and K Pogliano, “SpoIIIE assembly mediates septal membrane fission during *Bacillus subtilis* sporulation,” *Genes and Development* **24** 1160 (2010).
133. **KC Huang**, R Mukhopadhyay, B Wen, Z Gitai, and NS Wingreen, “Cell shape and cell-wall organization in Gram-negative bacteria”, *Proc. Nat. Acad. Sci. USA* **105** 19282 (2008).
134. R Mukhopadhyay*, **KC Huang***, and NS Wingreen, “Lipid localization in bacterial cells through curvature-mediated microphase separation”, *Biophysical J.* **95** 1034 (2008).
 * these authors contributed equally to this work.
135. A Varma, **KC Huang**, and KD Young, “The Min system as a general cell-geometry detection mechanism: patterns of Min oscillations respond to changes in cell shape in aberrantly shaped *Escherichia coli*,” *J. Bacteriol.* **190** 2106 (2008).
136. T Ursell, **KC Huang**, E Peterson, and R Phillips, “Cooperative gating and spatial organization of membrane proteins through elastic interactions,” *PLoS Comp. Biol.* **3** e81 (2007).
137. **KC Huang**, T Wang, and JD Joannopoulos, “Control of melting using nanoscale coatings,” *Proceedings of The Minerals, Metals, and Materials Society* (2007).
138. **KC Huang**, R Mukhopadhyay, and NS Wingreen, “A curvature-mediated mechanism for localization of lipids to bacterial poles,” *PLoS Comp. Biol.* **2** 1357 (2006). *Commentary in Science*.
139. **KC Huang**, T Wang, and JD Joannopoulos, “Nanoscale properties of melting at the surface of semiconductors,” *Phys. Rev. B* **72** 195314 (2005). *Selected for November 21, 2005 issue of Virtual Journal of Nanoscale Science & Technology*.
140. X Jiang, Y Zhang, S Feng, **KC Huang**, Y Yi, and JD Joannopoulos, “Photonic Band-Gaps and Localization in the Thue-Morse Structures,” *Appl. Phys. Lett.* **86** 201110 (2005). *Selected for May 23, 2005 issue of Virtual Journal of Nanoscale Science & Technology*.
141. **KC Huang**, T Wang, and JD Joannopoulos, “Superheating and Induced Melting at Semiconductor Interfaces,” *Phys. Rev. Lett.* **94** 175702 (2005).
142. **KC Huang** and NS Wingreen, “Min oscillations in round bacteria,” *Phys. Bio.* **1** 229 (2004).
143. RV Kulkarni, **KC Huang**, M Kloster, and NS Wingreen, “Pattern Formation within *Escherichia coli*: Diffusion, Membrane Attachment, and Self-Interaction of MinD Molecules,” *Phys. Rev. Lett.* **93** 228103 (2004). *Selected for December 1, 2004 issue of Virtual Journal of Biological Physics*.
144. **KC Huang**, ML Povinelli, and JD Joannopoulos, “Negative effective permeability in polaritonic photonic crystals,” *Appl. Phys. Lett.* **85** 543 (2004). *Selected for August 9, 2004 issue of Virtual Journal of Nanoscale Science & Technology*.
145. **KC Huang**, E Lidorikis, X Jiang, JD Joannopoulos, KA Nelson, P Bienstman, and S Fan, “The nature of lossy Bloch states in polaritonic photonic crystals,” *Phys. Rev. B* **69**, 195111 (2004). *Selected for June 7, 2004 issue of Virtual Journal of Nanoscale Science & Technology*.
146. **KC Huang**, Y Meir, and NS Wingreen, “Dynamic structures in *Escherichia coli*: Spontaneous formation of MinE rings and MinD polar zones,” *Proc. Nat. Acad. Sci. USA* **100**, 12724 (2003). *Selected for November 15, 2003 issue of Virtual Journal of Biological Physics*.
147. **KC Huang**, P Bienstman, JD Joannopoulos, KA Nelson, and S Fan, “Phonon-polariton excitations in photonic crystals,” *Phys. Rev. B* **68**, 075209 (2003). *Selected for September 8, 2003 issue of Virtual Journal of Nanoscale Science & Technology*.
148. **KC Huang**, P Bienstman, JD Joannopoulos, KA Nelson, and S Fan, “Field Expulsion and Reconfiguration in Polaritonic Photonic Crystals,” *Phys. Rev. Lett.* **90**, 196402 (2003). *Selected for May 26, 2003 issue of Virtual Journal of Nanoscale Science & Technology*.
149. **KC Huang**, RJ Needs, and G Rajagopal, “Comment on "Quantum Monte Carlo study of the dipole moment of CO" [J. Chem. Phys. **110**, 11700 (1999)],” *J. Chem. Phys.* **112**, 4419 (2000).

PATENTS

A Karalis, D Chan, Y Fink, **KC Huang**, M Ibanescu, JD Joannopoulos, E Lidorikis, E Reed, and M Soljatic, “Surface-Plasmon Index-Guided (SPIG) waveguides and Surface-Plasmon Effective-Index-Guided (SPEIG) waveguides,” US Patent number 7184641, issued Feb. 27, 2007.

A Colavin, **KC Huang**, C Arraya, “Methods and Systems for Identification of Biomolecule Sequence Coevolution and Applications Thereof,” US Patent number 15360947, issued August 3, 2017.

MA Fischbach, AR Brumbaugh, AG Cheng, D Dodd, JL Sonnenburg, **KC Huang**, AJ Aranda-Díaz, S Higginbottom, M Wang, FB Yu, “High complexity synthetic gut bacterial communities.”

SELECTED INVITED CONFERENCE TALKS AND WEBINARS

EMBO/FEBS “The New Microbiology” Advanced Course, Spetses, Greece, 2022.

Quantitative Approaches to Antimicrobial Resistance and Microbiology, Understanding the Physics of Life network, 2022.

4th International Conference on Microbiome Engineering, 2021.

The Ecology and Evolution of Microbial Communities, Kavli Institute for Theoretical Physics, UC Santa Barbara, CA, 2021.

Cell & Tissue Hydraulics, National University of Singapore, 2021.

Amgen Scholars Program Global Symposium, *Keynote speaker*, 2021.

Gordon Research Conference on Bacterial Cell Biology and Development, 2021.

Multimomics to Mechanisms: Challenges and Opportunities in Data Integration III, EMBL, Heidelberg, Germany, 2021.

New Approaches and Concepts in Microbiology V, EMBL, Heidelberg, Germany, 2021.

Single Ventricle Investigator Meeting, 2021.

Institut Henri Poincaré, *Quantitative Evolution, Phylogeny, and Inference: From Models to Data and Back Symposium*, 2021.

Gordon Research Conference on Microbial Adhesion and Signal Transduction, 2021.

Bacterial Cell Biophysics: DNA Replication, Growth, Division, Size, and Shape, EMBO Conference, Ein Gedi, Israel, 2020.

6th Annual Symposium on Microbial Systems Biology, Keynote Speaker, 2020.

Boston Bacterial Meeting, Keynote Speaker, 2020.

Gordon Research Conference on Bacterial Cell Surfaces, 2020.

NSF CREST Center, *Workshop on Emerging Themes in Cellular and Biomolecular Machines*, 2019.

ESF Research Conference on Bacterial Networks, Sant Felix de Guixols, Spain, 2019.

EXPLORE Lecture Series, Stanford University, 2019.

From Systems to Synthetic Biology, FEMS 8th Congress of European Microbiologists, Glasgow, Scotland, 2019.

Bacterial Cell Division: Closing the Gap, EMBO conference, Lund, Sweden, 2019.

Biopolymers in vivo subgroup, Biophysical Society Annual Meeting, 2019.

Physical Approaches to Understanding Microbial Life, Gif-sur-Yvette, France, 2018.

Moore Foundation *Marine Microbiology Initiative Symposium, Keynote speaker*, 2018.

Gordon Research Conference on Bacterial Stress Responses, 2018.

q-Bio Conference, 2018.

Gordon Research Conference on Bacterial Cell Surfaces, Discussion Leader, 2018.

The Human Microbiome: Time for Effective Translation, French American Innovation Day, UCLA, 2018.

Manipulation of the Gut Microbiota for Metabolic Health, Keystone Meeting, Banff, Alberta, 2018.

Bacterial electrophysiology: From single cells to biofilm communities Symposium, Biophysical Society Annual Meeting, 2018.

Spatiotemporal Regulation of Bacterial Cells, Marburg, Germany, 2018.

American Physical Society Far West Section Annual Meeting, Plenary lecture, Merced, CA, 2017.

The Microbiome Summit, Stanford Center for Human Microbiome Studies, 2017.

Gordon Research Conference on Proteins, 2017.

Single Cell Biophysics: Measurement, Modulation, and Modeling, Taipei, Taiwan, 2017.

Cellular Biophysics: Experiment and Theory Symposium, Keynote speaker, University of California at Berkeley, 2017.

Biogeography of Host-Microbe Interactions, Plenary lecture, American Society for Microbiology Annual Meeting, 2017.

New Approaches and Concepts in Microbiology III, EMBL, Heidelberg, Germany, 2017.

Special Subgroup Session on Cell Size, American Society for Cell Biology Annual Meeting, 2016.

Special Subgroup Session on Evolutionary Cell Biology, American Society for Cell Biology Annual Meeting, 2016.

Sequencing in Biology Workshop, Aspen Center for Physics, 2016.

Gordon Research Conference on Bacterial Cell Surfaces, 2016.

Single Cell Behavior, Plenary lecture, American Society for Microbiology Annual Meeting, 2016.

UC Berkeley Biophysics Retreat, Keynote speaker, Point Reyes, California, 2015.

Gordon Research Conference on Motile and Contractile Systems, 2015.

Prokaryotic Development Conference, Washington, DC, 2015.

ESF Research Conference on Bacterial Networks, Sant Felix de Guixols, Spain, 2015.

Cellular Dynamics and Models Symposium, CSHL, 2015.

High Risk/High Reward Symposium, NIH, 2014.

Gordon Research Conference on Plant and Microbial Cytoskeleton, Discussion Leader, 2014.

Bacteria Meet Physics II Workshop, Aspen Center for Physics, 2014.

All Shapes and Sizes: Form and Function in the Microbial World, Plenary lecture, American Society for Microbiology Annual Meeting, 2014.

ASCB Cell Biology Across the Bay Symposium, Santa Clara University, 2014.

“Let’s Have an Awesome Time Doing Science” Symposium, University of California at Berkeley, 2014.

Stanford EXPLORE Program seminar, 2014.

Building the Cell Symposium, American Society for Cell Biology Annual Meeting, 2013.

Cytoskeletal Polymers and Motors Mini-symposium, American Society for Cell Biology Annual Meeting, 2013.

New Approaches and Concepts in Microbiology, EMBL, Heidelberg, Germany, 2013.

Mechanobiology of Proteins and Cells, Mount Desert Island Biological Laboratory, Salisbury Cove, Maine, 2013.

The Great Wall Symposium, Paris, France, 2013.

Computational Biology workshop, Sainsbury Laboratory, 2013.

Physics of Functional Biological Assemblies: Pushing, Pulling and Sensing Workshop, Aspen Center for Physics, 2013.

Nature webcast, “Using microfluidics for real-time imaging of *in vitro* cell models,” 2013.

American Physical Society March Meeting, Baltimore, *Mechanics, Dynamics, and Organization in Cell Growth and Division Symposium*, 2013.

Gotham-Metro Condensed Matter Meeting, *Keynote speaker*, 2012.

Gordon Research Conference on Plant and Microbial Cytoskeletons, 2012.

Gordon Research Conference on Bacterial Cell Surfaces, 2012.

American Society for Microbiology Annual Meeting, *Mechano-Microbiology Symposium*, San Francisco, 2012.

The Great Wall Symposium, Lisbon, Portugal, 2011.

Signals and Space: Spatio-Temporal Patterns in Simple Biosystems, Niels Bohr Institute, University of Copenhagen, 2011.

Computation and Collective Behavior in Biological Systems Workshop, Aspen Center for Physics, 2011.

Paris Interdisciplinary PhD Symposium, Ecole Supérieure de Physique et de Chimie Industrielles, Paris, 2011.

Biological Frontiers of Polymer and Soft Matter Physics Workshop, University of California at Santa Barbara KITP, 2011.

How Molecules Come to Life: Biophysics 2016 Workshop, NSF, 2011.

Physical and Computational Approaches to Cancer Biology Workshop, University of California at San Francisco, 2011.

Institute of Mathematics and its Applications, University of Minnesota, *Symposium on Biological Interactions at the Material-Tissue Interface*, 2010.

Hopkins Marine Station, *Microbiology Course*, 2010.

DARPA *Eliminating Antibiotics* Workshop, San Diego, CA, 2010.
Society for General Microbiology Meeting on *Signaling and Systems Biology*, Edinburgh, 2010.
American Physical Society March Meeting, Portland, *Mechanics in Cell Biology Symposium*, 2010.
Fondation des Treilles, *Assembly of Mitochondrial Membranes in Health and Disease*, 2010.
International Conference on Systems Biology, Stanford, *Plenary speaker*, 2009.
Hopkins Marine Station, *Microbiology Course*, 2009.
Gordon Research Conference on Osmoregulation and Mechanotransduction, 2009.
American Physical Society March Meeting, Pittsburgh, *Systems Biology Symposium*, 2009.
American Physical Society March Meeting, New Orleans, *New Frontiers in Biological Physics Symposium*, 2008.
Dynamics Days 2008 International Conference on Chaos and Nonlinear Dynamics, 2008.
American Physical Society March Meeting, Denver, *Elasticity of Biological Membranes Symposium*, 2007.
TMS Annual Meeting, Orlando, *Computational Thermodynamics and Phase Transformations Symposium*, 2007.
Society for Industrial and Applied Mathematics, Annual Meeting, Boston, *Spatial and Temporal Inhomogeneities in Bacteria Symposium*, 2006.
University of Louisville, 6th Annual KC Huang Memorial Seminar, Department of Pharmacology and Toxicology, 2006.

SELECTED SEMINARS

Seres Therapeutics, 2022.
Novome Biotechnologies, 2022.
University of British Columbia, Department of Microbiology and Immunology, 2022.
Amazon BioSciences Colloquium, 2022.
University of California at San Francisco, Integrative Microbiology Program, 2022.
Hebrew University of Jerusalem, Department of Plant Pathology and Microbiology, 2021.
University of Wisconsin at Madison, Department of Biochemistry, 2021.
Cornell University, Antimicrobial Resistance Radical Collaboration Initiative, 2021.
California State University at Northridge, Department of Biology, 2021.
Simon Fraser University, Department of Physics, 2021.
Flatiron Institute, Department of Biophysics and Development, 2021.
Wayne State University, Department of Physiology, 2020.
École Polytechnique Fédérale de Lausanne, School of Life Sciences, 2020.
Argonne National Laboratory, Physics Division, 2020.
TU Delft, Bionanoscience Department, 2020.
Leiden University, Centre of Microbial Cell Biology, 2020.
Georgia Institute of Technology, School of Biological Sciences, 2020.
University of Pittsburgh, Department of Chemistry, 2020.
University of Tennessee, Department of Physics, 2019.
University of Washington, Department of Physics, 2019.
The Forsyth Institute, 2019.
Northwestern University, Stanley Manne Children's Research Institute, 2019.
University of California at San Diego, Department of Physics, 2019.
Texas A&M University, Department of Biology, 2019.
Harvard University, Department of Molecular and Cellular Biology, 2018.
University of Massachusetts at Amherst, Department of Biochemistry and Molecular Biology, 2018.
University of California at San Francisco, Tetrad Program Basic Sciences Seminar Series, 2018.
Umeå University, Department of Molecular Biology, 2018.

École Polytechnique Fédérale de Lausanne, School of Life Sciences, 2018.
University of California at San Diego, Department of Mechanical and Aerospace Engineering, 2018.
Francis Crick Institute, 2017.
California Institute of Technology, Department of Chemistry, 2017.
Yale University, Microbial Sciences Institute, 2017.
Emory University, Department of Physics, 2017.
Georgia Tech, Department of Physics, 2017.
Duke University, Department of Biochemistry, 2017.
University of North Carolina, Biology Department, 2017.
Lawrence Berkeley National Laboratory, 2016.
University of Louisville, Department of Microbiology, 2016.
Duke Institute, Université Catholique de Louvain, 2016.
New York University, Department of Biology, 2016.
Purdue University, Department of Physics, 2016.
Aspen Center for Physics, Colloquium, August 2016.
John Innes Centre, 2016.
Foundation for Fundamental Research on Matter AMOLF, Amsterdam, Netherlands, 2016.
Biozentrum Centre for Molecular Life Sciences, Basel, Switzerland, 2016.
Cornell University, Department of Bioengineering, 2016.
University of Pennsylvania, Department of Bioengineering, 2016.
University of California at Berkeley, Department of Chemistry *Statistical Physics Seminar*, 2016.
Pittsburgh University, Department of Physics, 2015.
BioQuant Institute, Heidelberg University, Heidelberg, Germany, 2015.
Max Planck Institute for Terrestrial Microbiology, Marburg, Germany, 2015.
European Molecular Biology Laboratory, Cell Biology Modeling Seminar, Heidelberg, Germany, 2015.
European Molecular Biology Laboratory, Genome Biology Unit, Heidelberg, Germany, 2015.
Indiana University, Department of Biology, 2015.
Massachusetts Institute of Technology, Department of Biology, 2015.
Washington University, Department of Biology, 2015.
University of Washington, Department of Microbiology, Genome Sciences, and Medicine, 2015.
University of California at Berkeley, Department of Plant and Microbial Biology, 2015.
Rockefeller University, Center for Studies in Physics and Biology, 2014.
Rice University, Department of Bioengineering, 2014.
Université Aix Marseille, Institut de Microbiologie de la Méditerranée, 2014.
Harvard Medical School, Department of Microbiology, 2014.
University of California at San Diego, Department of Physics, 2014.
Texas A&M University, Department of Biochemistry and Biophysics, 2014.
University of Maryland, Department of Physics, 2014.
Göttingen University, Department of Physics, 2013.
Johns Hopkins University, Department of Biological Chemistry, 2013.
Columbia University, Department of Systems Biology, 2013.
Princeton University, Department of Molecular Biology, 2013.
University of California at Davis, Department of Mathematics, 2013.
Ruprecht-Karls-Universität Heidelberg, Zentrum für Molekulare Biologie, Heidelberg, Germany, 2013.

European Molecular Biology Laboratory, Heidelberg, Germany, 2013.
Max Planck Institute of Molecular Cell Biology and Genetics, Dresden, Germany, 2013.
Harvard University, Department of Biological Chemistry, 2012.
NIH Lambda Lunch Meeting, 2012.
Harvard University, Department of Systems Biology, 2012.
University of California at Santa Cruz, Department of Microbiology and Environmental Toxicology, 2011.
Ohio State University, Mathematical Biology Institute, 2010.
Michigan State University, Department of Microbiology and Molecular Genetics, 2010.
Boston University, Mitochondrial Affinity Research Collaborative, 2010.
University of California at Merced, School of Natural Sciences, 2010.
University of California at San Francisco, Department of Cellular and Molecular Pharmacology, 2009.
Victor Chang Cardiac Research Institute, Molecular Cardiology and Biophysics, 2009.
Universidad de Buenos Aires, Department of Physics, 2009.
University of California at San Diego, Center for Theoretical Biological Physics, 2009.
Ohio University, Department of Physics, 2009.
Indiana University, Department of Physics, 2009.
University of California at Berkeley, Department of Physics, 2009.
University of California at Santa Barbara, Department of Mechanical Engineering, 2008.
Stanford University, Biochemistry Research Conference, 2008.
University of California at Merced, Departments of Physics and Applied Mathematics, 2008.
Ben Gurion University, Department of Physics, 2008.
Lehigh University, Department of Physics, 2008.
University of Chicago, Institute for Biophysical Dynamics, 2008.
Program in Integrative Information, Computer and Application Sciences, Princeton University, 2004.
Simons Center for Systems Biology, Institute for Advanced Study, 2008.
Rutgers University, Department of Physics & Astronomy, 2008.
Max Planck Institute of Molecular Cell Biology and Genetics, Dresden, Germany, 2007.
Max Planck Institute for the Physics of Complex Systems, Dresden, Germany, 2007.
Temasek Life Sciences Laboratory, Singapore, Cell Dynamics Group, 2007.
American University in Cairo, Department of Biology, 2007.
Temasek Life Sciences Laboratory, Singapore, Cell Division Group, 2007.
Bioinformatics Institute, Singapore, 2007.
Stanford University, Department of Electrical Engineering, 2007.
University of British Columbia, Department of Physics, 2007.
Harvard University, Department of Systems Biology, 2007.
Massachusetts Institute of Technology, Department of Physics, 2007.
TU Delft Kavli Nanoscience Institute, Department of Molecular Biophysics, 2007.
Stanford University, Department of Biochemistry, 2007.
University of Michigan, Ann Arbor, Department of Physics, 2007.
California Institute of Technology, Department of Chemistry, 2007.
California Institute of Technology, Department of Applied Physics, 2007.
Johns Hopkins School of Medicine, Department of Biophysics and Biophysical Chemistry, 2007.
Carnegie Mellon University, Department of Physics, 2006.
University of California, San Francisco, Department of Biochemistry and Biophysics, 2006.

Virginia Tech, Department of Physics, 2005.
Brown University, Department of Physics, 2005.
Brandeis University, Molecular and Cellular Biophysics, 2005.
University of Oxford, Department of Microbiology, 2005.
Program in Integrative Information, Computer and Application Sciences, Princeton University, 2004.
Princeton University, Department of Molecular Biology Annual Retreat, 2004.
Brown University, Department of Physics, 2004.
University of Arkansas Medical Science, Department of Physiology, 2004.
Williams College, Department of Physics, 2003.
Boston University, Department of Physics, 2003.

SELECTED INVITED TEACHING AND LECTURES

Physical Approaches to Understanding Microbial Life Summer School (2018).
EMBO course: **Modelling Cellular Processes in Space and Time** (2016).
EMBL Practical Course: **Microscopy, Modeling, and Biophysical Methods** (2014).
Woods Hole Marine Biological Institute: **Physiology Course** (2010-2012).
Cold Spring Harbor Laboratory: **Topics in Biology** (2010).
American Physical Society March Meeting, **Opportunities in Biological Physics Workshop** (2008).
Temasek Lifesciences Laboratory, Singapore: **Cellular Mechanics** (2007).
Bioinformatics Institute, Singapore: **Physical Biology** (2007).

TEACHING

Woods Hole Marine Biological Institute (2010,2011,2012,2017): Instructor, *Physiology* course.
Stanford University, Course Design Boot Camp participant (2011).
Stanford University, Department of Bioengineering (2010): Designed and instructed new course *BioE 42: Physical Biology of Cells* (30 lecture hours).
Stanford University, Department of Bioengineering (2008): Designed and instructed new course *BioE 334: Engineering Principles of Molecular Biology* (30 lecture hours).
Princeton University, Department of Molecular Biology (2005-2007): Designed and instructed new course *Introduction to Perl and MATLAB for Biology* (35 students/yr., 16 lecture hours/yr).
Massachusetts Institute of Technology, (2000-2002): Teaching Assistant for *Physics 8.511-8.512: Theory of Solids I&II*.
California Institute of Technology, (1997-1998): Teaching Assistant for *Applied Physics 130: Optoelectronics*.

SERVICE

Co-organizer, *New Approaches in Microbiology VI Conference*, European Molecular Biology Laboratory, 2023.
Co-organizer, *Life at the cell surface: Mechanobiology of the cell periphery II*, European Molecular Biology Laboratory, 2023.
Editorial Board Member, *Biophysical Journal*, 2021-.
Aspen Center for Physics, *Co-chair, Diversity Committee*, 2021-2022.
Bioscience Diversity Advisory Committee, Stanford University School of Medicine, 2021-.
Scientific Advisor Committee, *ENIGMA Scientific Focus Area*, Department of Energy, 2020-.
Co-organizer, *Life at the cell surface: Mechanobiology of the cell periphery*, European Molecular Biology Laboratory, 2021.
Co-organizer, *New Approaches in Microbiology V Conference*, European Molecular Biology Laboratory, 2021.
Faculty Search Committee Chair, Bioengineering Department, 2019-2020.
Faculty of 1000 Member, 2019-.

Advisory Board Member, *Review Commons*, 2019-.

Editorial Board Member, *Cell Systems*, 2018-.

Faculty Athletics Fellow, Stanford Men's Basketball team, 2018-.

Co-organizer, Bioengineering Department Annual Retreat, 2018.

Co-organizer, *New Approaches in Microbiology IV Conference*, European Molecular Biology Laboratory, 2019.

Member, Basic Science Diversity and Inclusion Task Force, Stanford University, 2018-.

Member, Affordability Task Force, Stanford University, 2018-.

Co-organizer, **“Physics of Microbial Communities” Summer Workshop**, Aspen Center for Physics, 2018.

Aspen Center for Physics, General Member (2017-).

Permanent Panel member, NIH TWD-B (2017-2022).

Ad-hoc Panel Member, NIH Prokaryotic Cellular and Molecular Biology (2017).

Co-organizer, *New Approaches in Microbiology III Conference*, European Molecular Biology Laboratory, 2017.

Participant, Denise Denton Emerging Leaders Workshop, 2016.

Co-organizer, *EMBO course on Modelling Cellular Processes in Space and Time*, Porquerolles, 2016.

Co-organizer, *Great Wall Symposium*, Institut Pasteur, 2015.

Co-organizer, *New Approaches in Microbiology II Conference*, European Molecular Biology Laboratory, 2015.

Co-organizer, *Multiscale Modeling of Cell Wall Mechanics and Growth in Walled Cells*, Banff International Research Station, 2015.

Faculty Search Committee, Bioengineering Department, 2013-2014.

Co-organizer, **“Bacteria Meet Physics II” Summer Workshop**, Aspen Center for Physics, 2014.

Referee, *Science*, *Nature*, *Nature Methods*, *PNAS*, *Mol Sys Biol*, *Phys Rev Lett*, *Phys Rev E*, *Molec Microbiol*, *J Bacteriol*, *Phys Biol*, *Appl Env Microbiol*, *Biophys J*, *J Phys Chem*, *PLoS Biol*, *PLoS Comp Biol*, *PLoS One*, *Small*, *Biochemistry*, *BMC Biol*.

Organizing Committee, *10th International Workshop on Nanomechanical Sensing*, Stanford, CA 2013.

Microbiology & Immunology Admissions Committee, 2013.

Organizer, **“Physical Mechanisms of Growth” Symposium**, American Physical Society March Meeting, 2012.

Bioengineering Department Admissions Committee, 2008-2011.

Co-organizer, **Bioengineering Departmental Colloquium**, 2010-2011.

Co-organizer, **Bioengineering Departmental Retreat**, 2011.

Reviewer, *NSF Center for Theoretical Biophysics* midterm evaluation.

Co-chair, **Junior Advisory Group**, American Society for Microbiology, 2010-2014.

Organizer, **“Mechanics in Cell Biology” Symposium**, American Physical Society March Meeting, 2010.

Co-organizer, **“Evolutionary Perspectives on Mechanisms for Cellular Organization” Workshop**, Kavli Institute for Theoretical Physics, Santa Barbara, 2010.

Organizer, **“Frontiers in Quantitative Biology” Seminar Series**, Stanford University, 2009-present.

Organizer, **“Bug Club Microbiology” Seminar Series**, Stanford University, 2009-present.

Co-organizer, **“Bacteria Meet Physics” Summer Workshop**, Aspen Center for Physics, 2009.

Organizer, **“Cellular Imaging at the Nanoscale” Symposium**, American Physical Society March Meeting, 2009.

Editor, **PMC Biophysics** (2008-2010).

Editor, **BMC Biophysics** (2010-present).

Princeton University, Department of Molecular Biology Postdoc Committee Chairman (2005-2007): organized seminar series and annual career symposium.

MIT Alumni Club of Princeton, (2005-2007): board member and co-director of Young Alumni events.

