

Christine K. Payne

Yoh Family Associate Professor
Department of Mechanical Engineering and Materials Science
Duke University
Durham, NC 27701
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Educational Background

1998 B.S. Chemistry University of Chicago, with Honors in Chemistry and the College
2003 Ph. D. Chemistry University of California, Berkeley, Advisor: Charles Harris

Employment History

2018- Associate Professor, Department of Mechanical Engineering and Materials Science, Duke University; Director of Graduate Studies (2020-)
Secondary Appointment: Department of Chemistry
2013-2017 Associate Professor, School of Chemistry and Biochemistry, Georgia Institute of Technology
Program Faculty: BioEngineering (2009-), Quantitative Biosciences (2014-), Biomedical Engineering (2015-)
2007-2013 Assistant Professor, School of Chemistry and Biochemistry, Georgia Institute of Technology
2003-2006 Postdoctoral Fellow, Harvard University, Advisor: Xiaowei Zhuang

Research Interests

Interactions of nanoparticles with cells; therapeutic, manufacturing, environmental applications
Electrical control of cellular properties
Advanced fluorescence microscopy methods for live cell imaging

Honors and Awards

2020 Fellow, Royal Society of Chemistry
2020 Bass Fellow, Duke award for excellence in undergraduate teaching and research
2017 Visiting Research Fellow, Institute of Physics, Academia Sinica, Taiwan (May-June)
2015 Visiting Research Fellow/Faculty Development Award, ICFO, Spain (May-December)
2014 Vasser Woolley Faculty Fellowship (Georgia Tech)
2011 DARPA Young Faculty Award
2009 NIH Director's New Innovator Award
2008 ACS PROGRESS-Dreyfus Lectureship Award
2007-2010 Research Scholar Development Award; NIH
2004-2006 Ruth L. Kirschstein National Research Service Award; NIH Postdoctoral Fellowship

Professional Memberships and Service

2020- Chair-elect, Physical Cell Biology subgroup, Biophysical Society
2019- Materials Research Society, member
2018-2019 Associate Member, Chemists with Disabilities Committee, ACS
2018 Panelist, NCI-ASCB Imaging Workshop (April, 2018)
2017-2019 Councilor, Division of Physical Chemistry, ACS
2017-2019 Editorial Advisory Board, Journal of Physical Chemistry
2016-2017 Director of Teaching Effectiveness, School of Chemistry and Biochemistry, Georgia Tech
2017 Symposium Organizer, "Single Cell Biophysics", Biophysical Society, Taiwan (June, 2017)
2015-2017 Advisory Board, Georgia Tech BioMat NIH Training Grant
2015-2017 ACS National Award Selection Committee (Chair, 2017)
2012- NIH Peer Review, ad hoc; NANO (2012, 2019), GDD (2014, 2018), NCI (2016), BRAIN (2018)
2011 Participant, Innovation Brainstorm, Strategic Planning for the NIH Common Fund

C.K. Payne**Curriculum Vitae, December 2020**

2011 Symposium Organizer, "Advanced Microscopy...Biophysical Questions," ACS Meeting, Denver
2010 Chair, Biophysical Subdivision, Division of Physical Chemistry, ACS
2009- NSF Peer Review: DMR and Chemistry
2009 Symposium Organizer, "Single Molecule Biophysics," OSA Annual Meeting, San Jose
2007-2016 Co-Organizer, Atlanta Area Chemical Physics (AACP) Seminar Series
2003- Biophysical Society, member
1999- American Chemical Society, member

Research Grants

Current NSF-CBET, "Library of protein-nanoparticle interactions: Automated sample handling and low cost proteomics," July 2019-June 2022, \$390k Total

NSF-Simons Foundation, "Southeast Center for Mathematics in Biology," July 2018-June 2023, \$10M Total, PI: Christine Heitsch (Math, GT), Payne – Senior Personnel

NIH/NIEHS-R21, "Pulmonary response to nanomaterial-ozone exposures," July 2020-June 2022, \$443k Total, multi-PI: Payne (contact) and R.M. Tighe (Duke, SOM)

Completed NIH-BRAIN R21 with B. Flanders (co-I, Kansas State), September 2015-August 2019, \$453k Total
NIH-NIEHS R56, mPI with M. Kemp and Y. Fan (Georgia Tech), September 2017-August 2018, \$150k Total
HERCULES Seed Grant with R. Weber (PI, EAS, GT) and M. Kemp (BME, GT), Emory School of Public Health, June 2017-March 2018, \$40k Total
NSF EAGER with B. Flanders (co-I, Kansas State), August 2015-July 2017, \$60k Total
NSF, in support of "Single Cell Biophysics" BPS Thematic Meeting, Taipei, June 2017, \$15k
NSF Major Research Instrumentation, September 2013-August 2016, \$469k Total
HERCULES Seed Grant, Emory School of Public Health, July 2014-March 2015, \$32k Direct
NIH Director's New Innovator Award, October 2009-June 2014, \$2.3M Total/\$1.5M Direct
DARPA Young Faculty Award, July 2011-December 2013, \$300k Total/\$175k Direct
NIH Research Scholar Development Award, April 2007-March 2010, \$268k Total/\$250k Direct
NIH R01 with R. Dickson (PI), C. Fahrni, and M. Kemp, September 2008-July 2012

Teaching

Courses Materials Science of Science Fiction (ME 490.03, Undergrad) Spring 19, Spring 20
Modern Materials (ME 490.01/555.13/CHEM 590.02, Undergrad/Grad) Fall 18, Fall 19, Fall 20
Thermodynamics, Kinetics, Statistical Mechanics (CHEM 3411, Undergrad, GT) Fall 16, Fall 17
Fundamentals of Data Analysis (CHEM 2801, Undergrad, GT) Fall 13, Fall 14, Spring 16, Fall 16
Quantum Mechanics (CHEM 3412, Undergrad, GT) Spring 08, Fall 08, Fall 09, Fall 11,
Spring 13, Spring 15
General Chemistry (CHEM 1310, Undergrad, GT) Spring 11, Fall 14
Statistical Mechanics (CHEM 6481, Grad, GT) Spring 07, Spring 09, Fall 10, Fall 12

REU Jenna Tomlinson (2008, PhD, University of Michigan), Solaire Finkenstaedt-Quinn (2009, PhD, University of Minnesota), Syeda Anum (2011, MD, UMass), Ryan Lannan (2012, PhD, UCLA), Quachel Bazile (2012, PhD, University of Alabama, Birmingham), Victoria Cochran (2014, PhD, University of Chicago), Jonathan Flores (2016, MS, Georgia Tech)::: Akosua Johnson (2018, current NC A&T undergrad), Riley Juenemann (2019, current Tulane undergrad)

B.S. Former: Nicole Fay (2007-2008, PhD, UC Berkeley), Jesse Haulk (2008), Kevin Hardin (2008-2009), Paul Park (2010), Heather Jekot (2010, MD, MCG), Jessica Obermiller (2011), Joshua Liu (2010-2011), Kelsey Killion (2012), Jairo Zapata (2009-2012), Candace Law (2012), Son Tran (2012), Joseph Kim (2011-2012), Hursh Sureka (2011-2013, PhD, MIT), Patrick Chen (2012-2013,

- CDC), Kaitlyn Willingham (2013), Chelsea Thompson (2013, technician at Ethicon), Edward Zhang (2013-2014, ABB Robotics), Nina Mohebbi (2013-2015, Abbott), Joseph Miles (2014-2015, GPC to GT transfer), Jessica Richey (2014-2015), Rohan Kadambi (2015-2016, current GT undergrad), Kaela Fennell-Chin (2017), Roger Romero (Summer 2017, current University of Chicago undergrad), Gregory Whyte (2016-2017), Adam Finlay (2016-2017)::: Patrick Donley (2018), Nick Cariello (2018, PhD, Michigan State), Trinity Campagna (Summer 2019, current University of Chicago undergrad), Quinton Tran (2018-2020), Brad Foster (2019-2020)
Current: Gustavo Sosa Macias (Chemistry, 2019-), Eduardo Chavez (Chemistry, 2020-), Mia Malden (ME, 2021-)
- M.S. Melinda Ogden (2009), Dipesh Khanal (2015)
- Ph.D. Former: William Humphries (2011, microscopy specialist at B&B Microscopes/Olympus), Candace Fleischer (2014, Assistant Professor, Emory University School of Medicine), Sabiha Runa (2017, technical writer, Oxford PharmaGenesis), Scott Thourson (2018, postdoc, University of Florida)
Current: Xu Han (MEMS, 2018-), Karsten Poulsen (MEMS, 2019-), Nathan Rayens (MEMS, 2019-), Judith Dominguez (MEMS, 2020-)
- Postdocs Former: Ashlee St. John Iyer (2008-2009), Don-Ricardo Miller (joint with Prof. M. Kemp, BME, 2009-2010), Craig Szymanski (2009-2011, postdoc at PNNL), Gerard Doorley (2010-2012, consultant), Umesh Kumar (2011-2012, research scientist, TERI, India), Steven Hira (2011-2013), Austin Cyphersmith (2012-2013, research specialist, microscopy core, UIUC), Debjyoti Bandyopadhyay (2012-2013, research scientist, ITC, India), Saheli Sarkar (2011-2014, postdoc, Northeastern), Josh Morris (2013-2014, Assistant Professor, Georgia Gwinnett College), Alexandra Hill (2013-2014, CMC regulatory manager, EMD Serono, Germany), Srikant Iyer (2013-2015, analyst, OXIDE diversity program), Qingjie Luo (2016), Tevhide Ozkaya Ahmadov (2016-2017), Zeqing Shen (2018-2019, Process Engineer, Applied Materials)
Current: Dhanya Jayaram (2016-, promoted to Research Scientist 2019), Pu Deng (2020-), Hao Wang (2020-)

Patents

“Methods, devices and systems for sorting particles,” USPTO #15/493,893

Publications

61. “DNA-nanoparticle interactions: Formation of a DNA corona and its effects on a protein corona,” D.M. Griffith, D.T. Jayaram, D. Spencer, D.S. Pisetsky, and C.K. Payne, *Biointerphases*, **15**, #051006 (2020).
60. “Food-grade TiO₂ particles generate intracellular superoxide and alter epigenetic modifiers,” D.T. Jayaram and C.K. Payne, *Chemical Research in Toxicology*, **33**, 2872-2879 (2020).
59. “Automation and low-cost proteomics for characterization of the protein corona: experimental methods for big data,” K. M. Poulsen, T. Pho, J.A. Champion, and C.K. Payne, *Analytical and Bioanalytical Chemistry*, **412**, 6543-6551 (2020).
58. “Superoxide generated by TiO₂ nanoparticles alters HDAC9, an epigenetic modifier” D.T. Jayaram and C.K. Payne, *Bioconjugate Chemistry*, **31**, 1354-1361 (2020).
57. “Electrical control of E. coli growth measured with simultaneous modulation and imaging” X. Han, B. Foster, and C.K. Payne, *Bioelectricity*, #bioe.2020.0002 (2020).

56. "Perspective: A protein corona primer for physical chemists," C.K. Payne, *J. Chemical Physics*, **151**, #130901 (2019).
55. "TiO₂ nanoparticles generate superoxide and alter gene expression in human lung cells," D.T. Jayaram, A. Kumar, L.E. Kippner, P.Y. Ho, M.L. Kemp, Y. Fan, and C.K. Payne, *RSC Advances*, **9**, 25039-25047 (2019).
54. "Advances in materials for cellular applications," J.D. Morris and C.K. Payne, *Biointerphases*, **14**, #010801 (2019).
53. "Microscopy and cell biology: New methods and new questions," J.D. Morris and C.K. Payne, *Annual Review of Physical Chemistry*, **70**, 199-218 (2019).
52. "Protein corona in response to flow: Effect on protein concentration and structure," D.T. Jayaram, S. Pustulka, R.G. Mannino, W.A. Lam, C.K. Payne, *Biophysical Journal*, **115**, 209-216 (2018).
51. "Nanoparticle-cell interactions: Relevance for public health," S. Runa, M. Hussey, and C.K. Payne, *J. Phys. Chem. B*, **122**, 1009-1016 (2018). *Selected as ACS Editor's Choice*.
50. "Nanoparticle-induced oxidation of the plasma membrane: importance of the protein corona," S. Runa, M. Lakadamyali, M.L. Kemp, and C.K. Payne, *J. Phys. Chem. B*, **121**, 8619-8625 (2017).
49. "Modulation of action potentials using PEDOT:PSS conducting polymer microwires," S.B. Thourson and C.K. Payne, *Scientific Reports*, **7**, #10402 (2017).
48. "Nanoparticle-induced oxidation of corona proteins initiates an oxidative stress response in cells," S. Runa, D.T. Jayaram, M.L. Kemp, and C.K. Payne, *Nanoscale*, **9**, 7595-7601 (2017).
47. "Controlling the resting membrane potential of cells with conducting polymer microwires," D.T. Jayaram, Q. Luo, S.B. Thourson, A. Finlay, and C.K. Payne, *Small*, #1700789 (2017).
46. "Conducting polymer nanowires for control of local protein concentration in solution," J.D. Morris, S.B. Thourson, K. Panta, B.N. Flanders, and C.K. Payne, *J. Phys. D: Appl. Phys.*, **50**, #174003 (2017).
45. "Heme protein-mediated synthesis of PEDOT:PSS: Enhancing conductivity by inhibiting heme degradation," J. Flores, C.K. Payne, and J.D. Morris, *RSC Advances*, **7**, 12017-12021 (2017).
44. "Differential cathepsin responses to inhibitor-induced feedback: E-64 and cystatin C elevate active cathepsin S and suppress active cathepsin L in breast cancer cells," C.L. Wilder, V. Watson, F.A.A. Steward, J. Johnson, S.R. Peyton, C.K. Payne, V. Odero-Marah, and M.O. Platt, *Internat. J. Biochem. & Cell Biol.*, **79**, 199-208 (2016).
43. "TiO₂ nanoparticles alter the expression of peroxiredoxin anti-oxidant genes," S. Runa, D. Khanal, M.L. Kemp, and C.K. Payne, *Journal of Physical Chemistry C*, **120**, 20736-20742 (2016).
42. "Modeling the effect of nanoparticles and the bistability of transmembrane potential in nonexcitable cells," M.A. Rana, N. Yao, S. Mukhopadhyay, F. Zhang, E.A.K. Warren, and C.K. Payne, *American Control Conference* (2016).
41. "Mechanism of the biomolecular synthesis of PEDOT:PSS: Importance of heme degradation by hydrogen peroxide," J.D. Morris, K.M. Wong, C.D. Peñaherrera, and C.K. Payne, *Biomaterials Science*, **4**, 331-337 (2016).

40. "Spatially-resolved intracellular sensing of hydrogen peroxide in living cells," E.A.K. Warren, T.S. Netterfield, S. Sarkar, M.L. Kemp, and C.K. Payne, *Scientific Reports*, **5**, 16929 (2015).
39. "Cellular binding of nanoparticles disrupts the membrane potential," E.A.K. Warren and C.K. Payne, *RSC Advances*, **5**, 13660-13666 (2015).
38. "Hemoglobin-mediated synthesis of PEDOT:PSS: Enhancing conductivity through biological oxidants," J.D. Morris, D. Khanal, J.A. Richey, C.K. Payne, *Biomaterials Science*, **3**, 442-445 (2015).
37. "PEGylated nanoparticles: Protein corona and secondary structure," S. Runa, A. Hill, V.L. Cochran, C.K. Payne, *Physical Chemistry of Nanomaterials and Interfaces XIII, Proceedings of SPIE*, **91651F** (2014).
36. "A model for controlling the resting membrane potential of cells using nanoparticles," S. Mukhopadhyay, F. Zhang, E. Warren, C.K. Payne, *53rd IEEE Conference on Decision and Control* (2014).
35. "Nanoparticle-cell interactions: Molecular structure of the protein corona and cellular outcomes," C.C. Fleischer and C.K. Payne, *Accounts of Chemical Research*, **47**, 2651-2659 (2014).
34. "Impact of serum proteins on MRI contrast agents: Cellular binding and T2 relaxation," A. Hill and C.K. Payne, *RSC Advances*, **4**, 31735-31744 (2014).
33. "Secondary structure of corona proteins determines the cell surface receptors used by nanoparticles," C.C. Fleischer and C.K. Payne, *J. Phys. Chem. B*, **118**, 14017-14026 (2014).
32. "Tuning PEDOT:PSS conductivity with iron oxidants," J.D. Morris and C.K. Payne, *Organic Electronics*, **15**, 1707-1710 (2014).
31. "Lysosome transport as a function of lysosome diameter," D. Bandyopadhyay, A. Cyphersmith, J.A. Zapata, Y.J. Kim, C.K. Payne, *PLoS One*, **9**, e86847 (2014).
30. "Cellular binding of anionic nanoparticles is inhibited by serum proteins independent of nanoparticle composition," C.C. Fleischer, U. Kumar, C.K. Payne, *Biomaterials Science*, **1**, 975-982 (2013).
29. "Protein-mediated synthesis of the conducting polymer PEDOT:PSS," S.M. Hira and C.K. Payne, *Synthetic Metals*, **176**, 104-107 (2013).
28. "Membrane potential mediates the cellular binding of nanoparticles," E.H. Shin, Y. Li, U. Kumar, H.V. Sureka, X. Zhang, C.K. Payne, *Nanoscale*, **5**, 5879-5886 (2013).
27. "Conditioned media downregulates nuclear expression of Nrf2," S. Sarkar, C.K. Payne, M.L. Kemp, *Cellular and Molecular Bioengineering*, **6**, 130-137 (2013).
26. "Imaging intracellular quantum dots: Fluorescence microscopy and transmission electron microscopy," C.J. Szymanski, H. Yi, J.T. Liu, E.R. Wright, C.K. Payne, in *Nanobiotechnology Protocols*, Eds. S.J. Rosenthal and D.W. Wright (Humana Press, New York, 2013).
25. "Nanoparticle surface charge mediates the cellular receptors used by protein-nanoparticle complexes," C.C. Fleischer and C.K. Payne, *J. Phys. Chem. B*, **116**, 8901-8907 (2012).
24. "Imaging lysosomal enzyme activity in live cells using self-quenched substrates," W.H. Humphries and C.K. Payne, *Analytical Biochemistry*, **424**, 178-183 (2012).

23. "Nanoparticles act as protein carriers during cellular internalization," G.W. Doorley and C.K. Payne, *Chem. Commun.*, **48**, 2961-2963 (2012).
22. "Fluorescent coumarin thiols measure biological redox couples," K.G. Reddie, W.H. Humphries, C.P. Bain, M.L. Kemp, C.K. Payne, N. Murthy, *Org. Lett.*, **14**, 680-683 (2012).
21. "Endo-lysosomal vesicles positive for Rab7 and LAMP1 are terminal vesicles for the transport of dextran," W.H. Humphries, C.J. Szymanski, C.K. Payne, *PLoS One*, **6**, e26626 (2011).
20. "Single particle tracking as a method to resolve differences in highly colocalized proteins," C.J. Szymanski, W.H. Humphries IV, C.K. Payne, *Analyst*, **136**, 3527-3533 (2011). Featured in "Emerging Investigators" edition.
19. "Cellular binding of nanoparticles in the presence of serum proteins," G.W. Doorley and C.K. Payne, *Chem. Commun.*, **47**, 466-468 (2011). Featured in "Emerging Investigators" edition.
18. "Intracellular degradation of low-density lipoprotein probed with two-color fluorescence microscopy," W.H. Humphries IV, N.C. Fay, C.K. Payne, *Integrative Biology*, **2**, 536-544 (2010).
17. "Pyrenebutyrate leads to cellular binding, not intracellular delivery, of polyarginine quantum dots," A.E. Jablonski, T. Kawakami, A.Y. Ting, C.K. Payne, *J. Phys. Chem. Lett.*, **1**, 1312-1315 (2010).
- x. "Pyrenebutyrate-mediated delivery of quantum dots across the plasma membrane of living cells," A.E. Jablonski, W.H. Humphries IV, C.K. Payne, *J. Phys. Chem. B*, **113**, 405-408 (2009). Withdrawn. The conclusions drawn from the data in this manuscript were incorrect. A full discussion can be found in Publication #17.
16. "Imaging gene delivery with fluorescence microscopy," C.K. Payne, *Nanomedicine*, **2**, 847-860 (2007).
15. "Cellular binding, motion, and internalization of synthetic gene delivery polymers," G.T. Hess, W.H. Humphries IV, N.C. Fay, and C.K. Payne, *Biochim. Biophys. Acta, Mol. Cell Res.*, **1773**, 1583-1588 (2007).
14. "Internalization and trafficking of cell surface proteoglycans and proteoglycan-binding ligands," C.K. Payne, S.A. Jones, C. Chen, and X. Zhuang, *Traffic*, **8**, 389-401 (2007).
13. "Photo-induced β -hydrogen elimination and radical formation with $\text{CpW}(\text{CO})_3(\text{CH}_2\text{CH}_3)$: Ultrafast IR and DFT studies," E.A. Glascoe, M.F. Kling, J.E. Shanoski, R.A. DiStasio Jr., C.K. Payne, B.V. Mork, T.D. Tilley, and C.B. Harris, *Organometallics*, **26**, 1424-1432 (2007).
12. "Temperature-dependent UV-Vis spectral changes in hydrogen- and deuterium-bonded photosynthetic reaction centers of *Rhodobacter sphaeroides*," A.E. Ostafin, J.A. Popova, C.K. Payne, H. Mizukami, J.R. Norris, *Photosynthetica*, **44**, 433-438 (2006).
11. "Nanophotonic light sources for fluorescence spectroscopy and cellular imaging," O. Hayden and C.K. Payne, *Ang. Chem. Int. Ed.*, **44**, 1395-1398 (2005).
10. "Ultrafast infrared mechanistic studies of the interaction of 1-hexyne with Group 6 hexacarbonyl complexes," J.E. Shanoski, C.K. Payne, M.F. Kling, E.A. Glascoe, and C.B. Harris, *Organometallics*, **24**, 1852-1859 (2005).
9. "Ultrafast UV pump/IR probe studies of C-H activation in linear, cyclic, and aryl hydrocarbons," M.C. Asplund, P.T. Snee, J.S. Yeston, M.J. Wilkens, C.K. Payne, H. Yang, K.T. Kotz, H. Frei, R.G. Bergman, and C.B. Harris, *J. Am. Chem. Soc.* **124**, 10605-10612 (2002).

8. "Intramolecular rearrangements on ultrafast timescales: Femtosecond infrared studies of ring slip in (η^1 -C₅Cl₅)Mn(CO)₅," C.K. Payne, P.T. Snee, H. Yang, K.T. Kotz, L.L. Schafer, T.D. Tilley, and C.B. Harris, *J. Am. Chem. Soc.* **123**, 7425-7426 (2001).
7. "Dynamics of photosubstitution reactions of Fe(CO)₅: An ultrafast infrared study of high spin reactivity," P.T. Snee, C.K. Payne, S.D. Mebane, K.T. Kotz, and C.B. Harris, *J. Am. Chem. Soc.* **123**, 6909-6915 (2001).
6. "Femtosecond infrared study of the dynamics of solvation and solvent caging," H. Yang, P.T. Snee, K.T. Kotz, C.K. Payne, and C.B. Harris, *J. Am. Chem. Soc.* **123**, 4204-4210 (2001).
5. "Triplet organometallic reactivity under ambient conditions: An ultrafast UV pump/IR probe study," P.T. Snee, C.K. Payne, K.T. Kotz, H. Yang, and C.B. Harris, *J. Am. Chem. Soc.* **123**, 2255-2264 (2001).
4. "Ultrafast infrared studies of ligand rearrangement at coordinatively saturated transition metal centers," K.T. Kotz, H. Yang, P.T. Snee, C.K. Payne, and C.B. Harris, in *Ultrafast Phenomena XII*, Eds. T. Elsaesser, S. Mukamel, M.M. Murnane, and N.F. Scherer (Springer-Verlag, Berlin Heidelberg, 2000) p. 636.
3. "Femtosecond infrared studies of ligand rearrangement reactions: silyl hydride products from Group 6 carbonyls," K.T. Kotz, H. Yang, P.T. Snee, C.K. Payne, and C.B. Harris, *J. Organomet. Chem.* **596**, 183-192 (2000).
2. "Ultrafast infrared studies of the reaction mechanism of silicon-hydrogen bond activation by η^5 -CpV(CO)₄," P.T. Snee, H. Yang, K.T. Kotz, C.K. Payne, and C.B. Harris, *J. Phys. Chem. A* **103**, 10426-10432 (1999).
1. "Femtosecond infrared studies of a prototypical one-electron oxidative-addition reaction: Chlorine atom abstraction by the Re(CO)₅ radical," H. Yang, P.T. Snee, K.T. Kotz, C.K. Payne, and C.B. Harris, *J. Am. Chem. Soc.* **121**, 9227-9228 (1999).

Invited Seminars, 2008-2020

Department of Chemistry, UNC Charlotte, NC; October 28, 2019

Department of Chemistry, Fordham University, Bronx, NY; September 25, 2019

2019 National Meeting of the American Chemical Society; Getting to the Bottom: Optical & Electron Imaging of Reactive Chemical Systems Symposium, August 25, 2019, San Diego, CA

Wintergreen Meeting of Physical Chemists, Wintergreen, VA; June 10, 2019

GRC on Environmental Nanotechnology, Newry, ME; June 4, 2019

Department of Toxicology, NC State University, Raleigh, NC; February 12, 2019

Department of Chemistry and Biochemistry, CalPoly, San Luis Obispo, CA; October 12, 2018

Department of Physics, University at Buffalo, SUNY; September 20, 2018

2018 National Meeting of the American Chemical Society; Understanding the Complexity of the Nano-Bio Interface Symposium, March 22, 2018, New Orleans, Louisiana

Department of Chemistry, Haverford College, Haverford, PA; November 10, 2017

Frontiers in Bioimaging, 3rd International Symposium, IAMS, Academia Sinica, Taipei, Taiwan; June 16, 2017

College of Medicine, National Cheng Kung University, Tainan, Taiwan; June 5, 2017

Department of Chemistry, National Taiwan University, Taipei, Taiwan; May 25, 2017

Department of Chemistry, National Tsing Hua University, Hsinchu, Taiwan; May 17, 2017

Materials Research Society/Stimuli Responsive Organic and Inorganic Nanomaterials for Biomedical Applications and Biosafety Symposium, Boston, MA; November 30, 2016

Department of Chemistry, New York University; October 7, 2016

Polymat, University of the Basque Country, San Sebastian, Spain; July 8, 2016

North American Neuromodulation Society-Neural Interfaces Conference, Baltimore, MD; June 29, 2016

Institute for Biophysical Dynamics, University of Chicago; April 5, 2016

2016 National Meeting of the American Chemical Society; Physical Principles in Functional Nanoscience Symposium, March 14; GSSPC: Resolving the Big Picture Symposium, March 14; Colloids for Medical Imaging Symposium, March 15, 2016, San Diego, California

Department of Chemistry, Mississippi State University, Starkville; March 4, 2016

King Abdullah University of Science & Technology (KAUST), Saudi Arabia; February 28, 2016

Pacific Conference on Spectroscopy and Dynamics, Asilomar, CA; January 31, 2016

PacifiChem 2015/Single-molecule Fluorescence Imaging Symposium, Honolulu, HI; December 16, 2015

Centro de Investigación Cooperativa en Biomateriales (CIC biomaGUNE), San Sebastian, Spain; October 29, 2015

Department of Bionanoscience, TU Delft, Netherlands; October 15, 2015

Institute of Materials, EPFL, Lausanne, Switzerland; August 28, 2015

2015 National Meeting of the American Chemical Society/Protein-Nanoparticle Interfaces Symposium, Boston, Massachusetts; August 17, 2015

Physical Chemistry Seminar, University of Maryland, College Park; April 1, 2015

Materials Seminar, Indiana University, Bloomington, Indiana; February 24, 2015

Light-driven Processes for Bio-inspired Materials and Systems Workshop, Rice University, Houston, Texas; December 15, 2014

Department of Chemistry, UC Davis, California; October 28, 2014

Department of Chemistry, University of Minnesota, Minneapolis-St. Paul; October 16, 2014

Department of Chemistry, Duke University, Durham, North Carolina; October 1, 2014

Imaging in 2020, Imaging the Immune System, Jackson Hole, Wyoming; September 24, 2014

SPIE, Physical Chemistry of Interfaces and Nanomaterials, San Diego, California; August 20, 2014

2014 National Meeting of the American Chemical Society/Nano Probes for Biological Systems Symposium, San Francisco, California; August 11, 2014

Centro de Investigación Cooperativa en Biomateriales (CIC biomaGUNE), San Sebastian, Spain; April 11, 2014

Institute of Photonic Sciences (ICFO), Barcelona, Spain; April 8, 2014

The Molecular Foundry, Lawrence Berkeley National Laboratory, Berkeley, California; March 25, 2014

Solvation, Dynamics, and Reactivity in Complex Environments Focus Session, Division of Chemical Physics, APS, Denver, Colorado; March 6, 2014

Department of Chemistry, University of Michigan; February 25, 2014

Department of Chemistry, University of Puerto Rico, Río Piedras; February 3, 2014

Supramolecular Chemistry Symposium, Southeastern Regional ACS, Atlanta, Georgia; November 14, 2013

Physical Chemistry Seminar, University of Rochester, New York; November 4, 2013

2012 National Meeting of the American Chemical Society/Biomacromolecules Symposium, Philadelphia, Pennsylvania; August 20, 2012

Department of Chemistry, University of Chicago; May 22, 2012

Department of Chemistry and Biochemistry, University of California, Santa Cruz; May 14, 2012

Translational and Molecular Imaging Institute, Mount Sinai School of Medicine, New York; March 16, 2012

Physical Chemistry Seminar, School of Chemistry, University of California, Berkeley; March 13, 2012

Physical Chemistry Seminar, Department of Chemistry and Biochemistry, University of California, San Diego; March 6, 2012

Department of Chemistry, University of Southern California, Los Angeles, California; February 27, 2012

Cardiovascular Biology Seminar, Emory School of Medicine, Atlanta, Georgia; February 13, 2012

Physical Chemistry Seminar, University of Colorado, Boulder; January 27, 2012

Department of Chemistry, Colorado State University, Ft. Collins, Colorado; January 26, 2012

Department of Chemistry, University of Wisconsin, Madison; January 24, 2012

Department of Chemistry and Biochemistry, University of California, Los Angeles; January 9, 2012

Department of Chemistry, University of Illinois at Urbana-Champaign; November 30, 2011

Department of Chemistry, Rice University, Houston, Texas; November 2, 2011

Biophysics Colloquia, Cornell University, Ithaca, New York; April 27, 2011

2011 National Meeting of the American Chemical Society, Denver, Colorado; August 29, 2011

Department of Chemistry, New York University, New York; April 5, 2011

Department of Chemistry, North Carolina State University, Raleigh, North Carolina; March 25, 2011

Department of Chemistry, Duke University, Durham, North Carolina; March 22, 2011

Single Molecule Approaches to Biology, Optical Society of America, Rochester, New York; October 27, 2010

Functionalized Nanobiomaterials for Medical Applications, MRS Workshop, Denver, Colorado; October 6, 2010

2010 National Meeting of the American Chemical Society, San Francisco, California; March 24, 2010

Department of Chemistry and Biochemistry, University of Notre Dame, Notre Dame, Indiana; February 4, 2010

Single Molecule Biophysics, Optical Society of America, San Jose, California; October 15, 2009

Department of Physics, University of Maine, Orono; April 3, 2009

Biochemistry Seminar, University of Colorado, Boulder; November 5, 2008

US-North Africa Regional Workshop on Nanostructured Materials and Nanotechnology, Hammamet, Tunisia; March 18, 2008