

# Christine K. Payne

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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

2013- 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 and environmental applications  
Conducting polymer nanowires for cellular modulation  
Advanced fluorescence microscopy methods for live cell imaging

## Professional Memberships and Service

2017- Councilor, Division of Physical Chemistry, ACS  
2017- Editorial Advisory Board, Journal of Physical Chemistry  
2016- Symposium Organizer, "Single Cell Biophysics", Biophysical Society, Taiwan (June, 2017)  
2015- Advisory Board, Georgia Tech BioMat NIH Training Grant  
2015- ACS National Award Selection Committee  
2012- NIH Peer Review, ad hoc; NANO (2012), GDD (2014), NCI (2016)  
2011 Participant, Innovation Brainstorm, Strategic Planning for the NIH Common Fund  
2011 Symposium Organizer, "Advanced Microscopy...Biophysical Questions," ACS Meeting, Denver  
2010 Chair, Biophysical Subdivision, Division of Physical Chemistry, ACS  
2009-present 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-present Biophysical Society, member  
1999-present American Chemical Society, member

## Honors and Awards

2014 Vasser Woolley Faculty Fellowship  
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

## Research Grants

Current NIH-BRAIN Initiative, "Conducting polymer nanowires for neural modulation," September 2015-August 2017, \$442,866 Total, co-PI: Prof. Bret Flanders, Physics, Kansas State University  
NSF EAGER-CBET, "Integration of conducting polymers with living cells," August 2015-July 2017, \$60,000 Total, co-PI: Prof. Bret Flanders, Physics, Kansas State University

- NSF, CBET-BME, "Single cell biophysics: measurement, modulation, and modeling" July 2016-June 2017, \$15,000 for workshop
- Pending NIH-NIEHS, "Exposure signature of metal oxide nanoparticles," December 2016-Novemeber 2021, \$1.8M Total, PIs: Payne, Kemp (BME), Fan (BIO); Percentile=14%
- NSF, CBET-BME, "High-throughput synthesis of conducting polymer nanowires for cellular modulation," July 2017-June 2020, \$422,496 to Payne, co-PI: J.D. Morris, Georgia Gwinnett College
- NSF-DMR, "Metal oxide nanoparticles and ROS generation in the absence of light: Importance for oxidative stress," July 2017-June 2020, \$379,377 to Payne, co-PI: M. Kemp (BME)
- NSF-IUSE, "Facilitating active learning in STEM education through immersive digital games: The case of quantum mechanics" July 2017-June 2020, PI: N. JafariNaimi, School of Literature, Media, and Communication, GT
- Vannevar Bush Faculty Fellowship, "Understanding and controlling the electrical properties of cells with conducting polymer wires: Applications in regenerative medicine," July 2017-June 2022, \$3M Total
- Completed 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 Statistical Mechanics (CHEM 6481, Graduate) Spring 07, Spring 09, Fall 10, Fall 12  
Quantum Mechanics (CHEM 3412, Undergraduate) Spring 08, Fall 08, Fall 09, Fall 11, Spring13, Spring 15  
General Chemistry (CHEM 1310, Undergraduate) Spring 11, Fall 14  
Fundamentals of Data Analysis (CHEM 2801, Undergraduate) Fall 13, Fall 14, Spring 16, Fall 16  
Thermodynamics, Kinetics, Statistical Mechanics (CHEM 3411, Undergraduate) Fall 16
- REU Jenna Tomlinson (2008, PhD, University of Michigan), Solaire Finkenstaedt-Quinn (2009, PhD, University of Minnesota), Syeda Anum (2011, MD, UMass), Ryan Lannan (2012), Quachel Bazile (2012, PhD, University of Alabama, Birmingham), Victoria Cochran (2014, current Harvard undergrad), Jonathan Flores (2016, current Georgia Gwinnett College 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, current GT undergrad), Rohan Kadambi (2015-2016, current GT undergrad), Kaela Fennell-Chin (BME, 2016-), Gregory Whyte (CHBE, 2016-), Adam Finlay (CHBE, 2016-)  
Current: Gregory Whyte (CHBE, 2016-), Kaela Fennell-Chin (BME, 2016-), Adam Finlay (CHBE, 2016-)

- M.S. Melinda Ogden (2009), Dipesh Khanal (2015)
- Ph.D. Former: William Humphries (2011, microscopy specialist at B&B Microscopes/Olympus), Candace Fleischer (2014, postdoc, Emory University)  
Current: Scott Thourson (BioE), Sabiha Runa (CHEM), Samantha Pustulka (CHBE)
- Postdocs Former: Ashlee St. John Iyer (2008-2009), Don-Ricardo Miller (joint with Prof. Melissa 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, postdoc with El-Sayed), Austin Cyphersmith (2012-2013, research specialist, microscopy core, UIUC), Debjyoti Bandyopadhyay (2012-2013, postdoc, 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, research chemist, Ultra Ink), Tevhide Ozkaya Ahmadov (2016-2017)  
Current: Dhanya Jayaram (2016-)

### Publications

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*, accepted (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*, accepted (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. Otero-Marah, and M.O. Platt, *International Journal of Biochemistry & Cell Biology*, **79**, 199-208 (2016).
43. "TiO<sub>2</sub> 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, 53<sup>rd</sup> *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  $\beta$ -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  $(\eta^1\text{-C}_5\text{Cl}_5)\text{Mn}(\text{CO})_5$ ," 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  $\text{Fe}(\text{CO})_5$ : 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  $\eta^5$ -CpV(CO)<sub>4</sub>," 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)<sub>5</sub> 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, 2008-2016

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