Christine K. Payne

Chemistry and Biochemistry
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Educational Background

1998	B.S.	Chemistry	University of Chicago	Advisors: James Norris, Norbert Scherer
2003	Ph. D.	Chemistry	University of California, Berkeley	Advisor: Charles Harris

Employment History

2007-	Assistant Professor, Georgia Institute of Technology
2003-2006	Postdoctoral Fellow, Harvard University, Advisor: Xiaowei Zhuang
1998-2000	Graduate Teaching Assistant, University of California, Berkeley

Research Interests

Intracellular reaction dynamics
Delivery of nanoparticles to living cells
Development of new fluorescence microscopy methods

Professional Memberships and Service

2009	Symposium Organizer, "Single Molecule Biophysics," OSA Annual Meeting
2009-	Chair-Elect, Biophysical Subdivision, Division of Physical Chemistry, ACS
2007-	Co-Organizer, Atlanta Area Chemical Physics (AACP) Seminar Series
2003-	Biophysical Society, member
1999-	American Chemical Society, member

Honors and Awards

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
1998	B.S. with Honors in the College and in Chemistry, University of Chicago

Teaching

Courses	Statistical Mechanics (CHEM 6481) Spring 07 & 09 Quantum Mechanics (CHEM 3412) Spring 08, Fall 08, & Fall 09
REU	Jenna Tomlinson (2008, now a Ph.D. student at University of Michigan), Solaire Finkenstaedt-Quinn (2009)
B.S.	Nicole Fay (2007-2008, now a Ph.D. student at UC Berkeley), Jesse Haulk (2008), Kevin Hardin (2008-2009)
M.S.	Melinda Ogden (2007-2009)
Ph.D.	Emily Herman, William Humphries, Amy Jablonski
Postdocs	Ashlee St. John Iyer, Don-Ricardo Miller (joint with Prof. Melissa Kemp, BME)

Invited Seminars

"Imaging reaction dynamics in living cells," College of Arts and Sciences Seminar, Valdosta State University, Valdosta, Georgia; April 23, 2009.

"Imaging intracellular dynamics," Department of Physics, University of Maine, Orono; April 3, 2000.

"Imaging reaction dynamics in living cells," Natural Science Seminar, New College of Florida, Sarasota, Florida; December 5, 2008.

"Pyrenebutyrate-mediated delivery of quantum dots to living cells," Southeastern Regional Meeting of the ACS, Nashville, Tennessee; November 14, 2008.

"Pyrenebutyrate-mediated delivery of quantum dots to living cells," Department of Chemistry and Biochemistry, University of Colorado, Boulder; November 5, 2008.

"Directed delivery of nanomaterials within living cells," US-North Africa Regional Workshop on Nanostructured Materials and Nanotechnology, Hammamet, Tunisia; March 18, 2008.

"Imaging reaction dynamics in living cells," Department of Chemistry and Biochemistry, San Diego State University, California; February 1, 2008.

"Role of diffusion in vesicle-mediated transport: Fluorescence correlation spectroscopy for quantitative cellular imaging," Department of Chemistry, University of Alabama, Huntsville; April 20, 2007.

"Fluorescence microscopy for live cell imaging," Nanoscale Science and Engineering Center, Harvard University, Cambridge, Massachusetts; May 1, 2006.

"Direct observation of a novel cellular transport mechanism with single-particle fluorescence microscopy," Georgia Institute of Technology, Atlanta, GA, November 1, 2005; University of Pittsburgh, Pittsburgh, PA, November 30, 2005; Emory University, Atlanta, GA, December 5, 2005, Ohio State University, Columbus, OH, December 7, 2005; Boston University, Boston, MA, December 13, 2005; UC San Diego, La Jolla, CA, January 5, 2006; Stanford University, Stanford, CA, January 10, 2006; UCLA, Los Angeles, CA, January 12, 2006; University of Oregon, Eugene, OR, January 19, 2006; Carnegie Mellon University, Pittsburgh, PA, January 24, 2006; UT Austin, Austin, TX, January 26, 2006; UC Berkeley, Berkeley, CA, February 6, 2006;

"Cellular imaging of polymer-mediated gene delivery," Harvard Single Molecule Discussion Group, Cambridge, Massachusetts; December 1, 2004.

"Cellular imaging of polymer-mediated gene delivery," Ohio State University Biophysics Seminar, Columbus, Ohio; October 6, 2004.

Publications (* indicates Georgia Tech publication)

17.* "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).

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 $CpW(CO)_3(CH_2CH_3)$: 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 $(\eta^1\text{-}C_5Cl_5)Mn(CO)_5$," **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).