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Education

University of Chicago, Doctor of Philosophy in Chemistry, December 1996
Thesis: "Ultrafast spectroscopic studies of solvation and excitation transfer dynamics"

Cornell University, Bachelor of Arts in Chemistry, May 1991

Research Experience

Associate Fellow of JILA and Adjoint Assistant Professor 7/03-present
University of Colorado and National Institutes of Standards and Technology, Boulder, CO

Senior Research Associate 9/98-6/03
The Scripps Research Institute, Department of Chemistry, La Jolla, CA

Postgraduate Research Chemist 4/97-8/98
University of California, San Diego, Department of Chemistry and Biochemistry, La Jolla, CA

Graduate Research Assistant 1/92-8/96
University of Chicago, Department of Chemistry, Chicago, IL

Technical Assistant 6/93-9/93 and 6/91-9/91
IBM Research Division, T.J. Watson Research Center, Yorktown Heights, NY

Undergraduate Research Assistant 1/89-5/89 and 9/89-5/91
Cornell University, Department of Chemistry, Ithaca, NY

Technical Assistant 6/89-8/89
AT&T Bell Laboratories, Materials Science Research Group, Murray Hill, NJ

Awards

National Physical Science Consortium Graduate Fellowship, 1991-1996
National Science Foundation Minority Fellowship
National Merit Scholarship, 1987-1991
National Hispanic Scholarship, 1987-1988

Professional Associations

Member of the American Chemical Society, 1996-present

Publications

“Three-pulse photon echo spectroscopy as a probe of flexibility and conformational heterogeneity in protein folding,” E. A. Gibson and R. Jimenez (2008) in *Ultrafast Phenomena XVI* (in press).

“Mass instability in isolated recombinant FixL heme domains of *Bradyrhizobium japonicum* (BjFixLH),” J. D. Satterlee, C. Suquet, A. K. Bidwai, J. E. Erman, L. Schwall and R. Jimenez (2008) *Biochemistry* **47**, 1540-1553.

“Linear spatio-temporal characterization of a UV microscope objective for nonlinear imaging and spectroscopy by using two-dimensional spectra interferometry,” W. Amir, D. N. Schafer, C. G. Durfee, J. A. Squier, E. A. Gibson, L. Kost and R. Jimenez (2007) *J. Microscopy* (submitted).

“Three-dimensional chemical concentration maps in a microfluidic device using two-photon absorption fluorescence imaging,” D. Schafer, E. A. Gibson, W. Amir, R. Erikson, J. Lawrence, T. Vestad, J. Squier, R. Jimenez and D. W. M. Marr (2007) *Opt. Lett.* **32**, 2568-2570.

“Nonlinear femtosecond electronic spectroscopy of proteins,” C. F. Carlsson and R. Jimenez (2007) *Ultrafast Optics* (submitted).

“Measuring protein folding kinetics with UV-Vis absorption and UV fluorescence in a microfluidic mixer,” E. A. Gibson, D. Schafer, W. Amir, D. W. M. Marr, J. A. Squier and R. Jimenez (2007) *Analytical Chem.* (submitted).

“Reflection gratings compensate dispersion in ultrafast systems,” S. Kane, J. Squier, R. Jimenez, L. Kuznetsova, F. Wise, H. Kapteyn and B. Touzet (2007) *Laser Focus World* May 2007, pp. 95-98.

“Grism based stretcher/compressor system for amplified, femtosecond kilohertz lasers,” D. M. Gaudiosi, E. A. Gibson, S. Kane, R. Huff, M. Murnane, H. C. Kapteyn, C. G. Durfee III, J. Squier and R. Jimenez (2006) in *Proc., 15th International Conference on Ultrafast Phenomena* (in press).

“Metalloporphyrin cofactor reconstitution of *Bradyrhizobium japonicum* FixL heme domain and its effect on protein stability probed by UV-vis and fluorescence spectroscopies,” B. M. Cho, L. Schwall and R. Jimenez (2006) *Biochemistry* (submitted).

“Efficient reflection gratings for pulse compression and dispersion compensation of femtosecond pulses,” E. A. Gibson, D. M. Gaudiosi, H. C. Kapteyn, R. Jimenez, S. Kane, R. Huff, C. Durfee and J. Squier (2006) *Opt. Lett.* **31**, 3363-3365.

“Scalable multi-kilohertz repetition rate Ti:sapphire amplifier based on down-chirped pulse amplification,” D. M. Gaudiosi, E. Gagnon, A. L. Lytle, J. Fiore, M. M. Murnane, H. C. Kapteyn, R. Jimenez, and S. Backus (2005) *Opt. Express* **14**, 9277-9283.

“Hydrodynamic focusing for vacuum-pumped microfluidics,” T. Stiles, R. Fallon, T. Vestad, J. Oakey, D. W. M. Marr, J. Squier and R. Jimenez (2005) *Microfluidics and Nanofluidics* **1**, 280-283.

“Photon echo spectroscopy of porphyrins and heme proteins: effects of quasi-degenerate electronic structure on the peak shift decay,” B. M. Cho, C. F. Carlsson, and R. Jimenez (2005) *J. Chem. Phys.* **124**, 144905/1-15.

“Protein Dynamics and the Immunological Evolution of Molecular Recognition,” R. Jimenez, G. Salazar, J. Yin, T. Joo, and F. E. Romesberg (2004) *Proc. Natl. Acad. Sci. U.S.A.*, **101**, 3803-3808.

“Flexibility and molecular recognition in the immune system,” R. Jimenez, G. Salazar, K.K. Baldridge, and F.E. Romesberg (2003) *Proc. Natl. Acad. Sci. U.S.A.*, **100**, 92-97.

“Excited state dynamics and heterogeneity of folded and unfolded states of cytochrome c,” R. Jimenez and F.E. Romesberg (2002) *J. Phys. Chem. B.*, **106**, 9172-9180.

“Protein dynamics and cytochrome c: Correlations between ligand vibrations and redox activity,” J.K. Chin, R. Jimenez, and F.E. Romesberg (2002) *J. Am. Chem. Soc.*, **124**, 1846-1847.

“Solvent-dependent photoinduced tautomerization of 2-(2'-hydroxyphenyl)benzoxazole,” O.K. Abou-Zied, R. Jimenez, E.H.Z. Thompson, D.P. Millar, and F.E. Romesberg (2002) *J. Phys. Chem. A.*, **106**, 3665-3672.

“Flexibility of an antibody binding site measured with photon echo spectroscopy,” R. Jimenez, D.A. Case, and F.E. Romesberg (2001) *J. Phys. Chem. B.*, **106**, 1090-1103.

“Tautomerization dynamics of a model base-pair in DNA,” O.K. Abou-Zied, R. Jimenez, and F.E. Romesberg (2001) *J. Am. Chem. Soc.*, **123**, 4613-4614.

“Ultrafast x-ray measurement of laser-heating in semiconductors: Parameters determining the thermal melting threshold,” A. Cavalleri, C.W. Siders, C. Rose-Petruck, R. Jimenez, Cs. Toth, J.A. Squier, C.P.J. Barty, K.R. Wilson, K. Sokolowski-Tinten, M.H. von Hoegen, and D. von der Linde (2001) *Phys. Rev. B.*, **6319**, no.-193306.

“Direct observation of protein vibrations by selective incorporation of spectroscopically observable carbon-deuterium bonds in cytochrome c,” J.K. Chin, R. Jimenez, and F.E. Romesberg (2001) *J. Am. Chem. Soc.*, **123**, 2426-2427.

“A phototautomerizable model DNA base pair,” A.K. Ogawa, O.K. Abou-Zied, V. Tsui, R. Jimenez, D.A. Case, and F.E. Romesberg (2000) *J. Am. Chem. Soc.*, **122**, 9917-9920.

“Picosecond-milliangstrom resolution crystal dynamics by ultrafast x-ray diffraction,” C. Rose-Petruck, R. Jimenez, T. Guo, A. Cavalleri, C.W. Siders, F. Raksi, J. Squier, B. Walker, K.R. Wilson, and C.P.J. Barty (1999) *Nature*, **398**, 310-312.

“Ultrafast movies of atomic motion with femtosecond laser-based x-rays,” C.W. Siders, A. Cavalleri, K. Sokolowski-Tinten, T. Guo, Cs. Toth, R. Jimenez, C. Rose-Petruck, M. Kammler, M.H. von Hoegen, D. von der Linde, K.R. Wilson, and C.P.J. Barty (1999) in *Soft X-ray Lasers and Applications III*, edited by J.J. Rocca and L.B. DaSilva, (SPIE Proceedings, Bellingham), **3776**, 302-311.

- “Time-resolved x-ray diffraction of GaAs with a 30-fs laser-driven plasma source,” R. Jimenez, C. Rose-Petruck, T. Guo, K.R. Wilson, and C.P.J. Barty (1998) in *Ultrafast Phenomena XI*, edited by J. Fujimoto, W. Zinth, and D. Wiersma, (Springer-Verlag, Berlin), 404-406.
- “Electronic excitation transfer from carotenoid to bacteriochlorophyll in the purple bacterium *Rhodospseudomonas acidophila*,” B.P. Krueger, G.D. Scholes, R. Jimenez, and G.R. Fleming (1998) *J. Phys. Chem. B.*, **102**, 2284-2292.
- “Picosecond-milliangstrom resolution dynamics by ultrafast x-ray diffraction,” T. Guo, F. Raksi, C. Rose-Petruck, R. Jimenez, J. Squier, B. Walker, K.R. Wilson, and C.P.J. Barty (1997) in *Applications of X-rays Generated from Lasers and Other Bright Sources*, edited by G.A. Kyrala and J.C. Gauthier, (SPIE Proceedings, Bellingham), **3157**, 84-92.
- “Three pulse echo experiments on LH1 and LH2 complexes of *Rhodobacter sphaeroides*: A nonlinear spectroscopic probe of energy transfer,” R. Jimenez, F. van Mourik, J.Y. Yu, and G.R. Fleming (1997) *J. Phys. Chem. B.*, **101**, 7350-7359.
- “Ultrafast spectroscopy of excitation transfer dynamics in biological systems,” G.R. Fleming and R. Jimenez (1996) in *Femtochemistry and Femtobiology: Ultrafast Reaction Dynamics at Atomic-scale Resolution*, edited by V. Sundström, (Imperial College Press, London), 701-723.
- “Internal conversion and energy transfer dynamics of spheroidene in solution and in the LH1 and LH2 light-harvesting complexes,” M. Ricci, S.E. Bradforth, R. Jimenez, and G.R. Fleming (1996) *Chem. Phys. Lett.*, **259**, 381-390.
- “Electronic excitation transfer in the LH2 complex of *Rhodobacter sphaeroides*,” R. Jimenez, S.N. Dikshit, S.E. Bradforth, and G.R. Fleming (1996) *J. Phys. Chem.*, **100**, 6825-6834.
- “Ultrafast spectroscopy of photosynthetic systems,” R. Jimenez and G.R. Fleming (1995) in *Biophysical Techniques in Photosynthesis*, edited by J. Ames and A.J. Hoff, (Kluwer Academic, Dordrecht), 63-73.
- “Singlet energy transfer from carotenoids in purple bacterial light harvesting antenna,” S.E. Bradforth, R. Jimenez, M. Ricci, S.N. Dikshit, and G.R. Fleming (1995) in *Femtochemistry: Ultrafast Chemical and Physical Processes in Molecular Systems*, edited by M. Chergui, (World Scientific, London), 427-430.
- “Electronic excitation transfer in bacterial light harvesting complexes,” S.E. Bradforth, R. Jimenez, S.N. Dikshit, and G.R. Fleming (1995) in *Proceedings of the 10th International Photosynthesis Conference*, edited by P. Mathis, (Kluwer Academic, Dordrecht), Vol. I, 23-28.
- “Excitation transfer in the core light harvesting complex (LH1) of *Rhodobacter sphaeroides*: An ultrafast fluorescence depolarization and annihilation study,” S.E. Bradforth, R. Jimenez, F. van Mourik, R. van Grondelle, and G.R. Fleming (1995) *J. Phys. Chem.*, **99**, 16179-16191.

“Femtosecond to nanosecond solvation dynamics in pure water and inside the γ -cyclodextrin cavity,” S. Vajda, R. Jimenez, E.W. Castner, S.J. Rosenthal, V. Fidler, and G.R. Fleming (1995) *Trans. Faraday Soc.*, **91**, 867-873.

“Ultrafast energy transfer in the core light-harvesting complex of the photosynthetic bacterium *Rhodobacter sphaeroides* observed by fluorescence upconversion,” S.E. Bradforth, R. Jimenez, V. Fidler, G.R. Fleming, S. Nagarajan, J. Norris, F. van Mourik, and R. van Grondelle (1994) in *Ultrafast Phenomena IX*, edited by G.A. Mourou, A.H. Zewail, P.F. Barbara, and W.H. Knox, (Springer-Verlag, Berlin), 441-442.

“Femtosecond solvation dynamics of water,” R. Jimenez, G.R. Fleming, P.V. Kumar, and M. Maroncelli (1994) *Nature*, **369**, 471-473.

“Polar solvation dynamics of methanol: Experimental and computer simulation studies,” S.J. Rosenthal, R. Jimenez, G.R. Fleming, P.V. Kumar, and M. Maroncelli (1994) *J. Mol. Liq.*, **60**, 25-56.

“The photodissociation dynamics of 3-cyclopentenone: Using the impact parameter distribution as a criterion for concertedness,” R. Jimenez, S.H. Kable, J.C. Loison, C.J.S.M. Simpson, W. Adam, and P.L. Houston (1992) *J. Phys. Chem.*, **96**, 4188-4195.

“Correlations without coincidence measurements: Impact parameter distributions for dissociations,” C.E.M. Strauss, R. Jimenez, and P.L. Houston (1991) *J. Phys. Chem.*, **95**, 8110-8118.

“Crystallization of reduced strontium and barium niobate perovskites from borate fluxes,” B. Hessen, S.A. Sunshine, T. Siegrist, and R. Jimenez (1991) *Mater. Res. Bull.*, **26**, 85-90.