Casey H. Londergan

Chair and Associate Professor of Chemistry
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Appointments

Haverford College	Haverford, PA
Associate Professor of Chemistry	4/2013–present
Assistant Professor of Chemistry	7/2006–4/2013
University of Pennsylvania	Philadelphia, PA
Visiting Associate Professor of Chemistry	9/2013–6/2014
NIH-NRSA Postdoctoral fellow, Department of Chemistry	7/2003–6/2006

Education and Training

University of California, San Diego	La Jolla, CA
Ph.D. in Chemistry	6/2003
M.S. in Chemistry	1/2000
Los Alamos National Laboratory	Los Alamos, NM
Post-baccalaureate research assistant	6/1997–9/1998
Williams College	Williamstown, MA
B.A. *Cum Laude* with Honors in Chemistry	6/1997

Awards

National Science Foundation	
NSF–CAREER Early Career Development Award	2012–2018
Research Corporation	
Cottrell Scholar	2015–present
Scialog Fellow for "Molecules Come to Life"	2015–2016
Cottrell College Science Award	2009–2011
Camille and Henry Dreyfus Foundation	
New Faculty Start-Up Award	2006–2011
Henry Dreyfus Teacher-Scholar Award	2015–2019
National Institutes of Health	
NRSA Kirschstein postdoctoral fellowship	2004–2006
University of California, San Diego	
Excellence in Teaching (Chemistry Department)	1998,1999
Master Teaching Assistant for Chemistry	2000–2001
Williams College	
Class of 1960 Scholar	1996–1997

Grants

National Science Foundation

RUI grant CHE-1800080 ($320,854)	awarded July 2018
CAREER grant CHE-1150727 ($505,424)	2012–2018

National Institute of General Medical Sciences

R15 AREA grant GM087499-02 ($303,153)	2012–2015
R15 AREA grant GM087499-01 ($202,335)	2009–2011

Commonwealth of Pennsylvania, Department of Health

CURE grant ($28,802)	2011–2015

Research Corporation

Cottrell College Science Award ($43,219)	2009–2011

Camille and Henry Dreyfus Foundation

Henry Dreyfus Teacher-Scholar Award ($60,000)	2015–2019
New Faculty Start-Up Award ($30,000)	2006–2011

Allocations and Subcontracts

XSEDE national supercomputer resource

Startup Allocation on Stampede	2015–2016
Startup Allocation on Stampede2	2018
Research Allocation on Stampede2	2018–2019

Brigham and Women's Hospital, Bradley A. Maron, principal investigator

Subcontract for American Heart Assocation grant($10,400)	2016–2017
Subcontract for NIH grant R56-XXXXX ($5,200)	2018
Subcontract for NIH grant R01- XXXXX ($15,600)	2018–2020

Peer-Reviewed Publications

(undergraduates denoted by *: 18 publications are shared with 33 undergraduate co-authors)

Haverford College, post-tenure:

Romei, M. R.*, von Krusenstiern, E. V.*, Ridings, S. R.*, King, R. G.*, Londergan, C. H. Frequency Changes in Terminal Alkynes Provide Very Strong and Highly Sensitive Raman Probes of Local Interactions. **submitted for publication.**

Dalton, S. R., Vienneau, A. R.*, Burstein, S. R.*, Xu, R. J.*, Linse, S., Londergan, C. H. Cyanylated Cysteine Reports Site-Specific Changes at Protein-Protein Binding Interfaces Without Perturbation. *Biochemistry* **2018**, in press (DOI:10.1021/acs.biochem.8b00283).

Xu, R. J.,* Blasiak, B., Layfield, J., Cho, M., Londergan, C. H. A Direct, Quantitative Connection Between Molecular Dynamics Simulations and Vibrational Probe Lineshapes. *J. Phys. Chem. Lett.* **2018**, *9*, 2560–2567.

Kelly, K. L., Dalton, S. R., Wai, R. B.*, Ramchandani, K.*, Xu, R. J.*, Linse, S., Londergan, C. H. Conformational Ensembles of Calmodulin Revealed by Nonperturbing Site-Specific Vibrational Probe Groups. *J. Phys. Chem. A*, **2018**, *22*, 2947–2955.

Verma, P. K. V., Kundu, A., Puretz, M.*, Dhoonmoon, C.*, Chegwidden, O. C.*, Londergan, C. H., Cho, M. The Bend+Libration Combination Band is an Intrinsic, Collective, and Strongly Solute-Dependent Reporter on the Hydrogen Bonding Network of Liquid Water. *J. Phys. Chem. B* **2018**, *122*, 2587–2599(cover article).

Thiele, G. A. R.;* Friedman, C. P.;* Tsai, K. J. S.;* Beld, J.; Londergan, C. H.; Charkoudian, L. K. Acyl Carrier Protein Cyanylation Delivers a Ketoacyl Synthase-Carrier Protein Cross-Link. *Biochemistry*, **2017**, *56*, 2533–2536.

Blasiak, B., Londergan, C. H., Webb, L. J. , Cho, M. Vibrational Probes: From Small Molecule Solvatochromism Theory and Experiments to Applications in Complex Systems. *Acc. Chem. Res.*, **2017**, *50*, 968–976.

Morton, J.G.*, Joe, C.L.*, Chavez Stolla, M.*, Koshland, S.R.*, Londergan, C.H., Schofield, M.H. NMR Determination of Hydrogen Bond Thermodynamics in a Simple Diamide: a Physical Chemistry Experiment. *J. Chem. Ed.*, **2015**, *92*, 1086–1090.

Londergan, C. H., Baskin, R.*, Bischak, C. G.*, Hoffman, K. W.*, Snead, D. M.*, Reynoso, C.* Dynamic Asymmetry and the Role of the Conserved Active-Site Thiol in Rabbit Muscle Creatine Kinase. *Biochemistry*, **2015**, *54*, 83–95.

Johnson, M. N. R.*, Londergan, C. H., Charkoudian, L. K. Probing the Phosphopantetheine Arm Conformations of Acyl Carrier Proteins Using Vibrational Spectroscopy. *J. Am. Chem. Soc.*, **2014**, *136*, 11240–11243.

Hoffman, K. W.*, Romei, M. P.*, Londergan C. H. A New Raman Spectroscopic Probe of Both the Protonation State and Noncovalent Interactions of Histidine Residues. *J. Phys. Chem. A*, **2013**, *117*, 5987–5996.

Haverford College, pre-tenure:

Yang, H.*, Habchi, J., Londergan, C. H., Longhi, S. Monitoring Structural Transitions in Intrinsically Disordered Proteins by Vibrational Spectroscopy of Cyanylated Cysteine. invited chapter in *Methods in Molecular Biology*, **2012**, vol. 895, 245–270.

Wolfshorndl, M.,* Baskin, R.,*, Dhawan, I.* Londergan, C. H. Covalently Bound Azido Groups are Very Specific Water Sensors, Even in Strongly Hydrogen-Bonding Environments. *J. Phys. Chem. B*, **2012**, *116*, 1172–1179.

Alfieri, K. N.,* Vienneau, A. R.,* Londergan, C. H. Using Infrared Spectroscopy of Cyanylated Cysteine to Map Membrane Binding Structure and Orientation of the Antimicrobial Peptide CM15. *Biochemistry*, **2011**, *50*, 11097–11108.

Bischak, C. G.*, Longhi, S., Snead, D. M.*, Costanzo, S., Terrer, E., Londergan, C. H. Probing Structural Transitions in the Intrinsically Disordered C-terminal Domain of the Measles Virus Nucleoprotein by Vibrational Spectroscopy of Cyanylated Cysteines. *Biophys. J.*, **2010**, *99*, 1676-1683.

Edelstein, L.*, Stetz, M. G.*, McMahon, H. A.*, Londergan, C. H. The Effects of Cyanylated Cysteine and α-Helical Structure on Each Other. *J. Phys. Chem. B*, **2010**, *114*, 4931-4936.

McMahon, H. A.*, Alfieri, K. N.*, Clark, K. A. A.*, Londergan, C. H. Cyanylated Cysteine: a Covalently Attached Vibrational Probe of Protein-Lipid Contacts. *J. Phys. Chem. Lett.* **2010**, *1*, 850-855.

Maienschein-Cline, M. C.,* Londergan, C. H. "The CN Stretching Mode of Aliphatic Thiocyanate is Sensitive to Solvent Dynamics and Specific Solvation." *J. Phys. Chem. B*, **2007**, *111*, 10020–10025.

University of Pennsylvania:

Londergan, C. H., Axelsen, P. H., Wang, J., Hochstrasser, R. M. "Two-Dimensional Infrared Spectroscopy Displays Signatures of Structural Ordering in Peptide Aggregates." *Biophys. J.*, **2006**, *90*, 4672–4685.

Londergan, C. H., Kim, Y. S., Hochstrasser, R. M. "Two-Dimensional Infrared Spectroscopy of Dipeptides in Trehalose Glass." *Mol. Phys.*, **2005**, *103*, 1547–1553.

University of California, San Diego:
Glover, S. D., Lear, B. J., Salsman, J. C., Londergan, C. H., Kubiak, C.P. "Electron Transfer at the Class II/III Borderline of Mixed Valency: Dependence of Rates on Solvent Dynamics and Observation of a Localized-to-Delocalized Transition in Freezing Solvents." *Phil. Trans. R. Soc. A* **2008**, *366*, 177–185.

Lear, B. J., Glover, S. D., Salsman, J. C., Londergan, C. H., Kubiak, C. P. "Solvent Dynamical Control of Ultrafast Ground State Electron Transfer: Implications for Class II–III Mixed Valency." *J. Am. Chem. Soc.* **2007**, *127*, 12772–12779.

Salsman, J.C., Ronco, S., Londergan, C.H., Kubiak, C.P. "Tuning the Electronic Communication and Rates of Intramolecular Electron Transfer in Trinuclear Ruthenium Cluster Dimers." *Inorg. Chem.*, **2006**, *45*, 547–554.

Londergan, C. H., Salsman, J. C., Lear, B. J. Kubiak, C. P. "Observation and Dynamics of 'Mixed Valence Isomers' and a Thermodynamic Estimate of Electronic Coupling Parameters." *Chem. Phys.*, **2006**, *324*, 57–62.

Rocha, R. C., Brown, M. G., Londergan, C. H., Salsman, J. C., Kubiak, C. P., Shreve, A. P. "Intervalence-resonant Raman spectroscopy of strongly-coupled mixed-valence dimer clusters of ruthenium." *J. Phys. Chem. A*, **2005**, *109*, 9006–9012.

Imai, N., Hamaguchi, T., Yamaguchi, T., Ito, T., Londergan, C. H., Kubiak, C. P. "Observation and dynamics of charge-transfer isomers." *Angew. Chem. Int. Ed.*, **2004**, *43*, 1376–1381.

Londergan, C. H., Kubiak, C. P. "Electron Transfer and Dynamic Infrared Line Coalescence: It Looks Like Dynamic NMR, but a Billion Times Faster." *Chem. Eur. J.*, **2003**, *9*, 5962–5969.

Londergan, C. H., Kubiak, C. P. "Vibronic Participation of the Bridging Ligand in Electron Transfer and Delocalization: New Application of a Three-State Model in Pyrazine-Bridged Mixed-Valence Complexes of Trinuclear Ruthenium Clusters." *J. Phys. Chem. A*, **2003**, *107*, 9301–9311.

Londergan, C. H., Rocha, R. C., Brown, M. G., Shreve, A. P., Kubiak, C. P. "Intervalence Involvement of Bridging Ligand Vibrations in Hexaruthenium Mixed-Valence Clusters Probed by Resonance Raman Spectroscopy." *J. Am. Chem. Soc.*, **2003**, *125*, 13912–13913.

Londergan, C. H., Salsman, J. C., Ronco, S., Kubiak, C. P. "Infrared Activity of Symmetric Bridging Ligand Modes in Pyrazine-Bridged Hexaruthenium Mixed-Valence Clusters." *Inorg. Chem.*, **2003**, *42*, 926–928 (cover article).

Londergan, C. H., Salsman, J. C., Dolkas, L. D.,* Ronco, S., Kubiak, C. P. "Solvent dynamical control of electron-transfer rates in mixed-valence complexes observed by infrared spectral line shape coalescence." *J. Am. Chem. Soc.*, **2002**, *124*, 6236–6237.

Breedlove, B. K., Yamaguchi, T., Ito, T., Londergan, C. H., Kubiak, C. P. "Mixed valence clusters." in *Comprehensive Coordination Chemistry 2*, Lever, A. B. P., Ed.; Elsevier: Amsterdam, 2004; vol. 2, p. 717–729.

Williams College:
Londergan, C. H., Peacock-López, E. "Dynamic model of hormonal systems coupled by negative feedback." *Biophys. Chem.*, **1998**, *73*, 85–107.

Talks and Presentations Since 2013

Invited talks and conferences

American Chemical Society national meeting	Washington, DC, Aug. 2017
American Chemical Society national meeting	San Francisco, CA, Apr. 2017
Hamilton College Department of Chemistry	Mar. 2017
Western Spectroscopy Conference, Asilomar, CA	Jan. 2017
American Chemical Society national meeting	Philadelphia, PA, Aug. 2017
CDSM Institute, Korea University	Seoul, South Korea, July 2016
Scialog Fellow for "Molecules Come to Life"	Mar. 2016 and 2015
Columbia University Department of Chemistry	Dec. 2015
NHLBI seminar series	Oct. 2015
Harvard Medical School Redox Biology Group	Sept. 2015
Research Corporation for Scientific Advancement, Board of Directors Meeting	Mar. 2014
Williams College Department of Chemistry	Nov. 2013

Contributed talks at conferences

Biophysical Society meeting on Conformational Ensembles	Berlin, Germany, Aug. 2017
Time-Resolved Vibrational Spectroscopy	Cambridge, UK, July 2017
American Chemical Society national meeting	San Francisco, CA, Apr. 2017
American Chemical Society national meeting	San Diego, CA, March 2016
Time-Resolved Vibrational Spectroscopy meeting	Madison, WI, June 2015
Intrinsically Disordered Proteins Gordon Conference	Easton, MA, July 2014
Vibrational Spectroscopy Gordon Conference	Biddeford, ME, Aug. 2014
American Chemical Society National Meeting	Indianapolis, IN, Sept. 2013

Recent presentations by students

American Chemical Society national meeting (3 students)	Washington, DC, Aug. 2017
Biophysical Society Annual Meeting (6 students)	New Orleans, LA, Feb. 2017
American Chemical Society national meeting (5 students)	San Diego, CA, March 2016
Biophysical Society Annual Meeting (5 students)	Baltimore, MD, Feb. 2015
Intrinsically Disordered Proteins Gordon Conference (2 students)	Easton, MA, July 2014
American Chemical Society National Meeting (2 students)	Indianapolis, IN, Sept. 2013

Service Since 2013

Scientific Community

Research mentor for 48 graduated and 11 current students	2006–present
Ad hoc reviewer for 14+ peer-reviewed journals	continuing
PHYS-ACS national meeting undergraduate program coordinator	2016–present
Guest editor, *J. Phys. Chem.* virtual issue on research at PUIs	2018
ACS PHYS Division Biophysical Subdivision chair succession	2017–2020
Participant, Cottrell Scholars Collaborative Project on PUI Jobs	2016–2018
Facilitator, ACS/Cottrell New Faculty Workshops	2016–present
Panelist for annual NSF review panels	2011–present
Honors examiner, Swarthmore College	May 2014, May 2015, May 2018
Advisory Board, Ultrafast Optical Processes Laboratory (UPenn)	2014–2017

Haverford College

Chair, Department of Chemistry	July 2018–present
Coordinator, Beckman Scholars Program	2015–present
(Two successful institutional grants authored, 2015 and 2018)	
Clerk of the Faculty	2016–2017
Chair, *ad hoc* search committee in Microbiology	fall 2016
Faculty Representative to Board of Managers	2014–2016
Chair, Faculty Affairs and Policy Committee	2014–2016
Faculty Athletic Representative;	2008–2009, 2010–2013, 2014–2017
Faculty Liaison to Men's Soccer Team	2009–present

Professional Development Activities

Analytical and Quantitative Light Microscopy (10-day Intensive course)	
Marine Biological Laboratory, Woods Hole, MA	May 2018
Cottrell Scholars Academic Leadership Training Workshop	Washington, DC, Jan. 2016
Haverford College Humanities Center Faculty Seminar	2014–2015 academic year

Memberships

American Chemical Society	1997–present
Sigma Xi	1997–present
Biophysical Society	2005–present
Council on Undergraduate Research	2006–present
Protein Society	2007–present

Current Scientific Collaborators

Minhaeng Cho — 2015–present
Director, Center for Molecular Spectroscopy and Dynamics
Institute for Basic Science, Korea University, Seoul, Korea

Sonia Longhi — 2007–present
Research Director, Structural Disorder within Viruses
CNRS, Université d'Aix-Marseille, France

Joshua Layfield — 2013–present
Assistant Professor
St. Thomas University

David Eliezer — 2010–present
Associate Professor
Weill Cornell Medical College

Feng Gai — 2007–present
Professor of Chemistry
University of Pennsylvania

Sara Linse — 2010–present
Professor of Biochemistry and Molecular Biology
Lund University, Sweden

Bradley A. Maron — 2016–present
Assistant Professor of Medicine, Harvard Medical School
Cardiovascular Specialist, Brigham and Women's Hospital

Lucie Delemotte — spring 2018–present
Assistant Professor of Membrane Structural Biology
KTH Royal University, Stockholm, Sweden

Louise K. Charkoudian — 2013–present
Assistant Professor of Chemistry
Haverford College

Karin S. Åkerfeldt — 2006–present
Professor of Chemistry
Haverford College