Markita Patricia del Carpio Landry

Assistant Professor ● Chemical and Biomolecular Engineering ● University of California, Berkeley
(919)349-4877 ● landry@berkeley.edu ● @Landry_Lab ● http://landrylab.com

RESEARCH INTERESTS

My research group merges the fields of single-molecule biophysics and nanomaterials research to develop new tools to probe and genetically edit biological systems *in vitro* and *in vivo*.

EDUCATION

- **Massachusetts Institute of Technology**, Cambridge, MA
  NSF Post-doctoral Research Fellow, Chemical Engineering, 2013 – 2016
  Postdoctoral Advisor: Michael S. Strano
- **University of Illinois at Urbana-Champaign**, Champaign, IL
  Ph.D. Chemical Physics, 2012
  Ph.D. Advisor: Yann R. Chemla
  Ph.D. Thesis Title: *Single-molecule methods for an improved understanding of biophysical interactions: From fundamental biology to applied nanotechnology*
- **University of North Carolina at Chapel Hill**, Chapel Hill, NC
  B.S. Chemistry, Biochemistry Track, 2006
  B.A. Physics, 2006

HONORS AND AWARDS

2017 – 2020	FFAR New Innovator Award
2017 – 2019	Hellen Wills Neuroscience Institute – Radical Ideas Awardee
2017 – 2020	Stanley Fahn Junior Faculty Award
2017 – 2022	Chan-Zuckerberg Biohub Young Investigator
2017 – 2021	Beckman Foundation Young Investigator
2016 – 2021	Burroughs Wellcome Fund Career Award at the Scientific Interface (CASI)
2015 – 2017	Brain and Behavior Foundation Young Investigator Award (NARSAD)
2015 – 2017	NIH Follow That Cell Challenge – Finalist
2014 – 2017	Burroughs Wellcome Fund PDEP
2013 – 2016	NSF Postdoctoral Research Fellowship
2009 – 2012	NSF Graduate Research Fellowship
2012	Burroughs Wellcome Fund Collaborative Research Grant
2011	Society of Hispanic Professional Engineers Fellowship
2009	NSF East Asia and Pacific Summer Institutes Fellowship
2008 – 2009	NSF Physics Frontier Fellowship
2008	TA of Excellence Award: Teaching Assistant rated as excellent by students

LANGUAGES

English	Native speaker, writer, reader
French	Native speaker, writer, reader
Spanish	Native speaker, writer, reader

PEER-REVIEWED PUBLICATIONS

*Denotes equal contribution ‡ Denotes corresponding author

26. Li, S., Zou, R., Wu, J. ‡, **Landry, M.P.**‡ Cholesterol-Directed Nanoparticle Assemblies Based on Single Amino Acid Peptide Mutations Activate Cellular Uptake and Decrease Tumor Volume. *RSC Chemical Science* (2017) – DOI: 10.1039/C7SC02616A
25. Luo, Z., Zou, R., Wu, J. ‡, **Landry, M.P.**‡ A Probe for the Detection of Hypoxic Cancer Cells. *ACS Sensors* (2017) – DOI: 10.1021/acssensors.7b00171
24. Beyene, A.B., McFarlane, I.R., Pinals, R.L, **Landry, M.P.**‡ Stochastic Simulation of Dopamine Neuromodulation for Implementation of Fluorescent Neurochemical Probes in the Striatal Extracellular Space. *ACS Chemical Neuroscience* (2017). DOI: 10.1021/acschemneuro.7b00193

23. Del Bonis O'Donnell, J.T., Page, R.H., Beyene, A.G., Tindall, E.G., McFarlane, I.R., **Landry, M.P.**‡ Molecular Recognition of Dopamine with Dual Near Infrared Excitation-Emission Two-Photon Microscopy. *Advanced Functional Materials* (2017). DOI: 10.1002/adfm.201702112

22. Saleh, N., Das, D., Plazas-Tuttle, J., Yang, D., O'Donnell, T., **Landry, M.P.‡** Importance and challenges of environmental ligand binding and exchange: Introducing single molecule imaging as a model characterization technique. *NanoImpact* (2017). 6, 90-98

21. **Landry, M.P.**, Ando, H., Chen, A., Cao, J., Kottadiel, V., Chio, L., Yang, D., Lu, T., Strano,M.S.‡ Single-Molecule Detection of Protein Efflux from Isolated Microorganisms using Fluorescent Single Walled Carbon Nanotube Sensor Arrays. *Nature Nanotechnology* (2017). 12 (4), 368-377

20. Chio, L., Yang, D., **Landry, M.P.**‡ Surface Engineering of Nanoparticles to Create Synthetic Antibodies. Methods in Molecular Biology, Springer (2017). 1575, 363-380

19. Del Bonis-O'Donnell, J.T., Beyene, A. G., Chio, L., Demirer, G. S., Yang, D., **Landry, M.P.**‡ Engineering the Corona Phase Molecular Recognition of Single Walled Carbon Nanotubes. *Journal of Visualized Experiments* (2016). 119, 1-9

18. Beyene, A. G., Demirer, G. S., **Landry, M.P.**‡ Nanoparticle-Templated Molecular Recognition Platforms for Detection of Biological Analytes. *Current Protocols in Chemical Biology* (2016). 8 (3) 197 – 223

17. Wong, M.H., Misra, R., Giraldo, J.P., Son, Y.W., **Landry, M.P.**, Swan, J.W., Blankschtein, D., Strano, M.S.‡ Lipid Exchange Envelope Penetration (LEEP) of Nanoparticles for Plant Engineering: a Universal Localization Mechanism *Nano Letters* (2016). 16 (2) 1161-1172

16. Bisker, G., Park, H.D., Iverson, N.M., Ahn, J., Nelson, J.T., Kruss, S., **Landry, M.P.**, Strano, M.S.‡ Protein-targeted corona phase molecular recognition. *Nature Communications* (2016). 7 (10241) 1 – 14

15. Salem, D.P., **Landry, M.P.**, Bisker, G., Kruss,S., Strano,M.S.‡ Chirality-Dependent Corona Phase Molecular Recognition of DNA-Wrapped Carbon Nanotubes. *Carbon* (2016). 97, 147 – 153

14. Jain, R. M., Ben-Naim, M., **Landry, M.P**., Strano, M.S.‡ Competitive Binding in Mixed Surfactant Systems for Single Walled Carbon Nanotube Separation. *Journal of Physical Chemistry* (2015). 119 (39) 22737 – 22745

13. Olivera, S., Bisker, G., Bakh, N., Gibbs, S., **Landry, M.P.**, Strano M.S.‡ Protein-Conjugated Carbon Nanomaterials for Biomedical Applications. *Carbon* (2015). 95, 767 – 779

12. Nelson, J.T., Reuel, N.F., Salem, D.P., Bisker, G., Kruss, S., Kim, S., **Landry, M.P.**, and Strano, M.S.‡ The Mechanism of Immobilized Protein A Binding to IgG to Nanosensor Array Surfaces. *Analytical Chemistry* (2015). DOI: 10.1021/acs.analchem.5b00843

11. Giraldo, J.P.*, **Landry, M.P.***, Kwak, S.Y., Jain, R.M., Wong, M.H., Iverson, N.M., Ben-Naim, M., Strano,M.S.‡ A Ratiometric Sensor Using Single Chirality Near-Infrared Fluorescent Carbon Nanotubes: Applications to *In Vivo* Monitoring. *Small* (2015). 11, 3973-3984

10. **Landry, M.P.**, Vukovik, L., Kruss, S., Bisker, G., Landry, A.M., Schulten, K., Strano,M.S.‡ RNA conformational dynamics on a single wall carbon nanotube surface. *Journal of Physical Chemistry* (2015). 119 (18) 10048 – 10058

9. Paulus, G. L., Nelson, J.T., Lee, K., Wang, Q., Reuel, N., Grassbaugh, B., Kruss, S., **Landry, M.P.**, Kang, J.W., Vander Ende, E., Zhang, J., Mu, B., Dasari, R., Opel, C., Wittrup, D.K., Strano, M.S.‡ A graphene-based physiometer array for the analysis of single biological cells. *Scientific Reports* (2014). 4 (6865)1–11

8. **Landry, M.P.**, Kruss, S., Nelson, J.T., Bisker, G., Iversion, N.M., Reuel, N.F., Strano, M.S.‡ Experimental Approaches to Study the Structure and Dynamics of the Corona Phase of Nanosensors for Synthetic Molecular Recognition. *Sensors* (2014). 14 (9) 16196 – 16211
    - *Invited Submission*

7. Giraldo, J.P., **Landry, M.P.**, Faltermeier, S. M., McNicholas, T.P., Boghossian, A. A., Reuel, N.F., Hilmer, A. J., Sen, F., Brew, J. A., Strano, M.S.‡ Plant nanobionics approach to augment photosynthesis and biochemical sensing. *Nature Materials* (2014). 13, 400 – 408
    - Highlighted in *Nature Nanotechnology News* (2014), G. Scholes, E. Sargent 13, 329 – 331

6. Kruss, S.*, **Landry, M.P.***, Vander Ende, E., Lima, B. M., Reuel, N.F., Zhang, J., Nelson, J., Mu, B., Hilmer, A., Strano,M.S.‡ Neurotransmitter Detection Using Corona Phase Molecular Recognition on Fluorescent Single-Walled Carbon Nanotube Sensors. *JACS* (2014), 136 (2), 713-24
5. Zhang, J.*, **Landry, M.P.***, Barone, P. W.*, Kim, J.*, Strano, M.S.‡ *et al*. Molecular Recognition Using Nanotube-Adsorbed Polymer Complexes. *Nature Nanotechnology* (2013), 8, 959 – 968
    - Highlighted in *Nature Nanotechnology News* (2013), Davide Bonifazi 8, 896 – 897
4. Wang, Q.; Bellisario, D.; Drahushuk, L.; Jain, R.; Kruss, S.; **Landry, M.P.**; Mahajan, S.; Shimizu, S.; Ulissi, Z.; Strano, M.S.‡ (2013). Low Dimensional Carbon Materials for Applications in Mass and Energy Transport. *ACS Chemistry of Materials* (2013). A-L
    - *Invited Submission*
3. **Landry, M.P.**, Zou, X., Wang, L., Huang, W.M., Schulten, K. Chemla, Y. R.‡ Protein-DNA Target Search Mechanisms for Higher-Order Protein Complexes. *Nucleic Acids Research* (2012). 40, 1-12
2. **Landry, M.P.**‡ The Pursuit of Science in a Globalized Market: An Approach to Internationally Collaborative Science. in *Chemistry as a Second Language: Chemical Education in a Globalized Society* (Flener, C, ed). *American Chemical Society* (2010). Ch. 4 pp. 67-89
1. **Landry, M.P.**, McCall, P.M., Qi, Z., Chemla, Y.R.‡ Characterization of photoactivated singlet oxygen damage in single-molecule optical trap experiments. *Biophysical Journal* (2009). 97, 2128-36

MANUSCRIPTS UNDER REVIEW

27. Demirer, G.S., Chang, R., Zhang, H., Chio, L., **Landry, M.P.**‡ Nanoparticle-Guided Biomolecule Delivery for Transgene Expression and Gene Silencing in Mature Plants. (Under Review)
28. Kwak, S., Wong, M.H., **Landry, M.P.**, Verma, G., Tisdale, W., Giraldo, J.P., Strano, M.S.‡ A Nanobionic Light Emitting Plant. (Under Review)

PATENTS

‡ Denotes lead inventor

1. **Landry M. P.**‡, Gozde, D. Mature plant transformation with nanoparticle-grafted gene vectors. U.S. Provisional patent filed March 2017
2. **Landry M. P.**‡, Wilbrecht, L., Beyene, A. B., O'Donnell J.T.D. Near-Infrared probes for modulatory neurotransmitter imaging in brain tissue. U.S. Provisional patent filed September 2016
3. Strano, M.S.‡, Giraldo, J.P., **Landry, M.P.** Ratiometric sensors from single chirality carbon nanotubes. US Patent 20,150,047,074. August 8th, 2014
4. Strano, M.S.‡, Giraldo, J.P., **Landry, M. P.**, Faltermeier, S. Plant Nanobionics. U.S. Patent Application No. 61/864,166. August 9th, 2013

SELECT CONFERENCE PAPERS

(1) PRESENTATIONS GIVEN IN FRENCH

- **Speaker at Laval University.** *Courir Sans Gaz: Comment Fonctionnent les Protéines qui sont Indépendantes de Sources d'Énergie Externes? Une Étude à l'Échelle de la Molécule Unique.* (*Translation : Running without Gas : How do proteins independent from external energy sources function?*). Laval, Québec, Canada. (February 2011)

(2) PRESENTATIONS GIVEN IN SPANISH

- **Seminario MADIMED, Universidad de La Habana:** Detección de lo Invisible: *El poder de la Luz Infrarroja Cercana Para Aplicaciones Biológicas.* (*Translation: The Power of Infrared Light in Bioengineering*) Habana, Cuba. (June 2016)
- **Conferencias Fisicas: Speaker at Universidad Mayor San Andrés:** *Observación de las Interacciones Proteínas y ADN con Pinzas Ópticas.* (*Translation: Observation of protein-DNA interactions with optical traps*). La Paz, Bolivia. (December 2008)

(3) PRESENTATIONS GIVEN IN ENGLISH

- **International Rice Research Institute, IRRI (Invited):** *Plant Genome Editing via Nanomaterial-Scaffolded Biomolecule Delivery.* Los Banos, Philippines (July 2017)
- **Inari, Inc (Invited):** *Passive Mature Plant Transformation with High Aspect Ratio Nanoparticles.* Boston, MA (June 2017)
- **Georgetown University Physics Department (Invited):** *Engineering and Imaging Excitons for Brain Imaging of Modulatory Neurotransmitters.* Washington, DC (June 2017)
- **Electrochemical Society Meeting 2017 (Invited):** *Nanosensors for Modulatory Neurotransmission Imaging.* New Orleans, LA (June 2017)
- **Gettysburg College Physics Department (Invited):** *Exciton Engineering for Imaging Neuromodulatory Neurotransmission.* Gettysburg, PA (March 2017)
- **International Conference on Plant Synthetic Biology and Bioengineering:** *Nanoparticles as Biomolecular Cargo Transporters in Plants.* Miami, FL (December 2016)
- **George Mason University Physics Department (Invited):** *Imaging Neurochemistry with Synthetic Fluorescent Nanosensors.* Washington, DC (October 2016)
- **Quantitative Cell Profiling Symposium:** *Single-Molecule Detection of Protein Efflux from Isolated Microorganisms using Fluorescent Single Walled Carbon Nanotube Sensor Arrays.* Osaka, Japan (September 2016)
- **Lawrence Berkeley National Laboratory Molecular Foundry (Invited):** *Nanoparticle-Polymer Conjugates for Near-Infrared Biomolecular Detection.* Berkeley, CA (August 2016)
- **New York University Langone Medical Center (Invited):** *Synthetic Infrared Nanosensors for Modulatory Neurotransmitters.* New York, NY (July 2016)
- **University of Texas El Paso Chemistry Department (Invited):** *Molecular Predictions and Computational Approaches to Understanding Chemical Neurotransmission*. El Paso, TX (April 2016)
- **Brain and Behavior Research Foundation Spring Foundation (Invited):** *Understanding How Brain Cells Communicate – And Sometimes Miscommunicate*. West Palm Beach, FL (February 2016)
- **American Institute of Chemical Engineers:** *Protein Efflux Mapping in Single Living Cells with Synthetic Optical Nanosensors.* Salt Lake City, UT (November 2015)
- **American Institute of Chemical Engineers:** *A Ratiometric Sensor Using Single Chirality Near-Infrared Fluorescent Carbon Nanotubes: Application to In Vivo Monitoring*. Salt Lake City, UT (November 2015)
- **American Institute of Chemical Engineers:** *Single-Molecule Visualization of Corona Phase Molecular Recognition.* Salt Lake City, UT (November 2015)
- **American Institute of Chemical Engineers:** *Comparative Dynamics and Sequence Dependence of DNA and RNA Binding to Single Walled Carbon Nanotubes*. Salt Lake City, UT (November 2015)
- **Brain and Behavior Research Foundation Annual Mental Health Symposium (Invited):** *New Tools to Understand How Brain Cells Behave – And Sometimes Misbehave*. New York City, NY (October 2015)
- **American Chemical Society:** *Comparative Dynamics and Sequence Dependence of DNA and RNA Binding to Single Walled Carbon Nanotubes*. Boston, MA (August 2015)
- **American Chemical Society:** *A Ratiometric Sensor Using Single Chirality Near-Infrared Fluorescent Carbon Nanotubes: Application to In Vivo Monitoring*. Boston, MA, (August 2015)
- **Gordon Research Conference on Nano-Mechanical Interfaces (Invited):** Corona Phase Molecular Recognition (CoPhMoRe) to Enable New Nanosensor Interfaces. Hong Kong, China, (July 2015)
- **Electrochemical Society Meeting (Invited):** *Corona Phase Molecular Recognition to Enable New Nanosensor Interfaces.* Chicago, IL, (May 2015)

- **University of North Carolina at Chapel Hill, Biomedical Engineering Department (Invited):** *Optical Tracking of Biological Activity, One Molecule at a Time.* Chapel Hill, NC (March 2015)
- **Georgia Institute of Technology, Chemical Engineering Department (Invited):** *Optical Tracking of Biological Activity, One Molecule at a Time.* Atlanta, GA (February 2015)
- **University of California, Berkeley, Chemical and Biomolecular Engineering Department (Invited):** *Monitoring Biomolecules in Complex Systems.* Berkeley, CA (February 2015)
- **University of Colorado Boulder, Chemical Engineering Department (Invited):** *Surface Engineering of Nanoparticles for Molecular Detection.* Boulder, CO (February 2015)
- **California Institute of Technology, Bioengineering Department (Invited):** Optical Tracking of Biological Activity, One Molecule at a Time. Pasadena, CA (February 2015)
- **University of California Davis, Biomedical Engineering Department (Invited):** *Optical Tracking of Biological Activity, One Molecule at a Time.* Davis, CA (February 2015)
- **University of California Santa Barbara, Materials Science Department (Invited):** *Engineering Molecular Recognition and Single Molecule Visualization of Molecular Detection.* Santa Barbara, CA (February 2015)
- **University of British Columbia, Chemistry Department (Invited):** *Tools to Visualize Molecular Recognition with Nanoparticle Sensors.* Vancouver, BC (January 2015)
- **University of California Santa Barbara, Chemical Engineering Department (Invited):** *Optical Tracking of Biological Activity, One Molecule at a Time.* Santa Barbara, CA (January 2015)
- **Stanford University, Chemical Engineering Department (Invited):** *Optical Tracking of Biological Activity, One Molecule at a Time.* Palo Alto, CA (January 2015)
- **North Carolina State University, Chemical Engineering Department (Invited):** *Engineering Nanoparticles for Synthetic Biological Molecular Recognition.* Raleigh, NC (January 2015)
- **American Institute of Chemical Engineers:** Neurotransmitter Detection Using Corona Phase Molecular Recognition on Fluorescent Single-Walled Carbon Nanotube Sensors. Atlanta, GA, (November 2014)
    - 2014 Janice Lumpkin Awardee
- **American Institute of Chemical Engineers:** *Molecular Recognition Using Corona Phase Complexes Made of Synthetic Polymers Adsorbed on Carbon Nanotubes*. Atlanta, GA, (November 2014)
- **American Institute of Chemical Engineers:** *Biochemical Ratiometric Sensing By Single Chirality Carbon Nanotubes in Living Tissues*. Atlanta, GA, (November 2014)
- **Biomedical Engineering Society:** *Molecular Recognition Using Corona Phase Complexes Made of Synthetic Polymers Adsorbed on Carbon Nanotubes*. San Antonio, TX (October 2014)
    - 2014 Innovation and Career Development Awardee
- **North East Bioengineering Conference:** *Molecular Recognition Using Corona Phase Complexes Made of Synthetic Polymers Adsorbed on Carbon Nanotubes.* Boston, MA. (April 2014)
- **American Institute of Chemical Engineers:** *Molecular Recognition Using Nanotube-Adsorbed Polymer Complexes.* San Francisco, CA. (November 2013)
    - 2013 Women's Initiatives Awardee
- **American Physical Society:** *Single-molecule study of protein-DNA target search mechanisms for dimer-active protein complexes.* Boston, MA. (February 2012)
- **Society for the Advancement of Chicanos and Native Americans National Meeting:** Caught in Transition: Measurements of Single Protein-DNA Complexes. San Jose, CA. (October 2011)
    - 2011 Graduate Student Travel Awardee
- **Speaker at UNC Chapel Hill Physics Seminar:** *Single-Molecule Methods: From Fundamental Biology to Applied Nanotechnology.* University of North Carolina at Chapel-Hill, Chapel Hill, NC. (March 2011)

- **Institut du cancer de Montréal:** *Towards Label-Free Detection of Cellular Biochemistry: Fluorescence-Based DNA-Nanotube Platform with Single Molecule Resolution.* Université de Montréal, Montréal, Canada. (February 2011)
- **Biophysical Society Meeting:** *Single Molecule Studies of the Recognition Sequence-Finding Mechanism of Protelomerase TelK.* San Francisco, California. (February 2010)
    - 2010 Minority Affairs Committee Awardee
- **Nanobiology Junior Seminar:** *Single Molecule TIRFM Imaging of Protelomerase TelK.* Osaka University, Frontier Biosciences Department. Osaka, Japan. (August 2009)

RESEARCH EXPERIENCE

- **Massachusetts Institute of Technology:** Chemical Engineering
  *Michael Strano, Primary Advisor. (*2013 – 2016)
  Synthesis of nano-scale optical sensors and development of molecular fluorescence imaging microscopes.
- **University of Illinois Graduate Student**: Chemical Physics
  Yann Chemla, Primary Advisor. (2007 –2012)
  Design and construction of single-molecule instrumentation: optical traps and fluorescence microscopy. I studied telomerase protein systems and DNA-nanotube interactions.
- **Junior Nanotechnology Network Fellow:** Technische Universität München
  Ludwig-Maximilians-Universität. (2010 –2010)
  I worked in the laboratories of Don Lamb, Matthias Rief, Hendrik Dietz, and Hermann Gaub to develop techniques for probing biological systems and nanomaterials at the single-molecule scale.
- **University of Illinois Business Consulting**: Consultant. (January 2010 – May 2010)
  Managed a team of doctoral and business students in an interdisciplinary setting to perform market research analysis for the creation of a startup technological company.
- **Osaka University Visiting Research Fellow**: Nanobiology
  *Toshio Yanagida laboratory. (*2009)
  My work in the Yanagida group centered on optimizing sub-diffraction limited imaging (FIONA) for protein-DNA dynamic studies with Total Internal Reflection Fluorescence Microscopy.
- **Duke University Research Assistant**: Pharmacology & Cancer Biology
  Madan Kwatra laboratory. (2007)
  My work in the Kwatra group was based on a quantitative study of G protein-coupled receptors as they relate to postoperative delirium in elderly patients.
- **University of North Carolina at Chapel Hill Research Assistant:** Biochemistry and Biophysics.
  Brian Kuhlman laboratory. (2002 –2006)
  My work in the Kuhlman group centered on the study of protein - protein interaction energies in the ubiquitin protein network by expressing protein mutants and performing protein kinetic assays.

TEACHING EXPERIENCE

- **Nanoscience and Engineering Biotechnology: Instructor** (Fall 2017)
  University of California, Berkeley department of Chemical and Biomolecular Engineering
  Topics covered molecular biology, protein folding thermodynamics, protein and enzyme engineering, recombinant DNA technology, nanomaterials synthesis, nanodevices, nanotechnology.
- **Chemical Engineering Thermodynamics: Instructor** (Spring 2017)
  University of California, Berkeley department of Chemical and Biomolecular Engineering
  Topics covered thermodynamic behavior of pure substances and mixtures, properties of solutions, phase equilibria, thermodynamic cycles, and chemical equilibria for homogenous and heterogenous systems.
- **Unit Operations for Chemical Engineering: Instructor** (Fall 2016)
  University of California, Berkeley department of Chemical and Biomolecular Engineering
  This undergraduate course is one of two capstone courses in the chemical engineering curriculum, with a focus on experimental design for topics in thermodynamics and transport phenomena.

- **Clubes de Ciencias (CdeC) Mexico: Instructor** (2014 - 2015)
  Universidad Nacional Autónoma de México
  Designed and taught an optics course for low-income university freshmen students in Ensenada, Mexico. Worked with Universidad Nacional Autónoma de México to remotely serve as a mentor for students.
- **Engineering Nanotechnology Co-Instructor:** (Fall 2013 & 2015)
  Massachusetts Institute of Technology department of Chemical Engineering
  Developed course materials for imaging and materials passivation techniques used in the field of engineering and nanomaterials science. Gave course lectures and prepared course handouts.
- **Center for the Physics of Living Cells Instructor:** (Summers 2009 – 2011)
  University of Illinois at Urbana Champaign department of Physics
  Led week-long intensive course for visiting graduate students and scientists, on the construction and use of a single-molecule total internal reflection fluorescence microscope and single-molecule optical trap.
- **Junior Nanotechnology Network Instructor:** (Summer 2010)
  University of Illinois at Urbana Champaign department of Physics
  Instructed 15 graduate students on the biological applications of state of the art single-molecule fluorescence and force instrumentation.
- **Advanced Thermodynamics and Statistical Mechanics Teaching Assistant:** (Spring 2008)
  University of Illinois at Urbana Champaign department of Chemistry
  Gave upper-level undergraduate student lectures, supplemental instruction sessions.
- **General Chemistry Teaching Assistant:** (Fall 2007)
  University of Illinois at Urbana Champaign department of Chemistry
- **Introductory Electrodynamics Teaching Assistant:** (Fall 2006 – 2007)
  University of Illinois at Urbana Champaign department of Physics
- **Introductory Mechanics Teaching Assistant:** (Spring 2006 – 2007)
  University of North Carolina at Chapel Hill department of Physics
- **General Chemistry Laboratory Teaching Assistant:** (Fall 2006)
  University of North Carolina at Chapel Hill department of Chemistry

CERTIFICATIONS

2010	Certified LabVIEW Associate Developer (CLAD)
2009	Certificate in Business Administration, University of Illinois College of Business

PROFESSIONAL SOCIETY MEMBERSHIPS

- American Institute of Chemical Engineers
- American Society for Cell Biology
  - Minority Affairs Committee
- Biophysical Society
- Society for the Advancement of Chicanos and Native Americans in Science
- Electrochemical Society
- American Chemical Society
- American Physical Society
- Biomedical Engineering Society

LEADERSHIP AND SERVICE

- **Robotics & Engineering for Youth: Faculty Advisor** (2017 - present)
  Mentor for student group to expose K-8 students to engineering and computer science via hands-on lego league robotics and scratch programming.
- **Alliance for Diversity in Science and Engineering (ADSE): Faculty Advisor** (2017 - present)
  Mentor and faculty advisor for ADSE, attended inaugural meeting, contribute to outreach and professional development events.

- **Alpha Chi Sigma Chemistry Fraternity: Faculty Mentor** (2016 - present)
  Mentor for Alpha Chi Sigma, Sigma chapter. Serve as student mentor, speaker, and outreach.
- **Latino/a Association of Graduate Students in Engineering and Sciences at UC Berkeley (LAGSES): Faculty Mentor** (2016 - present)
  Mentor for LAGSES students, speaker, panelist, and student-faculty liaison.
- **MIT Presidential Committee on Race and Diversity: Campus-wide elected postdoctoral representative** (2013 - 2016)
  Representative for the postdoctoral body. Led efforts with MIT president Rafael Rief to encourage recruitment, retention, and promotion of underrepresented students, faculty, and staff on the MIT campus.
- **Society for the Advancement of Chicanos and Native Americans in Science (SACNAS): Founder, MIT** (2013 - 2016) **President, University of Illinois** (2010, 2011, 2012, Member 2008 – 2012)
  Founded the first SACNAS chapter at MIT. Started a professional SACNAS chapter on campus.
- **MIT Postdoctoral Association: Diversity and Inclusion Chair** (2013 - 2016)
  Serve as a representative and liaison for MIT minority postdocs. Lead negotiation efforts for postdoctoral wages and benefits. Organize career development events for minority postdocs.