

## Linda Columbus

University of Virginia  
Department of Chemistry  
McCormick Road P.O. Box 400319  
Charlottesville, VA22904-4319

Phone: (434) 249-3032  
Fax: (434) 924-3710  
Web: <http://www.columbuslabs.org>  
Email: [columbus@virginia.edu](mailto:columbus@virginia.edu)

## EDUCATION, RESEARCH EXPERIENCE, AND EMPLOYMENT

- **University of Virginia, Charlottesville, VA**
  - Associate Director of the Global Infectious Disease Institute June 2017 - present
  - Associate Professor of Chemistry August 2013 – present
  - Assistant Professor of Chemistry, August 2007 – August 2013
- **The Scripps Research Institute, La Jolla, CA**
  - Postdoctoral Fellow with Scott Lesley, June 2006 – July 2007
  - Postdoctoral Fellow with Kurt Wüthrich, Aug. 2002 – June 2006
- **University of California, Los Angeles, Los Angeles, CA**
  - Postdoctoral Fellow with Wayne Hubbell, June 2001 – August 2002
- **University of California, Los Angeles, Los Angeles, CA**
  - Graduate research with Wayne Hubbell, Sept. 1996 – May 2001
  - Ph.D. in Biochemistry and Molecular Biology
  - Thesis: “Investigating backbone and side chain dynamics of  $\alpha$ -helices in the nanosecond regime with site-directed spin labeling”
- **Smith College, Northampton, MA**
  - Undergraduate research with David Bickar, June 1993 – May 1996
  - B.A.in Chemistry (*High Honors*)
  - Honors Thesis: “Investigation of MPP<sup>+</sup> binding to neuroreceptors”

## PUBLICATIONS (H-INDEX = 20, TOTAL NUMBER OF CITATIONS = 2173)

1. Gross A, **Columbus L**, Hideg K, Altenbach C, Hubbell WL. Structure of the KcsA potassium channel from *Streptomyces lividans*: A site-directed spin labeling study of the second transmembrane segment. *Biochemistry* 38:10324 – 10335 (1999). [PMID: 10441126](#)
2. Gaponenko V, Howarth JW, **Columbus L**, Gasmi-Seabrook G, Yuan J, Hubbell WL, Rosevear PR. Protein global fold determination using site-directed spin and isotope labeling. *Protein Science* 9:302 – 309 (2000). [PMID: 10716182](#)
3. **Columbus L**, Kalai T, Jeko J, Hideg K, Hubbell WL. Molecular motion of spin labeled side chains in  $\alpha$ -helices: Analysis by variation of side chain structure. *Biochemistry* 40:3828 – 3846 (2001). [PMID: 11300763](#)
4. **Columbus L** and Hubbell WL. A new spin on protein dynamics. *Trends in Biochemical Sciences*, 27:288 – 295 (2002). [PMID: 12069788](#)
5. **Columbus L** and Hubbell WL. Mapping backbone dynamics in solution with site-directed spin labeling: GCN4-58 bZip free and bound to DNA. *Biochemistry* 43:7273 – 7287 (2004). [PMID: 15182173](#)
6. Liang ZC, Lou Y, Freed JH, **Columbus L**, Hubbell WL. A multifrequency electron spin resonance study of T4 lysozyme dynamics using the slowly relaxing local structure model. *Journal of Physical Chemistry B* 108:17649 – 17659 (2004). [Abstract](#)
7. **Columbus L**, Peti W, Herrmann T, Etezady T, Wüthrich K. NMR structure determination of the conserved hypothetical protein TM1816 from *Thermotoga maritima*. *Proteins: Structure, Function and Bioinformatics* 60:552 – 557 (2005). [PMID: 15937903](#)

8. **Columbus L**, Lipfert J, Klock H, Millet I, Doniach S, Lesley SA. Expression, purification, and characterization of *Thermotoga maritima* membrane proteins for structure determination. *Protein Science* 15: 961 – 975 (2006). [PMID: 16597824](#)
9. Lipfert J, **Columbus L**, Chu V, Doniach S. Analysis of small-angle X-ray scattering data of protein-detergent complexes with singular value decomposition. *Journal of Applied Crystallography* 40: S235 – 239 (2007). [Abstract](#)
10. Lipfert J, **Columbus L**, Chu V, Lesley SA, Doniach S. Size and shape of detergent micelles determined by small-angle X-ray scattering. *Journal of Physical Chemistry B* 111: 12427 – 12438 (2007). [PMID: 17924686](#)
11. McCleverty C\*, **Columbus L\***, Kreuzsch A, Lesley SA. Structure and ligand binding of the soluble domain of a *Thermotoga maritima* membrane protein of unknown function TM1634. *Protein Science* 17: 869 – 877 (2008). [PMID: 18369189](#)
12. **Columbus L**, Lipfert J, Jambunathan K, Fox DA, Sim AYL, Doniach S, Lesley SA. Mixing and matching detergents for membrane protein NMR structure determination. *Journal of the American Chemical Society* 131: 7320 – 7326 (2009). [PMID: 19425578](#)
13. Beuck C, Szymczyzna BR, Kerkow DE, Carmel AB, **Columbus L**, Stanfield RL, and Williamson JR. Structure of the GLD-1 homodimerization domain: Insight into STAR protein-mediated translational regulation. *Structure* 18: 377 – 389 (2010). [PMID: 20223220](#)
14. Kroncke BM, Horanyi P, **Columbus L**. Structural origins of nitroxide side chain dynamics on membrane protein  $\alpha$ -helices. *Biochemistry* 49: 10045 – 10060 (2010). [PMID: 20964375](#)
15. Dewald AH, Hodges, JC, **Columbus L**. Physical determinants of  $\beta$ -barrel membrane protein folding in lipid vesicles. *Biophysical Journal* 100:2131 – 2140 (2011). [PMID: 21539780](#)
16. Kroncke BM and **Columbus L**. Identification and removal of nitroxide spin label contaminant: Impact on PRE studies of  $\alpha$ -helical membrane proteins in detergent. *Protein Science* 21:589 – 595 (2012). [PMID: 22389096](#)
17. Johnstone SR, Kroncke BM, Straub AC, Best AK, Dunn CA, Mitchell LA, Peskova Y, Nakomoto RK, Koval M, Lampe PD, **Columbus L**, Isakson BE. MAPK phosphorylation of connexin 43 promotes binding of cyclin E and smooth muscle cell proliferation. *Circulation Research* 11:201 – 211 (2012). [PMID: 22652908](#)
18. Straub AC, Lohman AW, Billaud M, Johnstone SR, Dwyer ST, Lee MY, Bortz PS, Best AK, **Columbus L**, Gaston B, Isakson BE. Endothelial cell expression of hemoglobin  $\alpha$  regulates nitric oxide signaling. *Nature* 491: 473 – 477 (2012). [PMC3531883](#)
19. Elkin SR, Kumar A, Price CW, **Columbus L**. A broad specificity nucleoside kinase from *Thermoplasma acidophilum*. *Proteins: Structure, Function and Bioinformatics* 81:568 – 582 (2013). [PMC3595323](#)
20. Oliver RC, Lipfert J, Fox DA, Lo RH, Doniach S, **Columbus L**. Dependence of micelle size and shape on detergent alkyl chain length and head group. *PLoS ONE* 8(5): e62488. (2013). [PMC3648574](#)
21. Fox, DA and **Columbus L**. Solution NMR resonance assignment strategies for  $\beta$ -barrel membrane proteins. *Protein Science*. 22:1133 – 1140 (2013). [PMC3832050](#)
22. Anton BP, Chang Y-C, Brown P, Choi H-P, Faller LL, et al. (2013) The COMBEX Project: Design, Methodology, and Initial Results. *PLoS Biology* 11(8): e1001638. [PMC3754883](#)
23. Kroncke BM and **Columbus L**. Backbone  $^1\text{H}$ ,  $^{13}\text{C}$ ,  $^{15}\text{N}$  resonance assignments of the  $\alpha$ -helical membrane protein TM0026 from *Thermotoga maritima*. *Biomolecular NMR Assignments* 7: 203 – 206 (2013). [PMC3543498](#)
24. Li J, Liu Q, Xiao L, Haverstick DM, Dewald A, **Columbus L**, Kelly KA, Landers JP. A Label-free Method for Cell Counting in Crude Biological Samples via Paramagnetic Bead Aggregation. *Analytical Chemistry*. 85:11233 – 11239 (2013).
25. Kenwood BM, Weaver JL, Bajwa A, Poon IK, Byrne FL, Murrow BA, Calderone JA, Huang L, Divakaruni AS, Tomisg JL Okabe K, Lo RH, Coleman GC, **Columbus L**, Yan Z, Saucerman JJ, Smith

- JS, Homes JW, Lynch KR, Ravichandran KS, Uchiyama S, Santos WL, Rogers GW, Okusa MD, Bayliss DA, Hoehn KL. Identification of a novel mitochondrial uncoupler that does not depolarize the plasma membrane. *Molecular Metabolism*. 3:114 – 123 (2014). [PMC3953706](#)
26. Butcher JT, Johnson T, Beers J, **Columbus L**, Isakson B. Hemoglobin alpha in the blood vessel wall. *Free Radical Biology & Medicine*. 73C:136 – 142 (2014). [PMC4135531](#)
27. Fox DA, Larsson P, Lo RH, Kroncke BM, Kasson P, **Columbus L**. The Structure of the Neisserial outer membrane protein Opa<sub>60</sub>: Loop flexibility essential to receptor recognition and bacterial engulfment. *Journal of the American Chemical Society*. 136:9938 – 9946 (2014). [PMC4105060](#)
28. Lo RH, Kroncke BM, Solomon T, **Columbus L**. Mapping membrane protein dynamics: a comparison of site-directed spin labeling to NMR <sup>15</sup>N-relaxation measurements. *Biophysical Journal*. 107:1697 – 1702 (2014). [PMC4190660](#)
29. Straub AC, Mutchler S, Billaud M, Mykhaylo A, Palmer L, Le TH, Somlyo AV, **Columbus L**, Isakson BE. Hemoglobin  $\alpha$ /eNOS coupling in endothelium is required for nitric oxide scavenging during vasoconstriction. *Arteriosclerosis, Thrombosis, and Vascular Biology*. 34:2594 – 2600 (2014). [PMC4239174](#)
30. Baker LA, Chakraverty D, **Columbus L**, Feig AL, Jenks WS, Pilarz M, Stains M, Waterman R, and Wesemann J. Cottrell Scholars Collaborative New Faculty Workshop: Professional Development for New Chemistry Faculty. *The Journal of Chemical Education*. 91: 1874-1881 (2014).
31. Oliver RC, Lipfert, Fox DA, Lo RH, Kim JJ, Doniach S, **Columbus L**. Tuning micelle dimensions and properties with binary surfactant mixtures. *Langmuir*. 30:13353 – 13361 (2014).
32. Johnson MB, Ball LM, Daily KP, Martin JN, **Columbus L**, and Criss AK. Opa+ *Neisseria gonorrhoeae* has reduced survival in human neutrophils via Src family kinase-mediated bacterial trafficking into mature phagolysosomes. *Cellular Microbiology*. 17:648 – 665 (2015). [PMC4402142](#)
33. **Columbus L** and Kroncke B. Solution NMR Structure Determination of polytopic  $\alpha$ -helical membrane proteins: A guide to spin label paramagnetic relaxation enhancement restraints. *Methods in Enzymology*. 557: 329 – 348 (2015).
34. **Columbus L**. Post-expression strategies for structural investigations of membrane proteins. *Current Opinion in Structural Biology*. 32: 131 – 138 (2015). [PMC4512879](#)
35. Gray C, Price CW, Lee C, Dewald A, Cline MA, McAnany CE, **Columbus L**, Mura C. Known Structure, Unknown Function: An Inquiry-based Undergraduate Biochemistry Lab Course. *Biochemistry and Molecular Biology Education*. 43:245 – 262 (2015). [PMC4758391](#)
36. Shu X\*, Keller TC\*, Begandt D, Butcher JT, Biwer L, Keller AS, **Columbus L**, Isakson BE. Endothelial nitric oxide synthase in the microcirculation. *Cellular and Molecular Life Sciences*. 72:4561 – 4575 (2015). [PMC4628887](#)
37. Keller TC, Butcher JT, Marziano C, Martin JN, Rogers S, Broseghini-Filho GB, Cabot M, Sgu X, Ning B, Best AK, Padilha AS, Purdy M, Yeager M, Peirce SM, Hu S, Doctor A, Barrett E, Le TH, **Columbus L**, Isakson BE. Modulating vascular hemodynamics with an alpha globin mimetic peptide (Hb $\alpha$ X). *Hypertension* 68:1494 – 1503 (2016). [PMC5159279](#)
38. Martin J, Ball L, Solomon T, Criss A, **Columbus L**. Neisserial Opa protein – CEACAM interactions: competition for receptors as a means for bacterial invasion and pathogenesis. *Biochemistry* 55: 4286 – 4294 (2016). [PMC4980159](#)
39. Yang J, Zong Y, Su J, Li H, Zhu H, **Columbus L**, Zhou L, and Liu Q. A novel conformation of the polypeptide-binding pocket supports an active substrate release from Hsp70s. *Nature Communications* 8:1201 – 1214 (2017). [PMC5662698](#)
40. Caldwell T\*, Baoukina S\*, Brock A, Oliver RC, Glover KJ, Tieleman DP, **Columbus L**. Low q bicelles are mixed micelles. *Journal of Physical Chemistry Letters*. In press. (2018).

**UNDER REVIEW**

41. Hays JM, Kieber MK, Li JZ, Han JI, **Columbus L**, Kasson PM. Simulation-guided spectroscopy to refine highly flexible protein structures. Submitted (2018).
42. Keller TC, Broseghini-Filho GB, Butcher JT, Page HRA, Lechauve C, Weaver RB, DeLalio LJ, Sharma P, Hong K, Xu W, Wiess MJ, Cortese-Krott MM, Padilha AS, **Columbus L**, Ackerman H, Sonkusare S, Isakson BE. A unique amino acid motif on alpha globin demonstrates its critical. Submitted (2018)

**IN PREPARATION**

43. Kieber M, Ono T, Oliver RC, **Columbus L**. Micelle dynamics: a tunable feature.
  44. Keiber, M, Swope N, Martin J, McAnany CE, Mura C, Columbus L. Solution structure of CEACAM1 N-domain.
  45. Kuhn J, Smirnov A, Criss AK, **Columbus L**. CEACAM targeted liposome delivery.
  46. Martin JN, Lo RH, Fox DA, **Columbus L**. Opa<sub>50</sub> extracellular loop dynamics and interactions modulated by ionic strength and detergents: Impact on NMR structure determination.
  47. **Columbus L**, Hunger G, Giering J. Cultivating Inquiry and Discovery in STEM: A Redesign of Introductory General Chemistry
- Underlined authors are undergraduate students; \*These authors contributed equally

**BOOK CHAPTERS**

1. **Columbus L**, Nakamoto, R.K., Cafiso, D.S. Properties of Membrane Proteins in Wiley *Encyclopedia of Chemical Biology* (2008). [Abstract](#)
2. Leibovich A, Hildreth M, **Columbus, L**. Leading Change in Undergraduate STEM Education in ACS Symposium Series: *Educational and Outreach Projects from the Cottrell Scholars Collaborative* (2017). In press.
3. Heemstra J, Waterman R, Antos J, Beuning P, Bur S, **Columbus L**, Feig A, Fuller A, Gillmore J, Leconte A, Londergan C, Pomerantz W, Prescher J, and Stanley L. Throwing away the cookbook: implementing course-based undergraduate research experiences (CUREs) in chemistry in ACS Symposium Series: *Educational and Outreach Projects from the Cottrell Scholars Collaborative* (2017).

**PATENTS**

U.S. Application Serial No. 14/437,548 and European patent (2908848): Composition and Methods for Regulating Arterial Tone

**HONORS, AWARDS, & FELLOWSHIPS**

2018	Biophysical Society Council
2015	University Academy of Teaching Fellow
2014	Virginia Outstanding Faculty Award
2013	Cavalier Achievement Award
2013	All-University Teaching Award
2010	Cottrell Scholar Award
2009	NSF CAREER Award
2008	UVA Mead Honored Faculty
2003 – 2006	NIH Ruth L. Kirschstein National Research Service Award Postdoctoral Fellowship
2000	Eli Lilly & Company Best Poster Award at the 14th Protein Society Symposium

1999 – 2001	NRSA Institutional Training Grant
1997 – 1999	Chemistry-Biology Interface Training Grant
1996 – 1997	Alumnae Association Fellowship Award
1996	American Chemical Society Student Award
1996	Smith College Chemistry Award

**CURRENT FUNDING**

2R01GM087828-07	Columbus (PI)	09/2009 – 05/2019
NIH/NIGMS		
Award amount: \$205,000/yr, direct (\$1,242,254 total)		
Structure and dynamics of bacterial membrane protein - receptor interactions		
<p>Many obligate bacterial membrane proteins hijack human cellular pathways by mimicking or manipulating host machinery. Of specific interest to this proposal are the outer membrane opacity-associated proteins (Opa) from <i>Neisseria</i>, which induce engulfment of the bacterium in non-phagocytic host cells by binding to a variety of host-receptors. We aim to determine the specific interactions that occur between Opa proteins and the human host receptors that facilitate <i>Neisseria</i> invasion. This proposed research will provide insight into the pathogenesis of <i>Neisseria</i> and, therefore, the potential for the rational design of novel antibiotics. However, the novel application is the potential ability of Opa-mediated liposome encapsulated therapeutics (e.g. enzymes, inhibitors, and peptides) to enter the cytoplasm of living cells and possibly tissue selectively. Understanding the molecular determinants of the three Opa-mediated entry mechanisms may facilitate the development of liposome delivery mechanisms.</p>		

NSF MCB 1817735	Columbus (PI)	07/1/2018 – 06/30/2021
Investigating the impact of lipid-protein interactions in membrane protein structure and conformational dynamics		
Award Amount: \$729,803 (total)		
<p>The proposal aims to identify unifying principles that determine lipid-protein interactions that stabilize fold and facilitate conformational change. Using several biophysical methods, a model system, TM0026, and a signal peptidase II, LspA, the molecular origins that stabilize membrane protein folds and facilitate functional conformational dynamics will be determined. The results of this proposal will provide an understanding of the lipid-protein interactions that dictate fold and function of membrane proteins.</p>		

**PENDING PROPOSALS**

MIRA	Columbus (PI)	Submission date 05/17/2018
NIH/NIGMS		
<p>The Maximizing Investigators' Research Award (MIRA) is a grant to provide support for the program of research in an investigator's laboratory that falls within the mission of NIGMS.</p>		
MARC	Columbus (PI)	Submission date 05/24/2018
NIH/NIGMS		
<p>Maximizing Access to Research Careers (MARC) U-STAR awards provide support for undergraduate students who are underrepresented in the biomedical sciences to improve their preparation for high-caliber graduate training at the Ph.D. level.</p>		
R01	Kasson (PI)	Submission date 05/31/2018
NIH		
Simulation-guided Spectroscopy and Refinement of Heterogeneous Conformational Ensembles		

R01 Isakson (PI) Submission date 06/05/2018  
 NIH  
 Connexin regulation of cellular proliferation

### PAST FUNDING

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UVA Ivy Foundation Biomedical Innovation Grants	Columbus and Isakson (Co-PI)	2015-2016
Award Amount: \$80,000		
Targeting the hemoglobin $\alpha$ /eNOS complex for novel anti-hypertensives		
Cottrell Scholar Award	Columbus (PI)	2011 – 2015
Research Corporation for Science Advancement		
Award Amount: \$75,000 (total; no cost extension)		
Hijacking the hijackers: taking advantage of the chemistry of bacterial pathogens		
DUE 1044858	Columbus (Co-PI with C. Mura)	2011 – 2014
NSF		
Award Amount: \$199,927 (total)		
Known structure, unknown function: An undergraduate research curriculum		
MCB 0845668	Columbus (PI)	2009 – 2014
NSF		
Award Amount: \$136,000/yr (total)		
CAREER: An innovative study of membrane protein – detergent interactions		
Jeffress Trust Awards Program	Columbus (PI)	2014-2015
Jeffress Memorial Trust		
Award Amount: \$100,000		
Using hybrid computational and NMR structure determination to study host-pathogen interactions at the molecular level.		
HRD 1202181	Martin (PI) Columbus and Vallas (Co-PI)	2012 – 2017
Award Amount: \$700,000/year (total) – no funds directly to my lab		
Role: Co-Principal Investigator		
The Virginia-North Carolina Alliance for Minority Participation: Mid-level LSAMP		

### RECENT INVITED SEMINARS (OUT OF ~140)

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2018 (Nov)	Cultivating Curiosity, Creativity, and Discovery in Undergraduate Experiences at America's Research Universities The 2018 Reinvention Collaborative National Conference
2018 (Oct)	Pittcon Lecture at the University of Akron
2018	Invited talk at the FASEB Scientific Research Conference on "Molecular Biophysics of Membranes"
	Neisserial opa protein - human receptor interactions: hijacking pathogenic membrane proteins to engineer cellular entry
2018	Department of Physiology at Columbia University Medical Center

- Hijacking pathogenic membrane proteins to engineer cellular entry: A molecular biophysics approach
- 2018 Department of Biological Sciences at University of Calgary, Canada  
Membrane protein structural biology: from micelles to bacterial invasion
- 2018 Department of Biochemistry and Molecular Biology at Penn State University, College of Medicine  
Membrane protein structural biology: from micelles to bacterial invasion
- 2018 Invited talk in the Membrane Structure & Assembly Subgroup 2018 Symposium in San Francisco on February 17<sup>th</sup>.  
Differences between Micelles, Bicelles, and Membranes and the Impact on Membrane Protein Structure
- 2017 Chemistry Department at Texas A&M University  
Hijacking pathogenic membrane proteins to engineer cellular entry: A molecular biophysics approach
- 2017 Chemistry Department, Michigan State University  
Hijacking pathogenic membrane proteins to engineer cellular entry: A molecular biophysics approach
- 2017 Invited talk in the Membrane Proteins: Structure, Function and Drug Development Symposium at the 254<sup>th</sup> ACS National Meeting & Exposition, Washington D.C.  
Receptor mediated uptake: Structure and function of Neisseria Opa proteins
- 2017 Membrane Protein Gordon Conference  
Protein-Surfactant Interactions Do Determine Fold
- 2017 University Maryland Baltimore County, Department of Chemistry & Biochemistry  
Membrane protein structural biology: from micelles to bacterial invasion
- 2017 Keynote speaker at Second Molecular Biophysics Symposium, Biocomplexity Institute, Virginia Tech University  
From Membrane Mimics to Bacterial Invasion
- 2017 Invited talk at the 253<sup>rd</sup> ACS National Meeting & Exposition, San Francisco  
Known structure, unknown function: A research-based undergraduate biochemistry laboratory course
- 2017 University of North Carolina Wilmington, Chemistry & Biochemistry  
Hijacking pathogenic membrane proteins to engineer cellular entry: A molecular biophysics approach

## TEACHING ACTIVITIES

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### Undergraduate Courses

Spring 2017, 2018 CHEM1420 Introductory Chemistry II  
Redesign of lecture course using active-learning approaches.

Fall 2016, 2017, 2018 CHEM 1410 Introductory Chemistry I  
Redesign of lecture course using active-learning approaches.

Fall 2007 and 2008 CHEM4410 Biological Chemistry I  
Lecture course focused on the structure and function of biomolecules.  
~150 students in each offering of the course

Fall 2008, 2009, 2011, 2012, 2014 CHEM4411 Biological Chemistry Lab I  
 Inquiry-based laboratory course focused on recombinant methods and protein structure/function. The course is designed to prepare students for the research based laboratory CHEM4421.  
 ~85 students in each offering of the course

Spring 2009, 2011, 2013, 2016 CHEM4421 Biological Chemistry Lab II  
 Research based biochemistry laboratory that has students apply knowledge from the fall semester to design experiments to investigate protein function based on structure.  
 ~85 students in each offering of the course

Fall 2009 Mead Chemistry Lunch Series  
 Eight research-active chemistry majors and I met every Friday for lunch and each of us presented twice on our research. The first presentation included background and significance of our research. Then, we each presented a piece of data and talked about how it was generated and what it meant.

Fall 2011, Spring 2013, Spring 2014 CHEM4430 From Lab Bench to Your Medicine Cabinet  
 Seminar style undergraduate course that teaches students to read scientific literature and assemble information and ideas into a cohesive understanding of the basic research that is involved in the development of therapeutics.  
 10 – 15 students

Fall 2015, 2016, Spring 2016 CHEM4961, 4951, 3961, and 3951 Research for Credit. Organize ~100 chemistry majors in research for credit, have faculty mentors affirm and assess student's involvement in research, provide feedback on a mid-semester and end-of-the-semester assignment.

### Graduate courses

Spring 2008, 2011, 2012 Biophysics 5060 Molecular Physiology: From Molecular Machines to Biological Information Processing

Two lectures titled NMR Spectroscopy: Principles of NMR and NMR Spectroscopy: Multidimensional NMR and Structure Determination 1 lecture on the application of EPR to biomolecular dynamics.

~ 6 students in each offering of the course

Spring 2008 Biophysics 8000 Magnetic Resonance Spectroscopy of Macromolecules

1 lecture titled Product Operators and NOE

~6 students in each offering of the course

Fall 2008 and 2012 PHY8130 Membrane Biophysics  
 1 lecture on the thermodynamics of micelle and protein-detergent complex formation  
 ~6 students in each offering of the course

### SUPERVISED RESEARCH

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#### High School Students

Haylee Witworth 2013 (summer)

Collin Price 2013 (summer)

Emma Guiberson 2013 (summer)

Anha Telluri 2016 (summer)

#### Undergraduate supervised research

Christopher Reyes 2007 – 2009

Huong Thien Nguyen 2007 – 2009

Tsega Solomon 2009 – 2012

Chris Lee 2011 – 2012



Rita Digrazia	2008 – 2009	Joseph Breheny	2011 (summer)
Justin Kim	2008 – 2011	Eli Chen	2011 (summer)
Ashley Keller	2008 – 2011	Cynthia Gray	2011 – 2014
Upneet Chawala	2009 – 2010	Kanishk Jain	2011 – 2013
Jacqueline Hodges	2009 – 2012	Audrey Ogendi	2012 – 2013
Golda Harris	2009 – 2012	Kiera Matthews	2012 and 2013 (summer)
Elleansar Okwei	2011 – 2014	Sebastien Ortiz	2012 – 2015
Tomihiko Ono	2012 – 2014	Sidney Bush	2012 (summer and fall)
Sarah Elkin	2009 – 2012	Jessica Yoo	2013 – 2015
Nana Bosomtwe	2013 – 2016	Keturah Wallace	2013 (summer)
Shelby Lipes	2013 – 2016	Jason Li	2015 – 2017
Serap Vatansever	2014 – 2016	So He Son	2015 (summer)
Ji In Han	2015 – present	Kelvin Li	2015 – present
Maria Villanueva	2016 (summer)	Tanquez Willis	2016 (summer)
Katherine Ahn	2017 – present	Edward Contreras	2018 – 2018
Katherine Lake	2018 – present		

**Graduate (Ph.D.) supervised research**

Alison Dewald	2008 – 2012
Brett Kroncke	2007 – 2012
Daniel Fox	2007 – 2013
Ryan Lo	2009 – 2014
Ryan Oliver	2010 – 2014
Ashton Brock	2011 – 2016
Jennifer Martin	2011 – 2016
Marissa Kieber	2012 – 2018
Jason Kuhn	2012 – present
Steven Keller	2015 – present
Nicole Swope	2015 – present
Tracy Caldwell	2016 – present

**Graduate (MS) supervised research**

Chris Lee	2011 – 2013
Catrina Campbell	2012 – 2014

**Graduate (MA) supervised research**

William Peairs	2007 – 2010
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**Postdoctoral fellows supervised research**

Kalyani Jambunathan	2007 – 2009
David Shultis	2009 – 2010
Carol Price	2009 – 2011
Jennifer Martin	2016 - present

**PROFESSIONAL MEMBERSHIPS**

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Biophysical Society Member 1997 – present  
 American Chemical Society 2007 – present  
 Protein Society 1998 – present

**PROFESSIONAL SERVICE**

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**Department**

2007 – 2008	Faculty Search Committee (Biological)
2007 – 2012	Department Seminar Committee
2008 – 2009	Faculty Search Committee (Physical Chemistry)
2009 – 2011	Department Webmaster
2009 – 2011	Awards & Development Committee
2010 – 2013	Graduate Recruitment Committee
2013 – 2014	Faculty Search Committee, Chair (Successful hire of Ken Hsu)
2014 – 2017	Undergraduate Studies Committee, Chair
2014 – 2016	Graduate Studies Committee
2014 – 2017	Executive Committee
2014 – 2016	Assessment Committee

2015 – 2017 Director of Undergraduate Programs  
 2015 – present Junior Faculty Mentor  
 2016 – present Reform of Introductory Chemistry  
 2017 – present Pilot study of Undergraduate Success in Chemistry at UVA

### University

2009 – 2011 Faculty Search Committee, Dept. of Molecular Physiology and Biological Physics  
 2009 – 2015 Postdoc Programs Faculty Advisory Board  
 2009 – present College Science Scholars Advisor  
 2009 – present Echols Scholars Program Advisor  
 2010 – 2015 1<sup>st</sup> and 2<sup>nd</sup> year academic advisor  
 2012, Fall “Developing a research identity” presentation and discussion with Excellence in Diversity Fellows  
 2013 – 2016 Biotechnology Training Grant Executive Committee  
 2013 – 2016 College Curriculum Planning Committee  
 2014, Spring Jefferson Scholar Graduate Fellowship Selection Committee  
 2014, Spring Leadership in Academic Matters Fellow  
 2014 – 2017 Biophysics Training Grant Executive Committee  
 2014 – 2017 MSTP faculty Advisory Committee  
 2015 – 2017 Health Professions Advising Task Force  
 2015 – present Provost’s Academic Strategy Committee  
 2018 – 2021 College of Arts & Sciences Steering Committee

### National

2009 – present Faculty of 1000 Faculty Member  
 2009, 2010 Ad hoc reviewer for NSF  
 2010 – 2013 Cottrell Scholar Collaborative Think & Do Tank  
 2010 – 2016 National High Magnetic Field Laboratory NMR/MRIs Advisory Committee  
 2010 – present NSF National High Magnetic Field Laboratory User Program external reviewer  
 2010 – 2015 Cottrell Scholar Collaborative New Faculty Workshop Organizer  
 2011 – 2013 Organizer of Workshop “Teaching Science Like We Do Science” at the Annual Biophysical Meeting  
 2011 – 2018 Biophysical Society Education Committee member  
 2012, 2013 Ad hoc NIH Special Emphasis Panel  
 2012 – present Faculty1000 Research’s Editorial Board  
 2013 Ad Hoc member of the NIH Biochemistry and Biophysics of Membrane’s Panel  
 2013 – present RCSA Cottrell Scholar Advisory Board  
 2013 – present AAU STEM Undergraduate Education Initiative Advisory Committee  
 2014 – 2018 Charter member of the NIH Biochemistry and Biophysics of Membrane’s Panel  
 2014 – present Executive Editor of *Protein Expression and Purification*  
 2017 – present Biological Magnetic Resonance Bank Advisory Board  
 2017 – present Biophysical Society Publications Committee  
 2018 – 2021 Biophysical Society Council Member

2022

Organizer of FASEB Molecular Biophysics of Membranes Summer  
Research Conference