KAREN G. FLEMING

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Research Interests

I work in discovery. My research is at the physics/biology intersection and enables novel insight into mechanisms of disease, evolution and biological design. My approaches are driven by the unique powers that biophysics can bring to solving complex cellular problems. For many years I studied the energetics of transmembrane helix-helix interactions; I developed theory to describe their associations; I defined conditions of "forced cohabitation" of helices in micelles; and I discovered thermodynamic coupling in helix-helix dimerization reactions. Recently my work has targeted the protein-folding problem. In this area, we quadrupled the number of known water-to-bilayer membrane protein stabilities; we developed a novel side chain hydrophobicity scale; we showed that aromatic side chain energies follow the polarity gradient inherent in a phospholipid bilayer; we wrote a holistic flux model for sorting in the periplasms of bacterial envelopes that identifies roles played by chaperones; we showed that the membrane itself plays a catalytic role in folding; and we defined the key function of the essential BAM complex as that of an enzyme.

Education

1983-1987	B.A. French and Pre-medical Studies Notre Dame, IN	Univ. of Notre Dame
1984-1985	French Language and Culture Foreign Studies, Angers, France	Université Catholique de l'Ouest
1988-1993	Ph.D. Biochemistry & Molecular Biology Washington, DC	Georgetown University
1993-1994	Postdoctoral Associate Dept. Molecular Biophysics & Biochemistry New Haven, CT	Yale University
1994-1996	NIH Postdoctoral Fellow Dept. Molecular Biophysics & Biochemistry New Haven, CT	Yale University
1997-1998	Associate Research Scientist Dept. Molecular Biophysics & Biochemistry New Haven, CT	Yale University

Academic Experience

1999-2000	Research Scientist Dept. Molecular Biophysics & Biochemistry New Haven, CT	Yale University
2000-2007	Assistant Professor T. C. Jenkins Department of Biophysics Baltimore, MD	Johns Hopkins University
Spring 2007	Visiting Academic with Prof. Carol Robinson Department of Chemistry	University of Cambridge

	Cambridge, U.K.	
2007-2013	Associate Professor with tenure T. C. Jenkins Department of Biophysics Baltimore, MD	Johns Hopkins University
2013-Present	Full Professor with tenure T. C. Jenkins Department of Biophysics Baltimore, MD	Johns Hopkins University

Awards and Honors

2026	President, The Biophysical Society
2025	President-Elect, The Biophysical Society
2024	Fellow, AAAS
2023	Avanti Award, Biophysical Society
2022	Fellow, Biophysical Society
2021	Fellow, American Society for Biochemistry & Molecular Biology
2020	Carl Brändén Award, The Protein Society
2020	Sharona Gordon Award (Inaugural Recipient), Society of General Physiologists
2020-2021	Phi Beta Kappa Visiting Scholar
2019	Provost's Prize for Faculty Excellence in Diversity, Johns Hopkins University
2017	Diversity Leadership Council Award: Presented as a member of the team in recognition of the Women of Hopkins art exhibit. Women.JHU.edu
2016	Thomas E. Thompson Award, Membrane Structure & Assembly, The 60th Annual Meeting of the Biophysical Society, Los Angeles, CA (Feb 2016)
2015	Diversity Leadership Council Award: a recognition of the *Empowering Women in STEM* workshops and website I founded and organize.
2015	Meeting Co-Chair, 59th meeting of The Biophysical Society (with Enrique De La Cruz, Yale)
2014-2017	Elected Member of Council, ASBMB
2014	Theme Co-Organizer, Lipids & Proteins, ASBMB National Meeting (with Vinzenz Unger, Northwestern University)
2012-2014	Elected Member of the Executive Board, The Biophysical Society
2010-2014	Elected Member of Council, The Biophysical Society
2010	Elected Meeting Co-Chair, Gordon Research Conference on Biomolecular Interactions & Methods (with Gideon Schreiber, Weizmann Institute)
2010-2011	Elected President, The Gibbs Society of Biothermodynamics
2008	Elected Meeting Vice Chair, Gordon Research Conference on Biomolecular Interactions & Methods
2002-2006	Department of Defense Career Development Award
2000-2005	MRC Scholar Award, Medical Research Council of Canada (Awarded but declined.)
2000-2005	Establishment Grant and Scholarship Award, Alberta Heritage Foundation for Medical Research (Declined)

1997	Arne Tiselius Young Investigator Award (Inaugural Recipient)
1994-1996	NIH NRSA Individual Postdoctoral Fellowship
1995	Fellowship Recipient, Analytical Ultracentrifugation Workshop, University of Connecticut Biotechnology Center, Storrs, CT
1991	Talbot Travel Award, The Biophysical Society
1990	Travel Award, Graduate Student Organization, to attend ASBMB meeting, New Orleans, LA
1991-1993	NIH NRSA Individual Pre-doctoral Fellowship
1985	Diplôme de Langue, Mention Très Honorable, Université Catholique de l'Ouest, Angers, France
1983-1987	Nina Heard Astin Scholar

Student Honors Resulting from Laboratory Research

2026

Andrea Ori, Selected Talk, Gordon Research Conference on Protein Folding Dynamics, Ventura, California.

2025

Andrea Ori, Selected Short Talk, Gibbs Conference on Biothermodynamics, Touch of Nature, Makanda, IL.

Andrea Ori, Selected Talk, Gordon Research Conference on Membrane Protein Folding, Barcelona, Spain.

2024

Lucas Shen, Selected Platform Talk, 68th Meeting of the Biophysical Society, Philadelphia, PA.

Taylor Devlin, Student Research Achievement Award, 68th Meeting of the Biophysical Society, Philadelphia, PA.

Lucas Shen, Selected Short Talk, Gibbs Conference on Biothermodynamics, Touch of Nature, Makanda, IL.

2023

Ethan Posner, Woodrow Wilson Research Fellowship (JHU)

Taylor Devlin, Selected Platform Talk, 67th Meeting of the Biophysical Society, San Diego, CA.

2022

Taylor Devlin, Selected Short Talk, Gibbs Conference on Biothermodynamics, Touch of Nature, Makanda, IL.

Taylor Devlin, First Prize in Trainee Oral Presentations, International AUC Conference, University of Lethbridge, Lethbridge, Alberta, Canada.

2021

Mathis J. Leblanc, H. Keffer Hartline Award for Excellence in Research (JHU)

2020

Michaela Roskopf, Szutz Award (JHU)

Mathis J. Leblanc, Aspire Award (JHU)

2019

Michaela Roskopf, Aspire Award (JHU)

Ellie Burton, H. Keffer Hartline Award for Excellence in Research (JHU)

2018

Henry J. Lessen, Selected Short Talk, Gibbs Conference on Biothermodynamics, Touch of Nature, Makanda, IL.

2016

Shawn Costello, H. Keffer Hartline Award for Excellence in Research (JHU)

Quenton Bubb, Detlev Bronk Award for Outstanding Scholarship (JHU)

2015

Sarah K. McDonald, Outstanding Poster Award, Gordon Research Conference on Membrane Protein Folding, Bentley University, Waltham, MA

Sarah K. McDonald, Selected Short Talk, Gordon Research Conference on Membrane Protein Folding, Bentley University, Waltham, MA

Sarah K. McDonald, Selected Platform Speaker, The 59th National Symposium of the Biophysical Society, Baltimore, MD

2011

C. Preston Moon, Student Research Achievement Award, The 55th National Symposium of the Biophysical Society, Baltimore, MD

2010

C. Preston Moon, Poster Award, Symposium on Frontiers in Membrane and Membrane Protein Biophysics, Irvine, CA

2006

Ann Marie Stanley, Selected Oral Presentation, The National Meeting of the Biophysical Society, Salt Lake City, UT

2005

Ann Marie Stanley, Selected Student Speaker, The 19th Annual Gibbs Conference on Biothermodynamics, Touch of Nature, IL

Abigail K. Doura, Talbot Travel Award to attend the National Meeting of the Biophysical Society, Long Beach, CA

Ann Marie Stanley, Student Research Achievement Award, The National Meeting of the Biophysical Society, Long Beach, CA

2004

Ann Marie Stanley, Best Poster Award, UK Analytical Ultracentrifuge Meeting, Oxford, UK

Ann Marie Stanley, Selected Student Speaker (one of eight chosen), FASEB Summer Research Conference on Membrane Molecular Biophysics, Tucson, AZ

Abigail K. Doura, Selected Student Speaker (one of eight chosen), FASEB Summer Research Conference on Membrane Molecular Biophysics, Tucson, AZ

Manuscripts Under Review or Revision at Journals on BioRxiv.org (*indicates undergraduate author)

N/A

Publications (*indicates undergraduate author)

92. Xia, Yingzi; Amann, Barbara; Gillilan, Richard; Jiang, Yang; Sharma, Piyoosh; Sen, Sreemantee; Fleming, Karen; O'Brien, Edward; Fried, Stephen (2026) "Phosphoglycerate Kinase Can Adopt Topologically Misfolded Forms That Are More Stable Than Its Native State" " *JACS*, **In Press**.

91. MuhammedNazaar S, Yao J, Necelis MR, Park YC, Shen Z, Bridges MD, Guo R, Swope N, Rhee MS, Kim M, Kim KH, Hubbell WL, **Fleming KG**, Columbus L, Kang SG, Hong H.

(2025) "The Lipid Bilayer Strengthens the Cooperative Network of Membrane Proteins" *Sci. Adv.* 11(27):eadv9568. doi: 10.1126/sciadv.adv9568

90. PJ Fleming, Correia JJ & KG Fleming (2024) "The Molecular Basis for Hydrodynamic Properties of PEGylated Human Serum Albumin" *Biophys J*, May 22: S0006-3495(24)00346-1. doi: 10.1016/j.bpj.2024.05.019. PMID: 38778541; PMCID: PMC11365107

89. Devlin TA and KG Fleming (2024) *"*A Team of Chaperones Play to Win in the Bacterial Periplasm" *TIBS*, Apr 26: S0968-0004(24)00081-1 doi: 10.1016/j.tibs.2024.03.015.

88. KG Fleming (2023) "Membrane defects as a generalized driving force for membrane protein interactions" *PNAS* 120(44): e2315655120. PMID: 37851703 doi: 10.1073/pnas.2315655120.

87. Devlin TA, Fleming PJ, Loza N* & KG Fleming (2023) **"**Generation of unfolded outer membrane protein ensembles defined by hydrodynamic properties**"** *European Biophysical Journal* 52(4-5):415-425.

86. Devlin TA, Marx DC, Roskopf MA*, Bubb QR*, Plummer AM and KG. Fleming (2023) "FkpA Enhances Membrane Protein Folding using an Extensive Interaction Surface" *Protein Science* 32(4):e4592. doi: https://doi.org/10.1101/2022.11.01.514694; PMID: 36899114

85. Fleming PJ, Correia JJ & KG Fleming (2023) **"**Revisiting Macromolecular Hydration with HullRadSAS**"** *European Biophysical Journal* 52(4-5):215-224.

84. To P, Xia Y, Devlin T, Fleming KG and SD Fried (2022) "A Proteome-Wide Map of Chaperone-Assisted Protein Refolding in a Cytosol-like Milieu" *Proc. Nat. Acad. Sci.* 119(48):e2210536119. doi: 10.1073/pnas.2210536119. PMID: 36417429; PMCID: PMC9860312.

83. Marx DC and KG Fleming (2021) "Local Bilayer Hydrophobicity Modulates Membrane Protein Stability" *J. Am. Chem. Soc* **143**: 764-772. PMID: 33412852; PMCID: PMC8634737

82. Marx DC and KG Fleming (2021) "Membrane proteins enter the fold" *Current Opinion Structural Biology* **69**:124-130.

81. Vorobieva AA, White P, Liang B, Horne JE, Bera AK, Chow CM, Gerben S, Marx S, Kang A, Stiving AQ, Harvey SR, Marx DC, Khan GN, Fleming KG, Wysocki VH, Brockwell DJ, Tamm LK, Radford SE and D Baker (2020) "*De novo* design of transmembrane beta-barrels" *Science* 371(6531):eabc8182. doi: 10.1126/science.abc8182; PMID: 33602829; PMC: 8064278

80. Marx DC, Plummer AM, Faustino AM, Devlin T, Roskopf MA*, Leblanc MJ*, Lessen HJ, Amann BT, Fleming PJ, Krueger S, Fried SD, and KG Fleming (2020) "SurA is a Cryptically-Grooved Chaperone that Expands Unfolded Outer Membrane Proteins" *Proc. Nat. Acad. Sci.* 45: 28026-28035. doi: 10.1073/pnas.2008175117. Epub 2020 Oct 22; PMID: 33093201; PMCID: 7668074

79. Marx DC, Leblanc MJ*, Plummer AM, Krueger S, Fleming KG (2020) "Domain Interactions Determine the Conformational Ensemble of the Periplasmic Chaperone SurA" *Protein Sci* 10: 2043-2053. doi: 10.1002/pro.3924. Epub 2020 Aug 31; PMID: 32748422; PMCID: Pending

78. O'Brien ES, Fuglestad B, Lessen HJ, Stetz MA, Lin DW, Marques BS, Gupta K, Fleming KG, Wand AJ (2020) "Membrane Proteins Have Distinct Fast Internal Motion and Residual Conformational Entropy" *Angew. Chem. Int. Ed. Engl*. DOI: doi: 10.1002/anie.202003527. [Epub ahead of print]; PMID: 32277554; PMCID: 7513704.

77. Alford RF, Fleming PJ, Fleming KG and JJ Gray (2020) "Protein Structure Prediction and Design in a Biologically Realistic Implicit Membrane" *Biophys J*. 118: 2042-2055. DOI 10.1016/j.bpj.2020.03006: PMID: 32224301; PubMed Central PMCID: PMC7175592.

76. Lessen HJ, Majumdar A and KG Fleming (2020) "Backbone Hydrogen Bond Energies in membrane Proteins are Insensitive to Large Changes in Local Water Concentration" *J. Am. Chem. Soc.* 142: 6227-6235. DOI: doi: 10.1021/jacs. 0c00290 PMID: 32134659; PubMed Central PMCID: PMC7610216.

75. Chum AP, Shoemaker SR*, Fleming PJ and KG Fleming (2019) "Plasticity and transient binding are key ingredients of the Periplasmic Chaperone Network" *Protein Sci* 28: 1340-1349. DOI: doi: 10.1002/pro.3641 PMID: 31074917; PubMed Central PMCID: PMC6566527

74. Lessen HJ, Fleming PJ, Fleming KG, and Sodt AJ (2018) "Building Blocks of the Outer Membrane: Calculating a General Elastic Energy Model for β-Barrel Membrane Proteins" *J. Chem. Theory Comput.* 14: 4487-4497. DOI: doi: 10.1021/acs.jctc.8b00377 PMID: 29979594; PubMed Central PMCID: PMC6191857.

73. Fleming, PJ and KG Fleming (2018) "HullRad: A Fast Method for Predicting Folded and Disordered Protein and Nucleic Acid Hydrodynamic Properties" *Biophys. J.* **114:** 856. doi: 10.1016/j.bpj.2018.01.002. PubMed PMID: 29490246; PMCID: PMC5984988

72. Fleming, KG (2018) "Taking Deterministic Control of Membrane Protein Monomer-Dimer Measurements" *Journal of General Physiology* 150: 181-183. DOI: 10.1085/jgp.201711913 PubMed PMID: 29343502; PubMed Central PMCID: PMC5805552.

71. Peterson JH, Plummer AM, Fleming KG, Bernstein HD (2017) "Selective Pressure for Rapid Membrane Integration Constrains the sequence of Bacterial Outer Membrane Proteins" *Mol Microbiol* 106: 777-792 PubMed PMID: 28941249; PubMed Central PMCID: PMC5705044 DOI: 10.1111/mmi.13845

70. Marx DC and KG Fleming (2017) "Influence of Protein Scaffold on Side Chain Transfer Free Energies" *Biophys J* 113: 597-604. PMID: 28793214 PMCID: PMC5550287 DOI: 10.1016/j.bpj.2017.06.032

69. Mo GCH, Ross B, Hertel F, Manna P, Yang X, Greenwald E, Booth C, Plummer AM, Tenner B, Chen Z, Wang Y, Kennedy EJ, Cole PA, Fleming KG, Palmer A, Jimenez R, Xiao J, Dedecker P and J Zhang (2017) "Genetically-Encoded Biosensors for Visualizing Live-cell Biochemical Activity at Superresolution" *Nature Methods* **14**: 427-434. PMID: 28288122 PMCID: PMC5388356 DOI: 10.1038/nmeth.4221

68. Danoff EJ and KG Fleming (2017) "Novel kinetic intermediates along the folding pathway of OmpA" *Biochemistry* **56**: 47-60. PMID: 28001375 DOI: 10.1021/acs.biochem.6b00809; PMCID

67. McDonald SK and KG Fleming (2016) "Negative charge neutralization in the loops and turns of outer membrane phospholipase A impacts folding hysteresis at neutral pH" *Biochemistry* **55**: 6133-6137. PMID: 27731977 DOI: 10.1021/acs.biochem.6b00652; PMCID: In Progress.

66. Costello SM*, Plummer AM, Fleming PJ & KG Fleming (2016) "Dynamic Periplasmic Chaperone Reservoir Facilitates Biogenesis of Outer Membrane Proteins" *PNAS* **113**: E4794-800. PMID: 27482090; PMCID: PMC4995976.

65. Plummer AM and KG Fleming (2016) "From Chaperones to the Membrane with a BAM!" *Trends Biochem. Sci.* **41:**872-882. This article was highlighted on the cover of the October 2016 issue. PMID: 27450425; PMCID: PMC In Progress; DOI: 10.1016/j.tibs.2016.06.005.

64. McDonald SK and KG Fleming (2016) "Aromatic Side Chain Water-to-Lipid Transfer Free Energies Show a Depth-Dependence Across the Membrane Normal" *J. Am. Chem. Soc.* **138**: 7946-50. PMID: 27254476; PMCID: 4927395; DOI: 10.1021/jacs.6b03460.

63. Fleming PJ, Patel DS, Wu EL, Qi Y, Yeom MS, Sousa MC, Fleming KG and W Im (2016) "BamA POTRA Domain Interacts with a Native Lipid Membrane Surface" *Biophys. J.* **110:** 2698-2709. PMID: 27332128; PMCID: PMC4919588 DOI: 10.1016/j.bpj.2016.05.010.

62. Zaccai NR, Sandlin CW, Hoopes JT, Curtis JE, Fleming PJ, Fleming KG and S Krueger (2016) "Deuterium labeling together with contrast variation small-angle neutron scattering suggests how Skp captures and releases unfolded outer membrane proteins" (2015) *Methods Enzymol* **566** 159-210. PMID: 26791979; PMCID: PMC4913355; DOI: 10.1016/bs.mie.2015.06.041

61. Sandlin CW, Zaccai NR and KG Fleming (2015) "Skp trimer formation is insensitive to ionic strength" *Biochemistry* **54**: 7059-7062**.** PMID: 26579730; PMCID: PMC4905700; DOI: 10.1021/acs.biochem.5b00806

60. Plummer AM[+], Gessmann D[+] and KG Fleming (2015) "The Role of a Destabilized membrane for OMP Insertion" *Methods Mol. Biol*. 1329: 57-65. PMID: 26427676: PMCID: N/A. [+]Joint First Authors.

59. Plummer AM and KG Fleming (2015) "BamA Alone Accelerates Outer Membrane Protein Folding In Vitro through a Catalytic Mechanism" *Biochemistry* **54**: 6009-6011. PMID: 26394056; PMCID: PMC4613867.

58. Danoff EJ and KG Fleming (2015) "Aqueous, Unfolded OmpA Forms Amyloid-Like Fibrils Upon Self-Association" *PLos ONE* **10**: e0132301. PMID: 26196893; PMCID: PMC4509890

57. Fleming KG (2015) "A kinetic push and thermodynamic pull as driving forces for outer membrane protein sorting and folding in bacteria" *Phil Trans R Soc Lond B Biol Sci* **370**: 1679. PMID: 26370938;

56. Danoff EJ and KG Fleming (2015) "Membrane defects accelerate outer membrane β-barrel protein folding" *Biochem* **54**: 97-99. PMID: 25513891; PMCID: PMC4303321.

55. Wu EL, Fleming PJ, Yeom MS, Widmalm G, Klauda JB, Fleming KG and W Im (2014) "*E coli* Outer Membrane and Interactions with OmpLA" *Biophys. J.* **106**: 2493. PMID: 24896129; PMCID: PMC4052237.

54. Gessmann D, Chung YH, Danoff EJ, Plummer AM, Sandlin CW, Zaccai NR and KG Fleming (2014) "Outer membrane β-barrel protein folding is physically controlled by periplasmic lipid head groups and BamA" *PNAS* **111**: 5878-93. PMID: 24715731; PMCID: PMC4000854.

53. Fleming KG (2014) "Energetics of Membrane Protein Folding" *Ann Rev Biophys* **43**: 233-55. PMID: 24895854; PMCID Pending.

52. Moon CP, Zaccai NR, Fleming PJ, Gessmann D and KG Fleming (2013) "Membrane protein thermodynamic stability may serve as the energy sink for sorting in the periplasm" *PNAS* **110:** 4285-4290. PMID: 23440211; PMCID: PMC3600475.

51. Lees JPB, Manlandro CM, Picton LK, Ebie Tan AZ, Casares S, Flanagan JM, Fleming KG and RB Hill (2012) "A designed point mutant in Fis1 disrupts dimerization and mitochondrial fission" *J. Mol. Biol.* **423**: 143-158 PMID: 22789569; PMCID: PMC3456991.

50. O'Neill MJ, Bhakta MN, Fleming KG and A Wilks (2012) "Induced Fit on Heme Binding to the Pseudomonas aeruginosa Cytoplasmic Protein (PhuS) Drives Interaction with Heme Oxygenase (HemO)" *PNAS* **109:** 5639-5644. PMID: 22451925; PMCID: PMC3326490.

49. Buchanan SK, Yamashita Y and KG Fleming (2012) "Structure and folding of outer membrane proteins" in *Comprehensive Biophysics* eds. EH Egelman and LK Tamm, Oxford: Academic Press Vol **5**: 139-163.

48. Moon CP, Kwon S* and KG Fleming (2011) "Overcoming hysteresis to attain reversible equilibrium folding for outer membrane phospholipase A in phospholipid bilayers" *J. Mol. Biol.* **413**: 484-494. PMID: 21888919; PMCID: PMC3193555.

47. Fleming PJ, Freites JA, Moon CP, Tobias DJ and KG Fleming (2011) "Outer membrane phospholipase A in phospholipid bilayers: A model system for concerted computational and experimental investigations of amino acid side chain partitioning into lipid bilayers" *BBA Biomembranes* **1818**: 126-134. PMID: 21816133; PMCID: PMC3233656.

46. Danoff EJ and KG Fleming (2011) "The soluble, periplasmic domain of OmpA folds as an independent unit and displays chaperone activity by reducing the self-association propensity of the unfolded OmpA transmembrane β-barrel" *Biophys. Chem.* **159**: 194-204. PMID 21782315; PMC3169180.

45. Moon CP and Fleming KG (2011) "From the Cover: Side-chain hydrophobicity scale derived from transmembrane protein folding in lipid bilayers" *PNAS* **108:** 10174-10177. PMID 21606332; PMC3121867.

    Commentary by Janice L. Robertson
    "We choose to go to the membrane" *PNAS* (2011) 108(25) 10027-10028.

44. Moon CP and KG Fleming (2011) "Using tryptophan fluorescence to measure the stability of membrane proteins folded in liposomes" *Methods Enzymol*. *Biothermodynamics, Part D* **492**: 189-211. PMID 21333792; PMC3799943.

42. Fleming, KG (2010) "Fluorescence Theory" in *Encyclopedia of Spectroscopy and Spectrometry, 2nd edition*, J. Lindon, editor, Academic Press, p 628-634. DOI 10.1016/B978-0-12-374413-5.00357-2

42. Ebie Tan A, Burgess NK, Marold JD, DeAndrade DS* & KG Fleming (2010) "Self association of unfolded outer membrane proteins" *Macromol. Biosci.* **10**: 763-7. PMID 20491126; PMC3025446.

41. Pang T, Savva CG, Fleming KG, Struck DK and R Young (2009) "Structure of the lethal phage pinhole" *PNAS* **106**: 18996-71. PMID 19861547; PMC2776468.

40. Ebie Tan A & KG Fleming (2008) "Outer membrane phospholipase A dimer stability does not correlate to occluded surface area" *Biochemistry* **47**: 12095-103. PMID 18939857

39. Burgess NK, Dao T, Stanley AM and KG Fleming (2008) "β-barrel proteins that reside in the same membrane *in vivo* demonstrate varied folding behavior *in vitro*" *J. Biol. Chem.* **283:** 26748-26758. PMID 18641391; PMC3258919

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35. Burgess NK, Stanley AM and KG Fleming (2008) "Determination of membrane protein molecular weights and association equilibrium constants using sedimentation equilibrium and sedimentation velocity" *Methods Cell Biol.* **84**: 181-211. PMID 17964932

34. Duong MT, Jaszewski TM, Fleming KG and KR MacKenzie (2007) "Changes in apparent free energy of helix-helix dimerization in a biological membrane due to point mutations" *J. Mol. Biol.* **371**: 422-434.

33. Stanley AM and KG Fleming (2007) "The Role of a Hydrogen Bonding Network in the Transmembrane β-barrel OMPLA" *J. Mol. Biol.* **370**: 912-924.

32. Ebie AZ and KG Fleming (2007) "Dimerization of the erythropoietin transmembrane domain in micelles" *J. Mol. Biol.* **366**: 517-524.

31. Stanley AM, Treubodt AM,* Chauwang P, Hendrickson TL and KG Fleming (2007) "Lipid chain selectivity of outer membrane phospholipase A" *J. Mol. Biol.* **366**: 461-468.

30. Stanley AM, Chauwang P, Hendrickson TL and KG Fleming (2006) "Energetics of outer membrane phospholipase A (OMPLA) dimerization" *J. Mol. Biol.* **358**: 120-131.

29. Kroch AE and KG Fleming (2006) "Alternate interfaces may mediate homomeric and heteromeric assembly in the transmembrane domains of SNARE Proteins" *J. Mol. Biol.* **357**: 184-197.

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27. Stanley AM and KG Fleming (2005) "The transmembrane domains of the ErbB receptors do not dimerize strongly in micelles" *J. Mol. Biol.* **347**: 759-772.

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25. Doura AK and KG Fleming (2004) "Complex interactions at the helix-helix interface stabilize the glycophorin A transmembrane dimer" *J. Mol. Biol.* **343**: 1487-1497.

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20. Trombetta, ES, Fleming, KG, Helenius, A (2001) "Quaternary and domain structure of glycoprotein processing glucosidase II" *Biochemistry* **40**: 10717-22.

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17. Fleming, KG^{+} and DM Engelman (2001) "Computation and mutagenesis suggest a right-handed dimer for the synaptobrevin transmembrane domain" *Proteins* **45**: 313-317. *+Corresponding author*

16. Fleming, KG (2000) Riding the wave: structural and energetic principles of helical membrane proteins" *Current Opinion in Biotechnology* (P. Hensley & D. Myszka, eds.) Vol. 11: 67-71.

15. Fleming, KG (2000) "Probing the Stability of Helical Transmembrane Proteins" in *Energetics of Biological Macromolecules, Part C*, a volume of *Meth. Enzymol.* (M. L. Johnson & G. Ackers, eds.) Academic Press, **323**: 63-77.

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13. Schubert, C; Hirsch, JA; Gurevich, VV; Engelman, DM; Sigler, PB; and KG Fleming* (1999) "Visual arrestin activity may be regulated by self-association" *J. Biol. Chem.* **274**: 21186-21190.

12. Fleming, KG; Hohl, TM; Yu, RC; Müller, SA; Wolpensinger, BA; Engel, A; Engelhardt, H; Brünger, AT; Söllner, T; and PI Hanson (1998) "A Revised Model for the Oligomeric State of the N-ethyl Maleimide Sensitive Factor, NSF" *J. Biol. Chem*. **273**: 15675-15681.

11. Fleming, KG (1998) "Measuring Transmembrane α-Helix Energies using Analytical Ultracentrifugation" in *ChemTracts*: *Biological Applications of the Analytical Ultracentrifuge* (J. C. Hanson, ed.) **11**: 985-990.

10. Fleming, KG (1998) "Analysis of Membrane Protein Dimerization by Sedimentation Equilibrium" *Application Information Bulletin* (A. Furst, ed.) Beckman Coulter, Inc.

9. Engelman, DM; Fleming, KG; and KR MacKenzie (1998) "Helix Stability and Interactions in Membrane Proteins" *Biol. Skr. Dan. Vid. Selsk*. **49**: 83-86.

8. O'Brien, R; DeDecker, B; Fleming, KG; Sigler, PB; and J Ladbury (1998) "The Effects of Salt on the TATA-binding Protein DNA Interaction of a Hyperthermophilic Archaeon" *J. Mol. Biol.* **279**: 117-125.

7. Fleming, KG; Ackerman, AL; and DM Engelman (1997) “The Effect of Point Mutations on the Free Energy of Transmembrane α-Helix Dimerization” *J. Mol. Biol.* **272:** 266-275.

6. Rodgers, KK and KG Fleming (1997) "Metal-dependent Structure and Self-Association of the RAG1 Zinc-binding Domain" in *Techniques in Protein Chemistry VIII.* D. K. Marshak, ed., pp. 573-584.

5. Munson, M; Balasubramanian, S; Fleming, KG; Nagi, AD; O'Brien, R; Sturtevant, JM and L Regan (1996) "What Makes a Protein a Protein? Hydrophobic Core Designs that Specify Stability and Structural Properties" *Protein Sci.* **5**: 1584-1593.

4. Rodgers, KK; Bu, Z; Fleming, KG; Schatz, DG; Engelman, DM and JE Coleman (1996) "A Zinc-binding Domain Involved in the Dimerization of RAG1″ *J. Mol. Biol.* **260**: 70-84.

3. Srivastava, M; **Gibson, KR**; Pollard, HB and PJ Fleming (1994) "Human Cytochrome b_{561}: A Revised Hypothesis for Conformation in Membranes which Reconciles Sequence and Functional Information" *Biochem. J.* **303**: 915-921.

2. **Gibson, KR**; Vanek, PG; Kaloss, WD; Collier, GB; Connaughton, JF; Angelichio, M; Livi, GP and PJ Fleming (1993) "Expression of Dopamine β-Hydroxylase in Drosophila Schneider 2 Cells: Evidence for a Mechanism of Membrane Binding other than Uncleaved Signal Peptide" *J. Biol. Chem.* **268**: 9490-9495.

1. Zhang, H; Buckley, NE; **Gibson, K** and S Spiegel (1990) "Sphingosine Stimulates Cellular Proliferation via a Protein Kinase C-Independent Pathway″ *J. Biol. Chem*. **265**: 76-81.

Research Support: My lab has been continuously funded by a national agency since 1999.

Active Support

2023-2028 NIH R35 GM148199 Role: Principal Investigator
“Forces Driving Membrane Protein Folds”
This grant investigates how lipid bilayers influence the stabilities of membrane proteins.

2024-2028 NSF Molecular & Cellular Biophysics 2427621 Role: Principal Investigator
“Periplasmic Chaperone Network Organization and Mechanism”
This grant uses solution structure, thermodynamics and computation to investigate how periplasmic chaperones function.
This grant includes in its budget yearly REU supplements for summer undergraduate research.

2025-2030 NIH 2T32GM135131-06 Role: PI
“Program in Molecular Biophysics”
This grant funds the Program in Molecular Biophysics Graduate Program.

Pending Support

None

Completed Support

2019-2024 NSF Molecular & Cellular Biophysics Role: Principal Investigator

"Periplasmic Chaperone Network Organization and Mechanism"
This grant uses solution structure, thermodynamics and computation to investigate how periplasmic chaperones function.
This grant includes in its budget yearly REU supplements for summer undergraduate research.

2009-2022 NIH R01 079440 Role: Principal Investigator
"Membrane Protein Stability"
This grant investigates the thermodynamic stabilities of transmembrane beta-barrel proteins.

2014-2019 NSF MCB Role: Principal Investigator
"Towards a Holistic Model for OMP Sorting in the Periplasm"
This grant will develop a physical and mathematical model for outer membrane protein sorting and maturation in the periplasmic compartment of Gram-negative bacteria.
This grant includes in its budget yearly REU supplements for summer undergraduate research.

2015-2018 XSEDE MCB120050 Role: Principal Investigator
"Conformational dynamics of BamA POTRA domains"
This no-cost grant provides computing resources for molecular dynamics calculations of BamA POTRA domains.

2014-2015 Anton Allocation PSCA14004P Role: Principal Investigator
"The roles of protein conformational dynamics and lipid membrane properties in the function of β-barrel assembly machinery"
This no-cost grant provides computing resources for molecular dynamics calculations of membrane proteins.

2014-2015 XSEDE MCB120050 Role: Principal Investigator
"Energetics of Lipid-Protein Interactions"
This no-cost grant provides computing resources for molecular dynamics calculations of membrane proteins.

2009-2014 NSF MCB0919868 Role: Principal Investigator
"Biophysical analysis of chaperone influences on membrane protein folding"
This grant investigates how periplasmic chaperones influence membrane protein folding pathways. The goal is to develop a quantitative flux model to describe the biological folding pathways taken by transmembrane beta-barrels. This proposal includes summer REU funding for undergraduate scientists.

2014 REU Supplement NSF Role: Principal Investigator
This award provides a summer research opportunity for an undergraduate student.

2013 REU Supplement NSF Role: Principal Investigator
This award provided a summer research opportunity for an undergraduate student.

2013-2014 XSEDE MCB120050 Role: Principal Investigator
"Energetics of Lipid-Protein Interactions"
This grant provides computing resources for molecular dynamics calculations of membrane proteins.

2012-2013 XSEDE MCB120050 Role: Principal Investigator
"Energetics of Lipid-Protein Interactions"
This grant provides computing resources for molecular dynamics calculations of membrane proteins.

2012 REU Supplement NSF MCB0423807 Role: Principal Investigator

This award provided summer research opportunities for two undergraduate students.

2004-2009 NSF MCB 0423807 Role: Principal Investigator
"Thermodynamic Analysis of Transmembrane Beta Barrel Self-Association"
This grant investigated complex formation by an outer membrane transmembrane beta-barrel protein.

2006 REU Supplement to MCB 0423807 Role: Principal Investigator
"Thermodynamic Analysis of Transmembrane Beta Barrel Self-Association.
This award provided a summer research opportunity for an undergraduate student.

2002-2006 BC010823 Career Development Award Role: Principal Investigator
Department of Defense Breast Cancer Research Fund
U. S. Army Medical Research and Materiel Command
"Energetics and Structure Prediction of the Network of Homo- and Hetero-Oligomers Formed by the Transmembrane Domains of the ErbB Receptor Family of Proteins"

2002-2005 BC 010746, Idea Award Role: Principal Investigator
Department of Defense Breast Cancer Research Fund
U. S. Army Medical Research and Materiel Command
"Energetics and Structure Prediction of the Network of Homo- and Hetero-Oligomers Formed by the Transmembrane Domains of the ErbB Receptor Family of Proteins"

1999-2003 NIH R01 GM57534 Role: Principal Investigator
"Structural and Energetic Principles of Membrane Proteins"

1994-1996 NRSA Post-doctoral Fellowship Role: Principal Investigator
NIH National Institute of General Medical Sciences

1991-1993 NRSA Individual Pre-doctoral Fellowship Role: Principal Investigator
NIH National Institute of Mental Health

Training programs and equipment grants

2017 NSF Major Research Instrumentation Proposal Role: Co-PI
Acquisition of a Solution-State 18.8 Tesla (800 MHz) Nuclear Magnetic Resonance Spectrometer
P.I: Juliette Lecomte (JHU)

2000-Present NIH GM08403 Role: Participating member
"Program in Molecular Biophysics"
The goal of this grant is to provide funding for training graduate students in molecular biophysics at Homewood, the School of Medicine, and the School of Public Health (JHU)

2000-Present NIH GM007231 Role: Participating member
"Cell and Molecular Biology"
This grant provides funding for training graduate students in biophysics and biology at the Homewood campus (JHU).

2008 NIH Instrumentation Grant Role: Collaborator
PI. Jack Freed (Cornell University).
"DEER EPR Spectrometer"

2008 NIH Instrumentation Grant Role: Minor User

PI. Michael McCaffrey (JHU)
"Fluorescence Correlation Spectrometer"

2004 NSF Shared Instrumentation Grant Role: Co-Principal Investigator
"Peptide Synthesis System to Probe Protein Structure and Interactions with other Biological Macromolecules and Ions"
P.I.: Tamara Hendrickson (JHU)

2004 NIH Shared Instrumentation Grant Role: Minor User
P.I: Blake Hill (JHU)

Invited Scientific Lectures and Seminars ***(since assuming Faculty Position in 2000)***

2026

Invited Speaker, The Biophysical Society Meeting, San Francisco, CA (Feb 2026)

2025

Invited Speaker, Colin Kleanthous Symposium, Department of Biochemistry, University of Oxford, Oxford, UK (Mar 2024)

Seminar *Speaker,* Texas A&M University, Department of Biochemistry & Biophysics, College Station, TX (Apr 2024)

International Speaker, Biophysical Society Thematic Meeting on Beyond Simple Models: The Consequences of Membrane Complexity in Living Systems, Copenhagen, Denmark (Jul 2025)

International Speaker, 8th International Conference on Molecular Perspectives of Protein-Protein Interactions, Crete, Greece (Oct 2025)

International Speaker, Biophysical Society Thematic Meeting on Understanding Peripheral Membrane Protein Interactions: Structure, Dynamics, Function and Therapy, Thessaloniki, Greece (Oct 2025)

2024

International Speaker, Workshop on Analytical Ultracentrifugation, Banz Abbey, Germany (Jul 2024).

Seminar Speaker, Vanderbilt University Medical Center (Apr 2024)

Seminar Speaker, Virginia Commonwealth University, Joint seminar with the Departments of Chemistry & Biochemistry, Richmond, VA (Apr 2024)

Seminar Speaker, Distinguished Scientist Seminar Series, Georgetown University, Washington, DC (Apr 2024)

Seminar Speaker, Clemson University, Department of Chemistry, Clemson, SC (Mar 2024)

Conference Speaker, American Society for Biochemistry & Molecular Biology, Membrane Protein Interest Group, San Antonio, TX (Apr 2024)

Conference Speaker, Gordon Research Conference on Protein Folding Dynamics (Jan 2024)

2023

Conference Speaker, Carolina Biophysics Conference University of North Carolina, Chapel Hill, NC (Nov 2023)

Ackers Lecturer, Gibbs Conference on Biothermodynamics, Carbondale, IL (Oct 2023)

Plenary Speaker, European Biophysical Society Organization Meeting hosted by the Swedish Society for Biophysics, Biochemistry and Molecular Biology, Stockholm, Sweden (Aug 2023)

Conference Speaker, BPS Conference on Proton Reactions: From Basic Science to Biomedical Applications, Granlibakken Resort, Tahoe, CA (Aug 2023)

Discussion Leader, Gordon Research Conference on Membrane Transport, Les Diablerets Conference Center, Switzerland (Jun 2023)

Keynote Speaker, Gordon Research Conference on Proteins, Holderness, NH (Jun 2023)

Conference Speaker, 19th Chemical Biophysics Symposium (student organized), University of Toronto, Toronto, Canada (Apr 2023)

Seminar Speaker, Life Sciences Institute, University of Michigan, Ann Arbor, MI (Mar 2023)

Conference Speaker, 67th Annual Meeting of the Biophysical Society, San Diego, CA (Feb 2023)

Avanti Award Talk, Recorded for online access for the 67th Annual Meeting of the Biophysical Society, San Diego, CA (Feb 2023)

Student-invited Seminar Speaker, Department of Chemistry, University of Pennsylvania, Philadelphia, PA (Feb 2023)

Co-Organizer and Speaker, Inter-Academy Workshop on Membrane Protein Structure and Folding, Stockholm University, Stockholm, Sweden (Feb 2023)

2022

Seminar Speaker, Department of Molecular and Cell Biology, University of California Berkeley (Oct 2022)

Conference Speaker, Molecular Biophysics of Membrane, a Biophysical Society Conference, Granlibakken, Tahoe City, NV (Jun 5-10, 2022)

International Speaker, Workshop on Analytical Ultracentrifugation, Lethbridge, Canada (Jul 2022).

Conference Speaker, Gordon Research Conference on Ligand Recognition and Molecular Gating, Il Ciocco, Italy (Apr 2022)

2021

Phi Beta Kappa Public Lecture, Nurturing a More Inclusive STEM Pipeline, University of California at Riverside, 8-9 Feb 2021. (*by Zoom*)

Phi Beta Kappa Seminar Speaker, Microbial Hot Potato, University of California at Riverside, 8-9 Feb 2021. (*by Zoom*)

Phi Beta Kappa Public Lecture, Nurturing a More Inclusive STEM Pipeline, University of Kansas (1-2 Mar 2021). (*by Zoom*)

Phi Beta Kappa Seminar, Microbial Hot Potato, University of Kansas (1-2 Mar 2021). (*by Zoom*)

2021 Probst Lecturer, Department of Chemistry, Southern Illinois University, Edwardsville, IL (22 Mar 2021) (*by Zoom*)

Phi Beta Kappa Public Lecture, Nurturing a More Inclusive STEM Pipeline, Washington College, Chestertown, MD (29-30 Mar 2021) (*by Zoom*)

Phi Beta Kappa Seminar, Microbial Hot Potato, Washington College (29-30 Mar 2021). (*by Zoom*)

Invited Seminar, From Chaperones to the Membrane with a BAM! University of Tenneesee, Knoxville (21 Apr 2021) (*by Zoom*)

Phi Beta Kappa Public Lecture, Nurturing a More Inclusive STEM Pipeline, Grinnell College, 6 May 2021. (*by Zoom*)

Phi Beta Kappa Public Lecture, Nurturing a More Inclusive STEM Pipeline, University of Washington, 17-18 May 2021. (*by Zoom*)

Phi Beta Kappa Seminar Speaker, Microbial Hot Potato, University of Washington, 17-18 May 2021. (*by Zoom*)

International Invited Speaker, Department of Biochemistry & Biophysics, Stockholm University, Stockholm, Sweden (*by Zoom*) (8 May 2021)

Award Talk, Carl Brändén Award, The Protein Society, Boston, MA (Jul 2021) (*by Zoom*)

2020

International Conference Speaker, Innovative Training Network, Protons and Proton-Coupled Transport, Stroble, Austria. (Nov 2020) *Presented as a Zoom conference due to coronavirus pandemic.*

Seminar Speaker, Department of Biochemistry, University of Michigan, Ann Arbor, MI (Oct 2020) *To Be Rescheduled due to coronavirus pandemic*

Conference Speaker, Telluride Summer Research Conference on Quinary Interactions, Telluride, CO. (Jun 2020) *Rescheduled due to coronavirus pandemic.*

Conference Speaker, Molecular Biophysics of Membrane, a Biophysical Society Conference, Granlibakken, Tahoe City, NV (Jun 2020) *Rescheduled to 2022 due to coronavirus pandemic.*

Conference Speaker, Gordon Research Conference on Ligand Recognition and Molecular Gating, Il Ciocco, Italy (15 Mar 2020) *Rescheduled to 2022 due to coronavirus pandemic.*

2019

Seminar Speaker, Department of Biochemistry, University of Pennsylvania, Philadelphia, PA (12 Dec 2019)

Seminar Speaker, Monday Seminar Series, Catholic University of America, Washington, DC (28 Oct 2019)

Seminar Speaker, Department of Chemistry, Indiana University Bloomington, Bloomington, IN (11 Oct 2019)

Keynote Speaker, Celebration of Science, Texas Woman's University, Denton, TX (18 Oct 2019)

Conference Speaker, Gibbs Conference on Biothermodynamics, Carbondale, IL (Oct 2019)

Invited Speaker, National Institute for ICHD/DIPHR annual retreat, National Institutes of Health, Bethesda, MD (16 Sep 2019)

International Keynote Speaker, Queenstown Molecular Biology Satellite meeting on Membrane Proteins, Queenstown, NZ (Aug 2019)

International Speaker, Workshop on Analytical Ultracentrifugation of Membrane Proteins, Christchurch, NZ (Aug 2019)

International Keynote Lecturer, The 23rd Swedish Conference on Macromolecular Structure and Function, Tällberg, Sweden (14-17 Jun 2019)

2018

Seminar Speaker, Department of Biochemistry & Molecular Biophysics, Washington University School of Medicine, St. Louis, MO (Nov 2018)

Conference Speaker, Mini-symposium on Analytical Ultracentrifugation, University of Pennsylvania, Philadelphia, PA (16 Oct 2018)

Seminar Speaker, Department of Chemistry & Biochemistry, Texas Woman University, Denton, TX (11 Oct 2018)

Seminar Speaker, Department of Chemistry & Biochemistry, Oberlin College (3 Oct 2018)

Conference Speaker, Symposium of the Society of General Physiologists, Marine Biological Laboratory, Woods Hole, MA (Sep 2018)

Conference Speaker, Center on Membrane Protein Production and Analysis Symposium, Roy and Diana Vagelos Education Center of Columbia University Medical Center, New York, NY (Jun 2018)

Conference Speaker, Gordon Research Conference on Membrane Transport Proteins, Sunday River, ME (Jun 2018)

Seminar Speaker, Department of Biochemistry, University of Wisconsin, Madison, WI (May 2018)

Invited Symposium Speaker, Protein Folding: Biophysics, Biology & Beyond, University of Maryland, College Park, MD (11 May 2018)

Seminar Speaker, Seminar Series in Biochemistry, Biophysics & Biodesign, City College of New York, New York, NY (May 2018)

Seminar Speaker, Department of Chemistry & Biochemistry, University of Notre Dame (20 Mar 2018)

Conference Speaker, Gordon Research Conference on Protein Transport Across Cell Membranes, Hotel Galvez, Galveston, TX (Mar 2018)

2017

Student-Invited Speaker, Department of Microbiology and Immunobiology, Harvard Medical School, Boston, MA (Dec 2017)

Seminar Speaker, Department of Biochemistry, California Institute of Technology (Caltech), Pasadena, CA (Dec 2017)

Seminar Speaker, Department of Chemistry and Biochemistry, University of California Los Angeles, Los Angeles (Dec 2017)

Short Talk, Congrès international du Groupe d'Etude des Membranes XIX Roscoff, France (Nov 2017)

International Invited Speaker, Institut de Biologie Structurale (IBS), Grenoble, France (Oct 2017)

Seminar Speaker, NIH Membrane Protein Interest Group, Bethesda, MD (Sep 2017)

International Invited Speaker, Symposium on 'The ins and outs of membrane biology' celebrating the retirement of Prof. Gunnar von Heijne (Stockholm University), Hemaven, Sweden (Sep 2017)

Seminar Speaker, Trinity Biomedical Sciences Institute, Trinity College Dublin, Dublin, Ireland (Aug 2017)

Workshop Presenter, 23rd International Conference on Analytical Ultracentrifugation, University of Glasgow, Glasgow, Scotland (Jul 2017)

Conference Speaker, Gordon Research Conference on Mechanisms of Membrane Transport, Colby Sawyer College, New London, NH (Jun 2017)

Conference Speaker, Gordon Research Conference on Membrane Protein Folding, Stonehill College, Easton, MA (Jun 2017)

International Invited Speaker, Cold Spring Harbor Asia Meeting on Membrane Structure, Suzhou, China (May 2017)

Conference Speaker, Navigating Lipid Research in Baltimore, Carnegie Institute of Baltimore, Baltimore, MD (May 2017)

Seminar Speaker, Public Health Research Institute, New Jersey Medical School, New Brunswick, NJ (May 2017)

Seminar Speaker, Department of Chemistry, Wesleyan University (April 2017)

Spotlight Talk, 2017 Annual Meeting of the American Society for Biochemistry & Molecular Biology, Chicago, IL (Apr 2017)

Symposium Speaker, Sixty-first Annual Meeting of the Biophysical Society, New Orleans, LA (Feb 2017)

2016

Colloquium Speaker, Department of Physics, University of Delaware, Newark, DE (Nov 2016)
Workshop Speaker, Taking Aim against Bacteria, Lehigh University, Bethlehem, PA (Nov 2016)
Celebration of Science Speaker, Women in Science: At the Intersection of Chemistry and Biology Texas Woman's University, Department of Chemistry and Biochemistry, Denton, TX Oct (2016) (Cancelled due to illness)
Seminar Speaker, Department of Infectious Diseases, Genentech, South San Francisco, CA (Sep 2016)
Speaker, Symposium on Social Science of Diversity Equity American Chemical Society Fall Meeting, Philadelphia, PA (Aug 2016)
Conference Speaker, The 30th Annual Symposium of the Protein Society, Baltimore, MD (Jul 2016)
Conference Speaker, FASEB Summer Research Conference on Membrane Molecular Biophysics, Snowmass, CO (Jul 2016)
Conference Speaker, The American Society for Microbiology, Boston, MA (Jun 2016)
Seminar Speaker, Department of Chemistry, University of Maryland College Park (May 2016)
Seminar Speaker, Department of Chemistry, Michigan State University (May 2016)
Seminar Speaker, Literature, Science and the Arts Seminar in Biophysics, University of Michigan (Apr 2016)
Seminar Speaker, Department of Chemistry & Biochemistry, University of Colorado Boulder (Mar 2016)
Award Lecture, The Thomas E. Thompson Award, Membrane Structure and Assembly Subgroup, The Biophysical Society, Los Angeles, CA (Feb 2016)

2015

International Conference Speaker, Membrane Proteins Theme Session 22nd International Conference on Analytical Ultracentrifugation, University of Latrobe, Melbourne, Australia (Dec 2015)
Outstanding Women in Science Speaker seminar series, Inaugural speaker, Department of Chemistry, University of Alabama, Birmingham, AL (Dec 2015)
Seminar Speaker, Department of Chemistry & Biochemistry, University of Minnesota Duluth, Duluth, MN (Nov 2015)
Seminar Speaker, Department of Chemistry, Yale University, New Haven, CT (Nov 2015)
Seminar Speaker, Department of Chemistry, University of Akron, Akron, OH (Oct 2015)
Conference Speaker, Gordon Research Conference on Proteins, Holderness School, NH (Jun 2015)
Seminar Speaker, Department of Biochemistry, Vanderbilt University, Nashville, TN (Apr 2015)
Conference Speaker, Keynote Symposium on Hybrid Methods in Structural Biology, Granlibakken Resort, Tahoe City, CA (Mar 2015) (Unable to attend due to illness.)
Seminar Speaker, Department of Chemistry & Biochemistry, University of North Carolina at Wilmington, Wilmington, NC (Jan 2015)
Seminar Speaker, Department of Physiology and Biophysics, Weill Cornell Medical College, New York, NY (Jan 2015)

2014

Keynote Speaker, The 28th Gibbs Conference on Biothermodynamics, Carbondale, IL (Sep 2014)
Seminar Speaker, Biochemistry Seminar Series, University of Washington, Seattle, WA (Nov 2014)

Seminar Speaker, Structural Biology Series, Purdue University, West Lafayette, IN (Nov 2014)

Conference Speaker, Seminar on Overcoming Bias and Barriers to Achieve Gender Equity in Science, Rosetta Conference, Leavenworth, WA (Jul 2014)

Short Talk, Gordon Research Conference on Bacterial Cell Surfaces, Mount Snow, VT (June 2014).

International Speaker, Conference on Physical Approaches to Membrane Proteins, Heraeus Seminar, Bad Honnef, German, (May 2014)

Conference Speaker, Frontiers in Membrane Protein Structural Dynamics, University of Chicago, Chicago, IL (May 2014)

Conference Speaker, Delaware Membrane Symposium, University of Delaware, Newark, DE (May 2014)

Theme Organizer and Invited Speaker, Lipids & Proteins Sessions, ASBMB Annual Meeting, San Diego, CA (Apr 2014)

Seminar Speaker, Department of Chemistry, University of Massachusetts at Amherst, Amherst, MA (Apr 2014)

Student and Postdoctoral Fellow-Invited Seminar Speaker, Cell Biology and Metabolism Program (CBMP) and Program in Cellular Regulation and Metabolism (PCRM), National Institutes of Health, Bethesda, MD (Apr 2014)

Seminar Speaker, Salisbury University, Department of Chemistry, Salisbury, MD (Feb 2014)

Seminar Speaker, North Dakota State University, Department of Chemistry and Biochemistry, Fargo, ND (Jan 2014)

2013

Seminar Speaker, Department of Molecular Biosciences, University of Kansas, Lawrence, KS (Nov 2013)

Seminar Speaker, Department of Chemistry, Gettysburg College, Gettysburg, PA (Oct 2013)

Seminar Speaker, Department of Chemistry, University of Missouri, Columbia, MO (Oct 2013)

Session Chair and International Speaker, Membrane Proteins Theme Session 21st International Conference on Analytical Ultracentrifugation, Atami, Shizuoka, Japan (Sep 2013)

Conference Speaker, Telluride Workshop on Membrane Protein Folding and Function, Telluride, CO (Aug 2013)

Conference Speaker, Biological Membranes and Membrane Proteins: Challenges for Theory and Experiment, Snowmass, CO (Jul 2013)

Short Talk, Membrane Protein Structure and Function, Cold Spring Harbor Asia Meeting, Suzhou, China (13 May 2013).

Conference Speaker, Frontiers in Structural Biology of Membrane Proteins, University of Alabama at Birmingham, Birmingham, AL (Apr 2013)

Seminar Speaker, Department of Biochemistry, University of Iowa, Iowa City, IA (Apr 2013)

Seminar Speaker, Institute for Biophysical Dynamics & Department of Chemistry, University of Chicago, Chicago, IL (Mar 2013)

Conference Speaker, Teaching Science Like We Do Science Workshop at the 57th Annual Meeting of the Biophysical Society, Philadelphia, PA (Feb 2013).

2012

Seminar Speaker, University of Illinois at Urbana Champaign, Center for Physics of Living Systems, Urbana, IL (Nov 2012)

International Speaker, Queenstown Molecular Biology Meeting, Queenstown, New Zealand (Aug 2012)

International Speaker, Biomolecular Interactions Centre & Department of Biochemistry, University of Canterbury, Christchurch, New Zealand (Aug 2012)

Short Talk, FASEB Summer Research Conference on Membrane Molecular Biophysics, Snowmass, CO (Jun 2012)

Undergraduate Biophysics Symposium Speaker, University of Virginia, Department of Biochemistry & Molecular Genetics, Charlottesville, VA (Jun 2012)

Seminar Speaker, University of Virginia, Department of Physiology & Biological Physics, Charlottesville, VA (Jun 2012)

Conference Speaker, Gordon Research Conference on Biopolymers, Newport, RI, (Jun 2012)

Seminar Speaker, Department of Chemistry, Princeton University, Princeton, NJ (Apr 2012)

International Speaker, Institut de Biologie Physico-Chimique, Paris, France (Apr 2012)

Platform Talk, The 56th Annual Meeting of the Biophysical Society, San Diego, CA (Feb 2012)

Conference Speaker, Gordon Research Conference on Protons and Membrane Reactions, Ventura, CA (Feb 2012)

Invited Speaker and Discussion Leader, Gordon Research Conference on Biomolecular Interactions and Methods, Galveston, TX (Jan 2012)

2011

Seminar Speaker, University of Kentucky, Department of Chemistry, Lexington, KY (Nov 2011)

Conference Speaker, The 25th Gibbs Conference on Biothermodynamics, Carbondale, IL (Sep 2011)

Conference Speaker, The 25th Annual Symposium of the Protein Society, Boston, MA (Jul 2011)

TEMPO Guest Speaker, University of California at Irvine, Department of Physiology, Irvine, CA (Jul 2011)

Conference Speaker, Summer Research Conference on Biological Membranes and Membrane Proteins: Challenges for Theory and Experiment, Snowmass, CO (Jun 2011)

Conference Speaker, The 66th Calcon Calorimetry Conference, Kahuku, HI (Jun 2011)

International Speaker, The 2nd Cold Spring Harbor Asia Conference on Membrane Proteins: Structure and Function, Suzhou, China, (May 2011) (Was unable to attend this meeting at the last minute due to illness.)

Conference Speaker, The 241st National Meeting of the American Chemical Society, Anaheim, CA (Mar 2011)

Conference Speaker, New & Notable Symposium, The 55th Annual Meeting of the Biophysical Society, Baltimore, MD (Mar 2011)

Seminar Speaker, National Synchrotron Light Source, Brookhaven National Laboratory, Upton, NY (Feb 2011)

2010

Short Talk, Symposium on Membrane and Membrane Biophysics: Experiment and Theory, Irvine, CA (Aug 2010)

Conference Speaker, FASEB Summer Research Conference on Molecular Biophysics of Cellular Membranes, Saxtons River, VT (Aug 2010)

Seminar Speaker, Hunter College of CUNY, Department of Chemistry, New York, NY (Apr 2010)

Seminar Speaker, Lehigh University, Department of Chemistry, Bethlehem, PA (Apr 2010)

Seminar Speaker, Laboratory of Molecular Biophysics, NHLBI, NIH, Bethesda, MD (Mar 2010)

Conference Speaker, Gordon Research Conference on Chemistry & Biology of Peptides, Ventura, CA (Feb 2010)

2009

Seminar Speaker, Catholic University, Department of Biology, Washington, DC (Nov 2009)

International Speaker, The 18th International Symposium on Analytical Ultracentrifugation and Hydrodynamics, Uppsala, Sweden, (Sep 2009)

Conference Speaker, Telluride Summer Research Conference on Biological Membranes and Membrane Proteins: Challenges for Theory and Experiment, Telluride, CO (Jul 2009)

Seminar Speaker, Center for Advanced Research in Biotechnology (CARB), Rockville, MD (Apr 2009)

2008

International Speaker, The 17th International Symposium on Analytical Ultracentrifugation and Hydrodynamics, Newcastle, UK (Sep 2008)

International Speaker, University of Leeds, Department of Biochemistry, Leeds, UK (Sep 2008)

Seminar Speaker, University of Delaware, Department of Chemistry & Biochemistry, Newark, DE (Oct 2008)

Seminar Speaker, Laboratory of Structural Biology, National Institutes of Health, Bethesda, MD (Aug 2008)

International Speaker, University of Melbourne, Department of Biochemistry, Melbourne, Victoria, Australia (Feb 2008)

International Speaker, The 33rd Lorne Conference on Protein Structure and Function, Lorne, Victoria, Australia, (Feb 2008)

2007

Seminar Speaker, Texas A&M University, Department of Biochemistry & Biophysics, College Station, TX (Nov 2007)

Conference Speaker, The 21st Annual Gibbs Conference on Biothermodynamics, Touch of Nature, IL (Sep 2007)

International Speaker, Laboratory of Molecular Biology, Cambridge, UK (Mar 2007)

Seminar Speaker, University of Virginia, Dept. of Physiology and Biophysics, Charlottesville, VA (Jan 2007)

Seminar Speaker, North Carolina State University, Department of Biochemistry, Raleigh, NC (Jan 2007)

2006

Conference Speaker, Gordon Research Conference on Reversible Associations in Structural and Molecular Biology, Ventura, CA, (Jan 2006)

Seminar Speaker, Virginia Commonwealth University, Dept. of Biochemistry, Richmond, VA (Mar 2006)

Conference Speaker, Gordon Research Conference on Biopolymers, Newport, RI (Jun 2006)

Session Organizer and Invited Speaker, FASEB Summer Research Conference on Membrane Molecular Biophysics, Saxtons River, VT (Jul 2006)

International Speaker, The 15th International Symposium on Analytical Ultracentrifugation, University College London, UK (Apr 2006)

International Speaker, University of Glasgow, Glasgow, UK (Apr 2006)

International Speaker, University of Oxford, Division of Structural Bioinformatics and Computational Biochemistry, Oxford, UK (Apr 2006)

International Speaker, University of York, Division of Biochemistry, York, UK (Apr 2006)

Seminar Speaker, University of Maryland, Department of Chemistry and Biochemistry, College Park, MD (Apr 2006)

Informal Seminar, Yale University, Department of Molecular Biophysics and Biochemistry, New Haven, CT (Jun 2006)

2005

Conference Speaker, The Ninth Symposium on Modern Analytical Ultracentrifugation, University of Connecticut (Jun 2005)

Keynote Speaker, Howard Hughes Undergraduate Symposium, University of Richmond, Richmond, VA (Sep 2005)

Seminar Speaker, City University of New York, Department of Chemistry, New York, NY (Nov 2005)

2004

Seminar Speaker, Pfizer Central Research, Groton, CT (Jun 2004) (Cancelled at the last minute due to illness.)

Conference Speaker, The Ninth Symposium on Modern Analytical Ultracentrifugation, University of Connecticut (Jun 2004) (Cancelled due to illness.)

Conference Speaker, FASEB Summer Research Conference on Membrane Molecular Biophysics, Tucson, AZ (Jun 2004) (Cancelled due to illness.)

Seminar Speaker, University of Kansas Medical Center, Department of Biochemistry and Molecular Biology, Kansas City, KS (Oct 2004)

Seminar Speaker, SUNY Stony Brook, Department of Biochemistry and Cell Biology, Stony Brook, NY (Nov 2004)

2003

Seminar Speaker, University of Vermont, Department of Biochemistry, Burlington, VT (Jan 2003)

Seminar Speaker, Johns Hopkins Medical School Department of Biological Chemistry, (May 2003)

Seminar Speaker, Laboratory of Chemical Physics, National Institutes of Health, Bethesda, MD (Jul 2003)

Conference Speaker, The Seventeenth Symposium of the Protein Society, Boston MA (Jul 2003)

Seminar Speaker, Carnegie Institute of Washington, Baltimore, MD (Sep 2003)

2002

Session Chair, FASEB Summer Research Conference on Membrane Molecular Biophysics, Saxtons River, VT (Jul 2002)

International Speaker, Euro-conference on Advances in Analytical Ultracentrifugation and Hydrodynamics, Macromolecular Solution Structure and Interactions in Biological and Synthetic Systems, Autrans, France (Jun 2002)

International Speaker, CNRS National Laboratory, Department of Biophysics, Paris, France (Jun 2002)

Seminar Speaker, University of Delaware, Department of Chemistry, Newark, DE.

Seminar Speaker, Brandeis University, Department of Biochemistry, Waltham, MA (Feb 2002).

Conference Speaker, Self-Organizing Biomolecules: The Evolving Picture, The Institute for Complex Adaptive Matter, Los Alamos National Laboratory, Santa Fe, NM

Seminar Speaker, Juniata College, Department of Chemistry, Huntingdon, PA

2001

Seminar Speaker, Pennsylvania State University, Department of Biochemistry, Hershey, PA (Jan 2001)

Keystone Meeting on Membrane Protein Structure/Function, Lake Tahoe, CA (Mar 2001)

International Speaker, Keihanna International Symposium on Solution Interactions, Kyoto, Japan (Jul 2001)

International Speaker, Nara Women's University, Department of Biochemistry, Nara, Japan (Jul 2001)

Seminar Speaker, Colgate University, Departments of Physics and Biology, Hamilton, NY

Seminar Speaker, Hamilton College, Department of Biology, Clinton, NY

2000

Seminar Speaker, Johns Hopkins Medical School, Department of Cell Biology and Anatomy, Baltimore, MD

Conference Speaker, Fourteenth Annual Gibbs Conference on Biothermodynamics, Carbondale, IL, (Oct 2000)

International Speaker, The 12th International Symposium on Hydrodynamics, Glasgow, Scotland (Sep 2000)

Student Mentoring

Seventeen PhD students

Abigail Kroch (Doura), PhD 2006

Immediately after graduating: NIH Postdoctoral Fellow with Keith Yamamoto at UCSF
Masters in Public Health, UC Berkeley (2011)
Current: Tenure Track Faculty, Univ. Toronto.

Ann Marie Stanley, PhD 2007

Immediately after graduating: NIH Postdoctoral Fellow with Tom Rappoport at Harvard University (2007-2010)
Current: Project Scientist at Astra Zeneca

Nancy Kathleen Burgess, PhD 2009

Immediately after graduating: Presidential Management Fellow at the US Dept. of Defense

Alexandra Ebie Tan, PhD 2009

Immediately after graduating: UC Berkeley Health Sciences Program Coordinator
Current: Post-bac coordinator Johns Hopkins University

C. Preston Moon, PhD 2011

Immediately after graduating: Seeking postdoctoral position in San Luis Obispo, CA.
Current: Lecturer at Cal State Poly, San Luis Obispo, CA

Emily Danoff, PhD, 2014

Immediately after graduating: Lab manager, NIH
Current: Staff Scientist, NIH

Sarah Kempka McDonald, PhD, 2016

Immediately after graduating: Postdoctoral Fellow with Francis Valiyaveetil at Oregon Health & Science University
Current: Software engineer

Clifford Sandlin, PhD, 2012-2016

Immediately after graduating: Postdoctoral Fellow at the University of Pennsylvania
Current: Working in Biotech

Ashlee Marie Plummer, PhD 2017
Immediately after graduating: Postdoctoral Fellow at Harvard Medical School
Currently: Assistant Professor Chemistry, Bryn Mawr College, Bryn Mawr, PA
Henry Lessen, PhD 2020
Immediately after graduating: Postdoctoral scientist at NIH
Current: Staff Scientist at Glaxo
Dagan Marx, 2015 – 2020, Postdoctoral scientist at Weill Cornell Medical College
Danielle Duckworth, 2017 – 2019, Decided to leave with a master's degree
Immediately after graduating: High School Science teacher
Taylor Devlin, 2019 – 2024, Hiked the Appalachian Trail now a post-doctoral researcher in Sweden
Anson Dang, 2020 – 2024, Decided to leave the lab for Jie Xiao's lab
Lucas Shen, PhD 2020 – 2025, Industry Scientist
Christian Mendoza, 2020 – Present, Current Student
Andrea Ori, 2021 – Present, Current Student

Student-invited Career Panelist Gordon Research Symposium on Proteins, (Jun 2023)
Chair's Mentor, Gordon Research Symposium on Biomolecular Interactions and Methods, Jan 2010. This is a meeting organized by and for student and postdoctoral scientists. I mentored the two co-Chairs in the organization of this meeting. The two co-chairs were Dr. Ann Marie Stanley (Harvard), and Ms. Rachel Farrow (a graduate student in Justin Molloy's lab at the NIMR, London).
Undergraduate Research Mentor for numerous JHU Biophysics BA and BME BS candidates; seven of whom have earned authorship on publications for their research in the laboratory. (Leo Dubrovsky, Sarah Kwon, Anthony Treubodt, Diana DeAndrade, Margo Goodall, Shawn M. Costello, Quenton Bubb, Ellie Burton, Emily Stahl, Michaela Roskopf, Mathis J. Leblanc, Nicole Loza, Ethan Posner, Emily Tan, Annie Yuan, Ellen Tang, Haley Tang)

Postdoctoral Mentoring

Three Postdoctoral Scientists
Felix Kobus, Ph. D., 2001-2003
Current: High school science teacher in Sydney, Australia
Nathan R. Zaccai, Ph. D., 2011-2013
Visiting scientist from the University of Bristol
Dennis Gessmann, Ph. D., 2012-2014
Current: Industry scientist

University Service

2026	Workshop Presenter, Active Learning, JHU Center for Teaching Excellence and Innovation, Faculty Development Workshop on Best Practices in Teaching, Baltimore, MD (Jan 2026)
2025-Pres.	Internal Faculty Mentor, Dept. of Biophysics
2025-Pres.	PI, T32 Grant on Program in Molecular Biophysicx
2023-2025	Director, T32 Program in Molecular Biophysics
2020-2023	Elected Member of the Homewood Academic Council (Promotion and Tenure Committee)
2017-2023	*Workshop Presenter,* Inclusive Pedagogy, JHU Center for Educational Resources Faculty Development Workshop on Best Practices in Teaching, Baltimore, MD (Jan

2023, Jan 2022, Jun 2020, Jan 2020, Jan 2019, Jan 2018, Jan 2017)

2020-2023 Vice Director, T32 Graduate Program in Molecular Biophysics
2020-2022 *President*, Phi Beta Kappa Alpha chapter of Maryland
2019-2020 Appointed member of the Homewood Academic Council
2018-2019 Member, Homewood Council on Inclusive Excellence
2021-Pres External faculty mentor, Department of Chemistry
2018-Pres External faculty mentor, Department of Earth & Planetary Sciences
2017-2021 External faculty mentor, Department of Physics
2017-2018 Convener, Launch committee for new faculty
2017 Principal Investigator and primary writer, NSF-ADVANCE proposal
2016-2019 Co-Chair, Women Faculty Forum at Homewood, Krieger School of Arts & Sciences
2015-2016 Member, Faculty Search Committee, Department of Physics
2015-2016 Member, Provost's Prize for Faculty Excellence in Diversity Selection Committee
2016 Chair, Dissertation Defense Committee (John Froehlig)
2008–2016 Director of Undergraduate Studies for the biophysics major
- Manage academic affairs of ~50 biophysics majors
- Created and updated an undergraduate advising manual
- Extensively interact with freshman interested in the major
- Coordinate an undergraduate mentoring program for our majors
- Organize social gatherings for current majors
- Conduct open houses for prospective high school students and their parents
- Conduct open house for new freshmen
- Attend academic ceremonies
- Coordinate an undergraduate newsletter
- Conduct exit interviews with graduating seniors
- Coordinate student awards

2011-2012 Member, Dean's Teaching Fellowship Selection Committee
2009-2010 Interviewed Fulbright Applicants from JHU
2009 Member, Woodrow Wilson Selection Committee
2008- 2011 Member Pre-Professional Advising Committee
2001- Pres. Committee member for 13 Thesis defense exams
2001- Pres. Thesis review committee, Jenkins Dept. Biophysics
2001- 2012 Thesis review committee, JHU Program in Molecular Biophysics
2001-2009 Teaching Assistant Coordinator, Jenkins Dept. Biophysics
2002-2008 Director of Graduate Student Advising, Jenkins Dept. Biophysics,
2002-2004 Member, Molecular Biophysics First Year Proficiency Exam
2002 Member, Woodrow Wilson Selection Committee
2001 Member, Howard Hughes UG Summer Research Selection Committee

Graduate Board Oral Examiner

2025 Jenkins Biophysics Program: Derin Tanrioven, Richard Yang
2025 Program in Molecular Biophysics: Jeff Vogt, Gabe Fortuno,
2024 Program in Molecular Biophysics: Neil Wood, Garrett Tisdale, Max Zegans, Sam Botterbusch
2023 Program in Molecular Biophysics: Marie Pearce, Tanya Nesterova, Paul Menses, Charina Fabilane;

2022 Program in Molecular Biophysics: Edgar Manriquez, Sam Canner, Martin Yepes, Anna Andrick; Jenkins Program in Biophysics: Mankun Sang, Soumya Behera; Cellular, Molecular, Developmental Biology: Harrison Curmotte

2021 Program in Molecular Biophysics: Briana Whitehead; Jenkins Program in Biophysics: Yingda De; Cellular, Molecular, Developmental Biology: Hannah Haller; Jonathan Fischer

2020 Program in Molecular Biophysics: Nicolas Yeha; Cellular, Molecular, Developmental Biology: Taylar Mouton; Department of Chemistry: Yi Zhuang

2019 Cellular, Molecular, Developmental Biology: Kathryn Diederich

2018 Program in Molecular Biophysics: Lauren Blake, Elyse Blazosky; Jenkins Graduate Program: Lior Shachaf; Department of Chemical & Biomolecular Engineering: Dominic Scalise
Cellular, Molecular, Developmental Biology: Kate Huffer

2001- 2017 Committee member for 28 Graduate Board Oral Exams

Empowering Women and Inclusive Excellence in Science & Engineering

Grant Awards on Equity in STEM

2016 Diversity Innovation Grant Award to create Women of Hopkins (https://www.womenofhopkins.com)

2015 Diversity Innovation Grant Award to create Bias & Barriers journal in STEM

Lectures, Workshops & Service on Equity and Inclusive Excellence in STEM

2021-Present Chair, Committee for the Professional Opportunities for Women, Biophysical Society

2024

Organizer and Discussion Leader, Biophysical Society Webinar with Pulitzer Prize winning author Kate Zernike on the topic of her book *The Exceptions*, Online (Mar 2024)

2022

Power Hour Leader, Gordon Research Conference on Ligand Recognition and Molecular Gating, Il Ciocco, Italy (Spring 2022)

2021

Programming Organizer for CPOW Committee, Biophysical Society Meeting, Boston, MA (Mar 2021)

Phi Beta Kappa Public Lecture, Nurturing a More Inclusive STEM Pipeline, University of California at Riverside, 8-9 Feb 2021. (*by Zoom*)

Phi Beta Kappa Public Lecture, Nurturing a More Inclusive STEM Pipeline, University of Kansas (1-2 Mar 2021). (*by Zoom*)

Phi Beta Kappa Public Lecture, Nurturing a More Inclusive STEM Pipeline, Washington College, Chestertown, MD (29-30 Mar 2021) (*by Zoom*)

Phi Beta Kappa Public Lecture, Nurturing a More Inclusive STEM Pipeline, University of Washington, 17-18 May 2021. (*by Zoom*)

2020

Invited Panelist, Department of Biomedical Engineering Conversations on Equity, Johns Hopkins University (30 Oct 2020)

Organizer, Johns Hopkins University Screening of *Picture A Scientist*
This screening attracted nearly 700 affiliates to watch the film.

Moderator, Johns Hopkins University Discussion of *Picture A Scientist*
Organized four panelists and had 125 affiliates in attendance

Moderator, Program and Molecular Biophysics Race and Equity Group Conversation on *How to Be Anti-Racist* book by Ibram Kendi (Aug 2020)

Moderator, Program and Molecular Biophysics Race and Equity Group Conversation on *13th:* a film by director Ava DuVernay (Jun 2020)

2019

*Invited Speaker, "*Nurturing a More Inclusive STEM Community" Department of Chemistry and Biochemistry, Indiana University Bloomington, Bloomington, IN (11 Oct 2019)

Power Hour Leader, Gordon Research Conference on Membrane Protein Folding, Stonehill College, Easton, MA (Jul 2019)

*Keynote Speaker, "*Nurturing a More Inclusive STEM Community" Gordon Research Seminar on Membranes of Membrane Transport, Colby Sawyer College, New London, NH (Jun 2019)

Invited Speaker, "Unconscious Bias: Tools for #WomenInSTEM", Women of Whiting, Johns Hopkins University, Baltimore, MD (12 Apr 2019)

Invited Speaker, National Diversity and Equity Workshop, Unpacking Sexual Harassment in STEM, Washington, DC (9 Apr 2019)

Invited Speaker, Organized and Lead Workshop and Play Act Scene involving graduate and undergraduate students on "Nurturing a More Inclusive STEM Enterprise by Understanding our Biases" The 63rd Annual Meeting of the Biophysical Society, Baltimore, MD (5 Mar 2019)

Invited Speaker, "Building Confidence: Tools for #WomenInSTEM", Women of Whiting, Johns Hopkins University, Baltimore, MD (30 Jan 2019)

Workshop Presenter, "Inclusive Pedagogy", Johns Hopkins University Center for Educational Resources Faculty Development Workshop on Best Practices in Teaching, Baltimore, MD (10 Jan 2019)

2018

Workshop Organizer and Speaker, "Sexual Harassment in Academia" Diversity and Inclusion Conference, Johns Hopkins University, Baltimore, MD (19 Oct 2018)

Seminar Speaker, "Confidence Matters as Much as Competence" Department of Chemistry & Biochemistry, Texas Woman University, Denton, TX (12 Oct 2018)

Seminar Speaker, "Bystander Intervention" Department of Chemistry & Biochemistry, Oberlin College (3 Oct 2018)

Mentor and Facilitator, ASBMB Grant Writing Workshop, Washington, DC (14-16 Jun 2018)

Invited Workshop Speaker, Professional Development Workshop on Inclusive Pedagogy, University of Maryland Baltimore County, Baltimore, MD (Apr 2018)

Power Hour Co-Leader, Gordon Research Conference on Protein Transport Across Membranes, Hotel Galvez, Galveston, TX (12 Mar 2018)

*Invited Speaker, "*Inclusive Pedagogy*"* Center for Educational Resources Lunch & Learn, Johns Hopkins University, Baltimore, MD (15 Feb 2018)

Session Organizer and Speaker, How to Project your Best Self: Confidence Matters Just as Much as Competence, The 62nd Annual Meeting of the Biophysical Society, San Francisco, CA (Feb 2018)

Workshop Presenter, Inclusive Pedagogy, Johns Hopkins University Center for Educational Resources Faculty Development Workshop on Best Practices in Teaching, Baltimore, MD (Jan 2018)

2017

Panel Member, Women in Leadership Panel, JHU Career Center and Alpha Phi Omega, Baltimore, MD (Nov 2017)

Mentor and Facilitator, ASBMB IMAGE Grant Writing Workshop, Washington, DC (22 Jun 2017)

Power Hour Co-Leader, Gordon Research Conference on Mechanisms of Membrane Transport, Colby-Sawyer College, New London, NH (26 Jun 2017)

Power Hour Leader, Gordon Research Conference on Membrane Protein Folding, Stonehill College, Easton, MA (5 Jun 2017)

Panel Member, Women's Networking Panel, ASBMB National Meeting, Chicago, IL (Apr 2017)

Invited Seminar, Bias and Barriers Facing #WomenInSTEM, Wesleyan University, Wesleyan, CT (27 Apr 2017)

Workshop Presenter, Inclusive Pedagogy, Johns Hopkins University Center for Educational Resources Faculty Development Workshop on Best Practices in Teaching, Baltimore, MD (Jan 2017)

2016

One of four team members responsible for the creation of an art exhibit extolling the accomplishments of women with a Johns Hopkins affiliation entitled *The Women of Hopkins* http://women.jhu.edu

This is art exhibit our team put together using funds we were awarded for a Diversity Innovation Grant from the Diversity Leadership Council at Johns Hopkins University. The exhibit has both a physical and digital presence.

Seminar Speaker, Expanding the Potential of Women in STEM, Department of Chemistry, Johns Hopkins University, Baltimore, MD (Oct 2016)

Workshop Presenter, Diversity Leadership Council Annual Meeting, Johns Hopkins University (Oct 2016)

Speaker, Symposium on Social Science of Diversity Equity, American Chemical Society Fall Meeting, Philadelphia, PA (Aug 2016)

2015

Invited Speaker, Seminar on Enhancing the Potential of Women in STEM, Department of Chemical and Biomolecular Engineering, Johns Hopkins University, Baltimore, MD (Oct 2015)

Invited Speaker, Seminar on Empowering Women on Overcoming Bias & Barriers in Science. Vanderbilt University, Nashville, TN (Apr 2015)

2015

Workshop Presenter, Diversity Leadership Council Annual Meeting, Johns Hopkins University (Oct 2014)

2014

Workshop Leader, "Overcoming Bias and Barriers to Achieve Gender Equity in STEM" Johns Hopkins University Diversity Conference, Baltimore, MD (Oct 2014)

Founder, Workshop Series on Achieving Gender Equity in Science

These workshops were recognized by a JHU Diversity Recognition Award in 2015.

This is a series of workshops that have the goal of raising awareness about the barriers faced by women in STEM. People of all genders are welcome to attend and participate, but it is hoped that this will have the most impact on women graduate students to empower them in their career path in science. The schedule as well as links to papers in the social psychology literature and popular press can be found here: http://genderequityinscience.wordpress.com/

Invited Speaker, Seminar on Overcoming Bias & Barriers to Achieve Gender Equity in Science. Rosetta Conference, Leavenworth, WA (Jul 2014)

Panel Member, Women's Networking Panel, ASBMB National Meeting, San Diego, CA (Apr 2014)

Organizational

2025-2026	President Elect, The Biophysical Society
2022	International Scientific Organizing Committee, The 25th International Conference on Analytical Ultracentrifugation, Lethbridge, Canada (Jul 2021)
2020	Organizing Committee, Telluride Summer Research Conference on Quinary Interactions, Telluride, CO (Jun 2020)
2019	International Scientific Organizing Committee, The 24th International Conference on Analytical Ultracentrifugation, Christchurch, NZ (24-29 Aug 2019)
2019	Organizing Committee, The 33rd Annual Symposium of the Protein Society, Seattle, WA (Jun 30- Jul 3, 2019)
2019	Co-Organizer, One Chemistry Symposium, Johns Hopkins University, Baltimore, MD (23 Apr 2019)
2018	Organizing Committee, Delaware Membrane Symposium, Newark, DE (April 2018)
2017	International Scientific Organizing Committee, The 23rd International Conference on Analytical Ultracentrifugation, Glasgow, Scotland (Jul 2017)
2017	Organizing committee, Delaware Membrane Symposium, Newark, DE (May 2017)
2015	Chair of the inaugural Gordon Research Conference on Membrane Protein Folding, Waltham, MA (Jun 2015)
2015	Co-chair (with Enrique De La Cruz, Yale Univ.) of the 59th meeting of the Biophysical Society, Baltimore, MD (Feb 2015)
2014-2017	Elected Member of Council, American Society for Biochemistry and Molecular Biology
2014	Theme Sessions Organizer for Lipids & Proteins, ASBMB National Meeting, San Diego, CA (Apr 2014)
2012-2013	Elected Member of the Executive Board, The Biophysical Society
2013	International Scientific Organizing Committee, 21st International Conference on Analytical Ultracentrifugation, Atami, Shizuoka, Japan (Sep 2013)
2011-2014	Elected Member of Council, The Biophysical Society
2011-2014	Member, Program Committee for the 57th and 58th meetings of the Biophysical Society (2013 & 2014 meetings)
2011-2013	Co-chair (with James Bowie, UCLA) of a new thematic meeting on Membrane Protein Folding. Inaugural meeting held in May 2013 in Seoul, Korea; Jointly sponsored by the Korean and US Biophysical Societies
2011-2012	Scientific Organizing Committee, 20th Analytical Ultracentrifugation Conference, San Antonio, TX (Mar 2012)
2010-2011	President, The Gibbs Society of Biothermodynamics
2011	Member, Meeting Organization Committee, 25th Gibbs Conference on Biothermodynamics, Carbondale, IL (Sep 2011)
2011-Pres.	Webmaster, Gibbs Society of Biothermodynamics

2010	Chair, Gordon Research Conference on Biomolecular Interactions & Methods, Galveston, TX (Jan 2010)
2009	Scientific Organizing Committee, The 18th International Symposium on Analytical Ultracentrifugation and Hydrodynamics, Uppsala, Sweden (Sep 2009)
2008	Vice Chair, Gordon Research Conference on Biomolecular Interactions & Methods, Ventura, CA (Jan 2008)
2006	Co-Chair, The 20th Annual Gibbs Conference on Biothermodynamics, Touch of Nature, IL (Oct 2006)
2001	Scientific Organizing Committee, The Keihanna International Symposium on Solution Interactions, Kyoto, Japan (Jul 2001)

Advisory

2024	External Consultant/Reviewer, T32 training Program in Biophysics, Northwestern University, Chicago, IL
2023	External Consultant/Reviewer, T32 training program in Biophysics, University of Michigan, Ann Arbor, MI
2017-2019	Co-PI and Steering Committee Member, Building Bridges Network Incubator Project, The Biophysical Society
2016	Member, National Academies of Sciences, Engineering and Medicine Committee on Proposal Evaluation for Allocation of Supercomputing Time for the Study of Molecular Dynamics Simulations, Washington, DC (Aug 2016)
2013-2017	Member, NIH BBM Study Section
2016	International grant reviewer, Medical Research Council, Research Council of the United Kingdom
2006-2017	Member, various NSF Review Panels for the Divisions of Molecular Biophysics, Advancing Theory in Biology, Membrane Dynamics and Biophysics, Physics of Living Systems, Chemistry of Life and CAREER Panels.
2012	Member, BCMB-H Study Section, Internet Assisted Review, Jul 2012
2012	External Thesis Examiner, Yale University, (Andrew Miranker, PI)
2009	Ad hoc Member, NIH Study Section BBM, Biophysics of Membranes, Fall panel
2009	International External Thesis Examiner, University of Melbourne, Dept. Biochemistry (Geoff Howlett, PI)
2009	International Grant Reviewer, FONDECYT Program, Chile
2009	External Reviewer, NSF, Shared Instrumentation Study Section
2008-2014	External grant reviewer, NSF, Various Divisions
2006	External Thesis Examiner, Yale University, Dept. Pharmacology (Andrew Miranker, PI)
2005	Swarthmore College Honors Examiner (Kathleen Howard, PI)
2002-2005	Member, NIH Study Section for Shared Instrumentation Grant Program

Editorial

2017 – Pres.	Associate Editor, *Journal of Biological Chemistry*
2019 – Pres.	Member, Editorial Board, *Journal of General Physiology*
2003- 2016	Member, Editorial Board, *Proteins*
2006	Contributing Member, Faculty of 1000.
2000- Pres.	Reviewer of manuscripts for *Science*, *Nature*, *PNAS*, *E-Life*, *Structure*, *Journal of*

Molecular Biology, *Biochemistry*, *Protein Science*, *Proteins*, *Biophysical Journal*, *BBA Biomembranes*

Community

2017	Visiting speaker, Physics & Biology Club, Broadneck High School, Annapolis, MD (Dec 2017)
2017	Panel member, Post-Science March town hall, Johns Hopkins School of Medicine, Baltimore, MD (May 2017)
2016-2017	Research Advisor for 10th grade high school student (Joshua Cooksey) at Marriotts Ridge High School, Marriotts Ridge, MD
2012	Faculty Advisor for the USA Science & Engineering Fair, Washington, DC Apr 28-29, 2012
2012	Science Fair Judge, Montgomery County Regional Science Fair, MD
2008-2011	Math and Science tutor for 6th-8th graders at Severna Park Middle School, Severna Park, MD

Teaching

My current teaching load is the equivalent of 1.5 semesters per academic year. My teaching style stems from the belief that students should be actively engaged in the learning process. I tend to organize class time into either a Socratic-style lecture or into small group, student led investigations of problems with the goal of illustrating important concepts.

250.xxx How to be an effective STEM JEDI (2023, 2024)

I designed and teach this seminar-style course in which I lead our graduate students through the evidence that contributes to the historic and systemic exclusion of certain demographic groups from science. Using an evidence-based approach, the class reads and discusses literature on the topics of implicit bias, stereotypes, how stereotype threat can compromise the cognitive achievements of historically "outside" groups, imposter syndrome, confidence, sexual and gender harassment and the skills of bystander intervention.

250.xxx Savvy Science Seminars (annually, 2019-Pres.)

I designed and teach both didactic and hands-on best practices to train graduate students in the skill of oral presentation. Didactic sessions are lecture and discussion-based. Hands-on sessions each summer involve video-taping practice talks by students and providing real-time comments on how the talks could be improved.

250.421 Advanced Seminar in Membrane Protein Structure Function & Pharmacology (2013-Pres., Even years)

I designed and teach this literature-based capstone course to senior undergraduate Biophysics majors. We cover fundamental literature on membrane bilayer structure, membrane protein folding and thermodynamics, transporter regulation, ion channel structure and function. I include a writing component in this course to help students develop scientific writing skills.

250.420 Macromolecular Binding (2015-Pres., Odd years)

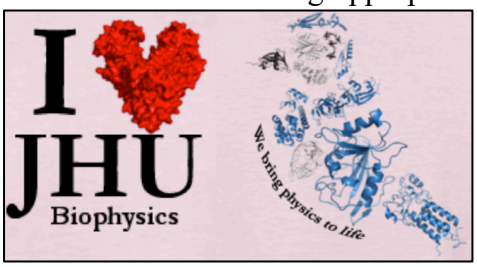
Alternating with 250.421, I teach this undergraduate elective course on macromolecular interactions. We cover the mathematical formalisms for binding reactions; students are instructed in modeling of reactions using python; and the last part of the course is a seminar style discussion of key binding literature. I include a significant writing component in this course to help students develop scientific writing skills.

250.383 Molecular Interactions Laboratory (2009-2012.)

Originally titled 250.382 Molecular Biophysics Laboratory

I designed and introduced this capstone laboratory course for juniors and seniors in Spring 2009 and taught everything except the NMR lectures. This is an active-learning discovery class in which students experience circular dichroism and fluorescence spectroscopy, calorimetry, sedimentation equilibrium, and sedimentation velocity ultracentrifugation to investigate yet-unstudied properties of proteins that relate to their folding and interactions. Students collect and fit data using appropriate equations and software and evaluate goodness of fit using statistical tools and residual graphs. For most techniques, the students are given a large leeway in experimental design so that they can explore questions that interest them.

In addition, students learn basic crystallography theory, grows crystals of lysozyme, learn to seed crystals, and use Coot to build atomic coordinates into density maps. In 2011, a writing component was introduced to this course, which requires a minimum of 20 written pages by students with at least one (usually more) editing exchange between me and the students. I teach the Molecular Interactions course in my laboratory using our research grade equipment.



Epic T-Shirt Competition Example from 2012: Front (left) and back (right) of 2012 winning T-Shirt design. The Blue Jay on the right is the JHU mascot and was created by the freshmen using nine different PDB files. The students actually did choose pink for the 2012 T-shirt color.

250.131 Freshman Seminar in Biophysics (2004-2020)

I taught half of this course from 2004-2016 and then taught the full course. During my involvement, I completely revamped it to introduce modern Biophysics concepts and research areas through active student participation. I cover molecular interactions and structures, evolution, bioinformatics, Boltzmann and kinetic energies. Because most students have limited backgrounds and are generally taking Introductory Chemistry, the level is necessarily basic, but the active learning strategies lead to some interesting and stimulating discussions. The activities are a mix of group and individual-driven initiatives. Some examples include:

- I teach them about the amino acid interactions important in protein folding using a meet and greet activity in which students are assigned functional groups and must meet all other members of the class and decide if their functional groups will interact "favorably" or "unfavorably" and to decide what kind of interaction they will have (H-bond, ionic, van der Waals). By the end they know the different interactions, the distinction between amino acid types, and they have met all the other students in the course, which fosters a sense of community for our majors from their earliest days at Hopkins.
- I bring them into our computer room and teach them the basics of the Protein Data Bank. They each have their own computer, and they learn to download structures and visualize them in several different representations using PyMOL. We start with rhodopsin in which they receive instructions on exactly what to click and type, but the homework for this lab is to pick a structure of their choice and generate a slide to present in class.
- I re-emphasize the PyMOL skills they learn in this class through a final project in the course, which is an "epic T-shirt competition". Students are divided into groups that design a freshman T shirt that must have a "JHU Biophysics" theme and include a molecular image they generate using PyMOL. The new and current biophysics majors as well as our faculty vote to determine the winning shirt, which I then order and give out to the majors at no cost.
- I designed a mutations dice game to illustrate principles of evolution as applied to the sequence of a zinc finger. Students do this in small groups, and after a few rounds of "evolution", we discuss

PAM and BLOSSUM substitution matrices and how mutations propagate to populations. We follow this session with one in the computer lab in which they are exposed to BLAST searches using the different substitution matrices.

250.690 Methods in Molecular Biophysics (2001-2008)

I piloted, organized and served as the main lecturer for this graduate course, which emphasizes the Physics and Chemistry underlying the most frequently employed biophysical methods. I taught the spectroscopy (basic quantum mechanics, absorbance, fluorescence and circular dichroism spectroscopy, light scattering) and analytical ultracentrifugation (sedimentation velocity and equilibrium) sections; the course also included NMR spectroscopy and crystallography taught by other faculty members. This course has subsequently moved to the new undergraduate teaching laboratories at Johns Hopkins University and has grown into a requirement for our major that is now taught by full-time teaching staff.

250.690 Methods in Molecular Biophysics (2009-2017)

I taught the analytical ultracentrifugation (sedimentation velocity and equilibrium) sections in this course.

250.644 Graduate Biophysical Chemistry (2014)

I taught lectures on proteins structure and forces.

250.372 Introduction to Biophysical Chemistry From 2004-2006 I contributed statistical thermodynamics and molecular binding lectures to this undergraduate course.