

Wilfredo Colón

Professor and Head, Department of Chemistry and Chemical Biology,
Rensselaer Polytechnic Institute,
110 8th Street, Troy, NY 12180;
Phone: (518) 276-6969; FAX: (518) 276-4887
e-mail: colonw@rpi.edu

RESEARCH

- Exploring the mechanism by which the inflammatory protein serum amyloid A leads to amyloid disease in individuals with persistent acute inflammation.
- Development and application of methods to identify hyperstable proteins in complex protein mixtures, such as cell lysates and biological fluids; exploring the biological and pathological roles of hyperstable proteins; Searching for hyperstable proteins in extremophilic microorganisms for biotechnology applications.

EDUCATION

1988 B.S. in Chemistry, University of Puerto Rico at Mayagüez
1993 Ph.D. in Chemistry, Texas A&M University, College Station, TX

PROFESSIONAL EXPERIENCE / APPOINTMENTS

2015 - Head, Department of Chemistry and Chemical Biology, Rensselaer Polytechnic Institute
2013 - 2015 Associate Dean of Science for Research, Rensselaer Polytechnic Institute
2013 - Professor of Chemistry and Chemical Biology, Rensselaer Polytechnic Institute
2010 - 2013 Graduate Program Director of Chemistry, Rensselaer Polytechnic Institute
2009 - 2010 Program Director and Leader, Chemistry of Life Processes Program, Chemistry Division, National Science Foundation
2008 - 2009 Program Director, Chemistry Division / Molecular and Cellular Biosciences Division, National Science Foundation
2005 - 2007 Graduate Program Director of Chemistry, Rensselaer Polytechnic Institute
2004 - 2012 Associate Professor of Chemistry and Chemical Biology, Rensselaer Polytechnic Institute
1997 - 2003 Assistant Professor of Chemistry, Rensselaer Polytechnic Institute
1994 - 1997 NSF Minority Postdoctoral Fellow, Fox Chase Cancer Center, Philadelphia
1993 - 1994 Postdoctoral Research Associate, Fox Chase Cancer Center, Philadelphia

HONORS AND AWARDS

- Member, Advisory Committee of Directorate for Biological Sciences of the National Science Foundation, 2014 -
- 2013 Siegfried G. and Jacqueline Bart '36 School of Science Faculty Fellowship Award
- 2011 American Chemical Society Award for Encouraging Disadvantaged Students into Careers in the Chemical Sciences

- Elected Fellow of the AAAS, 2007
- Rensselaer Early Career Award, 2002
- Presidential Early Career Award for Scientists and Engineers (PECASE), 2000
- National Science Foundation Career Award, 2000
- Research Corporation Innovation Award, 1998
- American Heart Association Scientist Development Award, 1998
- Camille and Henry Dreyfus New Faculty Award, 1997
- National Science Foundation Minority Postdoctoral Fellowship, 1994
- Hoechst Celanese Excellence Award in Chemistry, Texas A&M University, 1993

PROFESSIONAL ACTIVITIES

External Service

- Member, Advisory Committee of Directorate for Biological Sciences of the National Science Foundation, 2014.
- Served as faculty mentor in a Grant Writing Workshop for Early Career Scientists," sponsored by the Minority Affairs Committee of the American Society of Biochemistry and Molecular Biology, 2013 and 2014.
- Served on NSF review panel for *Postdoctoral Research Fellowship in Biology-Intersections of Biology and Mathematical and Physical Sciences and Engineering*, 2012-2013.
- Served on NSF review panel for the *Chemistry of Life program*, 2013-2014.
- Participated in a graduate education workshop: Challenges in Chemistry Graduate Education, organized by the National Academies of Sciences, Washington DC (Jan 23-24, 2012). Link to download: <http://dels.nas.edu/Workshop-Summary/Challenges-Chemistry-Graduate-Education/13407>.
- Participated in a ChemEd Bridges workshop on student transfer from Community College, Chicago (Oct 28-29, 2011). (<http://www.acs.org/content/acs/en/education/educators/reports/chemed-bridges-student-transfer-handbook-homepage.html>).
- Organizer and Chair of symposium entitled: Cellular and Proteomic *Methods to Study Protein Stability and Turnover*. National ACS meeting, March 30, 2011, Anaheim, CA.
- Invited as one of six US representatives to the five-country Chemical Sciences and Society Summit (CS3) on Chemistry for Better Health, Title: Discovery Biology: Challenges and Opportunities. Beijing, China, Sept 12-15, 2011. Link to download: http://www.rsc.org/images/Chemistry-for-better-health-cs3-white-paper_tcm18-222884.pdf.
- Played a leadership role in the creation of a new program (Chemistry of Life Processes (CLP) in the Division of Chemistry at the NSF. This program reviews chemistry-centered proposals at the interface with biology. Served as Program Director and Group Leader of the new CLP program from July 2009 – June 2010, and ran the first two CLP review panels in the Fall 2009 and Spring 2010.
- Organizer and Chair of symposium entitled: *Chemical Synthetic Biology*. National ACS meeting, March 23, 2009, Salt Lake City, Utah.

- Organized and led a new NSF CHE-MCB review panel in the Spring 2009 to evaluate CHE and MCB proposal at the interface of both divisions.
- Program Director at the National Science Foundation - shared appointment between the Division of Chemistry and the Division of Molecular and Cellular Biosciences (Jan 2008 – Dec 2009).
- Member of proposal review panel for the NSF Molecular and Cellular Biosciences program (2005-2007).
- Ad Hoc reviewer for NIH Fellowship Study Section - (F03B: Biophysical and Physiological Neuroscience (2006-2007).
- Associate Member (2001-2004) and Member (2004-2007) of the Committee on Minority Affairs of the American Chemical Society.
- Member of NIH Study Section - (NDBG-Neurodegeneration and Biology of Glia) (2002-2005).

Community / Outreach Service

- Was awarded the 2011 ACS Award for Encouraging Disadvantaged Students into Careers in the Chemical Sciences. This honor included a \$10,000 gift, which I used as seed funds to start an outreach program (RISE: Research Internship for Community College Student Enrichment) at RPI. The program began with two Troy High School graduates in summer 2013 and two new students will join the program in summer 2014.
- Co-Director of 2006 and 2007 Summer Research Program for Minority Undergraduate Students. This program involved 19 outside undergraduate students, 18 of which were underrepresented minorities. I directly recruited 12 of these students from Puerto Rico.
- Represented Rensselaer at the “Science: Invest in the Future” event held at Capitol Hill in Washington D.C. and sponsored by the Science Coalition. (July 10-11, 2001).
- *Dreyfus Minority High School Summer Research Program*: Director of a summer research program sponsored by the Dreyfus Foundation, intended to provide minority high school students with a research experience. (Summer 2000-2003).
- *Joseph Henry Challenge*: Local coordinator and host of six high school teams for a laboratory science competition involving 40 teams from the New York Capital District. (May 1999).

Rensselaer Service

- Principal Investigator on institute-wide HHMI proposal designed to increase student persistence in STEM disciplines. I worked with various groups including faculty, Office of Student Life, Office of Assessment, and Corporate and Foundation Relations to assemble a visionary program that was highly rated and will be funded by HHMI (\$1.2M / 5 years).
- Member, School of Science Accelerated BS-PhD program, 2011-2013.
- Graduate Program Director, Chemistry Department, 2010-2013.
- Member, Biotechnology NIH Training Grant Executive Committee, 2006 –
- Member, NMR, Bioanalytical, and Proteomics core facilities at the CBIS, 2006 –
- Graduate Program Director, Chemistry Department, 2005-2007.
- Member, School of Science Dean Search Committee, 2005.
- Member, Search Committee for Director of the Office of Minority Student Affairs, 2005.

- Member, Bio-analytical chemistry Faculty Search Committee, 2004.
- Member, Search Committee for Director of Research Administration and Finance, 2004.
- Frequent participation in fund-raising and *Alumni Relations* activities (2002-2007).
- Member, Chemistry Department Faculty Search Committee, 2002 – 2004.
- Member, Search Committee for Associate Dean of Students and Director of the Office of Minority Student Association, 2002.
- Member, Biotechnology Constellation Faculty Search Committee, 2001.
- Member, School of Science Dean Search Committee, 1999 – 2000.
- Member, Biochemistry Faculty Search Committee, 1999.
- Member, Chemistry Department Graduate Admissions Committee, 1997 – 1999.

PUBLICATIONS [citations >3000, h-index = 22 (per Google Scholar)]

53. Aguilera, J., Zhang, F., Beaudet, J.M., Linhardt, R.J. and Colón, W. (2014) Divergent effect of glycosaminoglycans on the in vitro aggregation of Serum Amyloid A. *Biochimie*, 104, 70-80.
52. Rosenman D.J., Huang Y.M., Xia K., Fraser K., Jones V.E., Lamberson C.M., Van Roey P., Colón W., Bystroff C. (2014) Green-lighting green fluorescent protein: faster and more efficient folding by eliminating a cis-trans peptide isomerization event. *Prot. Science* 23, 400-410.
51. Zhang, F., Aguilera, J., Beaudet, J.M., Xie, Q., Lerch, T.F., Davulcu, O., Colón, W., Chapman, M.S., and Linhardt, R.J. (2013) Characterization of Interactions between Heparin/Glycosaminoglycan and Adeno-associated Virus. *Biochemistry*, 52, 6275–6285.
50. Patke, S., Srinivasan S., Maheshwari, R., Srivastava, S.K., Aguilera, J. J., Colón, W.*, and Kane, R.S.* (2013) Characterization of the Oligomerization and Aggregation of Human Serum Amyloid A. *PLoS One*, 8:e64974. doi: 10.1371.
49. Srinivasan, S., Patke, S., Wang, Y., Ye, Z., Litt, J., S.K. Srivastava, Lopez, M.M., Kurouski, D., Lednev, I.K., Kane, R.S. * and Colón, W. * (2013) Pathogenic SAA1.1 shows a longer oligomer-rich fibrillation lag phase contrary to the non-pathogenic SAA2.2. *J. Biol. Chem.*, 288, 2744-2755.
48. Patke, S., Maheshwari, R., Litt, J., Srinivasan, S., Aguilera, J.J., Colón, W. * and Kane, R.S. * (2012) Influence of the Carboxy-Terminus of Serum Amyloid A on Protein Oligomerization, Misfolding, and Aggregation. *Biochemistry*, 51, 3092–3099.
47. Ramakrishnan V., Srinivasan, S., Salem, S.M., Matthews, S. J., Colón, W, Zaki M.J. and Bystroff C. (2012) GeoFold: Topology-based protein unfolding pathways capture the effects of engineered disulfides on kinetic stability. *Proteins*, 80, 920-934.
46. Xia, K., Manning, M., Zhang, S. and Colón, W. (2012) Proteomics Analysis of Kinetically Stable Proteins, **Integrative Proteomics**, Hon-Chiu Eastwood Leung, Subject editors: Tsz-Kwong Man and Ricardo J. Flores (Ed.), ISBN: 978-953-51-0070-6, InTech.

45. Xia, K, Zhang, S., Bathrick, B., Liu, S., Garcia, Y., and Colón, W. (2012) Quantifying the kinetic stability of hyperstable proteins via time-dependent SDS-trapping. *Biochemistry*, 51, 100-107.
44. Ye, Z, Bayron, D., Aguilera, J.J., Srinivasan, S., Wang, Y., Serpell, L.C and Colón, W. (2011) Inflammation protein SAA2.2 spontaneously forms marginally stable amyloid fibrils at physiological temperature. *Biochemistry*, 50, 9184–9191.
43. Sroga, G.E., Karim, L., Colón, W. and Vashishth, D. (2011) Biochemical characterization of major bone-matrix proteins using nanoscale-size bone samples and proteomics methodology. *Molec. Cell. Proteom.* 10, M110.006718.
42. Wang, Y., Srinivasan, S., Ye, Z., Aguilera, J.J., Lopez, M. and Colón, W. (2011) Serum amyloid A 2.2 refolds into a octameric oligomer that slowly converts to a more stable hexamer. *Biochem. Biophys. Res. Commun.* 407, 725-729.
41. Vassall, K.A, Stubbs, H.A., Primmer, H.A., Tong, M.S., Sullivan, S.M., Sobering, R., Srinivasan, S., Briere, L.K., Dunn, S.D., Colón, W., and Meiering, E.M. (2011) Decreased stability and increased formation of soluble aggregates by immature SOD1 do not account for disease severity in ALS. *Proc. Natl. Acad. Sci.*, 108, 2210-2215.
40. Muñoz, V.A., Srinivasan, S. Boswell, S.A., Meinhold, D.W., Childs, T., Osuna, R. and Colón, W. (2011) The role of the local environment of engineered Tyr to Trp substitutions for probing the denaturation mechanism of FIS. *Prot. Science*, 20, 302-312.
39. Xia, K., Zhang, S, Solina, B., Barquera, B., and Colón, W. (2010) Do Prokaryotes have more hyperstable proteins than eukaryotic organisms? *Biochemistry*, 49, 7239-7241.
38. Zhang, S., Xia, K., Chung, W., Cramer, S.M., and Colón, W. (2010) Identifying kinetically stable proteins with capillary zone electrophoresis. *Prot. Science*, 19, 888-892.
37. Shang, W., Nuffer, J.H., Muñoz-Papandrea, V.A., Colón, W., Siegel, R.W., and Dordick, J.S. (2009) Cytochrome c on silica nanoparticles: Influence of nanoparticle size on protein structure, stability, and activity. *Small*, 4, 470-476.
36. Colón, W., Chitnis, P., Collins, J.P., Hicks, J., Chan, T. and Tornow, J.S. (2008) Chemical Biology at the US National Science Foundation. *Nat. Chem. Biol.* 4, 511-514.
35. Xia, K, Manning, M., Hesham, H., Bystroff, C., Lin, Q. and Colón, W. (2007) Identifying the subproteome of kinetically stable proteins via diagonal 2D SDS-PAGE. *Proc. Natl. Acad. Sci.*, 104, 17329-17334.
34. Wang L. and Colón, W. (2007) Effect of zinc, copper, and calcium on the structure and stability of serum amyloid A. *Biochemistry*, 46, 5562-5569.

33. Moriarty, D.F, Fiorillo, C., Miller, C, and Colón, W. (2007) A truncated peptide model of the mutant P61A FIS forms a stable dimer. *Biochim. Biophys. Acta*, 1774, 78-85.
32. Meinhold, D., Beach, M., Shao, Y., Osuna, R., and Colón W. (2006) The location of an engineered inter-subunit disulfide bond in FIS affects the denaturation pathway and cooperativity. *Biochemistry*, 46, 9767-9777.
31. Feldman-Cohen, L. S., Shao, Y., Meinhold, D., Miller, C., Colón, W. and Osuna, R. (2006) Common and variable contributions by Fis residues on high-affinity binding at different DNA sequences. *J. Bacteriol.*, 188, 2081-2095.
30. Lynch, S. M. and Colón, W. (2006) Dominant role of copper in the kinetic stability of Cu/Zn superoxide dismutase. *Biochem. Biophys. Res. Commun.*, 340, 457-461.
29. Meinhold, D, Boswell, S., and Colón, W. (2005) P61A mutation in the factor for inversion stimulation results in a thermostable dimeric intermediate. *Biochemistry*, 44, 14715-14724.
28. Wang, L., Lashuel, H.A, Walz, T. and Colón, W. (2005) From Hexamer to amyloid: The mechanism of serum amyloid A fibril formation. *Amyloid*, 12, 139-148.
27. Moriarty, D.F. and Colón, W. (2005) Structural intermediates of globular proteins as precursors to amyloid formation in **"Amyloid proteins: The beta pleated sheet conformation and disease"**. Chapter 12, pages 275-300, Editors Jean Sipe, VCH-Wiley.
26. Wang L. and Colón, W. (2005) Urea-induced denaturation of apolipoprotein serum amyloid A reveals marginal stability of hexamer. *Prot. Science*, 14, 1811-1817.
25. Lynch, S.M., Boswell, S.A. and Colón, W. (2004) Kinetic stability of SOD is dependent on its metal ligands: Implications for ALS. *Biochemistry*, 43, 16525-16531.
24. Manning, M and Colón, W. (2004) Structural basis of protein kinetic stability: Resistance to sodium dodecyl sulfate suggests a central role for rigidity and a bias towards b-sheet structure. *Biochemistry*, 43, 11248-11254.
23. Boswell, S. A., Mathew, J., Beach, M., Osuna R., and Colón W. (2004) Variable contributions of tyrosine residues to the structural and spectroscopic properties of the factor for inversion stimulation. *Biochemistry*, 43, 2964-2977.
22. Wang L. and Colón, W. (2004) The interaction between apolipoprotein serum amyloid A and high-density lipoprotein. *Biochem. Biophys. Res. Commun.*, 317, 157-161.
21. De Beus, M. D., Chung, J., and Colón, W. (2004) Modification of cysteine 111 in Cu/Zn superoxide dismutase results in altered spectroscopic and biophysical properties. *Prot. Science*, 13, 1347-1355.

20. Chung, J., Yang, H., deBeus, M. D., Ryu, C. Y., Cho, H., and Colón, W. (2003) Cu/Zn superoxide dismutase can form pore-like structures. **Biochem. Biophys. Res. Commun.**, 312, 873-876.
19. Cheng, C-H., Battaglioli, G., Martin, D.L., Hobart, S. A. and Colón, W. (2003) Distinctive interactions in the holoenzyme formation for two isoforms of glutamate decarboxylase. **Biochim. Biophys. Acta**, 1645, 63-71.
18. Wang, L., Lashuel, H.A, Walz, T. and Colón, W. (2002) Murine apolipoprotein serum amyloid A in solution forms a hexamer containing a central channel. **Proc. Natl. Acad. Sci.**, 99, 15947-15952.
17. Hobart, S. A., Meinhold, D., Moriarty D. F., Osuna R., and Colón W. (2002) From two-state to three-state: Effect of P61A mutation on the dynamics and stability of the factor for inversion stimulation results in an altered equilibrium denaturation mechanism. **Biochemistry**, 41, 13744-13754.
16. Hobart, S. A., Ilin S., Moriarty D. F., Osuna R., and Colón W. (2002) Equilibrium denaturation studies of the *E. coli* factor for inversion stimulation: Implications for *in vivo* function. **Prot. Science**, 11, 1671-1680.
15. Colón, W. Solving the protein folding problem. (2001) **Chemical & Engineering News**, page 225 (March 26).
14. Cheng, C-H, Colón, W., Myer, Y.P. and Martin, D.L. (2000) ATP's impact on the conformation and holoenzyme formation in relation to the regulation of brain glutamate decarboxylase. **Arch. Biochem. Biophys.** 380, 285-293.
13. Colón, W. (1999) Analysis of protein structure by solution spectroscopy. **Methods Enzymol.** 310, 316-340.
12. Dolgikh, D. A., Latypov, R. F., Abdullaev, A. K., Colón, W., Roder, H., and Kirpichnikov, M. P. (1998) Expression of mutant horse cytochrome c genes in *Escherichia coli*. **Bioorg. Khim.** 24, 756-759.
11. Kelly, J.W., Colón, W., Lai, Z., Lashuel, H. A., McCulloch, J., McCutchen, S. L., Miroy, G. J. and Peterson, S. A. (1997) Transthyretin quaternary and tertiary structural changes facilitate misassembly into amyloid. **Adv. Prot. Chem.** 50, 161-181.
10. Colón, W., Wakem, P., Sherman, F. and Roder, H. (1997) Identification of the predominant non-native histidine ligand of unfolded cytochrome c. **Biochemistry**, 36, 12535-12541.
9. Roder, H. and Colón, W. (1997) Kinetic role of early intermediates in protein folding. **Curr. Opinion Struct. Biol.**, 7, 15-28.
8. Colón, W. and Roder, H. (1996) Kinetic intermediates in the formation of the cytochrome c molten globule. **Nat. Struct. Biol.**, 3, 1019-1025.

7. Colón, W., Elöve, G. E., Waken, L. P., Sherman, F. and Roder, H. (1996) Side chain packing of the n- and c- terminal helices plays a critical role in the kinetics of cytochrome c folding. **Biochemistry**, 35, 5538-5549.
6. Colón, W., Lai, Z., McCutchen, S. L., Miroy, G. J., Strang, C. and Kelly, J.W. (1996) FAP mutations destabilize transthyretin facilitating conformational changes required for amyloid formation. **Ciba Found Symp.** 199, 228-242.
5. Lai, Z., Colón, W. and Kelly, J.W. (1996) The acid-mediated denaturation pathway of transthyretin yields an intermediate which can self-assemble into amyloid. **Biochemistry**, 35, 6470-6482.
4. McCutchen, S. L., Lai, Z., Miroy, G. J., Kelly, J.W. and Colón, W. (1995) Comparison of lethal and nonlethal transthyretin variants and their relationship to amyloid disease. **Biochemistry**, 34, 13527-13536.
3. McCutchen, S. L., Colón, W. and Kelly, J.W. (1993) The transthyretin mutation Leu-55-Pro significantly alters tetramer stability and increases amyloidogenicity. **Biochemistry**, 32, 12119-12127.
2. Colón, W. and Kelly, J.W. Partial denaturation of transthyretin is sufficient for amyloid fibril formation *in vitro*. **Biochemistry**, 31, 8654-8660 (1992).
1. Colón, W. and Kelly, J.W. (1991) Transthyretin Acid Induced Denaturation is Required for Amyloid Fibril Formation *In Vitro*. in **Applications of Enzyme Biotechnology** , pp 99-108, Editors, Jeffery W. Kelly and Thomas O. Baldwin (Plenum, New York).

Issued Patents

1. Patent Number 7,217,348 B2 (May 15, 2007) Methods of identifying kinetically stable proteins. Wilfredo Colón and Marta Manning, Rensselaer Polytechnic Institute.
2. Patent Number 7,393,443 B2 (July 1, 2008) Methods of identifying kinetically stable proteins. Wilfredo Colón and Marta Manning, Rensselaer Polytechnic Institute.

INVITED PRESENTATIONS

1. Amherst College, "Methods for Identifying and Quantifying Protein Kinetic Stability: Biological and Pathological Implications", October 25, 2013.
2. University of Puerto Rico at Rio Piedras, "Methods for Identifying and Quantifying Protein Kinetic Stability: Biological and Pathological Implications". April 22, 2013.
3. University of Puerto Rico, Medical School, "From Inflammation to Amyloidosis". April 23, 2013.

4. University of Puerto Rico at Mayaguez, "Hyperstability and Aggregation: Biological, Pathological, and Biotechnological Implications". April 25, 2013.
5. Baylor University, "Development and Application of Methods for the Identification and Quantification of the Kinetic Stability of Proteins: Biological and Pathological Implications", March 22, 2013.
6. Arizona State University, "Development and Application of Methods for the Identification and Quantification of the Kinetic Stability of Proteins: Biological and Pathological Implications", Nov 18, 2011.
7. National Meeting of the ACS. "Identifying the subproteome of kinetically stable proteins via diagonal-two dimensional SDS-PAGE: Biological and pathological implications", Anaheim, CA, March 30, 2011.
8. American Electrophoresis Society/AICHE meeting, "Proteomics-Level Identification of Kinetically Stable Proteins by Diagonal 2D SDS-PAGE", Philadelphia, November 18, 2008.
9. National ACS Meeting, "Finding a Home at the NSF for Your Chemical Biology Proposal", Salt Lake City, Utah, March 23, 2009.
10. Southeastern Regional Meeting of the ACS (SERMACS), "Exploring the Biological and Pathological Significance of Protein Kinetic Stability Via Diagonal 2D SDS-PAGE", San Juan, PR, Oct 20-23, 2009.
11. National ACS Meeting, Organized and Chaired symposium on Chemical Synthetic Biology, Salt Lake City, Utah, March 23, 2009.
12. Fox Chase Cancer Center, "Identifying Sub-proteomes of Kinetically Stable Proteins", August 19, 2008.
13. UMass Medical School, Worcester, "Identifying Sub-proteomes of Kinetically Stable Proteins/From Inflammation to Amyloidosis", October 03, 2007.
14. St. Lawrence University/SUNY Potsdam, "From Inflammation to Amyloidosis", April 24, 2007.
15. Gordon Research Conference on Proteins, "Identifying Sub-proteomes of Kinetically Stable Proteins", June 19-22, 2007.
16. UNC at Chapel Hill Medical School, Department of Biochemistry, "From Hexamer to Amyloid: The mechanism of Serum Amyloid A Fibril Formation", Nov 29, 2005.
17. Cornell University Medical School, Department of Biochemistry, "From Hexamer to Amyloid: The mechanism of Serum Amyloid A Fibril Formation", March 31, 2005.

18. Biological Language Conference, Carnegie Mellon University, "Beta Sheet Proteins in Protein Deposition Diseases: The Role of Kinetic Stability", November 18-19, 2004.
19. ALS Symposium: "Amyotrophic Lateral Sclerosis: Mutant SOD1, Neurodegeneration, and Therapeutic Approaches", University of Massachusetts Medical School, "Misfolding-induced aggregation of apo SOD: Potential implication of cysteine111", September 21, 2004.
20. Gordon Research Conference on Proteins, Mitch de Beus and W. Colón, "In Vivo Copper-induced Aggregation of SOD1 Mutants Associated with Familial Amyotrophic Lateral Sclerosis", June 22-27, 2003.
21. Albany Medical Center, NY, "Conformational Diseases: Elucidating the Pathway of Protein Misfolding and Aggregation", April 10, 2002.
22. University of Puerto Rico at Mayaguez, "Deciphering the Grammatical Rules of Protein Folding", May 6, 2002.
23. Hamilton College, NY, "Deciphering the Grammatical Rules of Protein Folding", April 19, 2002.
24. University of Massachusetts at Dartmouth, "Deciphering the Grammatical Rules of Protein Folding", March 13, 2002.
25. Florida International University, Miami, FL, "Deciphering the Grammatical Rules of Protein Folding." (Keynote speaker at awards banquet), May 4, 2001.
26. National Science Foundation, Biological Division, "Deciphering the Grammatical Rules of Protein Folding", March 14, 2001.
27. International Chemistry Conference in Cuba, "Equilibrium Denaturation Pathway of FIS, a Dimeric DNA-Binding Protein." *In this conference, I was one of three speakers invited by the American Chemical Society to represent the US*, Dec 4-8, 2000.
28. The ALS Association Workshop, Philadelphia, PA, "The Acid-Induced Denaturation of Human Cu/Zn Superoxide Dismutase", Oct. 26-27, 2000.
29. International Symposium: *PROTEIN STRUCTURE, STABILITY AND FOLDING. Fundamental and Medical Aspects* in Moscow, Russia, "The Role of Folding Intermediates in Amyloid Diseases", June 22-26, 1998.
30. Mayo Clinic in Jacksonville, FL, "The Role of Structural Intermediates in Protein Folding and Amyloid Diseases", Oct. 1997.
31. FASEB Summer Research Conference on "Amyloid and Other Abnormal Assembly Processes", Title: The Effect of Mutation on the Stability of a Kinetic Folding Intermediate of Cytochrome c", June, 1997.

EXTERNAL FUNDING

\$6.6 million dollars in external funding.

Date	Role	Title	Source	Total Funding Amount*
09/2014	PI	Undergraduate Science Education Grant: I-PERSIST: Integrative Program for Education, Research, and Support Involving Science and Technology	HHMI	\$1,200,000
06/2012-05/2017	PI	Development and Application of Methods for Investigating the Biological Roles and Structural Basis of Protein Kinetic Stability	NSF	\$1,194,000
02/2007-01/2013	PI	Mechanism and Structural Basis of Amyloid Fibril Formation by Serum Amyloid A	NIH/NIA R01-AG028158-01	\$1,092,260
02/2009-01/2013	PI	Development and Application of Methods for Studying the Kinetic Stability of Proteins	NSF/MCB 0848120	\$600,000
09/2005-08/2008	PI	Structural Basis of Protein Kinetic Stability	NSF/MCB 0519507	\$570,000
01/2002-12/2005	PI	The Role of SOD1 Misfolding/Aggregation in Familial ALS	NIH/NINDS R01-NS42915-01	\$985,000
06/2000-05/2005	PI	The Significance of Intermediate Structures in Protein Folding and Assembly	NSF Presidential Early Career Award (PECASE)	\$500,000
09/2000-08/2002	PI	The Role of Salt Bridge Interactions in Protein Folding and Oligomerization	Petroleum Research Fund	\$25,000
06/2000-08/2003	PI	Summer Research Opportunity Program for Minority High School Students	Camille & Henry Dreyfus Foundation	\$68,000
02/2000-01/2002	PI	Investigating the Role of Folding Intermediates and Alternative Conformation of Cu/Zn SOD in Familial	Amyotrophic Lateral Sclerosis (ALS) Association	\$92,000

		ALS		
12/1998-11/2001	PI	Folding and Denaturation Studies of Cu/Zn Superoxide Dismutase	Research Corporation Innovation Award	\$35,000
07/1998-06/2001	PI	Investigating the Role of Protein Folding Intermediates in the Deposition of Serum Amyloid A in Reactive Amyloidosis	American Heart Assoc. Scientist Development Award	\$135,000
08/1998-07/2000	PI	Investigating the Role of Folding Intermediates and Alternative Conformation of Cu/Zn SOD in Familial ALS	The ALS Association	\$35,000
08/1998-07/1999	PI	The Role of Structural Intermediates in Protein Folding	NSF (starter grant)	\$35,000
6/97-5/02	PI	Camille & Henry Dreyfus Foundation	Camille & Henry Dreyfus Foundation	\$25,000

TEACHING AND STUDENT SUPERVISION

Courses

Protein Folding: Fall 1997, Fall 1999, Spring 2003, Spring 2004, Spring 2006, Spring 2007

Biological Spectroscopy: Fall 1998

Biophysical Methods: Spring 1999, Spring 2001

Molecular Biochemistry 1: Fall 2000, Fall 2001, Fall 2003, Fall 2004, Fall 2007

General Chemistry 1: Fall 2010, Spring 2011, Fall 2011, Spring 2012, Fall 2012

Protein Kinetic Stability: Spring 2010, Spring 2013, Spring 2014, Spring 2015

Students supervised

Undergraduates

Over fifty undergraduate students have worked in my laboratory since 1998.

Masters Degrees

1. **Sergey Ilin**, Thesis Title: "Equilibrium denaturation pathway of factor for inversion stimulation." BS/MS in Biochemistry and Biophysics, 1999.
2. **Haoren Wang**, Thesis Title: "PH-induced denaturation of Cu/Zn superoxide dismutase variants." MS in Chemistry, 2002.

3. **Melissa Fratine**, Thesis Title: "A method of guanidine hydrochloride (GuHCl) and 4-(2-Pyridylazo) resorcinol (PAR) to analyze metal content of soluble and aggregated FALS-related Cu/Zn SOD variants." MS in Biochemistry and Biophysics, 2003.
4. **Charmi Miller**, Thesis Title: "The role of a salt-bridge network on the stability and dynamics of factor for inversion stimulation." MS in Chemistry, 2005.
5. **Candace Drumma**, Thesis Title: "A study of methionine oxidation in apolipoprotein serum amyloid A." MS in Biochemistry and Biophysics, 2005.
6. **Renee Davis**, Thesis Title: "Using electrophoresis to quantify the kinetic stability of transthyretin." MS in Chemistry, 2008.
7. **Michael Perry**, Thesis Title: "Structural studies of serum amyloid through chemical cross-linking and mass spectrometry." MS in Chemistry, 2008.
8. **Ke Xia**, Thesis Title: "Developing a diagonal 2D SDS-PAGE assay to identify the subproteome of kinetically stable proteins." MS in Chemistry, 2008.
9. **Brendan Bathrick**, Thesis Title: "Quantifying protein kinetic stability at physiological temperature using S-Trap", MS in Chemistry, 2011.
10. **Shuanqi Liu**, Thesis Title: "Quantifying the kinetic stability of unpurified overexpressed proteins in cell culture via SDS-trapping", MS in Chemistry, 2012.

Doctoral

1. **Limin Wang**, Thesis Title: "Structural Studies of Apolipoprotein Serum Amyloid A." (September 1999 – July 2003).
2. **Sarah A. Boswell**, Thesis Title: "The Folding of the Dimeric Protein Factor for Inversion Stimulation." (January 2000 – December 2003).
3. **Jinhyuk Fred Chung**, Thesis Title: "Aggregation Studies of Cu/Zn Superoxide Dismutase in Relation to Amyotrophic Lateral Sclerosis." (September 2002 – December 2004).
4. **Sandra M. Lynch**, Chemical Engineering, Thesis Title: "Kinetic Folding Studies of Cu/Zn Superoxide Dismutase and Mutants Thereof Implicated in Familial Amyotrophic Lateral Sclerosis." (September 2002 – December 2005).
5. **Derrick Meinhold**, Thesis Title: "Analysis of Protein Thermodynamic Stability and Folding Cooperativity via Mutation to the DNA Binding E. coli Protein Factor for Inversion Stimulation." (September 2002 – May 2006).

6. **Marta Manning**, Thesis Title: "Development of a SDS-PAGE Assay for High Throughput Identification of Protein Kinetic Stability." (September 2003 – August 2006).
7. **Zhuqiu Ye**, Thesis Title: "Structural and Mechanistic Studies of Amyloid Fibril Formation by Serum Amyloid A 2.2." (September 2003 - May 2008).
8. **Virginia Muniz**, Thesis Title: "Studying the Denaturation Mechanism of the Factor for Inversion Stimulation and the Kinetic Stability of the Papain Family of Proteases." (September 2003 – December 2008).
9. **Christine Fiorillo**, Thesis Title: "Understanding the Potential Toxicity of Human Cu/Zn Superoxide Dismutase 1 in Amyotrophic Lateral Sclerosis" (September 2004 – August 2009).
10. **Ke Xia**, Thesis Title: "Identifying Kinetically Stable Proteins via D2D SDS-PAGE" (September 2004 – May 2009).
11. **Maria Hernandez**, Thesis Title: "Aggregation and Metal Binding Propensities of Cu/Zn Superoxide Dismutase Mutants Involved in Familial Amyotrophic Lateral Sclerosis." (January 2005 – August 2009)
12. **Songjie Zhang**, Thesis Title: "Identifying and Quantifying Kinetic Stability in Proteins via Electrophoresis" (September 2005 – May 2010).
13. **Yun Wang**, Thesis title: Title: "Investigating the Structural and Amyloidogenic Properties of Murine SAA Isoforms to Explore the Molecular Basis of Amyloid A Amyloidosis" (September 2004 – April 2010).
14. **Sai Srinivasan**, Thesis Title: "Molecular Basis of the Differences in Fibrillogenicity between SAA1.1 and SAA2.2" (September 2006 – May 2011).
15. **Javier Aguilera**, Thesis Title: "Glycosaminoglycan-mediated Interactions Modulate Diverse Assembly of Serum Amyloid A Oligomers, Protofibrils, and Fibrils." (Fall 2008 – Aug 2013).