

Melanie J. Cocco, PhD

Email: mcocco@uci.edu

Address: Molecular Biology and Biochemistry
University of California, Irvine
1218 Natural Sciences I
Irvine, CA 92697

Webpage: <https://coccolab.bio.uci.edu>

Education

- 1999 NIH Postdoctoral Fellow, Biophysics and Biochemistry, Yale University
- 1995 Howard Hughes Postdoctoral Fellow, Biophysics and Biochemistry, Yale University
- 1994 Ph.D. in Chemistry, The Pennsylvania State University
- 1986 B.S. in Chemistry, Virginia Tech (VPI & SU)

Professional Positions

University of California, Irvine

- 2013-present Associate Professor, Dept of Pharmaceutical Sciences, Univ of Cal, Irvine
- 2010-present Associate Professor, Dept of Molecular Biology and Biochemistry, Univ of Cal, Irvine
- 2015-2017 Director, Graduate Gateway Program in Cellular and Molecular Biology, Univ of Cal, Irvine
- 2008-2012 Visiting Scientist, Marie Curie Initial Training Network, European Union
- 2003-2010 Assistant Professor, Dept of Molecular Biology and Biochemistry, Univ of Cal, Irvine

Yale University

- 2000-2003 Associate Research Scientist, Dept of Molecular Biophysics and Biochemistry, Yale
- 1997-2002 NMR Facility Manager, Dept of Molecular Biophysics and Biochemistry, Yale
- 1996-1999 NIH Postdoctoral Fellow, Dept of Molecular Biophysics and Biochemistry, Yale
- 1994-1995 Howard Hughes Postdoctoral Fellow, Dept of Molecular Biophysics and Biochemistry, Yale

Penn State University

- 1986-1994 Graduate Student, Dept of Chemistry, The Pennsylvania State University

Research Experience

Faculty, University of California, Irvine. Research emphasis in the Cocco laboratory is focused on defining membrane protein structures and DNA binding protein dynamics using NMR spectroscopy and biophysical techniques. Applications toward the treatment of CNS damage, understanding antimicrobial peptide mechanisms, vaccine development, and cancer biology. Supervised the installation of Varian 800 MHz spectrometer and oversee facility operations.

Associate Research Scientist, Yale University. Conceived and carried out independent research on ligand binding to probe G4 (quadruplex) DNA/protein interactions. Collaboration with Lynne Regan: Structural characterization of designed proteins using NMR; performed NMR dynamics

studies crucial to the proof of design. Consultant on two additional projects in nucleic acids with Nigel Grindley and Scott Strobel.

NIH Postdoctoral Fellow, Yale University. Advisor: Don Engelman. Membrane protein studies using NMR spectroscopy. Trained three graduate students. *Howard Hughes Postdoctoral Fellow.* Advisor: Robert Fox. Carried out a structural analysis of the active site of thioredoxin and studied the folding of an SH3 domain.

Graduate Student, Research Assistant, The Pennsylvania State University (1986-1994).

Advisor: Juliette Lecomte. Graduate curriculum met the requirements for the organic chemistry area of study; thesis project was in biophysical chemistry. Investigated the structural role of the heme and the iron atom within myoglobin using NMR spectroscopy.

Undergraduate Research, Virginia Tech (1984-1986) Projects in synthetic organic chemistry.

Honors, Awards and Professional Activities

- NSF Biological Technologies (SBIR/STTR) Study Section, 2021
- NIH BTDD Centers (formerly P41) Study Section, 2021
- **Conference Organizer**, UC Drug Discovery Consortium Annual Symposium, 2021
- **Co-Chair** American Heart Association Postdoctoral Fellowship Review panel, 2021
- **Chair** 2021-3, Biophysical Society Membership Committee, 2017-2023
- **Chair** 2019-20, UC Drug Discovery Consortium, Executive Committee, 2017-present
- NIH Biochemistry and Biophysics of Membranes (BBM) Study Section – ad hoc 2021
- Founding Faculty Sponsor of the Biophysical Society Irvine Student Chapter, 2021
- Review Editor, Structural Biology, Frontiers Molecular Biosciences, 2020-present
- Biophysical Society Ambassador Program Committee, 2019-present
- NIH Major Equipment (S10) Study Section 2016-2020, **Alt Chair** 2019-2020
- NIH F04B F31/32 Fellowships: Chemistry, Biochemistry and Biophysics Study Section, Ad Hoc 2019-21
- NIH Biochemistry and Biophysics of Membranes (BBM) Study Section – ad hoc 2019, **Alt Chair**
- American Heart Association Postdoctoral Fellowship review panel, 2018
- **Session Chair**, *Translational Biophysics*, 62nd Annual Biophysical Society Meeting, 2018
- **Conference Co-Organizer**, *Membrane Proteins: Structure, Activity & Drug Development*, 254th ACS National Meeting, 2017
- Visiting Scientist, European Union Marie Curie Initial Training Network, Structural Biology of Membrane Proteins; Advisor/Lecturer for graduate students and postdocs among 15 laboratories in Europe, 2008-2012
- NSF Genes and Genome Systems, External Reviewer, 2008-09
- NSF Analytical and Surface Chemistry, External Reviewer 2008
- NSF Molecular and Cellular Biosciences, External Reviewer 2010
- **Chair** 2011, RNA Mechanisms of Cancer Review Panel, American Cancer Society
- **Vice-Chair** 2009-2010, RNA Mechanisms of Cancer Review Panel, American Cancer Society
- Genetic Mechanisms of Cancer Review Panel, American Cancer Society, Member 2008-2011
- Genetic Mechanisms of Cancer Review Panel, American Cancer Society, Ad Hoc 2007
- Mutagenesis and Carcinogenesis Gordon Conference, Young Investigator Travel Award, 2004
- NIH Postdoctoral Fellowship, 1996-1999

- Komen Foundation Breast Cancer Postdoctoral Fellowship, 1996-1999 (declined)
- Howard Hughes Postdoctoral Fellowship, 1994-1995
- Penn State University Dan Waugh Teaching Award 1991
- Penn State University Chemistry Dept. Strategic Planning Committee 1990
- American Chemical Society-Virginia Tech Student Affiliates Vice President 1985-1986, Secretary 1984
- Cmdr. William S. Sturh Scholarship, 1982-1986

University Service

- **Chair**, 2021-22, Faculty Senate Council on Education Policy, 2019-22
- Internal Reviewer, UCI NIH Training Grant Maximizing Access to Research Careers (MARC) Fellowship, 2021
- Faculty Senate Task Force on Supplemental Costs, 2019-20
- **Chair** 2017-18, Faculty Senate Executive Committee, School of Biological Sciences, 2016-18
- **Director** 2015-2017, Graduate Gateway Program in Cellular and Molecular Biology
- **Chair** 2014-15, Faculty Senate Executive Committee, School of Biological Sciences, 2013-15
- **Chair** 2012-14, Faculty Senate Campuswide Honors Program Board 2011-14
- **Chair** 2015-17, School of Biological Sciences PhD Program Admissions Committee, 2014-17
- School of Biological Sciences Faculty Research/Travel Awards Committee, 2013-14
- School of Biological Sciences NMR and Biacore Oversight Committee, 2003 – present
- School of Biological Sciences Structural Biology PhD Graduate Program Coordinator, 2006-2015
- **Co-Chair** 2007-08 School of Biological Sciences PhD Admissions Committee and Recruiting
- School of Biological Sciences Masters in Biotech and Management Steering Committee 2012-14
- School of Biological Sciences, Undergraduate Curriculum Revision Committee, 2014-16
- Campus Phishing Advisory Committee, 2019-present
- Undergraduate Major in Biochemistry and Molecular Biology Curriculum/Advising Committee, 2003-present
- **Chair** 19/20, Molecular Biology and Biochemistry Faculty Search Committee
- Molecular Biology and Biochemistry Department Seminar Organizer, 2018-21
- Molecular Biology and Biochemistry Department Seminar Organizer, 2011-14
- Committee to draft Collaboration Guidelines for Junior Faculty,
- Institute for Complex and Adaptive Matter (ICAM), Representative for UCI to the ICAM Science Advisory Committee. Reviewer of applications for ICAM sponsored conferences.(2012-14)

Reviewer Service

Ad Hoc Individual Proposal Reviewer:

2021 Poland National Science Center; antimicrobials

2018 National Sciences and Engineering Research Council of Canada (NSERC); membrane proteins

2017 US Army; protein NMR

2017 Netherlands Organisation for Scientific Research (NWO); ECHO grant review; membrane proteins

2014 Medical Research Council (UK) Molecular and Cellular Medicine Board, membrane proteins
 2011 Medical Research Council (UK) Molecular and Cellular Medicine Board, membrane proteins
 2009 French National Research Agency (ANR), membrane protein biophysics grant application
 2006 Hong Kong, China; University Grants Committee, structural biology grant application

Books Reviewed:

2011 Structural Principles of Membrane Protein Function, Garland Science
 2009 Molecular Biology (3 chapters reviewed, undergraduate textbook),
 Doudna, Cox and O'Donnell authors, WH Freeman & Co Publishers
 2008 Introduction to Structural Biology (graduate-level textbook; reviewed for concept)
 Hoenger and Sattler authors, Taylor & Francis Books, Inc Publishers

Reviewer for Journals:

- ACS Chemical Biology
- Acta Biochimica et Biophysica Sinica
- Analytical Biochemistry
- Applied Microbiology and Biotechnology
- BBA- Biomembranes
- Biochemistry
- Bioinformatics
- Biophysical Journal
- Biopolymers: Peptide Science
- ChemBioChem
- European Biophysics Journal
- FEBS Journal
- Frontiers in Molecular Biosciences
- ISABB Journal of Biotechnology and Bioinformatics
- Journal of Biological Chemistry (JBC)
- Journal of Biotechnology
- Journal of Magnetic Resonance (JMR)
- Journal of Membrane Biology
- Journal of Molecular Biology (JMB)
- Journal of Molecular Structure
- Journal of Neurochemistry
- Journal of the American Chemical Society (JACS)
- Langmuir
- Letters in Drug Design and Discovery
- Magnetic Resonance in Chemistry
- Magnetochemistry
- Malaria Journal
- Molecular Biotechnology
- Molecules
- Nature Communications
- Nucleic Acids Research
- PlosOne
- PlosPathogens
- Proceedings of the National Academy of Sciences (PNAS)
- Protein Science
- PROTEINS: Structure, Function, and Bioinformatics

Professional Memberships

Biophysical Society (BPS), American Chemical Society (ACS), American Association for the Advancement of Science (AAAS)

Collaborations/Consulting Agreements, Patents/ROIs

- Amgen (2005-7); high resolution NMR spectroscopy of the Human IgG1 Fc (52 kDa); two publications

- MRM/Protasis Corporation (2005-8) designs and builds NMR spectrometer probes; they invited me to collaborate on the development of an 800 MHz capillary probe capable of measurements on very small amounts of material. I established UC Irvine as the development site and collected data on my proteins using the developmental probe.
- CNRS, Paris France (2007-present); development of a vaccine against Chlamydia using the major outer membrane protein, MOMP; UCI Record of Invention submitted
- Grifols Bioscience (2010-2012); NMR analysis of blood clotting agents
- Exova Pharmaceuticals (2018) FDA compliance testing
- **Patent:** Amaro, R. E., Baronio, R., Chamberlin, A. R., Cocco, M., Demir, O., Hatfield, W. G., Kaiser, P., Lathrop, R. H., Lin, D.-W., Luecke, H., Salehi-Amiri, S.-F., Wassman, C. D., "SMALL MOLECULES TO ENHANCE P53 ACTIVITY", Docket 1279-531P, Provisional, United States. (submit: October 31, 2010).
- **ROI** UCI 27175 Aptamer-Promoted Neuronal Growth by Nogo-Blocking
- **ROI** UCI 27265 Improved Cell-Free Protein Synthesis For Protein Microarray

Structure Coordinate Files

2K11.pdb	Rhesus oral defensin-1
2KO2.pdb	Nogo-66 structure in dodecylphosphocholine (DPC) environment
2LCV, 2L8N.pdb	Cytidine Repressor DNA binding domain bound to promoter half site
1NA0, 1NA3.pdb	Designed TPR proteins

Publications

Links to publications

ORCID ID: <https://orcid.org/0000-0003-4039-5863>

<http://www.researcherid.com/rid/B-7929-2010> (2026 citations as of Jun 2021)

In review:

44. Moody CL, Soto, J, Tretyachenko-Ladokhina V, Senear DF, **Cocco MJ*** Dynamic Consequences of Specificity within the Cytidine Repressor DNA-Binding Domain. *bioRxiv*
DOI:10.1101/2021.02.28.433298
43. Soto, J, Moody, C, AlHoshani, A, Sanchez-Bonilla, M, **Cocco MJ** (2021) NMR hydrogen exchange and relaxation rates reveal positions stabilized by p53 rescue mutants N239Y and N235K. *bioRxiv*
DOI:10.1101/2021.02.26.433080

Published:

42. Barros EP, Demir O, Soto, J, **Cocco MJ**, Amaro, RE (2021) Markov State Models and NMR Uncover an Overlooked Allosteric Loop in p53, *Chem. Sci.*, **12**:1891-1900
41. Tifrea DF, Pal S, le Bon C, **Cocco MJ**, Zoonens M, de la Maza LM.(2020) Improved protection against Chlamydia muridarum using the native major outer membrane protein trapped in

- Resiquimod-carrying amphipols and effects in protection with addition of a Th1 (CpG-1826) and a Th2 (Montanide ISA 720) adjuvant. *Vaccine*, **38**:4412-22.
40. Tifrea, DF, Pal, S, Le Bon, C, Guisti, F, Popot, J-L, **Cocco, MJ**, Zoonens, M, de la Maza, LM (2018) Co-delivery of amphipol-conjugated adjuvant with antigen, and adjuvant combinations, enhance immune protection elicited by a membrane protein-based vaccine against a mucosal challenge with *Chlamydia*. *Vaccine*, **36**:6640-9.
39. Moro, S. and **Cocco, MJ***. (2015) (1)H, (13)C, and (15)N backbone resonance assignments of the full-length 40 kDa *S. acidocaldarius* Y-family DNA polymerase, dinB homolog. *Biomolecular NMR Assignments*, **9**: 441-5. DOI: 10.1007/s12104-015-9626-y
38. Feinstein, HE, Tifrea, DF, Popot, J-L, de la Maza, LM, **Cocco, MJ***. (2014) Long-term stability of a vaccine formulated with the amphipol-trapped major outer membrane protein from *Chlamydia trachomatis*. *J. Membrane Biology*, **247**:1053-65.
37. Alhoshani, A, Vithayathil R, Bandong J, Chrnyk, KM, Moreno, GO, Weiss, GA and **Cocco, MJ***. Glutamate is a Key Structural Contact Between Nogo-66 and Phosphocholine. (2014) *BBA – Biomembranes*, **1838**: 2350-6
36. Tifrea, DF, Pal, S, **Cocco, MJ**, Popot, J-L and de la Maza, LM. Increased immuno accessibility of MOMP epitopes in a vaccine formulated with amphipols may account for the very robust protection elicited against a vaginal challenge with *C. muridarum*. (2014) *J. Immunology*, **192**: 5201-13.
35. Vithayathil R, Hooy RM, **Cocco MJ**, Weiss GA. (2011) The Scope of phage display for membrane proteins. *J. Mol. Biol.* **414**:499-510
34. Popot JL, Althoff T, Bagnard D, Banères JL, Bazzacco P, Billon-Denis E, Catoire LJ, Champeil P, Charvolin D, **Cocco MJ**, Crémel G, Dahmane T, de la Maza LM, Ebel C, Gabel F, Giusti F, Gohon Y, Goormaghtigh E, Guittet E, Kleinschmidt JH, Kühlbrandt W, Le Bon C, Martinez KL, Picard M, Pucci B, Sachs JN, Tribet C, van Heijenoort C, Wien F, Zito F, Zoonens M. (2011) Amphipols from A to Z. *Annu Rev Biophys.* 2011 **40**:379-408
33. Moody, CL, Tretyachenko-Ladokhina, V, Laue, T., Senear, DF and **Cocco, MJ*** (2011) Multiple Conformations of the Cytidine Repressor DNA-Binding Domain Coalesce to One Upon Recognition of a Specific DNA Surface. *Biochemistry*, **50**:6622-32. doi: 10.1021/bi200205v
32. Tifrea, DF, Sun, G, Pal, S, Zardeneta, G, **Cocco, MJ**, Popot, J-L, de la Maza, LM (2011) Amphipols stabilize the *Chlamydia* major outer membrane protein and enhance vaccine protection based on a membrane-protein formulation. *Vaccine* **29**:4623-31
31. Corbin-Lickfett, KA, Souki, SK, Li, L, **Cocco, MJ** and Sandri-Goldin, RM. (2010) Three arginine residues within the RGG-box are crucial for ICP27 binding to herpes simplex virus 1 GC-rich sequences and for efficient viral RNA export. *Journal of Virology*, **84**:6367-76
30. Vasudevan, SV, Schulz, J, Zhou, C and **Cocco, MJ***. (2010) Protein Folding at the Membrane Interface, the Structure of Nogo-66. *Proceedings of the National Academy of Sciences*, **107**:6847-51
29. Corbin-Lickfett, KA, Rojas, S, Li, L, **Cocco, MJ** and Sandri-Goldin, RM. (2010) ICP27 Phosphorylation Site Mutants Display Altered Functional Interactions with Cellular Export Factors Aly/REF and TAP/NXF1 but Are Able to Bind Herpes Simplex Virus 1 RNA. *Journal of Virology*, **84**:2212-22.

28. Corbin-Lickfett, KA, Chen, I-HB, **Cocco, MJ*** and Sandri-Goldin, RM* (2009) The HSV-1 ICP27 RGG box specifically binds flexible, GC-rich sequences but not G-quartet structures. *Nucleic Acids Research*, **37**:7290-301.
27. Llenado, RA, Weeks, CS, **Cocco, MJ** and Ouellette, AJ (2009) Electropositive charge in α -Defensin Bactericidal Activity: Functional Effects of Arg \rightarrow Lys Substitutions Vary with Peptide Primary Structure. *Infection and Immunity*, **77**:5035-43
26. Sasaki, H, Arai, H, **Cocco, MJ** and White, SH (2008) pH-Dependence of Sphingosine Aggregation, *Biophysical Journal*, **96**:2727-33
25. Vasudevan, S, Yuan, J, Ösapay, G, Tran, P, Tai, K, Liang, W, Kumar, V, Selsted, ME*, and **Cocco, MJ*** (2008) Synthesis, Structure and Activities of an Oral Mucosal Alpha-Defensin from Rhesus Macaque, *Journal of Biological Chemistry*, **283**:35869-77
24. Gehman, JD, **Cocco, MJ** and Grindley, ND (2008) Chemical Shift Mapping of $\gamma\delta$ resolvase Dimer and Activated Tetramer: Mechanistic Implications for DNA Strand Exchange. *BBA - Proteins and Proteomics* **1784**:2086-92
23. Liu D, Ren D, Huang, H, Dankberg, J, Rosenfeld, R, **Cocco, MJ**, Li, L, Brems, DN, and Remmele, RL (2008) Structure and Stability Changes of Human IgG1 Fc as a Consequence of Methionine Oxidation. *Biochemistry* **47**: 5088-5100
22. Liu D, **Cocco, MJ**, Matsumura M, Ren D, Becker, B, Remmele, RL and Brems, DN (2007) Assignment of backbone (1)H, (13)C and (15)N resonances of human IgG1 Fc (51.4 kDa). *Biomolecular NMR Assignments* **1**: 233-235
21. Liu D, **Cocco, MJ**, Matsumura M, Ren D, Becker, B, Remmele, RL and Brems, DN (2007) Assignment of backbone resonances of the reduced human IgG1 C_H3 domain. *Biomolecular NMR Assignments* **1**: 93-94
20. Sun, G, Pal, S, Sarcon, AK, Kim, S, Sugawara, E, Nikaido, H, **Cocco, MJ**, Ellena M. Peterson, EM, de la Maza, LM (2007) Structural and functional analyses of the major outer membrane protein of *Chlamydia trachomatis*. *Journal of Biological Chemistry*, **189**: 6222-35
19. Levin, A., Coroneus, J., **Cocco, MJ.**, and Weiss, G. (2006) "Exploring the Interaction between the Protein Kinase A Catalytic Subunit and Caveolin-1 Scaffolding with Shotgun Scanning, Oligomer Complementation, NMR, and Docking" *Protein Science*, **15**: 478-86
18. Weeks, C, Tanabe, H, Cuymmings, JE, Crampton, SP, Sheynis, T, Jelinek, R, Vanderlick, TK, **Cocco, MJ**, Ouellette, AJ. (2006) Matrix metalloproteinase-7 activation of mouse paneth cell Pro-alpha-defensins: Ser43* \downarrow Ile44 proteolysis enables membrane disruptive activity. *Journal of Biological Chemistry*, **281**: 28932-42
17. Tretyachenko-Ladokhina, V, **Cocco, MJ**, Senear, DF, (2006) Flexibility and Adaptability in Binding of E. coli Cytidine Repressor to Different Operators Suggests a Role in Differential Gene Regulation. *Journal of Molecular Biology*, **362**: 271-86
16. Kamtekar, S, Ho, RS, **Cocco, MJ**, Li, W, Wenwieser, SVCT, Boocock, MR, Grindley, NDF, Steitz, TA, (2006) Implications of Structure of Synaptic Tetramers of $\gamma\delta$ Resolvase for the Mechanism of Recombination. *Proceedings of the National Academy of Sciences*, **103**: 10642-7

15. Tanabe, H, Ouellette, AJ, **Cocco, MJ** and Robinson, WE. (2004) Differential Effects on Human Immunodeficiency Virus Type 1 Replication by β -Defensins of Comparable Bactericidal Activities. *Journal of Virology*, **78**: 11622-31
14. Cortajarena, AL, Kajander, T, Pan, W, **Cocco, MJ**, and Regan, L. (2004) Protein Design to Understand Peptide Ligand Recognition by Tetratricopeptide Repeat Proteins. *Protein Design Engineering and Selection*, **17**: 399-409
13. **Cocco, MJ***, Hanakahi, L, Huber, MD, and Maizels, N. (2003) Distamycin Binds G4 DNA and Maps the Interaction Surface of Nucleolin RGG Domain Recognition. *Nucleic Acids Research*. **31**: 2944-2951; *corresponding author
12. Main, E, Xoing, Y, **Cocco, MJ**, D'Andrea, L and Regan, L. (2003) Design of Stable α -Helical Arrays from an Idealized TPR Motif. *Structure* **11**: 497-508.
11. **Cocco, MJ**¹, Ramirez-Alvarado, M¹ and Regan, L. (2003) Mutations in the B1 Domain of Protein G that Delay the Onset of Amyloid Fibril Formation *in Vitro*. *Protein Science* **12**: 567-576; ¹co-first authors
10. Li H, **Cocco MJ**, Steitz TA, and Engelman DM. (2001) Conversion of Phospholamban Into a Soluble Pentameric Helical Bundle. *Biochemistry* **40**: 6636-6645.
9. Zhou, FX, **Cocco, MJ**, Russ, WP, Brunger, AT, and DM Engelman, DM. (2000) Interhelical Hydrogen Bonding Drives Strong Interactions in Membrane Proteins. *Nature Struct. Biol.* **7**: 154-160.
8. Basu, S, Szewczak, AA, **Cocco, MJ**, Strobel, SA. (2000) Direct Detection of Monovalent Metal Ion Binding to a DNA G-quartet by 205TI NMR. *J. Am. Chem. Soc.* **122**: 3240-3241.
7. Lecomte, JTJ, Kao, YH, and **Cocco, MJ**. (1996) The Native State of Apomyoglobin Described by Proton NMR Spectroscopy: The A-B-G-H Interface of Wild-Type Sperm Whale Apomyoglobin. *Proteins: Structure, Function and Genetics* **25**: 267-285.
6. Wynn, R, **Cocco, MJ**, and Richards, FM. (1995) Mixed Disulfide Intermediates During the Reduction of Disulfides by *Escherichia coli* Thioredoxin. *Biochemistry* **34**: 11807-11813.
5. **Cocco, MJ** and Lecomte, JTJ. (1994) The Native State of Apomyoglobin Described by Proton NMR Spectroscopy: Interaction with the Paramagnetic Probe HyTEMPO and the Fluorescent Dye ANS. *Protein Science* **3**: 267-281.
4. **Cocco, MJ**, Barrick, D, Taylor, SV, and Lecomte, JTJ. (1992) Histidine 82 Influences Heme Orientational Isomerization in Sperm Whale Myoglobin. Long-Range Effect due to Mutation of a Conserved Residue. *J. Am. Chem. Soc.* **114**: 11000-11001.
3. **Cocco, MJ**, Kao, YH, Phillips, AT and Lecomte, JTJ. (1992) Structural Comparison of Apomyoglobin and Metaquomyoglobin: pH Titration of Histidines by NMR Spectroscopy. *Biochemistry* **31**: 6481-6491.
2. **Cocco, MJ** and Lecomte, JTJ. (1990) Characterization of Hydrophobic Cores in Apomyoglobin: A Proton NMR Spectroscopy Study. *Biochemistry* **29**: 11067-11072.
1. Lecomte, JTJ and **Cocco, MJ**. (1990) Structural Features of the Protoporphyrin-Apomyoglobin Complex: A Proton NMR Spectroscopy Study. *Biochemistry* **29**: 11057-11067.

Invited Talks

- 02/2021 **Biophysical Society Annual Meeting**, Career Workshop Panel Moderator
- 08/2018 **UCSD**, Drug Metabolism and Pharmacokinetics workshop
- 05/2018 **UCI** Southern California Users of Magnets
- 05/2018 **Industrial Biosciences Conference**, San Diego, CA, "*Agents to block the neurite outgrowth inhibitor (nogo) inspired by the structure.*"
- 04/2018 **Concordia University**, Irvine, CA
- 02/2018 62nd Annual **Biophysical Society Meeting**, San Francisco, CA, **Symposium Speaker**
"*AGENTS TO BLOCK THE NEURITE OUTGROWTH INHIBITOR (NOGO, RTN4) INSPIRED BY THE STRUCTURE.*"
- 12/2017 **UCLA**, High Throughput Screening workshop
- 10/2017 **UC Merced**, CA
- 08/2017 254th **ACS National Meeting**, Washington DC, "*Blocking the neurite outgrowth inhibitor (Nogo) to promote neuroregeneration.*"
- 03/2017 **SMALP conference**, UC Berkeley, CA "*Amphipols as solubilizing agents for membrane protein vaccines*"
- 02/2017 **Ionis Pharmaceuticals**, Carlsbad, CA
- 02/2017 **Inaugural UC-Wide Drug Discovery Symposium**, UCLA, CA, "*Blocking the neurite outgrowth inhibitor (Nogo) to promote neuroregeneration.*"
- 01/2017 **EHWA University, Soul, South Korea**
- 11/2016 **Chapman University**, School of Pharmacy
- 10/2016 **UC Riverside**, Dept Biochemistry
- 04/2016 **UCI**, Stem Cell Center
- 02/2016 Amphipols Conference, **Okinawa Institute for Science and Technology, Japan**
- 02/2016 60th Annual **Biophysical Society Meeting**, Los Angeles, CA, platform presentation
"*Structure Determinants and Binding Properties of the Neurite Outgrowth Inhibitor (NOGO)*"
- 08/2015 **Burnham Institute**, La Jolla, CA
- 11/2014 **Pacific University, Sacramento, CA** invited.
- 04/2013 245th **ACS National Meeting, New Orleans, LA**, "Proteins on the Edge (of the Lipid Bilayer)"
- 06/2012 Structural Biology of Membrane Proteins, **Marie Curie ITN Conference, Maratea Italy**,
"Proteins on the Edge (of the Lipid Bilayer)"
- 04/2012 Symposium on Biomolecular Structure, Dynamics & Function, **St. Jude Children's Research Hospital, Memphis, TN**, "Proteins on the Edge (of the Lipid Bilayer)"
- 04/2012 Applications of Amphipols to Membrane Protein Studies, **Case Western Reserve University, Cleveland, OH**, "Applications fo Amphipols to Vaccine Formulations"
- 11/2011 43rd Western **Regional ACS Meeting, Pasadena, CA**, "Proteins on the Edge (of the Lipid Bilayer)"
- 05/2011 Structural Biology of Membrane Proteins, **Marie Curie ITN Conference, Utrecht, Netherlands**, "Development of Membrane Protein Vaccines using Amphipols"
- 05/2011 **CNRS, Paris, France**, Institute of Biology and Physical Chemistry, "Proteins on the Edge (of DNA); Consequences of Specificity on the Structure and Dynamics within the CytR DNA-Binding Domain"

05/2011 **ETH, University of Zurich, Switzerland**, Brain Research Institute, "Proteins on the Edge (of the Lipid Bilayer); the Structure of Nogo-66"

03/2011 **UC Irvine**, Dept Microbiology and Molecular Genetics, "Proteins on the Edge"

12/2010 **University of Chicago**, Biophysics, "Proteins on the Edge (of the Lipid Bilayer)"

11/2010 **CalState Northridge**, Dept Chemistry and Biochemistry, "Proteins on the Edge (of the Lipid Bilayer)"

08/2010 Molecular Biophysics of Cellular Membranes, **FASEB Conference, Vermont**, "Proteins on the Edge (of the Lipid Bilayer)"

08/2010 Frontiers in Membrane and Membrane Protein Biophysics: Experiment and Theory, **UC Irvine**, "Proteins on the Edge (of the Lipid Bilayer)"

04/2010 **University of Wyoming**, Dept Chemistry, "Proteins on the Edge (of the Lipid Bilayer)"

03/2010 **Freie University, Berlin, Germany**, Dept Biology, Chemistry and Pharmacology, "Proteins on the Edge (of the Lipid Bilayer)"

03/2010 **CNRS, Paris, France**, Institute of Biology and Physical Chemistry, "Proteins on the Edge (of the Lipid Bilayer)"

03/2010 **CNRS, Toulouse, France**, Institute Pharmacology and Structural Biology, "Proteins on the Edge (of the Lipid Bilayer)"

02/2010 54th Annual **Biophysical Society Meeting, San Francisco, CA**, "Protein Folding at the Membrane Interface: the Structure of Nogo-66"

12/2009 20th **Southern California Users of Magnets Meeting, UC Riverside**. "The Structure of the Cytidine Repressor DNA-Binding Domain: Dynamic and Structural Consequences of Specificity"

11/2009 **UC San Diego**, Dept Chemistry and Biochemistry, "Proteins on the Edge (of the Lipid Bilayer)"

11/2009 **University of Toronto, Canada**, Dept Molecular Structure and Function, "Proteins on the Edge (of the Lipid Bilayer)"

11/2009 **Wadsworth Research Center, NY**, Dept Computational and Structural Biology, "Proteins on the Edge (of the Lipid Bilayer)"

10/2009 **San Diego State University**, Dept. Chemistry, "Proteins on the Edge (of the Lipid Bilayer)"

09/2009 **UC Riverside**, Dept Biomaterials Engineering

03/2009 **Johns Hopkins University**, Dept Materials Engineering

08/2008 **International Conferences of Magnetic Resonance in Biological Systems (ICMRBS)**

06/2008 18th **Southern California Users of Magnets Meeting**

10/2006 **CNRS, Paris, France**, Institute of Biology and Physical Chemistry

06/2006 **Pomona College**, Howard Hughes Seminar Series

03/2006 Seventh Annual **Roman Reed Research Meeting**

02/2006 16th **Southern California Users of Magnets Meeting**

11/2005 **Chao Cancer Center Conference**

03/2005 229th **American Chemical Society National Meeting**, Division of Physical Chemistry: Recent Developments in Magnetic Resonance: Liquid and Solid State Applications, Theoretical Methodology and Emerging Techniques.

03/2005 **CalState Long Beach**, Department of Chemistry and Biochemistry

03/2005 Sixth Annual **Roman Reed Research Meeting**

02/2005 **Chao Cancer Center Virology Program Retreat**

03/2004 Fifth Annual **Roman Reed Research Meeting**

10/2003 **Chao Family Comprehensive Cancer Center Conference**

- 06/2001 Cellular and Molecular Biology of Membranes; **Institut D'Etudes Scientifiques De Cargese**, Corsica, France
- 01/2001 45th **Annual Biophysical Society Meeting, Boston MA**
- 03/1996 **University of Connecticut**, Storrs
- 06/1991 **American Chemical Society** 25th Middle Atlantic Regional Meeting

Conference Presentations and Published Abstracts

65th Annual Meeting of the Biophysical Society, Boston (Online), CA , February 2021

1. Jenaro Soto, Colleen Moody, Donald F. Seneor, Melanie J. Cocco, "*DYNAMIC CONSEQUENCES OF SPECIFICITY WITHIN THE CYTIDINE REPRESSOR DNA-BINDING DOMAIN*"
2. Aldo J. Munoz, Melanie J. Cocco, "*EFFECT OF THE ANTI-SICKLE CELL DRUG GBT440 (VOXELOTOR) ON METHEMOLOBIN*"

64th Annual Meeting of the Biophysical Society, San Diego, CA , February 2020

Jenaro Soto, Colleen Moody, Ali Alhoshani, Marilyn Sanchez-Bonilla, Daisy Martinon, and Melanie J Cocco, "*Hydrogen exchange and NMR dynamics reveal positions stabilized by p53 rescue mutants N239Y and N235K*"

63rd Annual Meeting of the Biophysical Society, Baltimore, MD, February 2019

Melanie J Cocco, Jenaro Soto, Colleen Moody, Ali Alhoshani, Marilyn Sanchez-Bonilla, and Daisy Martinon, "*Hydrogen exchange and NMR dynamics reveal positions stabilized by p53 rescue mutants N239Y and N235K*"

Military Health System Research Symposium (MHSRS), Kissimmee, FL, August 2017

Cocco, MJ, "*Blocking Nogo to Promote Neuronal Regeneration*"

ACS Southern California Undergraduate Research Conference, UCLA, April 2017

Sylvia Alejo: "*Filter binding assay generates a binding affinity constant of aptamer and Nogo-66 which corresponds to therapeutic application† to neural growth in mouse primary neurons*"

ACS Southern California Undergraduate Research Conference, CSU Long Beach Apr 2016

Radiance Thompson poster: "*Strategies to block the Neurite Outgrowth Inhibitor, Nogo*"

ACS Southern California Undergraduate Research Conference, UCSD, April 2015

Verna Vu poster: "*Selection of Nog-66 Aptamers*"

56th Annual Meeting of the Biophysical Society, San Diego, February 2012

1. A Alhoshani, N Meada, JR Schulz, S Milton, C Glabe, H Fan and MJ Cocco, "*The oncogenic Jaagsiekte sheep retrovirus cytoplasmic tail adopts a unique conformation on a phosphocholine surface*"
2. HE Feinstein, G. Zardeneta, J-L Popot, Ldl Maza and MJ Cocco, "*Amphipols stabilize a membrane protein vaccine against chlamydia*"

24th Symposium of the Protein Society, San Diego, August 2010

C Moody, V Tretyachenko-Ladokhina, DF Senear, MJ Cocco "Structural Flexibility of the Cytidine Repressor DNA-Binding Domain"

54th Annual Meeting of the Biophysical Society, San Francisco, February 2010

Moody, C., Tretyachenko-Ladokhina, V., Senear, D. F., Cocco, M. J. "Structural Flexibility of the Cytidine Repressor DNA-Binding Domain"

52nd Annual Biophysical Society Meeting, February 2008

1. JR Schulz, R Vithayathil and MJ Cocco, "Nogo66: Receptor Interactions and Lipid-Associated Structure"
2. S Vasudevan and MJ Cocco, "Alpha Defensins Structure and Lipid Interactions"
3. CL Moody, V Tretyachenko-Ladokhina, DF Senear, MJ Cocco "Structural Characterization of CytR, a Bacterial Gene Repressor, Using NMR"
4. K Corbin-Lickfett, MJ Cocco, R Sandri-Goldin, "Structural Analysis of the HSV-1 ICP27 N-Terminal RNA Binding Motif"
5. H Sasaki, MJ Cocco, SH White, "Phase Change of Sphingosine as a Function of pH"

Experimental Biology Conf, 2008

RA Llenado, CS Weeks, MJ Cocco, S Young, X Qu, AJ Ouellette, "Positive selection of arginine in α -defensins: Attenuation fo bactericidal activity by Lys->Arg substitutions is dependent on peptide primary sequence"

Antimicrobial Peptides Gordon Conf, April 2007

MJ Cocco, C Moody, Y Zhu, C Weeks, X Qu and A Ouellette, "Defensin Interactions with Fast-Tumbling Bicelles"

Computational Aspects of Biomolecular NMR Gordon Conf, Sept 2006

MJ Cocco, C Moody, Y Zhu, C Weeks, X Qu and A Ouellette, "Defensin Interactions with Fast-Tumbling Bicelles"

50th Annual Biophysical Society Meeting, February 2006

J. R. Schultz, R Da, MJ Cocco, "Structural Characterization of Nogo-66"

3rd International Conference on the Annexins, March 2005

P. Pathuri, A. Rosengarth, MJ Cocco and H Luecke, "NMR Structural Studies of the Transmembrane Form of Annexin A1 at Lower pH Using Fast Tumbling Bicelles"

46th Experimental NMR Conference, April 2005

X. Meng, M. Cocco, V. A. Mandelshtam, and A.J. Shaka. "Quantitative Aspects of the Filter Diagonalization Method for Large Proteins"

49th Annual Biophysical Society Meeting, February 2005

1. J. R. Schultz, D. Tran, B. Nguyen, A. Ouellette, M. E. Selsted and M. Cocco. "NMR structure of the Alpha-Defensin Cryptdin-3"

2. E. Pone and M. Cocco. *"Conformations and Dynamics of a DNA Repair Enzyme: NMR Studies of the Lesion Bypass DNA Polymerase"*
3. V. G. Tretyachenko-Ladokhina, M. Cocco and D.F. Seneor. *"Thermodynamics and Dynamics of CytR-DNA Binding"*

45th Experimental NMR Conference, April 2004

1. EJ Pone and Melanie Cocco. *"Conformations and Dynamics of a DNA Repair Enzyme, the Bypass Polymerase DinB Homolog"*
2. Melanie Cocco, Vladimir Mandelshtam and AJ Shaka. *"Multidimensional Filter Diagonalization Applied to NMR Spectra of a Large Protein at High Field"*

Mutagenesis and Carcinogenesis Gordon Conference, March 2004

Melanie Cocco. *"Conformations and Dynamics of a DNA Repair Enzyme: NMR Studies of the Lesion Bypass Polymerase DinB Homolog"*

Funding

UCOP MRPI Cocco Co-PI MRPI-17-454909 1/1/2017 12/31/2019
Drug Discovery Consortium. This award from UCOP will establish a Drug Discovery Consortium (DDC) across the UC System. Funds are provided to distribute as Seed Grants, hire a Project Manager to facilitate cross-campus collaborations, and to provide educational experiences in drug development.
ucdrugdiscovery.org

UCI ICTS Seed Grant Cocco (PI). From NIH UL1 TR001414 03/01/16-02/28/17
Blocking Nogo to Promote Neuronal Regeneration. The proposed project will develop Nogo-blocking aptamers suitable for therapy (Cocco laboratory) and test in SCI models in vitro (Steward laboratory).
 Role: subaward PI

NMSS 6000805 Cocco (PI) 06/01/14-05/31/15
 National Multiple Sclerosis Foundation
Promoting Neuronal Regeneration using Aptamers that Bind Nogo. The goal of this project is to perform SELEX experiments targeting the protein Nogo to develop a series of aptamers that bind and promote regrowth.
 Role: PI

NIH 1R01AI092129-01 de la Maza(PI) 09/01/11-08/31/15
Trapping membrane proteins with adjuvant-carrying amphipols for vaccine formulations. The aims of this grant are to formulate the *C. trachomatis* major outer membrane protein (MOMP) with amphipols conjugated with various adjuvants, characterize its structure and determine the ability of these preparations to protect mice against a challenge with Chlamydia.
 Role: Co-PI

NIH 2R01GM069783-06 Ladokhin(PI) 08/01/11-07/31/16
pH-Triggered Membrane Insertion of Proteins. The goal of this project is to understand the structure and thermodynamics of insertion of the diphtheria toxin protein into cell membranes.
 Role: Co-PI

- UCI Faculty Research Award Cocco (PI) 01/01/11-12/31/11
Synfensins: Designed Synthetic Defensin Antimicrobial Peptides. Development of a novel antibiotic based on natural defense peptides.
 Role: PI
- NSF-MCB0719373 Senear (PI) 07/01/07 - 06/30/11
Conformational Dynamics of E. coli CytR Protein in Regulation of Gene Expression. To determine the structural and energetic determinants of the transcription factor CytR bound to DNA.
 Role: Co-Investigator
- NIH 5R01CA094188-07 Fan(PI) 06/01/07-5/31/12
Oncogenesis By Jaagsiekte Sheep Retrovirus. Studies on oncogenic transformation by jaagsiekte sheep retrovirus (JSRV), the cause of a transmissible lung cancer, ovine pulmonary carcinoma (OPA) that closely resembles human lung adenocarcinoma.
 Role: Collaborator
- NIH 1R01GM078528-01 Weiss (PI) 08/01/06-07/31/11
Engineering Soluble Aggregation-Prone and Membrane-Bound Proteins. Caveolin is the target of these studies to define the molecular determinants for both aggregation and membrane binding.
 Role: Co-Investigator
- NIH/NIAID R01 AI059346-01A1 Ouellette (PI) 07/01/06 - 06/30/11
Studies of alpha-Defensins in Primate Innate Immunity
 To characterize structure-activity relationships, biosynthetic regulation, and mechanisms of action for myeloid and Paneth cell α -defensins in rhesus macaques.
 Role: Co-Investigator.
- NIH/NIDDK R01 DK044632-14A1 Ouellette (PI) 05/01/06 – 03/31/11
Peptide Effectors of Enteric Host Defense
 To characterize structure-activity relationships and the role of conserved amino acid residue positions in α -defensins, pro- α -defensins, and defensin-related peptides in mouse Paneth cells.
 Role: Co-Investigator.
- Cal Roman Reed Res Fund RR05-155 (renewal) Cocco (PI) 01/01/06-12/31/06
Structure of Proteins that Inhibit CNS Repair: NOGO and Its Receptor. An NMR study to determine the structure of the protein NOGO, a target in the treatment of spinal cord injury.
 Role: PI
- Am Cancer Soc UCI Internal Research Grant Cocco (PI) 11/01/05-10/31/06
Mechanism of p53 Rescue; Restoring Function to Cancer Mutants. To understand the mechanism by which cancer mutants disable p53 and how to restore function.
 Role: PI
- Cal Cancer Res Coor Com CRCC9-550862-36240 Cocco (PI) 07/01/05-06/30/06

Understanding Structural Consequences of p53 Cancer Mutations and the Mechanism of Functional Rescue Using NMR Spectroscopy. The goal of this research is to define the inactivation or reactivation mechanism of cancer or rescue mutants of the tumor suppressor protein, p53.

Role: PI

UCI Council on Research MI-2006-07-7 Cocco (PI) 07/01/05-06/30/06
NMR Structural Studies of the Chlamydia Major Outer Membrane Protein. Structural studies to assist in the development of a Chlamydia vaccine.

Role: PI

Cal Roman Reed Res Fund RR04-114 (renewal) Cocco (PI) 01/01/05-12/31/05
Structure of Proteins that Inhibit CNS Repair: NOGO and Its Receptor. This is an NMR study to determine the structure of the protein NOGO, a target in the treatment of spinal cord injury.

Role: PI

Cal Cancer Res Coor Com CRCC9-550852-34384 Cocco (PI) 07/01/04-06/30/05
Dynamics of a DNA repair enzyme: NMR studies of the lesion bypass polymerase DinB homolog. The goal of this research is to define the conformation and dynamics of a DNA repair enzyme to better understand the mechanism of catalysis.

Role: PI

UCI Council on Research MI-2005-06-30 Cocco (PI) 07/01/04-06/30/05
Structural Basis for Defensin Specificity Toward Microbial Membranes. Structural studies of innate immune system proteins interacting with bacterial lipids.

Role: PI

NIH 1R01AI061397-01 Sandri-Goldin (PI) 05/01/04-04/30/09
Domain structure and interactions of HSV-1 ICP27. The goals of this project are to elucidate the structure of the functional domains of ICP27 and to chart the complete array of its dynamic interactions during viral infection.

Role: Co-Investigator

Cal Roman Reed Res Fund RR03-072 Cocco (PI) 01/01/04-12/31/04
Structure of Proteins that Inhibit CNS Repair: NOGO and Its Receptor. This is an NMR study to determine the structure of the protein NOGO, a target in the treatment of spinal cord injury.

Role: PI

NIH 1F32AR008445 Cocco (PI) 10/01/96-09/30/98
Structure/Function of Phospholamban in Membranes. The proposed work will test the phospholamban structure model and provide atomic-level information on the effect of phosphorylation of the complex in a membrane environment.

Research Advising

Postdoctoral Fellows - (current position)

- H. Eric Feinstein, PhD (2011-2012) – Amgen, Thousand Oaks, CA
- Kara Corbin-Lickfett, PhD (2007-2010) – Senior Scientist at Microbiologics, Inc, San Diego, CA
- Sheeja Vasudevan, PhD (2008-2010) – Research Faculty at St. Xaviers, Mumbai; Dept Biosciences and Bioengineering, Indian Institute of Technology, Bombay

UC Irvine PhD Dissertations Directed; current position

- Jenaro Soto, PhD candidate in Pharmaceutical Sciences, 2017-present.
- Sean Moro, 2015, Characterization of the Backbone Dynamics and Stability of the Thermostable Y-family Polymerase Dbh; Senior Manager, Medical Communications Orchard Therapeutics, Boston, MA
- Ali Alhoshani, 2014, Understanding the Interaction Mechanism of Nogo-66 with NgR1 and Membrane Phosphocholine; Assistant Professor, Dept Pharmacy, King Saud University, Saudi Arabia
- Colleen Moody, 2011, Structure and Dynamics of the Cytidine Prepressor DNA Binding Domain; Research Scientist, Grifols Biotech, Los Angeles, CA
- Jessica Schulz, 2009, Structural Characterization of Three Membrane Associated Proteins: Nogo66, Cryptdin-3, and the Cytoplasmic Tail of JSRV; Instructor, Carson City, NV

Masters students

- Rishi Viswanathan, MS Biotechnology and Management (2021)
- Wanlin Xiong, MS Biotechnology and Management (2021)
- Silvia Alejo, Masters Biotechnology (2020)
- Verna Vu, Masters Molecular Biology and Biochemistry (2017) Doctor of Osteopathy, Touro University, Vallejo, CA
- Deepthi Tumala, Masters Biotechnology (2008)
- Sri-LaLitha Lanka, Masters Biotechnology (2007)
- Yu Zhu, Masters Biotechnology (2005)
- Hina Ayub, Masters Physics (2005)

Undergraduate researchers (selected from more than 40) current position or graduate program (URM = UnderRepresented Minority)

- Brandon Cove, Biochemistry and Molecular Biology (2021-23)
- Arnav Singh, Biochemistry and Molecular Biology (2021-23)
- Amanda Porter and Keziah Thomas, Chaffey Community College Summer Research Program (2021)
- Kristal Brandon, Biochemistry and Molecular Biology (2020-22)
- Aldo Munoz (URM), MARC Fellow, Biological Sciences (2020-21) now in UCLA PhD program
- Klancy Nesernian, Pharmaceutical Sciences (2020-21) now at USC School of Pharmacy, Doctorate
- Kasey Bishop (URM), Biological Sciences (2020)
- Vyvy Cao, Pharmaceutical Sciences (2020) now in USC School of Pharmacy, Doctorate
- Irene (Thu) Ho, Pharmaceutical Sciences (2019), now in USC School of Pharmacy, Doctorate
- Katayoun Yazdi-Nejad, Biological Sciences (2018), UCSD School of Medicine

- Raymond Chu, Pharmaceutical Sciences (2018), UCSF School of Pharmacy, Doctorate
- David (Sung) Kim, Biological Sciences (2017), USC School of Pharmacy, Doctorate
- Nicolas Seranio, (URM) Biological Sciences (2015) Doctor of Medicine, U of Pennsylvania, Residency Stanford
- Mirella Vasquez, (URM) Summer Bridges Fellow (2014), graduated UCLA
- Charles Williams, (URM) Summer Bridges Fellow (2014), graduated UCSD
- Ameenah Howard, (URM) Biological Sciences (2014) Doctor of Medicine, UC Davis
- Husein Badani, Biological Sciences (2009) NASA Ames Research Center, Moffet Field
- Angelika Maciol, Biological Sciences (2009) Pharmacy Doctorate, UCSF

Teaching and Mentoring

Assistant, Associate Professor, UC Irvine, Molecular Biology and Biochemistry Dept (2003-present).

Annual teaching load: ~500-1000 students including one or two sections of Biochemistry and/or Molecular Biology.

- **Biochemistry:** metabolism, kinetics, thermodynamics; average undergraduate class size = 400-440
- **Molecular Biology:** DNA/RNA structure, replication, repair, transcription; average undergraduate class size 400-440 students
- **Advanced Biochemistry:** upper division undergraduate course including advanced enzyme kinetics, membrane proteins, carbohydrates and metabolomics
- **Advanced Molecular Biology:** upper division undergraduate course including sequencing techniques, DNA polymerase mechanism, micro and silencing RNAs and DNA repair in cancer biology
- **Pharmaceutical Targets,** created new course as a freshman seminar
- **Structural Biology:** graduate level NMR, Xray and Cryo-EM; taught NMR module
- **Magnetic Resonance in Biology,** created new course for upper division undergraduate and graduate students
- **Nucleic Acids:** first-year graduate core-curriculum course including DNA replication/repair
- Mentored three high school summer researchers awarded UCI Cancer Center fellowships
- Mentored >40 undergraduate researchers, including ten students in minority science programs
- Mentored two PREP students as part of UCI's NIH funded training program for minority graduates
- UCI Cross-Cultural Center's Mentorship Program: Mentored minority undergraduates who were first in their families to attend college;
- 2010 - 2012 PhD First Year Student Advisor
- 2006 - 2007 PhD First Year Student Advisor

Teaching Assistant, The Pennsylvania State University Chemistry Department (1986-1991).

- Supervisor of Teaching Assistants for General Chemistry; edited and corrected the General Chemistry Lab Manual (1 semester)

- Developed new biological chemistry experiments for General and Organic Chem. Labs (1 semester)
- NMR Facility Assistant (1 semester)
- Additional lab and recitation teaching experience in General and Organic Chemistry (8 semesters)