

# Matthew R. Redinbo, Ph.D.

## William R. Kenan Distinguished Professor

Department of Chemistry  
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### EDUCATION

Doctor of Philosophy in Biochemistry, Department of Chemistry and Biochemistry,  
University of California, Los Angeles; July, 1995.

Bachelor of Science in Biochemistry, Minor in English Literature,  
University of California, Davis; June, 1990.

### PROFESSIONAL EXPERIENCE

- July, 2013 – present                    **William R. Kenan, Jr. Distinguished Professor**, University of North Carolina
- August, 2013 – July, 2014            **Visiting Professor**, Nuffield Department of Medicine, University of Oxford
- Sept., 2013 – July, 2014              **Visiting Fellow**, Magdalen College, University of Oxford
- July, 2013 – present                    **Professor, Integrative Program in Biological and Genome Sciences**, School of  
Medicine, University of North Carolina at Chapel Hill
- June, 2012 – present                    **Founder**, *Syberix, Inc.*  
Biopharmaceutical venture focused on improving human health by rationally,  
selectively and safely drugging the microbiome.
- July, 2007 – present                    **Professor, Department of Chemistry**, College of Arts and Sciences, University  
of North Carolina at Chapel Hill.  
**Professor, Program in Molecular Biology and Biotechnology**, School of  
Medicine, University of North Carolina at Chapel Hill.  
**Professor, Department of Biochemistry and Biophysics**, School of Medicine,  
University of North Carolina at Chapel Hill.  
**Professor, Department of Microbiology and Immunology**, School of  
Medicine, University of North Carolina at Chapel Hill.  
**Director of UNC Structural Biology**

- Member**, UNC Lineberger Comprehensive Cancer Center, and the Program in Molecular and Cellular Biophysics.
- March, 2010 – March, 2012 **Founder, Chief Scientific Officer**, *Identizyme Defense Technologies, Inc.*  
Biotechnology venture focused on rapid identification of nerve agent chemical weapons. Dissolved in 2012.
- July, 2009 – June, 2012 **Chair, Department of Chemistry**, University of North Carolina at Chapel Hill.
- June, 2007 – May, 2011 **Founder, Chief Scientific Officer**, *Exigent Pharmaceuticals, Inc.*  
Biopharmaceutical venture focused on novel treatments for drug-resistant bacterial infections. Dissolved in 2011.
- September, 2006 – June, 2009 **Vice Chair, Department of Chemistry**, University of North Carolina at Chapel Hill.
- March, 2003 – June, 2007 **Associate Professor, Department of Chemistry**, College of Arts and Sciences, University of North Carolina at Chapel Hill.  
**Associate Professor, Department of Biochemistry and Biophysics**, School of Medicine, University of North Carolina at Chapel Hill.  
**Director of UNC Structural Biology**  
**Member**, UNC Lineberger Comprehensive Cancer Center, the Program in Molecular and Cellular Biophysics, and the Program in Molecular Biology and Biotechnology.
- August, 1999 – March, 2003 **Assistant Professor, Department of Chemistry**, College of Arts and Sciences, University of North Carolina at Chapel Hill.  
**Assistant Professor, Department of Biochemistry and Biophysics**, School of Medicine, University of North Carolina at Chapel Hill. .  
**Director of Structural Biology**, UNC Program in Molecular Biology and Biotechnology.  
**Member**, UNC Lineberger Comprehensive Cancer Center, the Program in Molecular and Cellular Biophysics, and the Program in Molecular Biology and Biotechnology.
- September, 1995 – July, 1999 **Postdoctoral Fellow**, laboratory of Wim G. J. Hol, Biomolecular Structure Center, University of Washington. Crystal structures of human topoisomerase I in covalent and non-covalent complexes with DNA.
- June, 1990 – August, 1995 **Graduate Student**, laboratory of Todd O. Yeates, Department of Chemistry and Biochemistry, University of California, Los Angeles. Protein x-ray crystallography, crystallographic methods, general biochemistry and molecular biology. Dissertation Title: “Structural Studies of Plastocyanin and Human Amyloid Beta-Peptide.”

## **SELECT AWARDS AND HONORS**

- Honorary Fellow, Magdalen College, University of Oxford, 2014-2020.  
Fellow, American Association for the Advancement of Sciences, 2013.  
Visiting Fellow, Magdalen College, University of Oxford, 2014.  
William R. Kenan, Jr. Distinguished Professor, 2013-present.  
Visiting Professor, Structural Genomics Consortium, University of Oxford, 2013-2014.  
Academic Leadership Fellow, UNC Institute for the Arts and Humanities, 2010-2011.  
Phillip and Ruth Hettleman Prize for Artistic and Scholarly Achievement, 2004.  
Burroughs Wellcome Fund Career Award in the Biomedical Sciences, 1999.

Outstanding Dissertation Award, University of California, Los Angeles, 1995.  
NIH National Research Service Award in Biotechnology, 1994-1995.  
NIH National Research Service Award in Cellular and Molecular Biology, 1991-1994.  
Outstanding Teaching Award, University of California, Los Angeles, 1991.

#### **UNIVERSITY ADMINISTRATIVE ROLES**

**Chair**, Department of Chemistry, University of North Carolina at Chapel Hill, 2009-2012  
Recruited seven Assistant Professors to a faculty of 45  
Absorbed 25% cut in state support while increasing student enrollment and research funding  
Completed three building construction projects and one building renovation  
**Vice Chair**, Department of Chemistry, University of North Carolina at Chapel Hill, 2006-2009

#### **SELECT UNIVERSITY SERVICE**

Selection Committee for Distinguished Professors, UNC Chapel Hill, Aug., 2015 – present.  
Advisory Board, Office of Technology Development, UNC, August, 2012 – present.  
Genome Science Building Core Design Group, UNC Chapel Hill, 2007 – 2012.  
Chair, Search Committee, Structural Biology Faculty Position, Center for Integrative Chemical Biology and Drug Discovery, UNC Chapel Hill, 2008 – 2009; Search Committee, Bioinformatics Faculty Position, Department of Chemistry, 2004-2005.  
Scientific Advisory Board, Center for Integrative Chemical Biology and Drug Discovery, UNC Chapel Hill, 2007-present.  
Administrative Board of the UNC Program in Molecular and Cellular Biophysics, 2004-2008.  
Faculty Search Committees, UNC Chapel Hill: Genomics and Bioinformatics, Department of Chemistry, 2001-2003; Medicinal Chemistry, School of Pharmacy, 2001-2003; Bioinformatics, Department of Pharmacology, School of Medicine, 2002-2003; Chair, Medicinal Chemistry, School of Pharmacy, 2004-2006.

#### **SELECT PROFESSIONAL SOCIETIES AND ACTIVITIES**

Advisory Committee, *Burroughs Wellcome Career Award at the Scientific Interface*, August, 2015 – present.  
Advisory Committee, *Burroughs Wellcome Career Collaborative Travel Grant*, March, 2012 – present.  
Advisory Committee, *Burroughs Wellcome Career Award in the Biomedical Sciences*, August, 2005 – present.  
NIH Study Section Reviewer, *Ad Hoc*:  
Drug Discovery and Molecular Pharmacology, Feb. 17-20, 2004; Oct. 20, 2004  
MSFB, June 22-23, 2006  
Countermeasures Against Chemical Threats, August 10-11, 2006; April 16, 2008  
MSFC, February, 2013  
Cancer Center P01 Review, February, 2013  
Special Emphasis Panels for NIDDK RFA November, 2014, February, 2015, and July, 2015  
ACS Study Section Reviewer, Ad Hoc: “Genetic Mechanisms of Cancer”, *American Cancer Society*, Jan. 13-14, 2004.  
Editorial Board, *Molecular Endocrinology*: 2005 – 2008.  
Member, U.S. National Committee for Crystallography, part of the National Academy of Arts and Sciences, term 2004 – 2006.  
Reviewer, Structural Biology Section of *Faculty of 1000* On-Line Biomedical Literature Review, 2002 – present  
Scientific Consultant, Syrrx Pharmaceuticals, 2001 – 2003.  
Ad Hoc Reviewer: *Science*, *Nature*, *Cell*, *Nature Structural Biology*, *EMBO Journal*, *Biochemistry*, *Journal of Biological Chemistry*, *Nucleic Acids Research*, etc.  
American Crystallographic Association; Member, 1992-present  
Session Co-Chair, “New Macromolecular Structures”, 2003 Annual Meeting, Cincinnati, OH.  
Chair, Young Scientist Special Interest Group, 1997-1998.

Program Committee, 1998 Annual Meeting, Washington, D.C.  
Session Chair, “Future of Funding in the Crystallographic Sciences”  
Session Chair, “Young Scientist Poster Highlight Session”  
Organizing Committee, Northwest Crystallography Workshop; Seattle, WA; June, 1998.  
American Association for the Advancement of Sciences; 1991-1994, 1997-present.

## PUBLICATIONS

Total citations: **10,163**, i10-index: **99**, h-index: **51** (accessed 12 August 2018)

123. Pellock, S.J., Creekmore, B.C., Walton, W.G., Mehta, N., Biernat, K.A., Cesmat, A.P., Ariyaratha, Y., Dunn, Z.B., Li, B., Jin, J., James, L.I., and **Redinbo, M.R.**  
Gut Microbial  $\beta$ -Glucuronidase Inhibition via Catalytic Cycle Interception.  
*ACS Central Science*, 10.1021/acscentsci.8b00239 (2018). PMID: PMC6062831
122. Little, M.L. and **Redinbo, M.R.**  
Crystal Structure of the Mouse Innate Immunity Factor BPIFA1.  
*Acta Crystallographica, Section F*, **74**, 268-276 (2018). PMID: 29717993
121. Yauw, S.T.K., Arron, M., Lomme, R.M.L.M., van den Broek, P., Greupink, R., Bhatt, A.P., **Redinbo, M.R.**, and van Goor, H.  
Microbial Glucuronidase Inhibition Reduces the Severity of Diclofenac-Induced Anastomotic Leak in Rats.  
*Surgical Infections*, **19**, 417-423. doi: 10.1089/sur.2017.245 (2018). PMID: 29624485
120. Kim, C.S., Ahmad, S., Wu, T., Walton, W.G., **Redinbo, M.R.**, and Tarran R.  
SPLUNC1 is an Allosteric Modulator of the Epithelium Sodium Channel.  
*FASEB J.*, **32**, 2478-2491. doi: 10.1096/fj.201701126R (2018). PMID: 29295861
119. Biernat, K.A., Li, B., and **Redinbo, M.R.**  
Microbial Unmasking of Plant Glycosides.  
*mBio*, **9**, e02433-17. (2018). Invited Commentary. PMID: 29382739
118. Little, M.S., Pellock, S.J., Walton, W.G., Tripathy, A. and **Redinbo, M.R.**  
Structural Basis for the Regulation of  $\beta$ -Glucuronidase Expression by Human Gut Enterobacteriaceae.  
*Proceedings of the National Academy of Sciences USA*, **115**, E152-E161. (2018). PMID: 29269393
117. Bhatt, A.P., Gunasekara, D., Speer, J.E., Reed, M.I., Peña, A., Midkiff, B., Magness, S., Bultman, S., Allbritton N.L., and **Redinbo, M.R.**  
NSAID-Induced Leaky Gut Modeled Using Polarized Monolayers of Human Intestinal Epithelial Cells.  
*ACS Infectious Diseases*, **12**, 46-52. doi: 10.1021/acsinfectdis.7b00139. (2018). PMID: 29094594
116. Pollet, R.M., D’Agostino, E.H., Walton, W.G., Xu, Y., Little, M.S., Biernat, K.B., Pellock, S.J., Patterson, L.M., Creekmore, B.C., Isenberg, H.N., Bahethi, R.R., Bhatt, A.P., Liu, J., Gharaibeh, R.Z., and **Redinbo, M.R.**  
An Atlas of  $\beta$ -Glucuronidases in the Human Intestinal Microbiome.  
*Structure*, **25**, 967-977. (2017). PMID: PMC5533298  

Featured Article.
115. Pellock, S.J. and **Redinbo, M.R.**  
Glucuronides in the Gut: Sugar-Driven Symbiosis between Microbe and Host.  
*Journal of Biological Chemistry*, **292**, 8569-8576. (2017). PMID: 28389557
114. Bellendir, S., Rognstad, D., Morris, L., Zapotoczny, G., Walton, W.G., **Redinbo, M.R.**, Ramsden, D., Sekelsky, J., and Erie, D.A.

Substrate Preference of Gen Endonucleases Highlights the Importance of Branched Structures as DNA Damage Repair Intermediates.

*Nucleic Acids Research*, **45**, 5333-5348. (2017). PMID: 28369583

113. Bhatt, A.P., **Redinbo, M.R.**, and Bultman, S.J.  
The Role of the Microbiome in Cancer Development and Therapy  
*CA: A Cancer Journal for Clinicians*, **67**, 326-344. (2017). PMID: 28481406
112. **Redinbo, M.R.**  
Microbial Molecules from the Multitudes Within Us.  
*Cell Metabolism*, **25**, 230-232. (2017). PMID: 28178564
111. Yu, A.-M., Ingelman-Sundberg, M., Cherrington, N., Aleksunes, L., Zanger, U.M., Xie, W., Jeong, H., Morgan, E., Turnbaugh, P.J., Klaassen, C.D., Bhatt, A.P., **Redinbo, M.R.**, Hao, P., Waxman, D.J., Wang, L.  
Regulation of Drug Metabolism and Toxicity by Multiple Factors of Genetics, Epigenetics, lncRNAs, Gut Microbiota, and Diseases.  
*Acta Pharmaceutica Sinica B*, **7**, 241-248. (2017). PMID: 283868695
110. Wu, T., Huang, J., Moore, P.J., Little, M.S., Walton, W.G., Fellner, R.C., Alexis, N.E., Di, P., **Redinbo, M.R.**, Tilley, S.L., and Tarran, R.  
Identification of Short Palate Lung and Nasal Epithelial Clone 1 as an Epithelium-Derived Smooth Muscle Relaxing Factor.  
*Nature Communications*, **8**, 14118. (2017). PMID: 28165446
109. Ahmad, S., Tyrrell, J., Walton, W.G., Tripathy, A., **Redinbo, M.R.**, and Tarran, R.  
SPLUNC1 has Antimicrobial and Antibiofilm Activity against Burkholderia cepacia Complex.  
*Antimicrobial Agents and Chemotherapy*. **60**, 60003-6012. (2016). PMID: 27458217
108. Walton, W.G. Ahmad, S., Little, M.R., Kim, C., Tyrrell, J., Lin, Q., Di, Y.-P., Tarran, R., and **Redinbo, M.R.**  
Structural Features Essential to the Antimicrobial Functions of Human SPLUNC1.  
*Biochemistry*, **55**, 2979-2991. (2016). PMID: PMC4887393. doi:10.1021/acs.biochem.6b00090
107. Ghodse, S., Biernat, K.A., Bassett, S.J., **Redinbo, M.R.**, and Bowers, A.A.  
Post-Translational Claisen Condensation and Decarboxylation en Route to the Bicyclic Core of Pantocin A.  
*Journal of the American Chemical Society*, **138**, 5487-5490. (2016). PMID: 27088303
106. Pasquel, D., Dorcakova, A., Li, H., Kortagere, S., Krasowski, M.D., Biswas, A., Walton, W.G., **Redinbo, M.R.**, Dvorak, Z., and Mani, S.  
Acetylation of Lysine 109 Modulates Pregnane X Receptor DNA Binding and Transcriptional Activity.  
*BBA - Gene Regulatory Mechanisms*, S1874-9399(16)30003-7. doi: 10.1016/j.bbagr.2016.01.006. (2016). PMID: 26855179
105. Pollet, R.M., Ingle, J.D., Hymes, J.P., Eakes, T.C., Eto, K.Y., Kwong, S.M., Ramsay, J.P., Firth, N., and **Redinbo, M.R.**  
Processing of Non-Conjugative Resistance Plasmids by Conjugation Nicking Enzyme of Staphylococci.  
*Journal of Bacteriology*, **198**, 888-897. (2015). PMID: PMC4772599
104. Wallace, B.D., Roberts, A.B., Pollet, R.M., Ingle, J.D., Biernat, K.A., Pellock, S.J., Venkatesh, M.K., Guthrie, L., O'Neal, S.K., Robinson, S.J., Dollinger, M., Figueroa, E., McShane, S.R., Cohen, R.D., Jin, J., Frye, S.V., Zamboni, W.C., Pepe-Ranney, C., Mani, S., Kelly, L., and **Redinbo, M.R.**  
Structure and Inhibition of Microbiome  $\beta$ -Glucuronidases Essential to the Alleviation of Cancer Drug Toxicity.  
*Chemistry and Biology*, **22**, 1238-1249. (2015). PMID: PMC4575908

Highlighted in *C&E News* **93**, 32-33 (Sept. 14, 2015), and in the international media.

103. **Redinbo, M.R.**  
The Microbiota, Chemical Symbiosis, and Human Disease.  
*Journal of Molecular Biology*, **426**, 3877-3891. PMID: 25305474. PMCID: PMC4252811. (2014).
102. Venkatesh, M., Mukherjee, S., Wang, H., Sun, K., Benechet, A.P., Qiu, Z., Maher, L., **Redinbo, M.R.**, Phillips, R.S., Fleet, J.C., Kortagere, S., Mukherjee, P., Fasano, A., Dumas, M.E., Le Ven, J., Nicholson, J.K., Khanna, K.M., and Mani, S.  
Symbiotic Bacterial Metabolites Regulate Gastrointestinal Barrier Function via the Xenobiotic Sensor PXR and Toll-like Receptor 4.  
*Immunity*, **41**, 296-310. PMID: 25065623. PMCID: PMC4142105. (2014).
101. McLaughlin, K.M., Nash, R.P., and **Redinbo, M.R.**  
Unique Helicase Determinants in the Essential Conjugative TraI Factor from *Salmonella typhimurium* Plasmid pCU1.  
*Journal of Bacteriology*, **196**, 3082-90. PMID: 24936053. PMCID: PMC4135661. (2014).
100. Tarran, R. and **Redinbo, M.R.**  
Mammalian Short Palate Lung and Nasal Epithelial Clone 1 (SPLUNC1) in pH-Dependent Airway Hydration.  
*The International Journal of Biochemistry and Cell Biology*, **52C**, 130-135. PMID: 24631954. PMCID: PMC4048990. (2014).
99. Garland, A.L., Walton, W.G., Coakley, R.D., Tan, C.D., Gilmore, R.C., Hobbs, C.A., Tripathy, A., Clunes, L.A., Bencharit, S., Stutts, M.J., Betts, L., **Redinbo, M.R.**, and Tarran, R.  
Molecular Basis for pH-Dependent Mucosal Dehydration in Cystic Fibrosis Airways.  
*Proceedings of the National Academy of Sciences USA*, **110**, 15973-15978. PMID: 24043776. PMCID: PMC3791714. (2013).
98. Cheng, Y., Johnson, M.D.L., Burillo-Kirch, C., Mocny, J.C., Anderson, J.E., Garrett, C.K., **Redinbo, M.R.**, and Thomas, C.E.  
Mutation of the Conserved Calcium-Binding Motif in *Neisseria gonorrhoeae* PilC1 Impacts Adhesion but not Piliation.  
*Infection and Immunity*, **81**, 4280-4289. PMID: 24002068. PMCID: PMC3811810. (2013).
97. Marden, J.N., Diaz, M.R., Walton, W.G., Gode, C.J., Betts, L., Urbanowski, M.L., **Redinbo, M.R.**, Yahr, T.L., and Wolfgang, M.C.  
An Unusual CsrA Family Member Operates in Series with RsmA to Amplify Post-Transcriptional Responses in *Pseudomonas aeruginosa*.  
*Proceedings of the National Academy of Sciences USA*, **110**, 15055-15060. PMID: 23980177. PMCID: PMC3773774. (2013).
96. Mani, S., Boelsterli, U.A. and **Redinbo, M.R.**  
Interrogating and Modulating Mammalian-Microbial Communication for Improved Health.  
*Annual Review of Pharmacology and Toxicology*, **54**, 559-580. PMID: 24160697. PMCID: PMC3947301. (2014).
95. Saitta, K.S., Zhang, C., Lee, K.K., Fujimoto, K., **Redinbo, M.R.**, and Boelsterli, U.A.  
Bacterial Beta-Glucuronidase Inhibition Protects Mice Against Enteropathy Induced by Indomethacin, Ketoprofen, or Diclofenac: Mode of Action and Pharmacokinetics.  
*Xenobiotica*, **44**, 28-35. PMID: 23829165. PMCID: PMC3972617. (2014).
94. Roberts, A.B., Wallace, B.D., Venkatesh, M.K., Mani, S., and **Redinbo, M.R.**  
Molecular Insights into Microbial  $\beta$ -Glucuronidase Inhibition to Abrogate CPT-11 Toxicity.  
*Molecular Pharmacology*, **84**, 208-217. PMID: 23690068. PMCID: PMC3716326. (2013).
93. Wallace, B.D., Betts, L., Talmage, G., Pollet, R.M., Holman, N.S., and **Redinbo, M.R.**

Structural and Functional Analysis of the Human Nuclear Xenobiotic Receptor PXR in Complex with RXR $\alpha$   
*Journal of Molecular Biology*, **425**, 2561-2577. PMID: 23602807. PMICD: PMC3699901. (2013).

92. Li, H., **Redinbo, M.R.**, Venkatesh, M., Ekins, S., Chaudhary, A., Bloch, N., Negassa, A., Mukherjee, P., Ganjam, K., and Mani, S.  
Novel Yeast-Based Strategy Unveils Antagonist Binding Regions on the Nuclear Xenobiotic Receptor PXR  
*Journal of Biological Chemistry*, **288**, 13655-13668. PMID: 23525103. PMICD: PMC3650402. (2013).
91. Edwards, J.S., Betts, L., Frazier, M.L., Pollet, R.M., Kwong, S.M., Walton, W.G., Ballentine, W.K., Huang, J.J., Habibi, S., Del Campo, M., Meier, J.L., Dervan, P.B., Firth, N., and **Redinbo, M.R.**  
Molecular Basis of Antibiotic Multiresistance Transfer in *Staphylococcus aureus*.  
*Proceedings of the National Academy of Sciences USA*, **110**, 2804-2809. PMID: 23359708. PMICD: PMC3581901. (2013).  
  
Featured in "This Week in PNAS", and highlighted in *C&E News* and by the *AAAS Science Update Daily*.
90. Wallace, B.D. and **Redinbo, M.R.**  
The Human Microbiome is a Source of Therapeutic Drug Targets.  
*Current Opinion in Chemical Biology*, **17**, 379-384. PMID: 23680493. PMICD: PMC3679281. (2013).
89. Mani, S. Dou, W. and **Redinbo, M.R.**  
PXR Antagonists and Implications in Drug Metabolism.  
*Drug Metabolism Reviews*, **45**, 60-72. PMID: 23330542. PMICD: PMC3583015. (2013).
88. Boelsterli, U.A., **Redinbo, M.R.**, and Saitta, K.  
Multiple NSAID-Induced Hits Injure the Small Intestine: Underlying Mechanisms and Novel Strategies.  
*Toxicological Sciences*, **131**, 654-667. PMID: 23091168. PMICD: PMC3551426. (2013).
87. Wallace, B.D. and **Redinbo, M.R.**  
Xenobiotic-Sensing Nuclear Receptors Involved in Drug Metabolism: A Structural Perspective.  
*Drug Metabolism Reviews*, **45**, 79-100. PMID: 23210723. (2013).
86. Porsch, E., Johnson, M.D.J., Broadnax, A., Garrett, C.K., **Redinbo, M.R.**, and St. Geme, J.  
The calcium binding properties of the *Kingella kingae* PilC1 and PilC2 proteins have differential effects on type IV pilus-mediated adherence and twitching motility.  
*Journal of Bacteriology*, **195**, 886-895. PMID: 23243304. PMICD: PMC3562114. (2013).
85. Hobbes, C.A., Blanchard, M.G., Alijevic, O., Tan, C.D., Kellenberger, S., Bencharit, S., Cao, R., Kesimer, M., Walton, W.G., Henderson, A.G., **Redinbo, M.R.**, Stutts, M.J., and Tarran, R.  
Identification of SPLUNC1's ENaC-inhibitory domain yields novel strategies to treat sodium hyperabsorption in cystic fibrosis airway cultures.  
*American Journal of Physiology – Lung Cellular and Molecular Physiology*, **305**, L990-L1001. PMID: 24124190. PMICD: PMC3882538. (2013).
84. Wallace, B.D., Edwards, J.S., Wallen, J.R., Moolman, W.J., van der Westhuyzen, R., Strauss, E., **Redinbo, M.R.**, and Claiborne, A.  
Turnover-dependent covalent inactivation of *Staphylococcus aureus* coenzyme A-disulfide reductase by coenzyme A-mimetics: mechanistic and structural insights.  
*Biochemistry*, **51**, 7699-7711. PMID: 22954034. PMICD: PMC3506119. (2012).
83. Nash, R.P., McNamara, D.E., Ballentine, W.K., Matson, S.W., and **Redinbo, M.R.**  
Investigating the impact of bisphosphonates and structurally related compounds on bacteria containing conjugative plasmids.  
*Biochemical and Biophysical Research Communications*, **424**, 697-703. PMID: 22796221. PMICD: PMC3423897. (2012).

82. LoGuidice, A., Wallace, B.D., Bendel, L., **Redinbo, M.R.**, and Boelsterli, U.A.  
Pharmacologic targeting of bacterial  $\beta$ -glucuronidase alleviates nonsteroidal anti-inflammatory drug-induced enteropathy in mice.  
*Journal of Pharmacology and Experimental Therapeutics*, **341**, 447-454. PMID: 22328575. PMICD: PMC3336811. (2012).
- See accompanying Highlight in *J. Pharm. Exp. Ther.*, **341**, 306.
81. Johnson, M.D.L., Garrett, C.K., Bond, J.E., Coggan, K.A., Wolfgang, M.C. and **Redinbo, M.R.**  
*Pseudomonas aeruginosa* PilY1 binds integrin in an RGD- and calcium-dependent manner.  
*PLoS One*, **6**, e29629. PMID: 22242136. PMICD: PMC3248442. (2011).
80. Navaratnarajah, P., Steele, B., **Redinbo, M.R.**, and Thompson, N.L.  
Rifampicin-independent interactions between the pregnane X receptor ligand binding domain and peptide fragments of co-activator and co-repressor proteins.  
*Biochemistry*, **51**, 19-31. PMID: 22185585. (2011).
79. Cheng, Y., Frazier, M.L., Lu, F., Cao, X., and **Redinbo, M.R.**  
Crystal structure of the plant epigenetic protein arginine methyltransferase 10.  
*Journal of Molecular Biology*, **414**, 106-122. PMID: 21986201. PMICD: PMC3217299. (2011).
78. Cheng, Y. and **Redinbo, M.R.**  
Activation of the human nuclear xenobiotic receptor PXR by the reverse transcriptase-targeted anti-HIV drug PNU-142721.  
*Protein Science*, **20**, 1713-1719. PMID: 21805522. PMICD: PMC3218365. (2011).
77. Nash, R.P., Niblock, F.C., and **Redinbo, M.R.**  
Tyrosine partners coordinate DNA nicking by the *Salmonella typhi* plasmid pCU1 relaxase enzyme.  
*FEBS Letters*, **585**, 1216-1222. PMID: 21439279. PMICD: PMC3086049. (2011).
76. Ahmad, S., Hughes, M.A., Lane, K.T., **Redinbo, M.R.**, Yeh, L.-A., and Scott, J.E.  
A high-throughput assay for discovery of bacterial  $\beta$ -glucuronidase inhibitors.  
*Current Chemical Genomics*, **5**, 13-20. PMID: 21643506. PMICD: PMC3106358. (2011).
75. Lomino, J.V., Tripathy, A., and **Redinbo, M.R.**  
Triggered *Mycobacterium tuberculosis* heparin binding hemagglutinin adhesin folding and dimerization.  
*Journal of Bacteriology*, **193**, 2089-2096. (2011).
74. Hemmert, A.C., Otto, T.C., Chica, R.A., Wierdl, M., Edwards, J.S., Lewis, S.L., Edwards, C.C., Tsurkan, L., Cadieux, C.L., Kasten, S.A., Cashman, J.R., Mayo, S.L., Potter, P.M., Cerasoli, D.M., and **Redinbo, M.R.**  
Nerve agent hydrolysis activity designed into a human drug metabolism enzyme.  
*PLoS One*, **6**, e17441. (2011).
- Highlighted in *C&E News* and *Nature Medicine*:  
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Total Cumulative 1999-present Direct to UNC: **\$10,334,478**

*CURRENT*

Current Total Direct: **\$1,752,813**

"Microbiome-Targeted Probes to Eliminate Chemotherapy-Induced GI Toxicity"

PI: Matthew R. Redinbo; Co-Is: Stephen Frye, Lindsey James, Scott Bultman

1.5 calendar months' effort; August 1, 2016 – July 31, 2019

Agency: NIH-National Cancer Institute; Type: R01 CA207416

Total Direct to Redinbo: \$700,000; Total Direct: \$1,090,000

"Improving CPT-11 Efficacy Using Structural and Chemical Biology"

PI: Matthew R. Redinbo

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Agency: NIH-National Cancer Institute; Type: R01 CA098468

Total Direct: \$875,000

"Does the Composition of the Gut Microbiota Affect Clinical Outcomes with Irinotecan?"

PIs: Matthew R. Redinbo, Hanna Sanoff

January 1, 2018 – December 31, 2018

UNC Lineberger Comprehensive Cancer Center Development Award

Total Direct: \$50,000

"Precision Targeting of the Gut Microbiota to Explore the Etiology of IBD"

PIs: Matthew R. Redinbo, R. Balfour Sartor, Jonathan Hansen

March 1, 2018 – September 31, 2019

Lilly Research Award Program

Total Direct: \$127,813

*COMPLETED*

Completed Cumulative Total UNC Direct: **\$8,581,665**

"Alleviating Environmental Toxin Damage via the Gut Microbiome"

PIs: Matthew R. Redinbo, Scott Bultman, Kun Lu

April 1, 2017 – March 31, 2018

Agency: NIEHS; Pilot Project of UNC's Center for Environmental Health & Susceptibility

P30ES010126 (Swenberg, Director)

Total Direct: \$50,000

"Development of Novel Drugs to Alleviate CPT-11 Toxicity"

PI: Sridhar Mani (Einstein), Co-PI: Matthew R. Redinbo

1 calendar month effort; April 1, 2012 – March 31, 2017

Agency: NIH-National Cancer Institute; Type: R01 CA161879

Total Direct to Redinbo: \$415,000; Total Direct: \$1,250,000

"SPLUNC1-Derived Peptides as ENaC Antagonists"

PI: Robert Tarran (UNC), Co-I: Matthew R. Redinbo

0.5 calendar month effort; May 10, 2012 – March 31, 2017

Agency: NIH-NHLBI; Type: R01 HL108927

Total Direct to Redinbo: \$240,000



“Structure and Inhibition of the Conjugative DNA Relaxase-Helicase”

P.I.: Matthew R. Redinbo

June 1, 2008 – May 31, 2014

Agency: NIH-Natl. Inst. Aller. Infec. Dis; Type: R01 AI78924

Total Direct: \$1,250,000

"Improving CPT-11 Efficacy Using Structural and Chemical Biology"

PI: Matthew R. Redinbo

February 1, 2003 – January 31, 2014

Agency: NIH-National Cancer Institute; Type: R01 CA98468

Total Direct: \$2,060,000

“Enzyme Production for Nerve Agent Detection and Elimination”

P.I.: Matthew R. Redinbo

April 1, 2010 – March 31, 2013

Agency: DARPA; Type: Research Grant

Total Direct: \$58,000

“Novel Protein-Based Therapeutics for Nerve Agent Detoxification”

P.I.: Matthew R. Redinbo

October 1, 2006 – May 31, 2012

Agency: NIH-Natl. Inst. Neur. Dis. Stroke; Type: U01 NS58089

Total Direct: \$726,000

“Yersinia Autotransporters (Yaps): Structure, Function and Host Response to Plague”

P.I.: Virginia L. Miller (UNC Chapel Hill); Co-P.I.: Matthew R. Redinbo

March 1, 2009 – February 28, 2011

Agency: NIH; Type: Southeast Regional Center of Excellence for Emerging Infections & Biodefense

Total Direct: \$284,915

"Structure and Function of the Human Pregnane X Receptor"

PI: Matthew R. Redinbo

July 1, 2002 – June 30, 2008

Agency: NIH-Natl. Inst. Diabetes, Digestive, Kidney Disease; Type: R01 DK62229

Total Direct: \$1,250,000

“Novel Therapeutic Approaches for Narcotic Overdose”

P.I.: Philip M. Potter (St. Jude); Co-P.I.: Matthew R. Redinbo

September 1, 2005 – May 31, 2009

Agency: NIH-Natl. Inst. Drug Abuse; Type: R01 DA18116

Total Direct: \$311,000

“Acquisition of a State of the Art Crystallographic Cluster”

P.I.: John E. Sondek (UNC); Co-P.I.: Matthew R. Redinbo

December 12, 2006

Agency NIH-NCRR Shared Instrumentation Grant; Type: RR23437

Total Direct: \$437,000

“Structural Studies of Human Drug Targets”

P.I.: Matthew R. Redinbo

August 1, 2005 – July 31, 2007

Agency: Pharmacoepia, Inc. Type: Research Grant

Total Direct: \$150,000

“Structural Basis of CYP3A4 Induction by Human PXR”

P.I.: Matthew R. Redinbo

July 1, 2004 – June 30, 2007  
Agency: Pfizer, Inc. Type: Research Grant  
Total Direct: \$230,000

"Structure and Mechanism of Human Topoisomerase I"  
PI: Matthew R. Redinbo;  
April 1, 2001 – December 31, 2005  
Agency: NIH-National Cancer Institute; Type: R01 CA90604  
Total Direct: \$622,500

Career Award in the Biomedical Sciences  
PI: Matthew R. Redinbo; September 1, 1999 – August 31, 2004  
Agency: Burroughs Wellcome Fund; Type: Award  
Total Direct: \$384,000

"Structural Genomics and High-Throughput Methods for Human Nuclear Receptors"  
PI: Matthew R. Redinbo; September 1, 2001 – August 31, 2003  
Agency: Burroughs Wellcome Fund; Type: Award  
Total Direct: \$20,000

"Crystallographic Analysis of the Human Pregnane X Receptor"  
PI: Matthew R. Redinbo; March 1, 2001 – December 31, 2002  
Agency: GlaxoSmithKline; Type: Glaxo-UNC Collaborative  
Total Direct: \$93,750

#### **INVITED ACADEMIC LECTURES**

1. "Relax to the Max: Crystal Structure and Mechanism of Human Topoisomerase I." National Institutes of Environmental Health Sciences, Research Triangle Park, NC; February 10, 2000.
2. "Structural Analysis of Human Topoisomerase I: Catalytic Mechanism and Evolutionary Origins." St. Jude Children's Research Hospital, Memphis, TN; May 11, 2000.
3. "Structural Insights into Xenobiotic Metabolism." Blaffer Lecture Series, M.D. Anderson Cancer Center, University of Texas Medical Center, Houston, TX; September 11, 2001.
4. "Structural Insights into Xenobiotic Recognition and Metabolism." Northwestern University School of Medicine, Chicago, IL; December 18, 2001.
5. "Structural Insights into Xenobiotic Recognition and Metabolism." National Institutes of Environmental Health Sciences, Research Triangle Park, NC; April 12, 2002.
6. "Structural Insights into Drug Metabolism." Northwestern University, Evanston, IL. May 20, 2002.
7. "The Promiscuous Recognition and Metabolism of Human Drugs: From Receptors to Enzymes." University of North Carolina at Chapel Hill, Department of Chemistry, Chapel Hill, NC. September 11, 2002.
8. "Structural Insights into Human Drug Recognition and Metabolism." University of North Carolina at Chapel Hill, Department of Biochemistry and Biophysics, Chapel Hill, NC. September 24, 2002.
9. "The Promiscuous Recognition and Metabolism of Human Drugs: From Receptors to Enzymes." Lerner Research Institute, The Cleveland Clinic Foundation, Cleveland, OH. October 10, 2002.
10. "Structural Insights into Drug Recognition and Metabolism: From Receptors to Enzymes." Department of Biochemistry, UT Southwestern Medical Center, Dallas, TX; January 23, 2003.
11. "Drugs, Receptors and Enzymes: Structural Insights into Molecular Promiscuity." Biological Chemistry Seminar Series, Department of Chemistry, University of North Carolina at Chapel Hill; February 5, 2003.
12. "The Promiscuous Recognition and Metabolism of Human Drugs: From Receptors to Enzymes." University of North Carolina at Greensboro, Department of Chemistry and Biochemistry, Greensboro, NC. February 7, 2003.
13. "The Recognition and Clearance of Human Drugs Like Heroin and Cocaine." North Carolina Central University, Departments of Biology, Chemistry and Physics, Durham, NC. April 25, 2003.
14. "Structural Determinants of PXR Function." Environmental Protection Agency, Research Triangle Park, NC; June 5, 2003.

15. "Human Drug Recognition and Elimination by Directed Promiscuity." University of North Carolina at Chapel Hill, Department of Pharmacology, Chapel Hill, NC. September 2, 2003.
16. "Precision and Promiscuity in Drug Action and Metabolism." University of North Carolina at Chapel Hill, Department of Medicinal Chemistry, School of Pharmacy, Chapel Hill, NC. December 4, 2003.
17. "Structural and Functional Analysis of Human PXR." National Institutes of Environmental Health Sciences, Research Triangle Park, NC. April 6, 2004.
18. "Structural Basis of Drug Recognition and Narcotic Metabolism." Wake Forest University School of Medicine, Winston-Salem, NC. April 20, 2004.
19. "Human Drug Recognition and Metabolism." Division of Drug Delivery and Disposition, UNC School of Pharmacy, Chapel Hill, NC. September 28, 2004.
20. "Structural Insights into Drug Recognition and Metabolism." Department of Environmental and Molecular Toxicology, North Carolina State University, Raleigh, NC. October 19, 2004.
21. "Drug Recognition and Metabolism." Hettleman Prize Lecture, University of North Carolina at Chapel Hill, Chapel Hill, NC. November 3, 2004.
22. "Playing Molecular Defense: Structural Insights into Drug Detection and Metabolism." Department of Chemistry, Eastern Carolina University, Greenville, NC. February 4, 2005.
23. "Playing Molecular Defense: Structural Insights into Drug Detection and Metabolism." Structure and Chemistry Seminar Series, The Scripps Research Institute, La Jolla, CA. February 24, 2005.
24. "Playing Molecular Defense: Structural Insights into Drug Detection and Metabolism." Department of Chemistry and Biochemistry, University of California at Los Angeles, Los Angeles, CA. February 25, 2005.
25. "Human Nuclear Receptors in the Development and Treatment of Disease." Pathology Grand Rounds, School of Medicine, University of North Carolina at Chapel Hill, Chapel Hill, NC. August 18, 2005.
26. "DNA Manipulation by Conjugative Relaxases: Implications for Antibiotic Resistance Propagation." Department of Biochemistry and Biophysics, University of North Carolina at Chapel Hill, Chapel Hill, NC. November 10, 2005.
27. "Combating Antibiotic Resistance Using Structural and Chemical Biology." Department of Chemistry and Biochemistry, University of Texas at Austin, Austin, TX. February 17, 2006.
28. "Combating Antibiotic Resistance Using Structural and Chemical Biology." Department of Chemistry, Wake Forest University, Winston-Salem, NC. March 1, 2006.
29. "Human Nuclear Receptors in Drug and Endobiotic Homeostasis." Department of Molecular and Cellular Biochemistry, The Ohio State University, Columbus, OH. April 18, 2006.
30. "Combating Antibiotic Resistance Using Structural and Chemical Biology." Department of Biological Sciences, Vanderbilt University, Nashville, TN. May 4, 2006.
31. "Human Nuclear Receptors: Ancient Precursors and Modern Marvels." Department of Chemistry, UNC Chapel Hill. September 13, 2006.
32. "Crystal Structure of an Ancient Protein: Evolution by Conformational Epistasis." Receptor Mechanisms Discussion Group, National Institutes of Environmental Health Sciences, Research Triangle Park, NC; April 3, 2007.
33. "Motion and Antagonism of the Human Nuclear Xenobiotic Receptor PXR." Department of Biochemistry, Albert Einstein College of Medicine, Bronx, NY; May 1, 2007.
34. "Human Nuclear Receptors: Ancient Precursors and Modern Marvels." Department of Biochemistry and Biophysics, Johns Hopkins School of Medicine, Baltimore, NJ; May 9, 2007.
35. "Killing Antibiotic Resistant Bacteria and Disrupting Resistance Propagation." Department of Chemistry and Biochemistry, University of North Carolina at Greensboro; September 7, 2007.
36. "Motion and Antagonism in the Human Nuclear Xenobiotic Receptor PXR." Structural Biology and Biophysics Program, Duke University; December 3, 2007.
37. "Targeting Antibiotic Resistant Bacteria by Disrupting Resistance Propagation." St. Jude Children's Research Hospital, Memphis, TN; March 5, 2008.
38. "Targeting Antibiotic Resistant Bacteria by Disrupting Resistance Propagation." Emory University, Atlanta, GA. April 28, 2008.
39. "Targeting Antibiotic Resistant Bacteria by Disrupting Resistance Propagation." Utah State University, Logan, UT. November 12, 2008.
40. "Targeting Antibiotic Resistant Bacteria by Disrupting Resistance Propagation." Purdue University, West Lafayette, IN. January 14, 2009.
41. "Waging the Battle Against Antibiotic Resistant Bacteria." 2009 UNC Mini Medical School, Chapel Hill, March 10, 2009.

42. "Inhibiting GI Targets to Improve Antibiotic and Anticancer Drug Efficacy." Center for Gastrointestinal Biology and Disease, University of North Carolina at Chapel Hill, April 23, 2009.
43. "Structural Studies of Microbial Targets: Drug Resistance, Efficacy and Infection." Loyola University School of Medicine, Chicago, IL. May 13, 2009.
44. "Structural Studies of Microbial Targets: Drug Resistance, Efficacy and Infection." University of North Carolina at Chapel Hill. September 23, 2009.
45. "From Atomic Structure to Bacterial Disruption: Molecular Insights into Microbial Mobility and Chemotherapeutic Efficacy." Wake Forest University School of Medicine, Winston-Salem, NC. April 6, 2010.
46. "From Atomic Structure to Cellular Function: Chemistry in the Biological Realm." Keynote Speaker, Blue Ridge Section, American Chemical Society, Annual Awards Banquet. Radford University, Radford, VA. April 14, 2010.
47. "Structural Insights into Microbial Function." Department of Microbiology and Immunology, University of North Carolina at Chapel Hill; October 26, 2010.
48. "Structural Insights into Microbial Function." Highlands Chemistry Seminar Series, Virginia Tech, Blacksburg, VA; October 29, 2010.
49. "Structure-Function Analysis of Microbial Enzymes and Factors." Molecular and Cellular Biophysics Seminar Series, University of North Carolina at Chapel Hill; April 12, 2011.
50. "Structural Insights into Microbial Function." Department of Biochemistry and Biophysics, Washington University School of Medicine, St. Louis, MO; May 25, 2011.
51. "How Bacteria Help and Hurt Us." Department of Biochemistry, University of Maryland School of Medicine, Baltimore, MD; October 24, 2011.
52. "Designing and Implementing Mentoring Programs for Early-Career Faculty." UNC Center for Faculty Excellence; January 27, 2012.
53. "Some Ups and Downs of Bacterial Symbiosis." Epithelial Cell Biology Seminar Series, UNC Chapel Hill; March 2, 2012.
54. "A Walk after Dinner: Unbalance in Human-Microbial Symbiosis." Molecular Biology Institute Seminar Series, University of California, Los Angeles; March 15, 2012.
55. "Imbalances in Human-Bacterial Symbiosis." National Institutes of Environmental Health Sciences, Research Triangle Park, NC; April 19, 2012.
56. "Regulating Symbiotic Bacteria in Your Body." Keynote Speaker; Cellular, Molecular and Biomedical Sciences Program Retreat, University of Vermont, Grande Isle Lake House, VT; August 15, 2012.
57. "Regulating Symbiotic Bacteria in Your Body." Structural Genomics Consortium, Oxford University, Oxford, UK; September 6, 2012.
58. "Drugging the Human Microbiome." University of Virginia, Department of Chemistry, January 25, 2013.
59. "Modulating Microbiology Using Structural and Chemical Biology." Department of Microbiology and Immunology, University of Michigan, March 7, 2013.
60. "Nuclear Receptor State and Structure." National Institutes of Environmental Health Sciences, RTP, NC, April 2, 2013.
61. "Interrogating Human-Microbial Dynamics using Structural and Chemical Biology." Department of Biochemistry, Duke University School of Medicine, May 6, 2013.
62. "Atomic Insights into Human Disease." University of Durham, Durham, United Kingdom; October 29, 2013.
63. "Atomic Insights into Human Disease." Structural Genomics Consortium, University of Oxford, United Kingdom; December 13, 2013.
64. "The Human Microbiome Can Be Safely and Selectively Modulated for Therapeutic Gain." John Innes Centre; Norwich, UK. 6 May 2014.
65. "Microbial Symbiosis at the Mucosa: Molecular and Chemical Insights." University of Glasgow, Scotland, UK. 20 May 2014.
66. "Controlling the Microbiota at the Epithelia Mucosa." Rutgers University, Piscataway, NJ. 16 October 2015.
67. "Pharmaceutical Control of the Microbiota for Improved GI Health." Center for Gastrointestinal Biology and Disease, UNC-NC State, Chapel Hill, NC. 21 January 2016.
68. "Pharmacological Control of the Intestinal Microbiota." Distinguished Lecture in Life Sciences, Huck Institutes of the Life Sciences. Pennsylvania State University, State College, PA. 23 February 2016.
69. "Drugging the Microbiome." Biochemistry Department, UCSF, San Francisco, CA. 17 May 2016.
70. "Drugging the Microbiome." Microbiology and Immunology, Stanford University, Palo Alto, CA. 18 May 2016.

71. "Pharmaceutical Control of the Microbiome." Microbiome Working Group Seminar Series, Food and Drug Administration; Silver Spring, MD. 4 August 2016.
72. "Drugging the Microbiome." Department of Chemistry, Vanderbilt University, Nashville, TN. 19 September 2016.
73. "Treating Disease through the Gut Microbiota." Department of Chemistry, IUPUI, and Department of Biochemistry, IU School of Medicine, Indianapolis, IN. 19 April 2017.
74. "Treating Disease through the Gut Microbiota: Structural and Chemical Insights." Department of Chemistry and Chemical Biology, Harvard University. 10 May 2017.
75. "Targeted Control of the Gut Microbiome." School of Public Health, University of Washington, Seattle, WA; 24 January 2018
76. "Precision Control of the Gut Microbiome." ASRC City College of New York Seminar Series in Biochemistry, Biophysics and Biodesign, New York, NY; 18 April 2018.
77. "Precision Control of the Gut Microbiome." Icahn School of Medicine at Mt. Sinai, Department of Pharmacological Sciences, New York, NY; 19 April 2018.

#### **INVITED CONFERENCE LECTURES**

1. "Crystal Structures of Human Topoisomerase I DNA Complexes and a Proposed Binding Mode of the Anti-Cancer Drug Camptothecin." 11<sup>th</sup> Naito Conference on Structural Genomics – Passage to Drug Design, Shonan Village Center, Kanagawa, Japan; October 15, 1999.
2. "The DNA-Binding and Relaxation Activities of Human Topoisomerase I." RIKEN Symposium on Structural Biology of Signal Transduction and DNA Recognition, Tokyo, Japan; October 12, 1999.
3. "The Human Nuclear Xenobiotic Receptor PXR: How is Promiscuity Achieved?" 29<sup>th</sup> Annual Mid-Atlantic Protein Crystallography Meeting; Williamsburg, VA; May 24, 2001.
4. "The Human Nuclear Xenobiotic Receptor PXR: Structural Determinants of Directed Promiscuity." Gordon Research Conference on Drug Metabolism; Holderness School, Plymouth, NH; July 10, 2001.
5. "The Werner Syndrome Exonuclease Forms a Hexamer on DNA and Exhibits Novel Nuclease Functions." 2002 Keystone Symposium: *Helicases, Cancer and Aging*; Lake Tahoe, CA, March 13, 2002.
6. "Structural Basis of the Activation of Human PXR by the St. John's Wort Compound Hyperforin." 2002 Keystone Symposium: *Nuclear Receptor Superfamily*; Snowbird, UT, April 14, 2002.
7. "The Human Nuclear Xenobiotic Receptor PXR: Structural Determinants of Directed Promiscuity." 19<sup>th</sup> Congress of the International Union of Crystallography, Geneva, Switzerland; August 23, 2002.
8. "The Human Nuclear Xenobiotic Receptor PXR: Structural Determinants of Directed Promiscuity." *Annual National Meeting of the American Society for Pharmacology and Experimental Therapeutics*, part of the Experimental Biology National Meeting. San Diego, CA. April 14, 2003.
9. "The Human Nuclear Xenobiotic Receptor PXR: Structural Determinants of Directed Promiscuity." *Nuclear Receptors as Drug Targets*, presented by IBC Life Sciences. Philadelphia, PA. May 20, 2003.
10. "Structural Determinants of PXR Function." Nuclear Receptor Regulation of Hepatobiliary Function. The American Association for the Study of Liver Diseases. Airlie, VA. May 30, 2003.
11. "Structure and Function of Human LRH-1: Monomeric Regulation of P450 Expression." 14<sup>th</sup> International Symposium on Cytochrome P450: Biochemistry, Biophysics and Bioinformatics. Dallas, TX. June 1, 2005.
12. "Securing Tenure." HHMI-Burroughs Wellcome Fund Course in Scientific Management. Chevy Chase, MD. June 8, 2005.
13. "DNA Conjugation as an Antibiotic Target." Gordon Conference on New Antimicrobial Discovery and Development. Ventura, CA. March 9, 2006.
14. "Human Nuclear Receptors in Drug and Endobiotic Homeostasis." 36<sup>th</sup> Annual Mid-Atlantic Protein Crystallography Meeting, Wake Forest University, June 2, 2006.
15. "Intellectual Property and the Assistant Professor: Valuing Technology Transfer for Young Faculty." Burroughs Wellcome Fund Annual Executive Board Meeting, Research Triangle Park, NC; October 26, 2006.
16. "Novel Protein-Based Therapeutics for Nerve Agent Detoxification." 1<sup>st</sup> Annual CounterACT Symposium, Washington, DC; April 26, 2007.
17. "Motion and Antagonism of the Human Nuclear Xenobiotic Receptor PXR." International Conference on Computational Toxicology, EPA, Research Triangle Park, NC; May 21, 2007.

18. "Novel Protein-Based Therapeutics for Nerve Agent Detoxification." 2<sup>nd</sup> Annual CounterACT Symposium, Washington, DC; April 17, 2008.
19. "Motion and Antagonism in the Human Nuclear Xenobiotic Receptor PXR." The Endocrine Society's 90<sup>th</sup> Annual Meeting, San Francisco, CA; June 15, 2008.
20. "Human Serine Hydrolases Engineered for the Catalytic Decontamination of Chemical Weapons." Army Research Office Workshop on Enzyme Stabilization. Key West, FL; December 9, 2008.
21. "Vitamin D and Bisphosphonates: Advances Beyond Osteoporosis." Meet the Professors Session, Joint Meeting of the International Society for Clinical Densitometry and the International Osteoporosis Foundation, Orlando, FL; March 12, 2009.
22. "Novel Protein-Based Therapeutics for Nerve Agent Detoxification." 3<sup>rd</sup> Annual CounterACT Symposium, Washington, DC; April 14, 2009.
23. "Novel Protein-Based Therapeutics for Nerve Agent Detoxification." 4<sup>th</sup> Annual CounterACT Symposium, San Francisco, CA; June 22, 2010.
24. "Alleviating Cancer Drug Toxicity by Inhibiting a Bacterial Enzyme." National Meeting of the American Crystallographic Association, New Orleans, LA, May 31, 2011.
25. "Novel Protein-Based Therapeutics for Nerve Agent Detoxification." 5<sup>th</sup> Annual CounterACT Symposium, Washington, DC; June 23, 2011.
26. "Life is Great Chemistry." 10<sup>th</sup> Annual NC-OPT Conference on Opportunities in Education, North Carolina State University, Raleigh, NC; October 14, 2011.
27. "Alleviating Drug Toxicity by Inhibiting a Bacterial Enzyme." Keystone Meeting on Challenges in Drug Discovery; Lake Tahoe, CA; March 21, 2012.
28. "Structural Aspects of Human Disease." Protein Structure: from Methods via Structure and Function to Drug Design. Trippenhuis, Amsterdam, Netherlands. September 3, 2012.
29. "Designing Therapeutic Microbes." Cell-Based Therapeutics: The Next Pillar of Medicine. UCSF Center for Systems and Synthetic Biology and *Science Translational Medicine*. UCSF, April 12, 2013.
30. "Modulating the Microbiome for Therapeutic Gain." Keystone Meeting on the Microbiome; Big Sky, MT; April 2, 2014.
31. "Pharmaceutical Control of the Microbiome." Conference on Individualizing Medicine, Mayo Clinic; Rochester, MN; October 8, 2014.
32. "Pharmaceutical Control of the Microbiome." Society of Toxicology Webinar on the GI Microbiota, 22 October 2014.
33. "Pharmaceutical Control of the Microbiome." American Chemical Society National Meeting, Denver, CO; 22 March 2015.
34. Keynote Speaker, 24<sup>th</sup> Annual Beaumont Health System Symposium on Molecular Pathology, Co-Sponsored by the Association for Molecular Pathology; "The Microbiome: A New Lens for Human Disease." Troy, MI; 16 September 2015.
35. "The Microbiome Contains Therapeutic Drug Targets." Food & Drug Administration: Linking the Microbiome to Health, Safety and Regulation. College Park, MD; 30 September 2015.
36. "Moving Science Outside Your Laboratory." Burroughs Wellcome Fund New Awardees Conference. Research Triangle Park, NC; 7 October 2015.
37. "Pharmacological Control of the Microbiome for Therapeutic Gain." New Jersey Drug Metabolism Discussion Group, New Jersey Section, American Chemical Society. Somerset, NJ; 15 October 2015.
38. "Reframing Research Questions: The Biochemistry of the Microbiome." Environmental Health: What's the Human Microbiome Got to Do with It? The National Academies of Sciences, Engineering, and Medicine. January 14, 2016. Washington, D.C.
39. "Control of the Microbiome with Targeted Novel Therapeutics." 21<sup>st</sup> Annual Sealy Center for Structural Biology Symposium. University of Texas Medical Branch. 23 April 2016. Galveston, TX.
40. "Drugging the Microbiome." Rozman Symposium 'No Guts, No Glory. The Importance of the Gut Microbiome.' Drug Metabolism Discussion Group of Delaware Valley. 8 June 2016. Langhorne, PA.
41. "Drugging the Microbiome." Environmental Health Sciences FEST, NIEHS National Conference; 8 December 2016. Durham, NC.
42. "Treating Disease through the Gut Microbiota." RTP Drug Metabolism Discussion Group 2017 Winter Symposium; 7 March 2017. Research Triangle Park, NC.
43. "Targeting the Gut Microbiota to Improve Human Health." Merck Symposium on The Human Microbiome: Translating Research into Discovery. Merck Exploratory Science Center, Boston, MA. 9 May 2017.

44. "Treating Disease through the Gut Microbiota." North Carolina Microbiome Symposium. North Carolina Biotechnology Center, Research Triangle Park, NC. 15 May 2017.
45. "Targeted Inhibitors for the Gut Microbiome." Eighth RTP Rodent Pathology Course, Research Triangle Park, NC. 19 September 2017.
46. "Bugs and Drugs: Flipping the Paradigm." Precision Health Forum, University of Illinois School of Medicine, Chicago, IL. 8 November 2017.
47. "Precision Microbiome-Targeted Inhibitors to Control the Microbiota's Influence on Cancer Care." Keystone Meeting on Microbiome, Host Resistance and Disease. Fairmont Banff Springs, Banff, Alberta, Canada. 8 March 2018.
48. "Targeted Control of the Gut Microbiome: from Drugs to Environmental Toxins." Society of Toxicology Annual Meeting, San Antonio, TX. 14 March 2018.
49. "Precision Control of the Gut Microbiome." PharmSci 2018 Conference, Eshelman School of Pharmacy, UNC; Chapel Hill, NC; 4 June 2018.

### **INVITED INDUSTRY LECTURES**

1. "Crystal Structures of Human Topoisomerase I DNA Complexes and a Proposed Binding Mode of the Anti-Cancer Drug Camptothecin." Glaxo Wellcome, Research Triangle Park, NC; November 15, 1999.
2. "Drug Detection and Gene Regulation by Human PXR." Syrrx Pharmaceuticals; San Diego, CA; September 5, 2001.
3. "Structural Determinants of PXR Function." Lilly Pharmaceuticals, Sphinx Chemistry Division, Research Triangle Park, NC; June 4, 2003.
4. "Drug Recognition by Human PXR." Lilly Pharmaceuticals, Indianapolis, IN; July 22, 2003.
5. "Human Nuclear Receptors in the Development and Treatment of Disease." Pfizer Global Research and Development. Ann Arbor, MI; November 15, 2005.
6. "Human Nuclear Receptors in the Development and Treatment of Disease." Pharmacoepia, Inc. Princeton, NJ; December 6, 2005.
7. "Antibiotic Resistance Propagation as an Antibiotic Target." Merck Pharmaceuticals, Rahway, NJ; September 19, 2006.
8. "Motion and Antagonism in the Human Nuclear Xenobiotic Receptor PXR." Schering Plough Research Institute. Kenilworth, NJ; May 16, 2007.
9. "Motion and Antagonism in the Human Nuclear Xenobiotic Receptor PXR." Sanofi-Aventis, Bridgewater, NJ; February 5, 2009.
10. "Regulating Symbiotic Bacteria in Your Body." Cubist Pharmaceuticals, Lexington, MA; October 5, 2012.
11. "The Human Microbiome Can Be Safely and Selectively Modulated for Therapeutic Gain." Novartis Institute for Biomedical Research, Boston, MA. 14 May 2014.
12. "Pharmaceutical Control of the Microbiome." Novartis Institute for Biomedical Research, Boston, MA. 22 July 2016.
13. "Treating Disease through the Gut Microbiota." Lilly Research Laboratories, Eli Lilly and Company, Indianapolis, IN. 18 April 2016.
14. "Targeted Inhibitors for the Gut Microbiome: Chemotherapy and Beyond." Merck Exploratory Science Center, Cambridge, MA; 19 October 2017.

### **UNIVERSITY TEACHING**

**Chemistry 131, "Nucleic Acid Chemistry."** 3 hours. Detailed functional, structural and chemical nature of the roles nucleic acids in play in biological chemistry and cellular biology.

Spring 2000: 43 students

Spring, 2001: 50 students

Spring 2002: 43 students

Spring 2004: 36 students

**Chemistry 232, "Seminars in Biological Chemistry."** 2 hours. Weekly seminars on biological chemistry from national and international speakers.

Spring, 2000: 12 students

Fall, 2012: 8 students

**Chemistry 233, “Current Literature in Biological Chemistry.”** 2 hours. Recent publications in biological chemistry are examined in a round-table type format. Graduate students at all stages participate and take turns choosing papers and leading discussion.

Fall, 2002: 17 students

**Chemistry 236, “Macromolecular Crystallography Methods.”** 2 hours. Cross-listed as Biochemistry and Biophysics 157. Taught with Professor Edward Collins (Depts. of Microbiology and Immunology, Biochemistry and Biophysics). Hands-on practical macromolecular crystallography including integration of theory with laboratory methods. Students determine the crystal structure of lysozyme from start to finish – crystallization, x-ray data collection and processing, experimental phasing by molecular replacement and multiple isomorphous replacement, model building and structure refinement by maximum likelihood methods, structure validation and assessment.

Spring, 2001: 6 students (New course)

Spring, 2003: 9 students

Spring, 2005: 10 students

Spring, 2007: 5 students

Spring, 2009: 10 students

**Chemistry 431, “Macromolecular Structure and Metabolism.”** 3 hours. Detailed functional, structural and chemical nature of the proteins and nucleic acids in biological chemistry and cellular biology.

Fall, 2004: 45 students (New course)

Fall, 2005: 42 students

Fall, 2006: 40 students

Fall, 2008: 65 students

**Chemistry 438, “Macromolecular Structure and Human Disease.”** 1 hour. Examining the role that protein and nucleic acid structure plays in disease treatment and understanding disease development.

Spring, 2006: 10 students (New course)

Fall, 2008: 8 students

Fall, 2010: 6 students

**Chemistry 430, “Introduction to Biological Chemistry.”** 3 hours. Introduction to biochemistry for chemistry and biochemistry majors.

Fall, 2007: 200 students

Fall, 2012: 200 students

Fall, 2014: 231 students

Fall, 2015: 257 students

Summer, 2017; 19 UNC students; University of Grenoble-Alps, part of UNC Study Abroad

**Chemistry 430H, “Honors Introduction to Biological Chemistry.”** 3 hours. Introduction to biochemistry for chemistry and biochemistry majors in the Carolina Honors Program.

Fall, 2016: 26 students

**Chemistry 732, “Advances in Macromolecular Structure and Function.”** 3 hours. Graduate course in biological chemistry.

Fall, 2017, 6 students.

## PERSONNEL MENTORED

Total Cumulative Trainees, 1999-present: **108**

Total Cumulative Graduate, Postdoctoral Trainees, 1999-present: **41**

## POSTDOCTORAL FELLOWS MENTORED (8 total to date)



1. **Eric A. Ortlund, Ph.D.** (University of South Carolina); November 1, 2002 – July 31, 2007.  
Current Title: *Associate Professor, Department of Biochemistry, School of Medicine, Emory University, Atlanta, GA*
2. **Laura M. Guogas, Ph.D.** (Harvard University); February 28, 2005 – December 1, 2007. NIH Postdoctoral Fellow.  
Current Title: *Laboratory Research Director, Duke Human Vaccine Institute.*
3. **Kimberly T. Lane, Ph.D.** (Duke University); SPIRE Fellow. June 1, 2006 – July 25, 2008.  
Current Title: *Assistant Professor, Radford University, Radford, VA.*
4. **Brian Hogan, Ph.D.** (UNC); June 1, 2005 – July, 2006.  
Current Title: *Teaching Associate Professor, UNC Chapel Hill.*
5. **Michael J. Miley, Ph.D.** (Washington University); October 1, 2004 – November 1, 2008.  
Current Title: *Technology Scientist, GE Healthcare.*
6. **Krystle McLaughlin, Ph.D.** (University of Rochester); SPIRE Fellow. October 1, 2011 – June, 2014.  
Current Title: *Assistant Professor, Vassar College.*
7. **Aadra Bhatt, Ph.D.** (UNC Chapel Hill); 1 Jan 2015 – 30 June 2018.  
Current Title: *Research Assistant Professor, Department of Medicine, UNC School of Medicine.*
8. **Naimee Mehta, Ph.D.** (Kansas); January 1, 2017 – 3 July 2018.  
Current Title: *Research Scientist in biotechnology company, San Diego.*

**GRADUATE STUDENTS MENTORED (32 total to date)**

1. **Diem-Thu Thieu Leshner, Ph.D.**, Department of Chemistry, June 1, 2000 – March 29, 2004. *Currently Lecturer in Chemistry at the College of Charleston.*
2. **Jill E. Chrencik, Ph.D.**, Department of Chemistry, June 1, 2000 – February 23, 2004. *Currently Senior Research Scientist at Pfizer, Inc.*
3. **Sompop Bencharit, D.D.S., Ph.D.**, School of Dentistry, June 1, 2000 – November, 2004. *Currently Associate Professor, School of Dentistry, Virginia Commonwealth University.*
4. **Ryan E. Watkins, Ph.D.**, Biophysics Program, Department of Biochemistry & Biophysics, June 1, 2000 – January, 2004. *Currently Core Facility Director at M.D. Anderson Cancer Center, Houston, TX.*
5. **Schroeder M. Noble, Ph.D.**, Biophysics Program, Department of Biochemistry & Biophysics, June 1, 2001 – July 30, 2005. *Currently Laboratory Research Director at Walter Reed Army Institute of Research, Silver Spring, MD.*
6. **Virginia Carnahan, M.S.**, NSF Predoctoral Fellow, Biophysics Program, Department of Biochemistry & Biophysics, June 1, 2002 – June 15, 2007. *Not currently in science.*
7. **Christopher Fleming, Ph.D.**, Biophysics Program, Department of Biochemistry & Biophysics, April 15, 2003 – June 30, 2007. *Currently Senior Research Scientist, Syngenta, Inc.*
8. **Denise Teotico, Ph.D.**, Department of Chemistry, April 15, 2003 – June 29, 2007. *Currently Research Scientist, GlaxoSmithKline.*
9. **Jillian Orans, Ph.D.**, Department of Chemistry, December 1, 2002 – Dec., 2007. *Currently Research Scientist in Research Triangle Park, NC.*
10. **Scott Lujan, Ph.D.**, Biophysics Program, Department of Biochemistry & Biophysics, April 15, 2003 – Dec., 2007. *Currently Staff Scientist at NIEHS.*
11. **Yu Xue, Ph.D.**, Department of Chemistry, September, 2000 – November, 2008. *Currently Senior Research Scientist at GlaxoSmithKline.*
12. **Sarah Kennedy, Ph.D.**, Department of Chemistry, May, 2004 – May 15, 2009. *Currently Associate Professor, Radford University, VA.*
13. **Andrew Hemmert, Ph.D.**, Department of Biochemistry & Biophysics, September 15, 2005 – April 15, 2010. *Currently Staff Scientist in industry.*
14. **Yuan Cheng, Ph.D.**, Department of Biochemistry & Biophysics, September 15, 2005 – March 15, 2011. *Currently Staff Scientist at Bristol Meyers Squibb.*
15. **Joseph Lomino, Ph.D.**, Department of Biochemistry & Biophysics, November 15, 2005 – April 30, 2011. *Currently postdoctoral fellow at the University of Maryland School of Medicine.*
16. **Daniel Yao, M.S.**, Department of Chemistry, October 15, 2007 – May 1, 2011. *Not currently in science.*
17. **Rebekah Potts, M.D., Ph.D.**, Medical Scientist Training Program, UNC, September 1, 2006 – June 30, 2011. *Currently Resident in Psychiatry, UNC Chapel Hill.*

18. **Michael Johnson, Ph.D.**, Department of Biochemistry & Biophysics, May 15, 2007 – Nov. 10, 2011. *Currently Assistant Professor (tenure-track), Department of Immunology, University of Arizona.*
19. **Monica Frazier, Ph.D.**, Department of Biochemistry & Biophysics, May 15, 2007 – March 30, 2012. *Currently a staff scientist at Rho, Inc., Research Triangle Park, NC.*
20. **Denise Little, M.S.**, Department of Chemistry, May 15, 2010 – April 4, 2012. *Currently an Instructor at West Point.*
21. **Jonathan Edwards, Ph.D.**, Department of Biochemistry & Biophysics, December 1, 2007 – April 6, 2012. *Currently a venture capitalist in Geneva, Switzerland.*
22. **Bret Wallace, Ph.D.**, Department of Chemistry, December 15, 2007 – March 26, 2012. *Currently a Senior Research Scientist, Symberix, Inc.*
23. **Adam Roberts, Ph.D.**, Department of Biochemistry & Biophysics, May 15, 2010 – May, 2014. *Currently postdoctoral fellow at Cleveland Clinic.*
24. **Mary Aiken**, NSF Predoctoral Fellow, Department of Chemistry, May 15, 2011 – May, 2014. *Moved to different PhD laboratory.*
25. **Coy Eakes, M.S.**, Department of Chemistry, February 1, 2012 – May, 2014. *Not currently in laboratory science; craft brewer in Copenhagen.*
26. **Rebecca M. Pollet, Ph.D.** NSF Predoctoral Fellow, Department of Biochemistry & Biophysics, May 15, 2012 – July 5, 2016. *Currently postdoctoral fellow at University of Michigan.*
27. **Julianne Huang, Ph.D.** Department of Chemistry, March 15, 2012 – November 28, 2016. *Not currently in science.*
28. **Michael S. Little, Ph.D.** NSF Predoctoral Fellow, Department of Chemistry, June 1, 2013 – May, 18, 2018. *Currently Staff Scientist at Bristol Meyers Squibb.*
29. **Kristin Biernet**, Department of Chemistry, 15 February 2015 – present.
30. **Samuel Pellock**, Department of Biochemistry and Biophysics, 24 April 2015 – present.
31. **Samantha Ervin**, Department of Chemistry, 1 January 2017 – present.
32. **Marissa Bivins**, Department of Pharmacology, 11 April 2018 – present.
33. **Parth Jariwala**, Department of Chemistry, 1 July 2018 – present.

#### **UNDERGRADUATE STUDENTS MENTORED (64 total to date)**

1. **Escher Howard-Williams**, January, 2000 – May, 2001. *Earned MD (UNC).*
2. **Joel Wedd**, January, 2000 – May, 2000. *Earned MD (UNC).*
3. **Scott Kennedy**, January, 2000 – May, 2000. *Earned PhD (UNC).*
4. **Christine Chen**, July, 2003 – May, 2004. *Earned PhD (UCLA).*
5. **Courtney Jones**, September, 2003 – May, 2004. *Earned PhD (UNC).*
6. **Heather Bethea**, September, 2003 – May, 2004. *Earned PhD (UNC).*
7. **Isaac Solomon**, August, 2002 – August, 2005. *Earned MD-PhD (Washington University).*
8. **Janet Hager**, May, 2003 – May, 2005. *Earned JD (Yale).*
9. **Monica Shah**, September, 2004 – May, 2005. *Earned PhD (Emory).*
10. **Jason Bischoff**, October, 2005 – July, 2007. *Earned MD (UNC).*
11. **Jeffrey Keenan**, January, 2005 – August, 2006. *Earned MD (Maryland).*
12. **Druthi Patel**, January, 2005- August, 2006. *Earned MD (UNC).*
13. **Jenny Xue**, July, 2005 – May, 2008. *Earned MD (UNC).*
14. **Doug Ornoff**, October, 2005 – May, 2007. *Earned MD-PhD (UNC).*
15. **Ann Mast**, August, 2006 – May, 2008. *Remained undergraduate at UNC.*
16. **Ying Liu**, August, 2008 – May, 2009. *Remained undergraduate at UNC.*
17. **Josh Almond**, January, 2007 – May, 2008. *Earned PhD (Duke).*
18. **Katie Hooks**, August, 2007 – May, 2008. *Earned MS (Bristol).*
19. **Sara Mishamandani**, August, 2008 – December, 2008.
20. **Karl Shieh**, May, 2007 – May, 2009. *Earned MD (UNC).*
21. **Justin Sperlazza**, January, 2008 – May, 2009. *Earned MD-PhD (Virginia Comm. U.)*
22. **W. Keith Ballentine**, May, 2007 – May, 2009. *Earned MD (UNC).*
23. **Dan McNamara**, January, 2008 – May, 2009. *Earned PhD (UCLA).*
24. **Sung Taek Kim**, September, 2007 – December, 2009.

25. **Lisa Withers**, August, 2008 – July, 2010. *Remained undergraduate at UNC.*
26. **Angela Broadnax**, August, 2009 – August, 2010. *Earned PhD (Wake Forest).*
27. **Sewon Hwang**, August, 2009 – June, 2010. *Earned MD (South Korea).*
28. **Taylor Pardue**, August, 2009 – May, 2010. *Remained undergraduate at UNC.*
29. **Franklin Niblock**, January 2010 – December 2010. *Remained undergraduate at UNC.*
30. **William Gray**, February, 2010 – May, 2011. *Earned PhD (Yale).*
31. **Christina Anyikwa**, June, 2010 – June, 2011. *Moved to medical school.*
32. **Christopher K. (Brian) Garrett**, June, 2010 – August, 2011. *Earned PhD (UNC).*
33. **Garrick Talmage**, February, 2010 – May 1, 2012. *Earned MD (Univ. Chicago).*
34. **Eileen Tran**, September, 2011 – May, 2014. *Moved to MS program.*
35. **Herodes Guzman**, August, 2011 – May, 2013. *Moved to MD program (UNC).*
36. **Sara Robinson**, September, 2012 – May, 2014. *Moved to Physical Therapy program.*
37. **Christian Adams**, March, 2012 – June, 2013. *Remained undergraduate at UNC.*
38. **Sarah McShane**, November, 2012 – April, 2015. *Moved to MD program.*
39. **Jeff Hymes**, January, 2013 – May, 2014. *Earned MS (NC State). Working in pharmaceutical industry.*
40. **James Ingle**, January, 2013 – May, 2014. *Working in pharmaceutical industry.*
41. **Erin Moore**, May, 2014 – April, 2015. *Moved to laboratory technician position at UNC.*
42. **Kunal Patel**, August, 2012 – April, 2015. *Moved to MD program (UNC Chapel Hill).*
43. **Emma D'Agostino**, May, 2014 – May, 2016. *Moved to PhD program (Emory).*
44. **Adair London**, August, 2014 – May, 2016. *Moved to MD program (UNC Chapel Hill).*
45. **Shouri Gottiparthi**, May, 2015 – April, 2016. *Remained undergraduate at UNC.*
46. **Loraine Patterson**, October, 2015 – June, 2017. *Moved to be technician at UNC School of Medicine lab.*
47. **Ben Creekmore**, October, 2015 – May, 2018. *Moved to MD/PhD program at UPenn.*
48. **Bich Ngoc (Jade) Tran**, October, 2015 – May, 2018. *Moved to MS program at UNC.*
49. **Kristen Segars**, November, 2015 – May, 2016. *Moved to MD-PhD program at Boston University.*
50. **Rohini Bahethi**, November, 2015 – May, 2017. *Moved to MD program.*
51. **Dariana Torres Rivera**, May – August, 2016. *Returned to the University of Puerto Rico.*
52. **Hanna Isenberg**, August, 2016 – December, 2016. *Moved to veterinary sciences.*
53. **Peter Cooke**, January, 2017 – May, 2017. *Moved to be technician at UNC School of Medicine lab.*
54. **Josh Gray**, January, 2017 – May, 2018. *Moved to MD program at Johns Hopkins.*
55. **Jerry Wei**, January, 2017 – present.
56. **Michael Snider**, February, 2017 – present.
57. **Andrew Cesmat**, May, 2017 – present.
58. **Caroline Hopkins**, August, 2017 – present.
59. **Miles Farlow**, August, 2017 – June, 2018. *Remained undergraduate at UNC.*
60. **Grace Bergan**, August, 2017 – present.
61. **Trevor Reid**, January, 2018 – present.
62. **James Horng**, January, 2018 – present.
63. **Ben Carry**, March, 2018 – present.
64. **Angela Rivera**, SOLAR student, University of Arizona, May – July, 2018.

#### **HIGH SCHOOL STUDENTS MENTORED (3 total to date)**

1. **Ari Sanders**, Project SEED, Durham, NC; *Entered Davidson College in Fall, 2003*
2. **Collin Emerson**, June 1-August 15, 2003. *Entered Princeton University in Fall, 2004*
3. **Sloane Miller**, June – August, 2010, June – August, 2011. *Entered UNC Chapel Hill in Fall, 2011.*