Christina R. Bourne

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Education and Professional Employment

2014 - current	**Assistant Professor** Biochemistry and Structural Biology	**University of Oklahoma** Dept. Chemistry and Biochemistry, Norman, OK
2012 **2007-2012**	**Associate Research Scientist** **Assistant Research Scientist** Supervisor: William W. Barrow, Ph.D.	**Oklahoma State University** Dept. Veterinary Pathobiology, Stillwater, OK
2005-2007	**Mary Horton Postdoctoral Fellow** **American Cancer Society**	**OU Health Sciences Center** Dept. Biochem and Molecular Biol, Okc, OK
2003-2005	**Postdoctoral Fellow** Mentor: Adam Zlotnick, Ph.D.	
2003	**Adjunct Instructor**	**Oklahoma City Community College** Science Division, Okc, OK
1998-2003	**Doctor of Philosophy** Mentor: Allen B. Edmundson, Ph.D.	**University of Oklahoma Health Sciences Center** Dept. Biochem and Molecular Biol **Oklahoma Medical Research Foundation** Dept. of Crystallography, Okc, OK
1997-1998	**Associate Research Technician**	**Oklahoma Medical Research Foundation** Dept. of Crystallography, Okc, OK
1992-1997	**Bachelor of Science** Mentor: C. LeRoy Blank, Ph.D.	**University of Oklahoma** Dept. of Chemistry, Norman, OK

Professional Activities

- Member, OU Macromolecular Crystallography Laboratory Advisory Committee (2017 – present)
- Participant, BioCAT Advanced SAXS Training Course, Argonne National Laboratory, Argonne, Il (2015)
- Member, OU Institutional Biosafety Committee (2015 – present)
- OU Department of Chemistry and Biochemistry Graduate Student Committee (2014 – present)
- Member, Editorial Board, *Scientific Reports* (2014-2017)
- Tech to Trek guest for promoting science careers to young women, Southwestern Okla State U (2015)
- RapiData X-ray Diffraction Data Collection and Structure Solving, National Synchrotron Light Source, Brookhaven National Laboratory, Upton, NY (2014)
- Mentor, Oklahoma State University Women's Mentorship Program (2012 – 2014)

- Member, BEI Resources Scientific Focus Group for Biodefense and High Containment bacteria (2011 – 2013, chair 2012-2013)
- Member, Advisory Board, Journal of Molecular Recognition (2011 – present)
- Guest scientist for Stillwater area "Born to do Science" community outreach program (2010)
- MolSoft2009 Workshop on Modern Drug Target Crystallography and Structure Based Drug Discovery, San Diego, CA (2009)
- RapiData Biology Department participant, National Synchrotron Light Source, Brookhaven National Laboratory, Upton, NY (2000)
- Light Scattering University, Wyatt Technology, Santa Barbara, CA (1998)

Ad Hoc reviewer: (limited to previous 4 years): *ACS Medicinal Chemistry, Acta Crystallographica F, ACS Biochemistry, Computational Biology and Chemistry, Current Topics in Biotechnology, Journal of Infection and Drug Resistance, Intervirology, Journal of Molecular Recognition, Journal of Nanobiotechnology, Medicinal Research Reviews, Nucleic Acids Research, Protein Science, Scientific Reports, Structure, Toxins, Virology*

Member of**:** International Chemical Biology Society (2012 - 2014), American Society for Microbiology (2008 – present), American Society of Virology (2006 – 2007), American Society for Biochemistry and Molecular Biology (2003 – present), American Crystallographic Association (2001 – present), Alpha Epsilon Lambda Honor Society (OUHSC chapter president 2001), American Chemical Society (1998 – 2006)

Teaching Experience

- Research Supervisor of Record: CHEM3440 Mentored Research Experience, CHEM3980 Honors Research, CHEM3990 Independent Study, CHEM 4990 Independent Study, CHEM5960 Directed Readings, CHEM5990 Independent Studies, CHEM6980 Research for Doctoral Dissertation
- Instructor of Record, CHEM5240, Biochemical and Biophysical Methods, Graduate level, 11 weeks (Spring 2017, Spring 2018)
- Instructor of Record, CHEM5210, Molecular Biology, Graduate level, 5.5 weeks (Fall 2015, Spring 2016, Spring 2017, Spring 2018)
- Instructor of Record, CHEM5760 Special Topics in Structural Biology: The Structural Basis of Biomacromolecular Interactions, 5.5 weeks (Spring 2016)
- Organizer, Structural Biology Journal Club (Spring 2015 – current, monthly)
- Instructor of Record, CHEM4923, Senior Project (Fall 2015, Fall 2018)
- Instructor of Record, CHEM3753 Introduction to Biochemical Methods (Fall 2014, Spring 2015, Fall 2016, Fall 2017)
- Director, VetMed Basic Sciences Journal Club (2012 – 2013 Academic Year)
- Guest Lecturer, VMED7114 Veterinary Physiology I, 4 hours contact time, muscle biochemistry (2012)
- Team teaching, BIOC6214 Physical Biochemistry of Macromolecules, 2 lectures, OUHSC (2007)
- Team teaching, BIOC6321 Nuts and Bolts of Crystallography, 3 lectures, OUHSC (2007)
- Adjunct Instructor, BIOC1514 Microbiology of Infectious Disease, Oklahoma City Community College, didactic and laboratory course, 8.5 contact hours per week (summer 2003)

Publications (29 total)

Muthuramalingam M, White JC, Murphy, T., Ames, J., **Bourne CR**. **(2018)** *Under review* "The toxin from a ParDE toxin-antitoxin system found in *Pseudomonas aeruginosa* protects cells from quinolone antibiotic toxicity"

Muthuramalingam M, White JC, **Bourne CR**. **(2016)** Toxin-Antitoxin Modules Are Pliable Switches Activated by Multiple Protease Pathways. Toxins (Basel). Jul 9;8(7) [PMCID: PMC4963847]

Muddala, N.P, Nammalwar, B., Selvaraju, S., **Bourne, C.R.,** Henry, M., Bunce, R.A., Berlin, K.D., Barrow, E.W., Barrow, W.W. **(2015)** Evaluation of new dihydropthalazine-appended 2,4-diaminopyrimidines

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AGAINST *BACILLUS ANTHRACIS*: IMPROVED SYNTHESES USING A NEW PINCER COMPLEX. *Molecules* 20:7222-44. [PMCID: PMC4445145]

Nammalwar, B., **Bourne, C.R.**, Wakeham, N., Bourne, P.C., Barrow, E.W., Muddala, N.P, Bunce, R.A., Berlin, K.D., Barrow, W.W. **(2015)** MODIFIED 2,4-DIAMINOPYRIMIDINE-BASED DIHYDROFOLATE REDUCTASE INHIBITORS AS POTENTIAL DRUG SCAFFOLDS AGAINST *BACILLUS ANTHRACIS*. *Bioorg. Med. Chem.* 23:203-11. [PMCID: PMC4278362]

Nammalwar, B., Muddala, N.P., **Bourne, C.R.**, Henry, M., Bourne, P.C., Bunce, R.A., Barrow, E.W., Berlin, K.D., Barrow, W.W. **(2014)** SYNTHESIS AND BIOLOGICAL EVALUATION OF 2,4-DIAMINOPYRIMIDINE-BASED ANTIFOLATE DRUGS AGAINST *BACILLUS ANTHRACIS*. Molecules 19:3231. [PMCID: PMC4016962]

Bourne, C.R. (2014) UTILITY OF THE BIOSYNTHETIC FOLATE PATHWAY FOR TARGETS IN ANTIMICROBIAL DISCOVERY. *Antibiotics* 3(1):1-28**.** [PMCID: PMC4790348]

Bourne, C.R., Wakeham, N., Nammalwar, B., Tseitin, V., Bourne, P.C., Barrow, E.W., Mylvaganam, S., Ramnarayan, K., Bunce, R.A., Berlin, K.D., Barrow, W.W. **(2013)** STRUCTURE-ACTIVITY RELATIONSHIP FOR ENANTIOMERS OF POTENT INHIBITORS OF *B. ANTHRACIS* DIHYDROFOLATE REDUCTASE. *Biochimica et Biophysica Acta – Proteins and Proteomics* 1834:46-52. [PMCID: PMC3530638]

Nammalwar, B., Bunce, R. A., Berlin, K. D., **Bourne, C. R.**, Bourne, P. C., Barrow, E. W., Barrow, W. W. **(2013)** COMPARATIVE STUDY OF THE FRECH CATALYST WITH TWO CONVENTIONAL CATALYSTS IN THE HECK SYNTHESIS OF 2,4-DIAMINOPYRIMIDINE-BASED ANTIBIOTICS. *Organic Preparations and Procedures International*. 45(1):66-71. [PMCID: PMC3683996]

Nammalwar, B., **Bourne, C.R.**, Bunce, R.A., Wakeham, N., Bourne, P.C., Ramnarayan, K., Mylvaganam, S., Berlin, K.D., Barrow, E.W., Barrow, W.W. **(2012)** INHIBITION OF BACTERIAL DIHYDROFOLATE REDUCTASE BY 6-ALKYL-2,4-DIAMINOPYRIMIDINES. *ChemMedChem* 7:1974-82. [PMCID: PMC3570588]
*Featured on inside cover figure

Barrow, E.W., Clinkenbeard, P.A., Duncan-Decocq, R.A., Perteet, R.F., Hill, K.D., Bourne, P.C., Valderas, M.W., **Bourne, C.R.**, Clarkson, N.L., Clinkenbeard, K.D., Barrow, W.W. **(2012)** HIGH-THROUGHPUT SCREENING OF A DIVERSITY COLLECTION USING BIODEFENSE CATEGORY A AND B PRIORITY PATHOGENS. *Journal of Biomolecular Screening* 17(7):946-56. [PMCID: PMC3700734]

Bourne, C.R., Wakeham, N., Bunce, R.A., Nammalwar, B., Berlin, K.D., Barrow, W.W. **(2012)** CLASSIFYING COMPOUND MECHANISM OF ACTION FOR LINKING WHOLE CELL PHENOTYPES TO MOLECULAR TARGETS. *Journal of Molecular Recognition* 25:216-23. [PMCID: PMC3703735]

Nammalwar, B., Bunce, R.A., Berlin, K.D., **Bourne, C.R.**, Bourne, P.C., Barrow, E.W., Barrow, W.W. **(2012)** SYNTHESIS AND BIOLOGICAL ACTIVITY OF SUBSTITUTED 2,4-DIAMINOPYRIMIDINES THAT INHIBIT *BACILLUS ANTHRACIS*. *European Journal of Medicinal Chemistry* 54:387-96. [PMCID: PMC3408765]

Nammalwar, B., Bunce, R. A., Berlin, K. D., **Bourne, C. R.**, Bourne, P. C., Barrow, E. W., Barrow, W. W. **(2012)** MICROWAVE-ASSISTED HECK SYNTHESIS OF SUBSTITUTED 2,4-DIAMINOPYRIMIDINE-BASED ANTIBIOTICS. *Organic Preparations and Procedures International*. 44(3):281-87. PMIC in progress

Nammalwar, B., Bunce, R.A., Berlin, K.D., **Bourne, C.R.**, Bourne, P.C., Barrow, E.W., Barrow, W.W. **(2012)** APPROACHES TO IODINATED DERIVATIVES OF VANILLIN AND ISOVANILLIN. *Organic Preparations and Procedures International*. 44(2):146-152. [PMCID: PMC3691060]

Bourne, C.R., Barrow, E.W., Bunce, R.A., Bourne, P.C., Berlin, K.D., Barrow, W.W. **(2010)** INHIBITION OF ANTIBIOTIC RESISTANT *STAPHYLOCOCCUS AUREUS* BY THE BROAD-SPECTRUM DIHYDROFOLATE REDUCTASE INHIBITOR RAB1. *Antimicrobial Agents and Chemotherapy* 54(9): 3825-33. [PMCID: PMC2934973]

Bunce, R.A., **Bourne, C.R**., Bourne, P.C., Barrow, E.B., Barrow, W.W., Berlin, K.D. **(2010)** HPLC DETECTION AND ENANTIOMERIC SEPARATION OF (+)- AND (-)-(E)-3-[5-(2,4-DIAMINOPYRIMIDIN-5-YLMETHYL)-2,3-DIMETHOXYPHENYL]-1-(1-PROPYL-1H-PHTHALAZIN-2-YL)PROPENONE, INHIBITORS OF *BACILLUS ANTHRACIS*

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DIHYDROFOLATE REDUCTASE, BY SUPERCRITICAL FLUID CHROMATOGRAPHY. *Proc. Of the Oklahoma Academy of Science* 90:139-142.

Bourne, C. R., Bunce, R. A., Bourne, P. C., Berlin, K. D., Barrow, E. W., Barrow, W. W. **(2009)** CRYSTAL STRUCTURE OF *BACILLUS ANTHRACIS* DIHYDROFOLATE REDUCTASE WITH THE DIHYDROPHTHALAZINE-BASED TRIMETHOPRIM DERIVATIVE RAB1 PROVIDES A STRUCTURAL EXPLANATION OF POTENCY AND SELECTIVITY. *Antimicrobial Agents and Chemotherapy* 53(7): 3065-73. [PMCID: PMC2704665]

Bourne, C. R., Katen, S. P., Fulz, M. R., Packianathan, C., Zlotnick, A. **(2009)** A MUTANT HEPATITIS B VIRUS CORE PROTEIN MIMICS INHIBITORS OF ICOSAHEDRAL CAPSID SELF-ASSEMBLY. *Biochemistry*, 48(8): 1736-42. [PMCID: PMC2880625]

Bourne, C., Lee, S., Venkataiah, B. Lee, A., Korba, B., Finn, M.G., Zlotnick, A. **(2008)** SMALL-MOLECULE EFFECTORS OF HEPATITIS B VIRUS CAPSID ASSEMBLY GIVE INSIGHT INTO VIRUS LIFECYCLE. *Journal of Virology* 82(20): 10262-70. [PMCID: PMC2566253]

Zlotnick, A., Lee, A., **Bourne, C. R.**, Johnson, J. M., Domanico, P. L., Stray, S. J. **(2007)** *IN VITRO* SCREENING FOR MOLECULES THAT AFFECT VIRUS CAPSID ASSEMBLY AND OTHER PROTEIN ASSOCIATION REACTIONS. *Nature Protocols* 2(3): 490-98. [PMCID: PMC2099249] *Cover figure from this manuscript

Bourne, C. R., Finn, M. G., Zlotnick, A. **(2006)** GLOBAL STRUCTURAL CHANGES IN HEPATITIS B CAPSIDS INDUCED BY THE ASSEMBLY EFFECTOR HAP1. *Journal of Virology* 80(22): 11055-61. [PMCID: PMC1642186]

Ramsland, P. A., Terzyan, S. S., Cloud, G., **Bourne, C. R.**, Farrugia, W., Tribbick, G., Geysen, H. M., Moomaw, C. R., Slaughter, C. A., Edmundson, A. B. **(2006)** CRYSTAL STRUCTURE OF A GLYCOSYLATED FAB FROM AN IGM CRYOGLOBULIN WITH PROPERTIES OF A NATURAL PROTEOLYTIC ANTIBODY. *Biochemical Journal*, 395(3): 473-81. [PMCID: PMC1462693]

Stray, S. J., **Bourne, C. R.**, Punna, S., Lewis, W. G., Finn, M. G., Zlotnick, A. **(2005)** A HETEROARYLDIHYDROPYRIMIDINE ACTIVATES AND CAN MISDIRECT HEPATITIS B VIRUS CAPSID ASSEMBLY. *Proceedings of the National Academies of Science USA*, 102(23): 8138-40. [PMCID: PMC1149411]

Terzyan, S. S., **Bourne, C. R.**, Ramsland, P. A., Bourne, P. C., Edmundson, A. B. **(2003)** COMPARISON OF THE THREE-DIMENSIONAL STRUCTURES OF A HUMAN BENCE-JONES DIMER CRYSTALLIZED ON EARTH AND ABOARD U.S. SPACE SHUTTLE MISSION STS-95. *Journal of Molecular Recognition*, 16 (2): 83-90.

(*nee* DeWitt)

Bourne, P. C., Ramsland, P. A., Shan, L., Fan, Z.-C., **DeWitt, C. R**., Shultz, B. B., Terzyan, S. S., Moomaw, C. R., Slaughter, C. A., Guddat, L. W., and Edmundson, A. B. **(2002)** THREE-DIMENSIONAL STRUCTURE OF AN IMMUNOGLOBULIN LIGHT-CHAIN DIMER WITH AMYLOIDOGENIC PROPERTIES. *Acta Crystallographica*, D58, 815-823.

Ramsland, P. A., Upshaw, J. L., Shultz, B. B., **DeWitt, C. R.,** Chissoe, W. F., Raison, R. L., Edmundson, A. B. **(2001)** INTERCONVERSION OF DIFFERENT CRYSTAL FORMS OF FABS FROM HUMAN IGM CRYOGLOBULINS. *Journal of Crystal Growth*, 232, 204-214.

Broyles, R. H., Belegu, V., **DeWitt, C. R**., Shah, S. N., Stewart, C. A., Pye, Q. N., Floyd, R. A. **(2001)** SPECIFIC REPRESSION OF BETA-GLOBIN PROMOTER ACTIVITY BY NUCLEAR FERRITIN. *Proceedings of the National Academies of Science USA*, 98(16), 9145-9150. [PMCID: PMC55387]

Alvarado, U. R., **DeWitt, C. R.,** Shultz, B. B., Ramsland, P. A., Edmundson, A. B. **(2001)** A METHOD FOR GROWING PROTEIN CRYSTALS IN CAPILLARY TUBES. *Journal of Crystal Growth*, 233, 407-414.

Edmundson, A. B., **DeWitt, C. R.,** Goldsteen, B. Z., Ramsland, P.A. **(1999)** PACKING MOTIFS AS PREDICTORS OF THE PROPENSITY OF ANTIBODY FRAGMENTS TO CRYSTALLIZE. *Journal of Crystal Growth*, 196, 276-284.

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Edmundson, A. B., Goldsteen, B. Z., **DeWitt, C. R.,** Fan, Z.-C., Shan, L., Faber, C., Hanson, B. L., Borrebaeck, C. A. K. **(1998)** DESIGNING FABS AND FVS WITH PROPENSITIES TO CRYSTALLIZE. *The Immunologist*, 6, 54-60.

Presentations

Invited Seminar, **Bourne, C.R.** "Functional models of chromosomal ParDE toxin-antitoxin systems", MidWest Regional Meeting of the American Chemical Society, Chemical Biology of Microbial Processes Symposium, Oct. 20th, 2017.

Invited Seminar, **Bourne, C.R.** "Gyrase inhibition by toxin-antitoxin molecules", East Central University, Ada OK, Sept. 8th, 2017.

Invited Seminar, **Bourne, C.R.** "Gyrase inhibition by toxin-antitoxin molecules", University of Exeter Life Sciences Institute, Exeter, UK, May 26th, 2017.

Poster, **Bourne, C.R.**, White, J.C., Dabadi, S., Muthuramalingam, M. "Gyrase inhibition by toxin-antitoxin modules", Sealy Center Structural Biology Symposium, Galveston, TX, May 4th, 2017.

Poster, **Bourne, C.R.,** White, J.C., Dabadi, S., Muthuramalingam, M. "Gyrase inhibition by toxin-antitoxin modules", Experimental Biology Meeting, Chicago, IL, April 23rd, 2017. Abstract published in the FASEB Journal, 31(1) supplement, April 2017.

Oral presentation, **Bourne, C.R.** "Gyrase inhibition by toxin-antitoxin modules", Experimental Biology Meeting Spotlight Talk, Chicago, IL, April 22nd, 2017. (Selected for oral presentation from submitted abstract; highlighted in ASBMB Today Sept. 2017 with quote and picture)

Invited Seminar, **Bourne, C.R.** "Gyrase Inhibition by Toxin-Antitoxin Modules" OU Health Sciences Center, Oklahoma City OK, April 12th, 2017.

Invited Seminar, **Bourne, C.R.** "DNA Gyrase Inhibition by Toxin-Antitoxin Modules" Southwestern Oklahoma State University, Weatherford, OK, Feb. 14th, 2017.

Invited Seminar, **Bourne, C.R.** "Toxin-Antitoxin Modules: Functions in Bacteria" 15th Annual Great Plains Infectious Disease Meeting, University of Kansas, Lawrence, KS, Nov. 5, 2016.

Poster, Muthuramalingam, M., White, J.C., Sharp, K.A., Dabadi, S**., Bourne, C.R.** "Impact of Sequence Variability on the Function of ParE, a Gyrase Inhibiting Bacterial Toxin", 6th Biennial National IDeA Symposium of Biomedical Research Excellence, Washington, D.C., June 27, 2016.

Poster, Mutharamlingam, M., White, J.C., Bourne, P.C., **Bourne, C.R.** "Impact of Sequence Variability on the Function of ParE, a Gyrase Inhibiting Bacterial Toxin" American Crystallographic Association, Philadelphia, PA, July 27, 2015.

Invited Seminar, **Bourne, C.R.** "Toxin-Antitoxin Systems: Roles in Bacterial Survival and Death", Oklahoma State University Department for Microbiology and Molecular Genetics, March 2, 2015.

Oral presentation, **Bourne, C.R.** "Toxin-Antitoxin Systems: Roles in Bacterial Survival and Death", Molecular Cellular Developmental Biology Discussion Group, Norman OK, Sept. 25, 2015.

Honors

- Louis Stokes Alliance for Minority Participation (LSAMP) Outstanding Faculty Mentor Award (2018)
- Mary Horton Postdoctoral Fellowship, American Cancer Society (2005)
- Travel Grant for attendance at the 20th International Union of Crystallography Congress and General Assembly, US National Committee for Crystallography (2005)
- Pauling Poster Prize, American Crystallographic Association Meeting (2003)
- OU Health Sciences Center Student Association Outstanding Leadership Award (2001)
- Ludo Frevel Crystallography Scholarship, International Centre for Diffraction Data (2001)
- Graduate Fellowship in Biomedical Sciences, Oklahoma Medical Research Foundation, OK (2000)

- Lew Wentz Professional and Graduate Studies Scholarship, OU Health Sciences Center, OK (1999)

Current Research Support

Oklahoma Center for the Advancement of Science
HR17-099 07/17 - 12/20
"Targeting bacterial cell metabolism by manipulating toxin-antitoxin systems"
The goal of this project is to identify a small molecule strategy to interrupt the interactions of the ParE gyrase inhibiting toxin with its cognate ParD antitoxin. The results of this study will provide a proof-of-principle for bacterial cell killing by manipulation of conserved TA systems, thereby providing a novel therapeutic intervention strategy.
Role: Principal Investigator

NIH National Institute of General Medical Science
1P20-GM-103640 06/17 - 05/19
"Molecular Interactions of Toxin-Antitoxin Modules in *Pseudomonas aeruginosa*"
This project investigates three TA systems found in the opportunistic pathogen *P. aeruginosa*, and specific objectives are to determine interactions of the two ParE toxins with DNA gyrase and/or DNA, to identify other binding partners of antitoxins, and to build a screening platform to allow identification of growth conditions that trigger activation of TA systems.
Role: Project Leader (PI: Ann West)

Completed Research Support

NIH National Institute of General Medical Science
1P20-GM-103640 06/14 - 05/17
"Probing the potential of the gyrase inhibitor ParE for antibacterial applications"
This project investigates the bactericidal mechanism of a specific bacterial toxin-antitoxin system, ParDE, wherein the ParE toxin protein is known to inhibit DNA gyrase when it is not bound to the ParD antitoxin. The result of this study is expected to provide direct structural information on the site on DNA gyrase that is contacted by ParE, and from that suggest ways to mimic the effect for therapeutic purposes.
Role: Project Leader (PI: Ann West)

University of Oklahoma College of Arts and Sciences Junior Faculty Summer Support
"Molecular mechanisms of bacterial cell adaptation switches" 06/16 – 07/16
Focused preliminary investigation on how and when bacterial toxin-antitoxin systems are activated in the human pathogen *Pseudomonas aeruginosa*; preliminary data used for NIH R21 and state OCAST applications.
Role: Principal Investigator

University of Oklahoma Vice-President for Research Junior Faculty Summer Support
"Biological testing of next generation anti-folate bacterial inhibitors" 06/15 – 07/15
Salary support for PI while training summer undergraduate student in enzyme inhibition studies, with data contributing to a manuscript in progress.
Role: Principal Investigator

University of Oklahoma Vice-President for Research Junior Faculty Summer Support
"Making one key to fit different locks: Designing … inhibit related enzymes" 06/14 – 07/14
Salary support for PI while training summer NSF Research Experience for Undergraduate student in protein purification and crystallization; part of a larger project aimed at a folate pathway inhibitor discovery and development.
Role: Principal Investigator

Oklahoma State University Core Facilities Support

"Upgrade of OSU Macromolecular X-ray Equipment" 11/12 – 12/12
This application replaced the Oxford cryo-cooling system within the X-ray suite, the instrument control computer and virtual server, and added a data processing and visualization system for facility and student use.
Role: Principal Investigator

NIH NIAID Division of Microbiology and Infectious Disease
IDIQ Contract HHSN2722011000201 06/11 – 05/14
"*In Vitro* Assessment for Antimicrobial Activity, PartA: Bacteria and Fungi"
I have implemented real-time PCR techniques to verify bacterial strain genomic profiles and the Phenotype Microarray system (Biolog, Inc.) for inference of mechanism of action of inhibitory compounds; DOJ approved for working with Select Agent strains as needed.
Role: Co-investigator

NIH National Institute for Allergy and Infectious Disease
R01-AI-090685 07/10 - 07/15
"Broad-spectrum Antifolates for Treatment of Drug Resistant *Bacillus anthracis*"
This multidisciplinary research approach includes molecular modeling to design improved activity, synthesis of next generation compounds, testing of activity and will culminate with pre-clinical evaluations in mice. My role was evaluation of the biochemical properties of the newly synthesized inhibitors (MIC, IC_{50}, plasma binding, cytochrome P450 interactions) and determining the three-dimensional structures of the enzyme complexed with the inhibitors.
Role: Co-investigator

Research Advisory Council Seed Award (Internal)
OSU-AE-1-550060 02/10 – 02/11
"Validation of a new Broad-spectrum Antimicrobial Target"
This award has been used to perform proof-of-concept studies on the inhibition of a novel bacterial target with a long-term goal to develop new antimicrobials.
Role: PI

American Cancer Society
PF-05-237-01-GMC 07/05 – 11/07
"Crystallographic Study of Hepatitis B Virus Capsid Assembly and Inhibition"
This study established the structural components required for interfering with virus assembly using small molecules bound by the capsid protein.
Role: Awardee