William F. Walkenhorst

Personal information:

Born: March 24, 1961; Dayton, Ohio, USA
Home Address: 4235 Vincennes Place, New Orleans, LA 70125
Married to Brenda Walkenhorst, 1984.
Children: Amanda b. 1986, Dana b. 1988, William b. 1991

Address: Loyola University New Orleans
Department of Chemistry
6363 St. Charles Avenue
New Orleans, LA 70125
(504) 865 - 3270

Education: University of Wisconsin-Madison
Ph. D., Biochemistry, 1993
Thesis Advisor: John L. Markley
Thesis: Structural Investigations of Ovomucoid Third Domains by NMR Methods

Bradley University, Peoria, IL
B. S., Chemistry, 1983

Honors and Fellowships:

Renan Bu and Monica LeDee
Distinguished Professorship in Chemistry 2013-Present

Loyola University Marquette Research Fellowship 2013
"The Effects of pH and Ionic Strength on the Effectiveness
of Antimicrobial Peptides"

NIH NRSA Postdoctoral Fellowship
Fox Chase Cancer Center, July 1994 to July 1996
Sponsor: Dr. Heinrich Roder

NIH Molecular Biology Training Grant Postdoctoral Fellowship
Fox Chase Cancer Center, 1993-94

Amoco Fellowship, 1990-91, Department of Biochemistry
University of Wisconsin-Madison.

Bradley University Scholarship 1979-1983, Department of Chemistry

National Merit Scholar 1979.

Teaching and Research Experience:

8/2002-Present	Associate Professor, Loyola University New Orleans, LA, Chemistry Department. Teach Biochemistry I (Biomolecular Structure and Function), Biochemistry II (Metabolism and Regulation), Biochemistry lab courses, General Chemistry lecture and laboratory, and Science for Non-majors.
8/97-7/2002	Assistant Professor, Loyola University New Orleans, Chemistry Dept.
8/96-7/97	Villanova University, Philadelphia, PA, Chemistry Department Taught Biochemistry II (Metabolism) and Biochemistry III (Molecular Biology) as well as Organic I lecture and laboratory classes. Taught a three hour course in scientific writing and speaking.
6/93-8/96	Fox Chase Cancer Center, Philadelphia, PA., Structural Biology Group Detailed protein folding studies were conducted on H124L staphylococcal nuclease using rapid mixing and hydrogen exchange techniques to trap slowly exchanging backbone amide protons during refolding. The kinetic pathway of folding was investigated using stopped flow fluorescence and quantitative kinetic modeling.
8/86-5/93	University of Wisconsin-Madison, Department of Biochemistry. Utilized multidimensional NMR techniques to investigate protein structure and folding. Experienced in protein spectral assignment using most standard homonuclear and heteronuclear NMR experiments. A high resolution solution structure was determined for modified turkey ovomucoid third domain inhibitor from more than 700 NMR constraints using metric matrix distance geometry. In addition, ligand binding studies were conducted using multinuclear NMR to determine the mechanism and stereochemistry of binding of several classes of drug molecules to ovomucoid third domains in a collaborative project with the Upjohn Company.
5/85-8/86	Monsanto Corporation, St. Louis, MO. Protein Biochemistry Group, Corporate Research and Development Staff. Was responsible for the synthesis, purification, and screening of two major classes of peptides for serine proteinase inhibitory activity in a number of enzyme systems. Used basic modeling of active site combined with peptide analogs to successfully change inhibitor specificity and activity. Determined thermodynamic K_I's for very tightly binding inhibitors, since these give erroneous results using standard methods for measuring K_I.
7/83-5/85	Monsanto Corporation, St. Louis, MO. Nutrition Chemicals Division. Responsible for the solid-phase synthesis and HPLC purification of GRF (growth hormone releasing factor) analogs tested for growth hormone releasing ability in vivo. Assisted in the design of these peptides using several models of protein secondary structure to interpret structure and activity. Also synthesized compounds tested as substrate and end product type inhibitors of lipoprotein lipase.

Peer Reviewed Publications: (*indicates Loyola University undergraduate researchers)

1. William F. Walkenhorst, *Justine N. Sundrud, and *Joshua M. Laviolette, "Additivity and Synergy Between an Antimicrobial Peptide and Inhibitory Ions". *Biochimica et Biophysica Acta* (Biomembranes – Special Issue: Interfacially Active Peptides) **1838**: 2234-42 (2014).

2. William F. Walkenhorst, *J. Wolfgang Klein, *Phuong Vo, and William C. Wimley, "The pH Dependence of Microbe Sterilization by Cationic Antimicrobial Peptides: Not Just the Usual Suspects". *Antimicrobial Agents and Chemotherapy* **57**: 3312-20 (2013).

3. Rathinakumar, R., Walkenhorst, W.F., and Wimley, W.C., "Broad-Spectrum Antimicrobial Peptides by Rational Combinatorial Design and High-Throughput Screening: The Importance of Interfacial Activity. *J. Am. Chem. Soc.* **131**: 7609–17 (2009).

4. Walkenhorst, W.F., Merzlyakov, M., Hristova, K., and Wimley, W.C., "Polar Residues in Transmembrane Helices Can Decrease Electrophoretic Mobility in Polyacrylamide Gels Without Causing Helix Dimerization. *Biochim Biophys Acta.* **1788**: 1321-31 (2009).

5. Walkenhorst, W.F., *Edwards, J.A., Markley, J.L., and Roder, H. "Early Formation of a Beta Hairpin during Folding of *Staphylococcal Nuclease* H124L as Detected by Pulsed Hydrogen Exchange", *Protein Science* **11**:82-91 (2002).

6. Bishop, C.M., Walkenhorst, W.F., and Wimley, W.C. "Folding of Beta-Sheets in Membranes: Specificity and Promiscuity in Peptide Model Systems", *J. Mol. Biol.* **309**: 975-988 (2001).

7. Green, G.R., *Ferlita, R.R., Walkenhorst, W.F., and Poccia, D.L. "Linker DNA Destabilizes Condensed Chromatin", *J. Biochem. Cell Biol.* **79**: 349-363 (2001).

8. Walkenhorst, W.F., Green S.M., and Roder, H., "Kinetic Evidence for Folding and Unfolding Intermediates in *Staphylococcal Nuclease*", *Biochemistry* **36**: 5795-5805 (1997).

9. Hinck, A.P., Walkenhorst, W.F., Truckses, D.M., and Markley, J.L. "NMR and Mutagenesis Investigations of a Model *Cis:Trans* Peptide Isomerization Reaction: X_{aa}^{116}-Pro^{117} of *Staphylococcal Nuclease* and its Role in Protein Stability and Folding", (review in *Biological NMR Spectroscopy*, Oxford University Press, 133-160 (1996).

10. Pinkerton, T.C., Howe, J.W., Ulrich, E.L., Comiskey, J.P., Haginaka, J., Murashima, T., Walkenhorst, W.F., Westler, W.M., and Markley, J.L. "Protein Binding Chiral Discrimination of HPLC Stationary Phases made with Whole, Fragmented, and Third Domain of Turkey Ovomucoid", *Analytical Chem.* **67**: 2354-2367 (1995).

11. Walkenhorst, W.F., Krezel, A.M., Rhyu, G.I., and Markley, J.L. "Solution Structure of Reactive-Site Hydrolyzed Turkey Ovomucoid Third Domain by Nuclear Magnetic Resonance and Distance Geometry Methods", *J. Mol. Biol.* **242**: 215-230 (1994).

12. Markley, J.L., Hinck, A.P., Loh, S.L., Prehoda, K., Truckses, D., Walkenhorst, W.F., Wang, J. "Case Study of Protein Structure, Stability, and Function: NMR Investigations of the Proline Residues in *Staphylococcal Nuclease*", *Pure and Applied Chemistry*, **66**: 65-69 (1994).

13. Hinck, A.P., Walkenhorst, W.F., Westler, W.M., Choe, S., and Markley, J.L. "Overexpression and Purification of Avian Ovomucoid Third Domains in *Escherichia coli*", *Protein Engineering* **6**: 221-227 (1993).

14. Haginaka, J., Murashima, T., Pinkerton, T.C., Comiskey, J.P., Ulrich, E.L., Markley, J.L., and Walkenhorst, W.F., "Enantioselectivity of Ovomucoid Bonded-Phase HPLC Columns Produced with Isolated Domains," *Kuromatografi* **14**: 100-101 (1993).

15. Wang, J., Mooberry, E.S., Walkenhorst, W.F., Markley, J.L. "Solution Studies of *Staphylococcal Nuclease* H124L. 1. Backbone ^{1}H and ^{15}N Resonances and Secondary Structure of the Unligated Enzyme as Identified by Three-Dimensional NMR Spectroscopy", *Biochemistry* **31**: 911-920 (1992).

16. McWherter, C.A., Walkenhorst, W.F., Campbell, E.J., and Glover, G.I. "Novel Inhibitors of Human Leukocyte Elastase and Cathepsin G. Sequence Variants of Squash Seed Protease Inhibitor with Altered Protease Selectivity", *Biochemistry* **28**: 5708-5714 (1989).

Professional Poster Presentations: (*indicates Loyola University undergraduate researchers)

"Ionic strength and specific ion effects on antimicrobial peptide activity", William F. Walkenhorst, *Joshua M. Laviolet, *Carissa A. Marston, *Justine Sundred, William Wimley, 245th National American Chemical Society Meeting, April 8, 2013

"Ionic strength and specific ion effects on antimicrobial peptide activity", William F. Walkenhorst, *Joshua M. Laviolet, *Carissa A. Marston, *Justine Sundred, William Wimley, Research Day, President's Open House, Loyola University, April 2012 and April 2013.

"Effects of pH and Ionic Strength on the Activity of Antimicrobial Peptides", *Dayamaayi Kurimella, *Jordan Wolfgang Klein, *Andrew V. Scott, W.F. Walkenhorst, President's Open House Spring 2011

"Influence of pH, ionic strength, and surface type on antimicrobial peptide activity" William F. Walkenhorst, *Mary H. Abernathy, *Wolfgang Klein, *Alexa M. Triplett, William C Wimley, 67th Southwest Meeting American Chemical Society, Austin, TX Nov. 9, 2011

"Effects of pH and ionic strength on the activity of antimicrobial peptides", *Wolfgang Klein[1]; *Dayaamayi Kurimel[1]; William Wimley[2], PhD; William F Walkenhorst[1], PhD. [1] Department of Chemistry, Loyola University New Orleans, [2] Tulane University School of Medicine, Department of Biochemistry, Joint Department of Chemistry & Sociology Session, May 2010

"Surface decontamination by antimicrobial peptides", *Dayaamayi Kurimel[1]; *Wolfgang Klein[1]; William Wimley[2], Associate Professor; William F Walkenhorst[1], Associate Professor, [1]Department of Chemistry Loyola University New Orleans, [2] Tulane University School of Medicine, Biochemistry Dept, Joint Department of Chemistry & Sociology Session, May 2010

"Effects of pH and ionic strength on the activity of antimicrobial peptides", *Wolfgang Klein[1]; *Dayaamayi Kurimel[1]; William Wimley[2], PhD; William F Walkenhorst[1], PhD. [1] Department of Chemistry, Loyola University New Orleans, [2] Tulane University School of Medicine, Department of Biochemistry, Joint Regional Meeting American Chemical Society, 62nd Southeast and 66th Southwest Regional Meeting, New Orleans, LA, December 1-4, 2010.

"Surface decontamination by antimicrobial peptides", *Dayaamayi Kurimel[1]; *Wolfgang Klein[1]; William Wimley[2], Associate Professor, PhD; William F Walkenhorst[1], Associate Professor, PhD, [1] Department of Chemistry Loyola University New Orleans, [2] Tulane University School of Medicine, Department of Biochemistry, Joint Regional Meeting American Chemical Society, 62nd Southeast and 66th Southwest Regional Meeting, New Orleans, LA, December 1-4, 2010.

"Effects of Solution Conditions on the Activity of Antimicrobial Peptides", *Dayaamayi Kurimel, *Jordan Wolfgang Klein and William F. Walkenhorst, Department of Chemistry, Loyola University New Orleans, New Orleans, LA, Local Meeting of the American Chemical Society (ACS), Xavier University of Louisiana, October 13, 2010, New Orleans, LA

"Investigating the Effects of pH and Salts On Antimicrobial Peptide Activity" William F. Walkenhorst, Ph.D.[1], *Jessica Cosgrove[1], *Pepper Hanna[1], *Samaneh Khoshini[1], *Dana E. Walkenhorst[1] and William C. Wimley[2], [(1)]Department of Chemistry, Loyola University New Orleans, New Orleans, LA, [(2)]Department of Biochemistry, Tulane University, New Orleans, LA. Local Meeting of the American Chemical Society (ACS), Xavier University of Louisiana, September 30, 2009, New Orleans, LA

Investigating the Effects of pH and Ionic Strength On the Activity of Antimicrobial Peptides William F. Walkenhorst, Ph.D.[1], *Jessica Cosgrove[1], *Pepper Hanna[1], *Samaneh Khoshini[1], *Dana E. Walkenhorst[1] and William C. Wimley[2], (1)Chemistry, Loyola University New Orleans, New Orleans, LA, (2)Department of Biochemistry, Tulane University, New Orleans, LA, 61st Southeastern Regional Meeting of the American Chemical Society, San Juan, Puerto Rico, October 21-24, 2009

Fluorescent Studies of Labeled Transmembrane Helices Reveal a Lack of Interaction Despite Apparent Dimerization on SDS-PAGE Gels, William F. Walkenhorst, *Elena Batista, *Laura Thomas, Loyola University; William C. Wimley, Tulane University Health Sciences Center, 235th National Meeting of the American Chemical Society, April 6-10, 2008 New Orleans, LA

Polar Residues in Transmembrane Helices can Dramatically Decrease Electrophoretic Mobility in Polyacrylamide Gels Without Helix Dimerization; William F. Walkenhorst[1], William C. Wimley[2]. [1]Loyola University, New Orleans, LA, USA, [2]Tulane Health Sciences Center, New Orleans, LA, USA; 51st Annual Biophysical Society Meeting, March 3-7, 2008 Baltimore, MD

Does MS1 Peptide Dimerize in Lipid Vesicles? William F. Walkenhorst, *Carissa Campbell, *Loreny Gamboni, *Courtney Milanese, *Amelia Neuberger, *Laura Thomas, *Laura Sorenson, *Elena Batista, Loyola University New Orleans, and William C. Wimley, Department of Biochemistry, Tulane University, New Orleans LA, poster at Xavier University, Fall 2007

Polar Residues in Transmembrane Helices Can Reduce Mobility on SDS Gels Dramatically Without Driving Dimerization. William F. Walkenhorst, *Carissa Campbell, *Loreny Gamboni, *Courtney Milanese, *Amelia Neuberger, Chemistry Department, Loyola University, New Orleans, LA, William C. Wimley, Department of Biochemistry, Tulane University Health Sciences, poster presented at Texas Protein Folder's Meeting, April 2007

"Investigation of Structure and Stability in a Variant of the C-terminal Fragment of Ovomucoid Third Domain", Ramanan Thirumoorthy, Arthur S. Edison, *Elizabeth C. Skeins and William F. Walkenhorst, Texas Protein Folder's Meeting, Houston, TX, April 26-28, 2002.

"Investigation of Structure and Stability in a Synthetic Variant of the C-terminal Fragment of Ovomucoid Third Domain", Ramanan Thirumoorthy Arthur S. Edison, *Elizabeth C. Skeins and William F. Walkenhorst, 31st Southeast Magnetic Resonance Conference (SEMRC), Gainesville, FL, October 26-28, 2001.

"Beta-sheet Folding in membranes: Promiscuity and Specificity in Peptide Model Systems", Christopher M Bishop, William F Walkenhorst and William C. Wimley, 45th Annual Meeting of the Biophysical Society, Boston, MA Feb, 2001

"Investigation of Structure and Stability in a Model Protein System: A Synthetic Variant of the C-Terminal Fragment of Ovomucoid Third Domain", William Walkenhorst**,** Elizabeth Skeins*, Christina Ralph*, and William Pearson*, 44th Annual Biophysical Society meeting, Protein Folding & Stability: Peptides & Protein Fragments, New Orleans, LA, February 15, 2000

R. E. Lake*, W. C. Wimley, C. M. Bishop, W. F. Walkenhorst, "A Model System For Studying Beta Sheet Formation in Membrane Vesicles," Joint Southeast /Southwest Regional Meeting of the American Chemical Society, New Orleans, LA, December 6-8, 2000

E. C. Skeins*, W. F. Walkenhorst, "Investigation of Stability in a Synthetic Variant of the C-Terminal Fragment of Ovomucoid Third Domain," Joint Southeast /Southwest Regional Meeting of the American Chemical Society, New Orleans, LA, December 6-8, 2000

S. B. Stroble*, R. R. Ferlita*, W. F. Walkenhorst, "Characterization of Capsaicinoid Components of Hot Sauces," Presented at the Joint Southeast – Southwest Regional Meeting of the American Chemical Society, New Orleans, LA, December 6-8, 2000

*Edwards, J. A., *Reichardt, E. E., *Nguyen, L., and Walkenhorst, W. F., "Acid and Alkaline Denaturation of Staphylococcal Nuclease as Monitored by Fluorescence and Circular Dichroism", 50th Southeastern Regional Meeting of the American Chemical Society (SERMACS), November 4–7, 1998. (*Student Travel Funds provided by Loyola SGA Richard Frank grant*)

Walkenhorst, W.F., Green, S.M., Markley, J.L., and Roder, H. "Kinetic Evidence for Sequential Intermediates in the Folding Pathway of Staphylococcal Nuclease," Johns Hopkins Protein Folding Meeting, March 15-19, 1996.

Walkenhorst, W.F., Markley, J.L., and Roder, H. "Folding Studies of H124L Staphylococcal Nuclease by Pulsed Hydrogen Exchange and Rapid Mixing Methods", J. Cell. Biochem., Abstract Supplement 21B, 24th Annual Keystone Symposia, Abstract D2-238, p. 51, (1995).

Hinck, A.P., Loh, S.L., Prehoda, K.E., Truckses, D.M., Walkenhorst, W.F., Wang, J., and Markley, J.L. "What Stabilizes the Cis Lysine-116 Proline-117 Peptide Bond in Staphylococcal Nuclease?", 205th ACS National Meeting, Division of Biological Chemistry, Denver, CO (1993).

Pinkerton, T.C., Comiskey, J.P., Ulrich, E.L., Haginaka, J., Murashima, T., Markley, J.L., and Walkenhorst, W.F. "Enantioselectivity of Immobilized Ovomucoid Domains", 205th ACS National Meeting, Division of Colloid and Surface Chemistry, Denver, CO March 28-April 2, 1993.

Wang, J., Mooberry, E.S., Walkenhorst, W.F., and Markley, J.L. "Heteronuclear Three-Dimensional NMR Spectroscopy of Unligated Staphylococcal Nuclease H124L", 20th Annual Keystone Symposia on Molecular and Cellular Biology, Keystone, Colorado, April 8-14, 1991.

Walkenhorst, W.F., Krezel, A.M., Darba, P., Robertson, A.D., Rhyu, G.I., and Markley, J.L. "Comparison of the Solution Structures of Virgin and Reactive-Site Cleaved Turkey Ovomucoid Third Domain Proteins by NMR methods", Protein Folding Seminar, AAAS Annual Meeting, New Orleans, LA, February 14-19, 1990.

Krezel, A.M., Walkenhorst, W.F., Darba, P., Robertson, A.D., Rhyu, G.I. and Markley, J.L. "Comparison of the Folded Conformations of Native and Reactive-Site Cleaved Turkey Ovomucoid Third Domain Inhibitors", XIVth International Conference on Magnetic Resonance in Biological Systems, Warwick, England, September 9-14, 1990.

Krezel, A.M., Walkenhorst, W.F., Darba, P., Robertson, A.D., Rhyu, G.I. and Markley, J.L. "Computation of NMR-derived Solution Structures for Native and Reactive-Site Cleaved Turkey Ovomucoid Third Domain Inhibitors", American Association for the Advancement of Science (AAAS) Annual Meeting, San Francisco, CA, January, 1989.

Krezel, A.M., Walkenhorst, W.F., Darba, P., Robertson, A.D., Rhyu, G.I. and Markley, J.L. "Comparison of NMR Calculated Structures for the Native and Reactive-Site Cleaved Turkey Ovomucoid Third Domain Inhibitors", XIIIth International Conference on Magnetic Resonance in Biological Systems, Madison, WI, August, 1988.

Professional Talks Presented (International, National, Regional, and Local Meetings)

Invited talk: "The effect of pH, ionic strength, and specific ions on AMP activity", 4th International Symposium on Antimicrobial Peptides, September 29-30, 2014 Graz, Austria

Invited talk "pH dependant electrostatic interactions of antimicrobial peptides", 245th National Meeting of American Chemical Society, New Orleans, LA. April 8, 2013

"Charge Effects on the Activity of Antimicrobial Peptides: Not Just the Usual Suspects", New Orleans Protein Folding Intergroup, May 23, 2013

"Environmental Effects on Antimicrobial Peptide Activity" at New Orleans Protein Folding Intergroup (NOProFIG) on June 30, 2011

"Peptidoglycan Composition Can Reverse the pH Dependence of AMP Activity" at New Orleans Protein Folding Intergroup (NOProFIG) on November 17, 2011

Invited talk: “Environmental effects on antimicrobial peptide activity”, in Peptides in Biotechnology and Biomedicine Session at Joint Regional Meeting American Chemical Society, 62nd Southeast/66th Southwest Joint Regional Meeting, New Orleans, Dec.1-4, 2010.

“Assessing the Versatility of the Ram Family of Antimicrobial Peptides Under a Wide Variety of Environmental Conditions**”** at New Orleans Protein Folding Intergroup on October 21, 2010

“The Protean Nature of a Class of Antimicrobial Peptides: The Effect of pH, Ionic Strength, and Surface on Antimicrobial Activity**”** at New Orleans Protein Folding Intergroup on June 17, 2010

“Investigating the Effects of Surface Composition on the Activity of Membrane Active Antimicrobial Peptides” New Orleans Protein Folding Intergroup (NOProFIG) on April 16, 2009

“Mixed Evidence for Dimeric Membrane Peptides: Small and Large Cross-linked Control Peptides” (NOProFIG) on February 14, 2008

“Effect of pH and Ionic Strength on Antibiotic Peptide Activity” at New Orleans Protein Folding Intergroup (NOProFIG) on Oct. 9, 2008

“Synthesis and Purification of Fluorescently Tagged Glutathione for use as Positive and Negative Controls for FRET Experiments” at New Orleans Protein Folding Intergroup (NOProFIG) on Nov. 11, 2006

“Size Exclusion Chromatography of Membrane Soluble Helical Dimer Peptides in SDS detergent solution” New Orleans Protein Folding Intergroup (NOProFIG), September 23, 2004

“Structure and Stability of OMCF as monitored by CD and NMR Methods”,
Talk Presented to the New Orleans Protein Folding Intergroup, September 21, 2002.

“A Cooperative Folding Transition in OMCF as monitored by CD and NMR Methods”,
New Orleans Protein Folding Intergroup, August 30, 2001.

“Synthesis and Purification of the C-terminal Fragment of Ovomucoid Third Domain”, New Orleans Protein Folding Intergroup, April 13, 2000.

“Early Protection of a Beta Hairpin in Staphylococcal Nuclease as Monitored by Pulsed Hydrogen Exchange”, New Orleans Protein Folding Intergroup, August 17, 2000.

“Molecular Recognition in Model Protein Systems”, New Orleans Protein Folding Intergroup, February 11, 1999.

“Acid and Alkaline Denaturation of Staphylococcal Nuclease”, New Orleans Protein Folding Intergroup, August 19, 1999.

“Investigations of Cell Matrix Adhesion Regulatory Protein”, New Orleans Protein Folding Intergroup, October 28, 1999.

“Peptide Inhibitors of Serine Proteinases”, Departmental Seminar Series, Chemistry Department, Loyola University New Orleans, December 8, 1997.

Grants and Collaborations Funded:

Summer Collaborative Outreach and Research Experience (SCORE), Funded each summer: Summer 2008 through Summer 2013 for research on: Investigating the Effect of Surface Type, pH, Ionic Strength, and Specific Ions on Activity of Membrane Active Antimicrobial Peptides. Funded from LA-BOR PKSFI (Post Katrina Support Fund Initiative) P.I. Dr. Frank Jordan. ~$90,000 total in subcontracts for faculty, teacher, student salary, and supplies over six years.

Departmental Enhancement Grant**:** Thomas G. Spence (P.I.), Joelle Underwood, William Walkenhorst, Kurt Birdwhistell, Anna Duggar, LA-Board of Regents, "Development of a Forensic Chemistry Laboratory", $192,000 Funded 2008

Research Commercialization and Educational Enhancement Program (RC/EEP) Grant from LA Board of Regents, "Design, Development, and Delivery of Therapeutic Drugs", $5.8 million to Robert Gary (P.I.) in 2007, Loyola University subcontract for $43,000 over 3 years (2008-2010).

Funded for a Loyola University Faculty/Course Development grant titled: Development of a Circular Dichroism Spectrophotometer for Structural Characterization of Protein Molecules. $2,450 William F. Walkenhorst and Thomas G. Spence, Spring 2006.

Paid Collaborator on NIH Grant project with Dr. Maureen Shuh on Overexpression and Purification of SRF and other transcription factors from Human transforming leukemia virus (HTLV-1), June 2005.

Departmental Enhancement grant: Andy Knight (P.I.) and William Walkenhorst (co-P.I.), LA Board of Regents, A Chromatography Suite for Drug Development, $58,000, Funded 2005.

Departmental Enhancement grant: Thomas G. Spence (P.I.) and William F. Walkenhorst, (co-P.I.), Louisiana Board of Regents, Photonics Laboratory for an Integrated Approach to Teaching Spectroscopy in Chemistry, $56,963, Funded 2004

Paid collaborator Summer 2003 National Science Foundation Research Experience for Undergraduate Faculty, with Dr. Wesley Stites, University of Arkansas, 4 weeks salary.

"Forensic Chemistry in the Undergraduate Curriculum", Kurt Birdwhistell and Bill Walkenhorst, Louisiana Board of Regents, $40,450, July 1, 1999 – June 30, 2000.

"Molecular Recognition in Model Protein Systems", William Walkenhorst (P.I.), Louisiana Board of Regents, $102,000, July 1, 1998 – June 30, 2001.

"Modern Instrumental and Molecular Methods in the Biochemistry Laboratory",
Loyola University Course Development Grant, for development of a new course.
Funded for $2,000 Jan. 98 – May 98

Grants Applied for but not funded (partial list)**:**

Collaborator on NIH Grant application with Dr. Bill Wimley submitted Fall 2013 entitled: "Selective targeting of peptides to microbial membranes" to National Institute of Allergy and Infectious Diseases, Special Panel on Drug Target Development and Validation for Antimicrobial Resistant Pathogens (R21/R33). Loyola subcontract $151,000, not funded.

Collaborator on NIH NIGMS R01 Grant application with Dr. Bill Wimley submitted October 2012 entitled: "High-throughput selection of antimicrobial peptides" Loyola subcontract $199,000, not funded.

Applied for National Science Foundation (NSF) Research Opportunity Award (ROA) supplement to Dr. Bill Wimley's NSF Division Materials Research (DMR) grant. Requested $25,923 to support research, students, supplies for 2011-2012. Not funded.

Collaborator on NIH NIGMS R01 Grant application with Dr. Bill Wimley submitted 2011 entitled: "Folding and Design of Peptides in Membranes", subcontract $196,978, not funded.

Co-PI with Thom Spence on BOR Departmental Enhancement Grant to purchase a High Pressure Liquid Chromatography Instrument with a dual MS/MS (mass spectroscopy) detection system for use in teaching and research. ~$250,000, Submitted 2010, not funded

Loyola University New Orleans Freshman Chemistry Bridge Program to Retain STEM majors, Thomas G. Spence (P.I.), Joelle Underwood, William Walkenhorst, Kurt Birdwhistell; National Science Foundation**,** $110,000. Applied 2009, not funded

"Use of Combinatorial Peptide Libraries to Investigate Model Helix-Helix Recognition Events in A Membrane Model System" The American Chemical Society, Petroleum Research Fund, Undergraduate Faculty Sabbatical Grant 2003, $34,000.00, not funded

"Undergraduate Science Research Program", (co-PI with K. Birdwhistell, A. Knight, L. Koplitz, M. Shuh, W. Walkenhorst, J. Wee), Merck/AAAS Grant, 2001, $60,000, not funded.

Research Corporation for Cottrell College Research Award, "Dissecting Protein Stability: Investigating Cooperativity in a Model Protein System" $37,684.00 in May 2001, not funded.

Research Corporation for Cottrell College Research Award, "Dissecting Protein Stability: Replacement of a Covalent Bond in a Model Protein System" for $31,484.00 in May 2000.

Applied for NSF-CCLI grant "A 300 MHz FT-NMR Spectrometer for Undergraduate Teaching and Research", PI: Dr. Andrew Knight, Co-PI's: Dr. Kurt Birdwhistell and Dr. Bill Walkenhorst in June, 2000 for $110,925, not funded.

"Biophysical Investigations of Molecular Recognition in Protein Folding and Ligand Binding", Principal Investigator, Camille and Henry Dreyfus Foundation 1997, for $12,500, not funded.

Directed Student Research and Independent Study (Independent Studies, Special Projects, Senior Theses (Capstone), and University or Departmental Honors Theses)

A. Honor's Theses Mentored (mentor students as they conduct laboratory research, write honor's thesis and present talk to their respective departments)

Russell Ferlita, 2000, Biology Honor's Thesis: "The Physiochemical Effect of Linker DNA on Higher Order Chromatin Structure". Joint project with Dr. Ray Green

Beth Skeins, 2001, Chemistry Honor's Thesis: "Investigation of Stability and Structure in a Synthetic Variant of the C-terminal Fragment of Ovomucoid Third Domain"

Adam Oliver, 2001, Biology Honor's Thesis: "A Biochemical Characterization of *Agkistrodon piscivorous leucostoma* (Western Cottonmouth) Venom". (co-sponsor Dr. Bob Thomas)

Jackie Torres, 2002, Psychology Honor's Thesis: "Estrogen Levels in Human Saliva as Measured by Enzyme Linked Immunoassay Techniques".

Katherine A. Watts, 2003, Biology Honor's Thesis: "Investigation of Structure and Stability in the F37W Mutant of Ovomucoid Third Domain".

Victoria Solderitch, 2003, Biology Honor's Thesis: "The Structure and Stability of a Synthetic Variant of an Egg White Protein".

Laina Martin, 2006, University Honor's Thesis: "Analytical Techniques in the Analysis and Detection of Cocaine and Amphetamines". (library research only)

Carissa Campbell, 2006, Chemistry Honor's Thesis: "Fluorescent Labeling and Purification of TAMRA-Labeled Glutathione".

Loreny Gamboni, 2007, Chemistry Honor's Thesis: "Synthesis and Purification of Fluorescently-Labeled Glutathione".

Courtney Milanese, 2007, Chemistry Honor's Thesis: "Forster Resonance Energy Transfer (FRET) Experiments on L14 and N14 Membrane Spanning Peptides".

Amelia Neuberger, 2007, Chemistry Honor's Thesis: "Effect of Varying Detergent Concentration on FRET of L14 and N14 Peptides".

Laura Thomas, 2008, University Honor's Thesis: "Investigating Dimerization in an α–Helical Peptide System".

Phuong Vo, 2009, Biology Honor's Thesis: "Investigating the Effect of pH on the Potency of Membrane Active Antimicrobial Peptides".

Mary Abernathy, 2012, Chemistry Honor's Thesis: "Antimicrobial Peptides and Their Potential As Therapuetics".

Carissa Marston, 2013, Biology Honor's Thesis: "Effect of pH on the Activity of Membrane Active Antimicrobial Peptides". (Tied for 1st place talk in Biology Honor's Symposium).

Joshua LaViolette, 2013, Chemistry Honor's Thesis: "Ionic Strength and Specific Ion Effects on Antimicrobial Peptide Activity".

Justine Sundrud, 2014, Biology Honor's Thesis: "Additivity and Synergy Between an Antimicrobial Peptide and Inhibitory Ions".

Lukas Gilevicius, 2014, Chemistry Honor's Thesis: "Engineering c-type heme in a Cyanobacterial Hemoglobin". (research conducted at Johns Hopkins University).

B. Research Projects Mentored (Chem A498 Directed Research – students write up research results as a term paper and most present their project as a talk to Chemistry department)

Jason Edwards (Chemistry), 1997-99, In vitro transcription/translation of CMAR protein; Investigation of the Alkaline Denaturation of Staphylococcal Nuclease by Circular Dichroism.

Eunice Blackmon (Chemistry), 1997, Development of a Polyacrylamide Gel Electrophoresis Molecular Weight Standard.

Christina Ralph (Biology), 1998-2000, Fluorescence Investigations of the Alkaline Denaturation of Staphylococcal Nuclease.

Loan Nguyen (Chemistry), 1998, Fluorescence Investigations of the Alkaline Denaturation of Staphylococcal Nuclease.

Ivan Suleiman (Chemistry), 1998, Ion-Exchange Purification of Cytochrome c Fragments.

Erik Reichardt (Chemistry), 1998-99, CNBr Cleavage of Cytochrome c.

Ryan Wall (Biology), 1998-99, Enzymatic Cleavage and Purification of Ovomucoid Third Domain.

Bill Pearson (Chemistry), 1999-2000, Alkaline Denaturation of Staphylococcal Nuclease as Followed by Circular Dichroism.

Effie Martin (Chemistry), 1999, Development of a Method for Size Exclusion HPLC

Sara Stroble (Chemistry), 2000, Separation and Characterization of Capsaicins in Hot Peppers.

Rich Lake (Biology), 1999-2000, Beta Sheet Formation of a Peptide in Membrane Vesicles by CD Methods.

Mary Kombolias (Chemistry), 2001, Thermal Transitions in Membrane Beta Sheets as followed by Differential Scanning Calorimetry.

Alison Derbes (English), 2001, Thermal Transitions in Membrane Beta Sheets as followed by Differential Scanning Calorimetry.

Jose Posas (Chemistry), 2002-2003, NMR Investigation of Peptide Structural Propensities in collaboration with Wesley Stites at University of Arkansas

Sarah Ramadan (Chemistry), 2003, Determination of an Extinction Coefficient for PueA

Erika Shaffer, (Chemistry), 2003-04, Purification, and Characterization of Transcription Factors from a Human Leukemia Virus HTLV-1. (co-sponsor Dr. Maureen Shuh)

Kassie Moore, (Chemistry), 2003-04, Growth, Purification, and Determination of an Extinction Coefficient for Polyurethanase gene product PueA.

Brett Norman (Chemistry), 2003-04, Expression, Purification, and Characterization of Pue A Polyurethanase from *E. Coli*.

Hayden Lindsey (Psychology), 2007-08, Labeling and Cross-linking Studies on Glutathione.

Elena Batista (Chemistry), 2007-08, HPLC purification and Fluorescence Studies of Peptides.

Kris Gutierrez (Chemistry), 2007-08, Cross-linking control peptides for FRET studies.

Dana Walkenhorst (Chemistry), 2009, HPLC purification of Antimicrobial Peptides (AMPs) and Effect of Surface Type on Decontamination by AMPs.

Hussain Badani (Chemistry), 2009, Effect of pH Combined with AMPs on Surface Decontamination.

Jessica Cosgrove (Psychology), 2009-11, Environmental Factors and AMP Activity.

Pepper Hanna (Psychology), 2009-11, Environmental Factors and AMP Activity.

Samineh Khoshini (Psychology), 2009-11, Environmental Factors and AMP Activity.

Ashley Sarver (Chemistry), Summer 2010, The effect of pH and Ionic Strength on AMP Activity

Andrew V. Scott (Chemistry), 2010-11, "Assessing Antimicrobial Peptide Activity under Various pH and Ionic Strength Conditions".

Dayaamayi Kurimella (Visual Arts Pre-Med), 2010-11, Investigating the Effect of a Variety of Solution Conditions on AMPs.

Jordan Wolfgang Klein (Psychology), 2010-12, Investigating the Effect of Surface Type, pH, and Ionic Strength on the Activity of Membrane Active Antimicrobial Peptides.

Alexa M. Triplett (Chemistry), 2011-12, The Effect of Solution Environment On the Activity of the Ram Family of Antimicrobial Peptides.

Veronica Herrera (Chemistry), Current, AMP Activity: Synergy between pH and Toxic Ions.

Gabriel Bretz (Biology Exchange student, Brazil), Current, Investigating Specific Ion Effects on AMP Activity: The Search for Synergy.

C. Student Presentations Mentored (senior capstone talks/papers, summer research talks)

C.1 Senior Capstone Experience Chem A493 (mentor students engaged in a library research project, writing a term paper, and presenting talk to Chemistry department).

Jodie Clements, Silpa Nalam, Greg Ditta, Randi Charbonet, 1998-2001

Maggie Hopkins, 2002, "Colon Cancer Cell Line Research" (conducted at Oschner Hospital).

Adam Van den Boom, 2003, "Matrix Metalloproteinases and Cancer".

Nicole Rupprecht, 2004, "Biochemical Mechanisms in Skin Cancer and Its Treatment"

Kassie Moore, 2005, "A Discussion of the Causes and Treatments of Phenylketonuria"

Anna Pasvantis, 2005, "The Biochemical Basis for the Pathology and Treatment of HIV Infection"

Sarah Ramadan, 2005, "Diabetes: Its Cause and Treatment"

Rana Kaleemullah, 2006, "The Chemistry of Hair and Hair-Care Products"

Laina Martin, 2006, "The Chemistry and Pharmacology of Chocolate"

Whitt Rutledge, 2006,"The Metabolism and Medical Effects of Alcohol Consumption"

Shannon Roberson, 2007, "DNA methylation of the IgH locus during B-cell development"

Sarah Willard, 2007, "Solid-Phase Synthesis of Oligo(p-benzamide) Spiro-Ladder Foldamers"

Ariel Aguillard, 2007, "Analysis of Complex Lipid Mixtures"

Elena Batista, 2008, "Methods to Reduce Peanut Allergens During Roasting"

Dana Walkenhorst, 2009, **"**Developing a Mouse Model of Collagen-Induced Arthritis", (research later published with Biology faculty member, Dr. Kim Mix).

Brianna Diggs, 2011, "Using Biochemical Techniques to Assay Antimicrobial Peptide Activity"

C.2 Senior Capstone Experience Chem A497 (mentor students engaged in library research or internship in Forensic chemistry, term paper, and presenting talk to Chemistry department).

Dawnyel Verrett, Sherida Jackson, F2006.

Erica Tchach, 2006, "Pharmacology and Forensic Identification of Marijuana"

Courtney Milanese, 2006, "The Chemistry of Ninhydrin in Developing Latent Fingerprints"

Sarah Wilson, 2006, "The Forensic Science of Arson Investigation"

Candace Walker, 2006, "The Forensic Science Involved in Rape and Assault Cases"

Janene Baker, 2007, "Drug Screening Analysis"

Laura Sorenson, 2007, "AmplFStr Identifiler, Validation, and the ABI 3130 in DNA Profiling"

Brian Schulz, 2008, "Chemistry and Side-Reactions of Drug-Detection Tests in Forensics"

Megan Loschen, 2008, "Forensic Fiber Examination Using Both Microscopic and Instrumental Techniques"

Kamilah Gonzalez, 2009, "Detection of Opiates and other Illicit Drugs in Human Hair"

Ashley Sarver, 2010, "The Use of Gas Chromatography and Mass Spectrometry in Forensic Investigation of Fires and Explosions"

Mary Mena, 2010, "Detection and Analysis of Gunshot Residue"

Cash Blake, 2013, "Methylmalonic Acidemia: A Case Study in Forensics"

C.3 Student Summer Presentations (mentor students engaged in research and presenting talk to faculty, students, parents involved with summer collaborative research program).

Summer 2008, Summer Collaborative Outreach and Research Experience (SCORE)

Rachel Hahn (Vassar University, Biology), (also Phuong Vo, Elena Batista, Kris Gutierrez).
H.S. Teacher Kelly Williams (Ursuline Academy)
H.S. Students: Danielle Alexander (Hahnville HS)
Amanda Deadmond (Slidell HS)
Allese Joplin (NO Charter Math & Science HS)
Samaneh Khoshini (Lusher Charter HS)

The students presented two Powerpoint talks at a symposium at the end entitled:

"Testing Antibiotic Peptide Activity Against Four Organisms Under Various Conditions:

I. Introduction"
II. Effect of pH and Ionic Strength"

Summer 2009, Summer Collaborative Outreach and Research Experience (SCORE)

*Rachel Hahn (Vassar University, Biology) *Paid from BOR RC/EEP Grant
(Also Jessica Cosgrove, Pepper Hanna, Samineh Khoshini, see section B).
H.S. Teacher Kelly Williams (Ursuline Academy)
H.S. Students: Jihye Lim, Gage Lois, Dominique Rochon, and Triston Wong.

The students presented a Powerpoint talk at a symposium at the end of the summer entitled:

"Testing the effectiveness of antimicrobial peptides for surface decontamination"

Summer 2010, Summer Collaborative Outreach and Research Experience (SCORE)

Jordan Wolfgang Klein (Psychology)
Dayaamayi Kurimella (Visual Arts)
Ashley Sarver (Chemistry)

The students presented a Powerpoint talk at a symposium at the end of the summer entitled:

"Assaying the Versatility of Antimicrobial Peptide Antibiotics"

Summer 2011, Summer Collaborative Outreach and Research Experience (SCORE).

Jordan Wolfgang Klein (Psychology)
Mary H. Abernathy (Chemistry)
Alexa M. Triplett (Chemistry)

The students presented a Powerpoint talk at a symposium at the end of the program entitled:

"The Effect of Environment on the Ram Family of Antimicrobial Peptide Antibiotics"

Summer 2012, Summer Collaborative Outreach and Research Experience (SCORE).

Carissa Marston (Biology)
Justine Sundred (Biology)
Josh Laviolette (Chemistry)
Ms. Mary Macklin (Sacred Heart H.S. Teacher)

The students presented a Powerpoint talk at a symposium at the end of the program entitled:

"The Study of Antimicrobial Peptide Antibiotics as Potential Therapeutics"

Service

A. Service on University, College, or Departmental Committees

1. Chemistry Department Chair 2002 - 2004
2. Served on Faculty Senate Aug. 1998 – May 2000; 2011-Present.
3. College of A&S VP Institutional Advancement Liason Committee 1999-2000
4. Served on Search Committee for Physical Chemist, Fall 1998.
5. Served on Departmental Protocol Committee, Spring 1998.
6. Chaired Instrumentation Acquisition Committee, Fall 1997.
7. Departmental Recruitment Coordinator, Aug. 1998 – 2004.
8. Departmental Web Page Coordinator, Aug. 1999 – 2001
9. Coordinator Departmental Seminars, May 1999 – May 2001, rotating to present
10. Coordinator Freshman Chemistry Labs, May 2001 – 2003, 2007-08, 2013-14
11. Wendt Scholarship Selection Committee, 1999-2008
12. Chair, Chemistry/Biology committee to establish Biochemistry major. 2003
13. Maintenance of departmental HPLC, Cary 1E UV-Vis, Fluorometer, 1997-Present
14. Member Quality Enhancement Planning Team, 2004
15. College Planning Team (alt.) 2004-05
16. Member Non-Traditional Academic Programs Sub-Committee of UPT, 2002-03
17. Chair, Departmental In-Depth Review Committee, 2004
18. Natural Sciences Division Protocol and Merit Rules Committee, Spring 2004
19. Chair, A&S Intellectual Property Rights Committee, Spring 2004
20. Departmental Forensic Advisor for all Forensic Chemistry Interns, 2005-S2011
21. H&NS, Handbook Revision Committee, 2007-09
22. Member University Budget Committee, 2007-08, 2012-Present
23. College Rank and Tenure Committee (CRTC), 2007-11, 2013-Present
24. Chair CRTC 2008-S2011 (Guided revision of CRTC protocol and List of Materials to be Submitted for Promotion and Tenure).
25. Humanities and Natural Science Dean's Search Committee, 2007-08
26. Organic Chemist Search Committee, Fall 2008
27. College Curriculum Committee, 2009-11
28. Common Curriculum Implementation Committee, 2009 – 11
29. University Undergraduate Research Committee 2009-2013
30. Salary Oversight and Review Committee – F2013-Present (replacing Dr. Kurt Birdwhistell).

B. Special Service for Loyola University

Participated in President's Open House Orientation and/or President's Open House Natural Science Poster Session 1998 - Present.

C. Service to New Orleans Community

1. Acted as Judge in the Greater New Orleans Science and Engineering Fair for High School students in 1998-99.

2. Served as Judge for Science Poster Day at Tulane University in October 1997.
3. Volunteer with ACS affiliate Chemistry Club at Children's museum, 2003.
4. Judge for Ben Franklin High School Science Fair 2002-2006
5. Volunteer Lusher Crawfish Boil 2001-2005
6. Mentored 4 high school students and a high school teacher in a research project in summer 2008
7. Mentor for Ben Franklin High School Science Fair Project Fall 2008
8. Mentor for Slidell HS Independent Research Project Fall 2008
9. Construction of sets used by Audubon Zoo Department of Education, 2009
10. Mentored four high school students and one high school teacher in a research project in summer 2009.
11. Guided ~16 high school students per year in a lab exercise summer 2010-12

D. Local, State or National Service

1. Founding member New Orleans Protein Folding Intergroup 1998-Present
2. Reviewed manuscript for the journal "Biopolymers" 2005
3. Reviewed 1 Biopolymer paper and 2 Petroleum Research Foundation (PRF) proposals, 200
4. Reviewed proposals for Defense Threat Reduction Agency (DTRA), 2008
5. Reviewer for NSF Research at Undergraduate Institutions Proposals Fall 2011
6. Reviewer for journal "BBA – Biomembranes", Spring 2014
7. Member Thesis Committee for Hussain Badani, Tulane Medical School, 2014

E. Contribution to the Profession

1. Member of American Chemical Society (ACS), 1990 – Present.
2. Member of American Association for the Advancement of Science, 1990-98.
3. Member of Biophysical Society, 1999- 2002
4. Council on Undergraduate Research, 2001 – 2005
5. Member American Society for Microbiology, 2012-2014

F. Department Infrastructure Grants and Workshops

1. Funded (PI or co-PI) on four LA BOR Departmental Enhancement and two Loyola University Course Development grants for ~350K. (see grants section)
2. Applied for ~470K in Departmental Enhancement grants (unfunded grants).
3. Funded on a Program for Institutional Effectiveness Support (PIES) proposal in Spring 2005 for a new team-taught, interdisciplinary, common curriculum science course; Attended an Intensive month long PIES Teaching workshop in Summer 2005.
4. Funded for Center for Workshops in the Chemical Sciences from National Science Foundation Workshop in *Forensic Science* for summer 2006.
5. Attended a workshop on POGIL (Process Oriented Guided Inquiry Learning) at Washington University, St. Louis in Summer 2007
6. Attended AACU (American Association Colleges Universities) Workshop on Undergraduate Research Long Beach, CA in April 2007.
7. American Chemical Society (ACS) Meeting in Austin, TX (Nov. 9-12, 2011) Attended sessions on "Teaching Freshman Chemistry: Past, Present, and Future Directions" and "Taking Research to the Classroom".

G. Advising

1. Advised Chemistry majors (~8-15 per year) 1997-Present.
2. Faculty Advisor to Theta Phi Alpha sorority. 2000-2005
3. Advisor, Alpha Chi Sigma (AXE) Chemistry Professional Fraternity 2003-07
4. Advisor all Forensic Interns, in addition to normal advising, 2005-2011

H. Other Service

1. Attended a teleconference entitled: "Creating Engaged Learning Environments for Today's Students", 2005
2. Attended 3 day MALDI Mass Spectroscopy Training Course in Spring 2007 for Maintenance of New Instrument.
3. Upgraded Computers, Software, and Components on 4 departmental Instruments. Repaired UV-Vis and Maldi Instrument Fall 2007
4. Co-developed (w/ Thom Spence) and taught new non-majors (Common Curriculum) laboratory course called "Chemistry and Technology".