

BRIAN MICHAEL LEE

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Professional Experience

- 2017-present *Assistant Professor*, Department of Chemistry, Gupta College of Science, Coastal Carolina University, Conway, SC.
- 2014-2017 *Research Assistant Professor*, Department of Biomedical Sciences, College of Veterinary Medicine, Iowa State University, Ames, IA.
- 2006-2014 *Assistant Professor*, Department of Chemistry and Biochemistry, Southern Illinois University, Carbondale, IL.
- 2004-2005 *Staff Scientist*, with Dr. Peter E. Wright, Department of Molecular Biology, The Scripps Research Institute, La Jolla, CA.
- 1997-2003 *Research Associate*, with Dr. Peter E. Wright, Department of Molecular Biology, The Scripps Research Institute, La Jolla, CA.
- 1992-1996 *Graduate Research Assistant*, with Dr. Michael F. Summers, Howard Hughes Medical Institute, University of Maryland Baltimore County, Baltimore, MD.
- 1990-1991 *Student Research Assistant*, with Dr. J. Craig Venter, National Institute of Neurological Disorders and Stroke, National Institutes of Health, Bethesda, MD.

Education

- 1997 Ph.D., Biochemistry, University of Maryland Graduate School, Baltimore, Maryland.
Dissertation: "Structural and dynamic nuclear magnetic resonance studies of capsid protein and nucleocapsid protein from human immunodeficiency virus type 1."
Advisor: Michael F. Summers, Ph.D.
- 1989 B.S., Chemistry, College of William and Mary, Williamsburg, Virginia.

Research Activities

Research Interests

Structure and function of proteins and small regulatory RNA, protein-RNA interactions, molecular recognition, protein dynamics, zinc-finger proteins, NMR spectroscopy and X-ray crystallography.

Primary Research Projects

1. Small RNAs can regulate the expression of virulence genes directly through interactions with mRNAs and indirectly through interactions with regulatory proteins, such as ribonuclease Y. Structural elements within both the sRNA and mRNA transcripts are key determinants of these interactions and regulatory activity.

Collaborator: Gabriela Pérez-Alvarado, Coastal Carolina University, Conway, South Carolina.

Funding: SCoRE Program of CCU INBRE (NIH P20), CCU Program Enhancement Grant, CCU Student Activities Fund Student Research Fellowship, CCU Women in STEM

2. Ribonuclease Y (RNase Y), previously known as conserved virulence factor A (CvfA), regulates the expression of virulence factors and metabolic enzymes in response to nutritional stress in *Streptococcus pyogenes*. Our research is focused on the structure, interactions and catalytic activity of RNase Y, with the goal of elucidating the RNA substrates and the mechanism of translational regulation leading to invasive pathogenesis:

Collaborators: Gabriela Pérez-Alvarado at Coastal Carolina, and Kyu Hong Cho at Indiana State University.

Previous Funding: NIH-NIGMS (R15 GM101603-02 MPI), CVM Summer Scholars Research Program (NIH T35), SIUC REU Summer Program, ISU Honors Program, SIUC Research Rookies, ACS Project SEED.

Previous Collaborative Research Projects

1. A universal influenza vaccine with heterosubtypic protection may obviate the need for seasonal influenza vaccines and limit the emergence of an uncommon pandemic strain of influenza. The research is focused on characterizing hemagglutinin (HA) antigens that elicit broadly neutralizing antibodies and optimizing immunogen design for universal vaccine candidates.

Collaborators: David Verhoeven and Brett Sponseller at Iowa State University.

Funding: Merck Investigator Studies Program Review Committee (MISP-RC)

2. Antimicrobial resistance in *Streptococcus pneumoniae* is a serious threat to human health according to the CDC. The inclusion of the multidrug resistant strain 19A in the second generation PCV13 vaccine has not prevented the emergence of multidrug resistance in non-vaccine serotypes 22F and 33F. Bacterial infections leading to pneumonia are often preceded by respiratory syncytial virus (RSV) infection.

Collaborators: David Verhoeven, Mark Ackermann and Edward Yu at Iowa State University.

Funding: Merck Investigator Studies Program Review Committee (MISP-RC)

3. Spinal muscular atrophy (SMA) is a genetic disease linked to loss of function of the survival motor neuron (SMN) protein. Our research collaboration is focused on structural aspects of splicing regulation and SMN interactions with mRNA.

Collaborator: Ravindra Singh, Department of Biomedical Sciences, Iowa State University.

4. Nontypeable *Haemophilus influenzae* (NTHi) is a leading cause of recurrent middle ear infections in children and pneumonia in the elderly. This research is focused on identifying antigens that may elicit broadly neutralizing antibodies, and to design immunogens for a potential vaccine candidate. A truncated, surface displayed form of pyruvate dehydrogenase E1 component (PDE1) has been identified.

Collaborator: David Verhoeven, Department of Biomedical Sciences, Iowa State University.

5. Actin dynamics plays a critical role in cancer metastasis. LMO7 is an adaptor protein that shuttles between the nucleus and actin assemblies in the cytoplasm. Our research collaboration is focused on the structure and function of the LMO7 domains that regulate interactions with actin:

Collaborator: Gabriela C. Pérez-Alvarado, Coastal Carolina University, Conway, South Carolina.

Pending Patent Application

Docket Number: P11965US01

Verhoeven and Lee

February 5, 2016

Pyruvate dehydrogenase E1 complex as an immunogen for prevention of *Haemophilus influenzae* infections

Grant Proposals Submitted for Research Support

SCoRE Program of CCU INBRE

Lee (PI)

June to August, 2020

SC INBRE (NIH-NIGMS P20)

\$24,600

Structure and function of small RNAs in Firmicutes (Gram positive bacteria) that regulate gene expression and mediate the host responses to either pathogenic or probiotic bacteria within the human microbiome.

Coastal Carolina University IDEA Networks of Biomedical Research Excellence

May 24, 2018

NIH-NIGMS (P20)

Wakefield (PI)

Application for renewal of support through the South Carolina INBRE program grant (P20).

Role: INBRE Faculty Mentor

NSF-MRI (Tracking #1828239)

February 5, 2018

Wakefield (PI), Budner (Co-I), Lee (Co-I), McWilliams (Co-I), and Pérez-Alvarado (Co-I)

\$988,237

Acquisition of a Bruker 500 MHz NMR to Enhance Faculty and Student Research at Coastal Carolina University and Collaborating Institutions. A high-field NMR spectrometer will enable multiple research projects, including organic synthesis, inorganic synthesis, structural biology, and chemical education research.

Current Research Support

SAF Research Fellowship Cameron Carroll (student) May **2019** to May **2020**
 Structure and interactions of the streptolysin S associated gene A (*sagA*) from group A *Streptococcus*
 Role: Mentor

Completed Research Support

The Pel/sagA small regulatory RNA interactions that guide the endoribonuclease activity of conserved virulence factor A during invasive streptococcal infections June 1, **2019** to August 15, **2019**
 CCU Professional Enhancement Grant (PEG) Lee (PI) and Pérez-Alvarado (Co-I) \$4,000
 Structures and interactions of small regulatory RNA (sRNA) transcripts and conserved virulence factor A protein that regulate virulence during invasive infections of group A streptococcus (GAS).

SCoRE Program of CCU INBRE Lee (PI) June 4 to August 10, **2018**
 SC INBRE (NIH-NIGMS P20) \$21,000
 Metal-dependent phosphohydrolase activity and RNA binding specificity of the conserved virulence factor A regulates pathogenesis in *Streptococcus pyogenes*
 Participants: Lauren Angello (Biology), Cameron Carroll (Psychology), Sara Nibar (Biochemistry)

Merck Verhoeven (PI), Lee (Co-I) and Sponseller (Co-I) October **2016** to September **2018**
 Investigator Studies Program Review Committee (MISP-RC) \$223,965
 Investigation of a candidate universal influenza vaccine targeting the HA head

Merck Verhoeven (PI), Lee (Co-I), Ackermann (Co-I) and Yu (Co-I) November **2016** to October **2017**
 Investigator Studies Program Review Committee (MISP-RC) \$232,302
 Mechanism of antibiotic resistant *Streptococcus pneumoniae* using a novel lamb model of RSV co-infection
 Role: Co-Investigator

R15 GM101603-01 MPI Lee (PI), Cho (PI), Pérez Alvarado (PI) August **2012** to March **2017**
 NIGMS-NIH \$334,650
 Metal-dependent phosphohydrolase activity of CvfA from *Streptococcus pyogenes*.

Seed Funding for Pilot Projects Lee (PI) and Verhoeven (Co-I) May **2015** to June **2016**
 Presidential Initiative for Interdisciplinary Research, Iowa State University \$18,000
 Antibody fragments for structural studies of viral proteins

S10 OD016259-01 Ackerman (PI) August **2013** to July **2014**
 NIH SIG \$436,700
 Request to purchase a 600 MHz NMR replacement console and cold probe. This funding will upgrade the sensitivity and experimental capabilities of an existing 600 MHz NMR spectrometer at Washington University, which has been essential to my research efforts. Role: Major user.

R25 GM107760-01 Renzaglia (PI) and Sharp (PI) September **2013** to June **2018**
 NIGMS-NIH \$2,090,264
 Southern Illinois Bridges to the Baccalaureate Program
 This project is a partnership with two local community colleges to provide a two-year program of research seminars, inquiry-based learning and introductory research experience to underrepresented minorities and students from disadvantaged backgrounds. In the second year, the top students are recruited to participate in faculty-mentored research within NIH and NSF supported laboratories. Role: Senior Personnel and Mentor.

DMR-1157058 Goodson (PI) May **2012** to April **2015**
 National Science Foundation \$315,000
 REU Site for Interdisciplinary Materials Research

This project gives potential graduate students the opportunity to participate in research during the summer. Mentors work closely with students providing an independent research project with students presenting the results at a public poster session at the end of the program. Role: Senior Personnel and Mentor.
Mentored Participant: Fanny Chu, Binghamton University (2012).

Academic Scholarship Office Lee (PI) September **2007** to May **2014**
Southern Illinois University \$28,000
Undergraduate Research Assistantships

This funding provides undergraduates students with an opportunity to participate in research during the academic year. A competitive REACH Awards program is also available to students who submit a research proposal. Mentors work closely with students providing academic and career advisement.
Mentored Participants: Dalton Michels (2013-2014), Taylor Griffith (2012-2013), Bryce Hilburn (2009-2011), Stephanie Geiser (2010-2011), Sarah Wells (2007-2009), Megan Czerniejewski (2008-2009).

ACS Project SEED Pérez-Alvarado (PI) June **2008** to August **2012**
American Chemical Society \$15,210

This project gives under-represented students planning to study Chemistry in college the opportunity to participate in research during the summer while still in high school. ACS also provides scholarships to qualified students. Mentors work closely with students and provide advisement for college preparation.
Mentored Participants: Benjamin Hale, Herrin H.S. (2008); Rebecca Weber, Herrin H.S. (2010, 2011).
Role: Senior Personnel (2008), Mentor (2008, 2010, 2011), Co-PI (2009, 2010, 2012) and PI (2011)

DMR-0852004 Dyer (PI) May **2009** to April **2012**
National Science Foundation \$315,000

REU Site for Interdisciplinary Materials Research: Participating REU students work on interdisciplinary projects with guidance from faculty mentors in Chemistry, Physics and/or Engineering departments.
Mentored Participants: Jeffrey Allen, Carroll College (2011); Stephanie Geiser, SIUC (2010); Tequilla Manning, Grinnell (2009). Role: Senior Personnel and Mentor

NIH-NRSA Lee (PI) **1999** to **2001**

National Institutes of Health
Ruth L. Kirschstein National Research Service Award for Individual Postdoctoral Training
5S rRNA Recognition by Transcription Factor IIIA.

Publications

Professional Journals († These authors contributed equally. ‡ Member of consortium. * Student mentored by BML.)

19. David Verhoeven, Brett A. Sponseller, James E. Crowe Jr., Sandhya Bangaru, Richard J. Webby, Brian M. Lee and Jessie D. Trujillo (2020) "Use of equine H3N8 hemagglutinin as a broadly protective influenza vaccine immunogen," manuscript submitted for publication.
18. Firas Khatib, Ambroise Desfosses, Foldit Players‡, Brian Koepnick, Jeff Flatten, Zoran Popovic, David Baker, Seth Cooper, Irina Gutsche and Scott Horowitz (2019) "Building de novo cryo-electron microscopy structures collaboratively with citizen scientists," *PLOS Biology*, **17** (11) e3000472. [doi:10.1371/journal.pbio.3000472](https://doi.org/10.1371/journal.pbio.3000472)
17. Joonbae Seo, Natalia N. Singh, Eric Ottesen, Brian M. Lee and Ravindra Singh (2016) "A novel human-specific splice isoform alters the critical C-terminus of Survival Motor Neuron protein," *Scientific Reports*, **6**: 30778. [doi:10.1038/srep30778](https://doi.org/10.1038/srep30778)
16. Natalia N. Singh, Brian M. Lee, Christine J. DiDonato and Ravindra N. Singh (2015) "Mechanistic principles of antisense targets for the treatment of spinal muscular atrophy," *Future Medicinal Chemistry* **7** (13) 1793-1808. [doi:10.4155/fmc.15.101](https://doi.org/10.4155/fmc.15.101)

15. Natalia N. Singh, Brian M. Lee and Ravindra N. Singh (2015) "Splicing regulation in spinal muscular atrophy by a unique RNA structure formed by long distance interactions," *Annals of the New York Academy of Sciences* **1341**: 176-187. [doi:10.1111/nyas.12727](https://doi.org/10.1111/nyas.12727)
14. Daniel J. Merkel*, Sarah B. Wells*, Bryce C. Hilburn*, Fatima Elazzouzi, Gabriela C. Pérez-Alvarado and Brian M. Lee (2013) "The C-terminal region of cytoplasmic polyadenylation element binding protein is a ZZ domain with potential for both nucleic acid and protein-protein interactions." *Journal of Molecular Biology* **425** (11) 2015-2026. [doi:10.1016/j.jmb.2013.03.009](https://doi.org/10.1016/j.jmb.2013.03.009)
13. Brian Lee (2012) "Nab2, a three-cornered hat to bind a poly(A) tail." *Structure* **20** (6) 937-938. [doi:10.1016/j.str.2012.05.005](https://doi.org/10.1016/j.str.2012.05.005)
12. Raphael Stoll, Brian M. Lee, Erik W. Debler, John H. Laity, Ian A. Wilson, H. Jane Dyson and Peter E. Wright (2007) "Structure of the Wilms Tumor Suppressor Protein Zinc Finger Domain Bound to DNA." *Journal of Molecular Biology* **372** (5) 1227-45. [doi:10.1016/j.jmb.2007.07.017](https://doi.org/10.1016/j.jmb.2007.07.017)
11. Brian M. Lee†, Bethany A. Buck-Koehntop†, Maria A. Martinez-Yamout, H. Jane Dyson and Peter E. Wright (2007) "Embryonic neural inducing factor Churchill is not a DNA-binding zinc finger protein: solution structure reveals a solvent-exposed beta-sheet and zinc binuclear cluster." *Journal of Molecular Biology* **371** (5) 1274-89. [doi:10.1016/j.jmb.2007.06.021](https://doi.org/10.1016/j.jmb.2007.06.021)
10. Brian M. Lee, Jing Xu, Bryan Clarkson, Maria A. Martinez-Yamout, H. Jane Dyson, David A. Case, Joel M. Gottesfeld and Peter E. Wright (2006) "Induced fit and "lock-and-key" recognition of 5S RNA by zinc fingers of transcription factor IIIA." *Journal of Molecular Biology* **357** (1) 275-91. [doi:10.1016/j.jmb.2005.12.010](https://doi.org/10.1016/j.jmb.2005.12.010)
9. Glen B. Legge, Maria A. Martinez-Yamout, David M. Hambly, Tam Trinh, Brian M. Lee, H. Jane Dyson and Peter E. Wright (2004) "ZZ domain of CBP: an unusual zinc finger fold in a protein interaction module." *Journal of Molecular Biology* **343** (4) 1081-1093. [doi:10.1016/j.jmb.2004.08.087](https://doi.org/10.1016/j.jmb.2004.08.087)
8. John H. Laity, Brian M. Lee and Peter E. Wright. (2001) "Zinc finger proteins: new insights into structural and functional diversity." *Current Opinion in Structural Biology* **11** (1) 39-46. [doi:10.1016/S0959-440X\(00\)00167-6](https://doi.org/10.1016/S0959-440X(00)00167-6)
7. Laura S. Neely, Brian M. Lee, Jing Xu, Peter E. Wright and Joel M. Gottesfeld (1999) "Identification of a minimal domain of 5S ribosomal RNA sufficient for high affinity interactions with the RNA-specific zinc fingers of transcription factor IIIA." *Journal of Molecular Biology* **291** (3) 549-60. [doi:10.1006/jmbi.1999.2985](https://doi.org/10.1006/jmbi.1999.2985)
6. Brian M. Lee, Roberto N. de Guzman, Brian G. Turner, Nico Tjandra and Michael F. Summers (1998) "Dynamical behavior of the HIV-1 nucleocapsid protein." *Journal of Molecular Biology* **279** (3) 633-649. [doi:10.1006/jmbi.1998.1766](https://doi.org/10.1006/jmbi.1998.1766)
5. Rossitza K. Gitti†, Brian M. Lee†, Jill Walker, Michael F. Summers, Sanghee Yoo and Wesley I. Sundquist (1996) "Structure of the amino-terminal core domain of the HIV-1 capsid protein." *Science* **273** (5272) 231-235. [doi:10.1126/science.273.5272.231](https://doi.org/10.1126/science.273.5272.231)
4. Cory Momany, Ladislau C. Kovari, Andrew J. Prongay, Walter Keller, Rossitza K. Gitti, Brian M. Lee, Alexander E. Gorbalenya, Liang Tong, Jan McClure, Lorna S. Ehrlich, Michael F. Summers, Carol Carter and Michael G. Rossman (1996) "Crystal structure of dimeric HIV1 capsid protein." *Nature Structural Biology* **3** (9) 763-770. [doi:10.1038/nsb0996-763](https://doi.org/10.1038/nsb0996-763)
3. Paul R. Blake, Brian Lee, Michael F. Summers, Jae-Bum Park, Zhi Hao Zhou and Michael W. W. Adams (1994) "Heteronuclear magnetic resonance studies of Zn, ¹¹³Cd, and ¹⁹⁹Hg substituted *P. furiosus* rubredoxin: implications biological electron transfer." *New Journal of Chemistry* **18** (3) 387-395.
2. Paul R. Blake, Brian M. Lee, Michael F. Summers, Michael W. W. Adams, Jae-Bum Park, Zhi Hao Zhou and Ad Bax (1992) "Quantitative measurement of small through-hydrogen-bond and 'through-space'

^1H - ^{113}Cd and ^1H - ^{199}Hg J couplings in metal-substituted rubredoxin from *Pyrococcus furiosus*." *Journal of Biomolecular NMR* **2** (5) 527-533. doi:10.1007/BF02192814

1. A. Martin-Gallardo, W.R. McCombie, J.D. Gocayne, M.G. Fitzgerald, S. Wallace, B.M. Lee, J. Lamerdin, S. Trapp, J.M. Kelley, L.I. Liu, M. Dubnick, L.A. Johnstonow, A.R. Kerlavage, P. Dejong, A. Carrano, C. Fields and J.C. Venter (1992) "Automated DNA sequencing and analysis of 106 kilobases from human chromosome 19q13.3." *Nature Genetics* **1** (1) 34-39. doi:10.1038/ng0492-34

Manuscripts in Preparation (* Student mentored by BML.)

4. Gabriela C. Pérez-Alvarado, Gavin Sowa*, Stephanie Geiser*, Katherine Turnbull*, Suryatej Akavaram*, José De La Espriella*, Taylor D. Griffith*, Rebecca C. Weber*, Dalton Michels*, Jinsai Shang*, Bingxin Yuan*, Kyu Hong Cho and Brian M. Lee "Structure and RNA interactions of the KH domain of CvfA from *Streptococcus pyogenes*." In preparation for *Nucleic Acids Research*.
3. Stephanie Geiser*, Gavin Sowa*, Katherine Turnbull*, Suryatej Akavaram*, José De La Espriella*, Jinsai Shang*, Rebecca C. Weber*, Dalton Michels*, Kyu Hong Cho, Gabriela C. Pérez-Alvarado and Brian M. Lee "Expression and purification the dimeric N-terminal region of CvfA from *Streptococcus pyogenes*." In preparation for *Protein Expression and Purification*.
2. Brian M. Lee, Justin C. Baker, Pradeep Ramiah-Rajasekaran and Gabriela C. Pérez-Alvarado " ^1H , ^{15}N and ^{13}C backbone assignments of the extended PDZ domain of the transcription factor and adaptor protein LMO7." In preparation for *Biomolecular NMR Assignments*.
1. Valeria A. Copello, Catherine A. Carney, Taylor D. Griffith*, Bryce C. Hilburn*, Katherine Turnbull*, Suryatej Akavaram*, José De La Espriella*, Kyu Hong Cho, Brian M. Lee and Gabriela C. Pérez-Alvarado "Strategies for high-yield protein expression, purification, increased solubility and stability for biophysical characterization of the HD domain in CvfA," In preparation for *Protein Expression and Purification*.

Published Abstracts (Presenter is underlined. * Student mentored by BML.)

4. Brian M. Lee, Daniel Merkel*, Bryce Hilburn* and Sarah Wells* (2012) "Solution structure of the binuclear zinc finger of cytoplasmic polyadenylation element binding protein (CPEB)." *Biophysical Journal* **102** (3) 249a.
3. Daniel Merkel*, Bryce Hilburn*, Sarah Wells*, Stephanie Geiser*, Haley Hoover*, Oluwatobi Ajoku* and Brian Lee (2011) "Structural characterization of the zinc finger domain of cytoplasmic polyadenylation element-binding protein." *Biophysical Journal* **100** (3) 606a.
2. Bryce Hilburn*, Daniel Merkel*, Sarah Wells* and Brian Lee (2011) "Structural analysis of the C-terminal RNA binding domain of CPEB3." *Biophysical Journal* **100** (3) 233a-234a.
1. Daniel Merkel*, Sarah Wells*, Bryce Hilburn*, Haley Hoover*, Oluwatobi Ajoku*, Stephanie Geiser*, Fatima Elazzouzi, Brian M. Lee (2010) "Structural studies of a novel zinc finger domain required for recognition of the cytoplasmic polyadenylation element within the 3' UTR of mRNA." *Biophysical Journal* **98** (3) 176a.

Research Contributions (* Student mentored by BML.)

13. Daniel J. Merkel*, Sarah B. Wells*, Bryce C. Hilburn*, Fatima Elazzouzi, Gabriela C. Pérez-Alvarado and Brian M. Lee (2012) "The ZZ domain of cytoplasmic polyadenylation element binding protein 1 (CPEB1)." (Solution NMR) *Protein Data Bank* ID: **2M13** and *Biological Magnetic Resonance Data Bank* Entry ID: **18840**. doi:10.2210/pdb2m13/pdb
12. Raphael Stoll, Brian M. Lee, Erik W. Debler, John H. Laity, Ian A. Wilson, H. Jane Dyson and Peter E. Wright (2007) "Structure of the Wilms tumor suppressor protein zinc finger domain bound to DNA (ZF2-4)." (X-ray diffraction 3.15 Å resolution) *Protein Data Bank* ID: **2PRT** and *Nucleic Acid Database* ID: **PD1019**. doi:10.2210/pdb2prt/pdb

11. Raphael Stoll, Brian M. Lee, Erik W. Debler, John H. Laity, Ian A. Wilson, H. Jane Dyson and Peter E. Wright (2007) "Structure of the Wilms tumor suppressor protein zinc finger domain bound to DNA (17mer)." (Solution NMR) *Protein Data Bank* and *Nucleic Acid Database* ID: **2JP9**. *Biological Magnetic Resonance Data Bank* Entry ID: **15532**. [doi:10.2210/pdb2jp9/pdb](https://doi.org/10.2210/pdb2jp9/pdb)
10. Raphael Stoll, Brian M. Lee, Erik W. Debler, John H. Laity, Ian A. Wilson, H. Jane Dyson and Peter E. Wright (2007) "Structure of the Wilms tumor suppressor protein zinc finger domain bound to DNA (14mer)." (Solution NMR) *Protein Data Bank* and *Nucleic Acid Database* ID: **2JPA**. *Biological Magnetic Resonance Data Bank* Entry ID: **15533**. [doi:10.2210/pdb2jpa/pdb](https://doi.org/10.2210/pdb2jpa/pdb)
9. Brian M. Lee, Bethany A. Buck-Koehntop, Maria A. Martinez-Yamout, H. Jane Dyson and Peter E. Wright (2007) "Embryonic neural inducing factor Churchill is not a DNA-binding zinc finger protein: solution structure reveals a solvent-exposed beta-sheet and zinc binuclear cluster." (Solution NMR) *Protein Data Bank* ID: **2JOX**. *Biological Magnetic Resonance Data Bank* Entry ID: **15208**. [doi:10.2210/pdb2jox/pdb](https://doi.org/10.2210/pdb2jox/pdb)
8. Brian M. Lee, Jing Xu, Bryan Clarkson, Maria A. Martinez-Yamout, H. Jane Dyson, David A. Case, Joel M. Gottesfeld and Peter E. Wright (2006) "Transcription factor IIIA zinc fingers 4-6 bound to 5S rRNA 55mer" (Solution NMR) *Protein Data Bank* and *Nucleic Acid Database* ID: **2HGH**. *Biological Magnetic Resonance Data Bank* Entry ID: **7194**. [doi:10.2210/pdb2hgh/pdb](https://doi.org/10.2210/pdb2hgh/pdb)
7. Glen B. Legge, Maria A. Martinez-Yamout, David M. Hambly, Tam Trinh, Brian M. Lee, H. Jane Dyson and Peter E. Wright (2004) "ZZ domain of CBP- a novel fold in a protein interaction module." (Solution NMR) *Protein Data Bank* ID: **1TOT**. *Biological Magnetic Resonance Data Bank* Entry ID: **6238**. [doi:10.2210/pdb1tot/pdb](https://doi.org/10.2210/pdb1tot/pdb)
6. Chun Tang, Rossitza K. Gitti, Brian M. Lee, Jill Walker, Michael F. Summers, Sanghee Yoo and Wesley I. Sundquist (2002) "Structure of the N-terminal domain of the mature HIV-1 capsid protein." (Solution NMR) *Protein Data Bank* ID: **1GWP**. [doi:10.2210/pdb1gwp/pdb](https://doi.org/10.2210/pdb1gwp/pdb)
5. Michael F. Summers, Brian G. Turner, Roberto N. de Guzman, Brian M. Lee and Nico Tjandra (1998) "Dynamical behavior of the HIV-1 nucleocapsid protein; NMR, 30 structures." (Solution NMR) *Protein Data Bank* ID: **1MFS**. [doi:10.2210/pdb1mfs/pdb](https://doi.org/10.2210/pdb1mfs/pdb)
4. Cory Momany, Ladislav C. Kovari, Andrew J. Prongay, Walter Keller, Rossitza K. Gitti, Brian M. Lee, Alexander E. Gorbalenya, Liang Tong, Jan McClure, Lorna S. Ehrlich, Michael F. Summers, Carol Carter and Michael G. Rossmann (1997) "HIV-1 capsid protein (p24) complex with FAB25.3." (X-ray diffraction 3.70 Å resolution) *Protein Data Bank* ID: **1AFV**. [doi:10.2210/pdb1afv/pdb](https://doi.org/10.2210/pdb1afv/pdb)
3. Rossitza K. Gitti, Brian M. Lee, Jill Walker, Michael F. Summers, Sanghee Yoo and Wesley I. Sundquist (1996) "HIV-1 capsid protein, amino-terminal core domain 1-151, NMR: 50 models." (Solution NMR) *Protein Data Bank* ID: **1GDS**, **1GDY**, **1GDZ**. (superseded by **1GWP**, above).
2. A. Martin-Gallardo, W. R. McCombie, J. D. Gocayne, M. G. Fitzgerald, S. Wallace, B. M. Lee, J. Lamerdin, S. Trapp, J. M. Kelley, L. I. Liu, M. Dubnick, L. A. Johnstondow, A. R. Kerlavage, P. Dejong, A. Carrano, C. Fields and J. C. Venter (1992) "Human DNA from cosmid DNA MMDB (f10080) and MMDC (f13544) from chromosome 19q13.3 (obtained by automated sequence analysis)." *GenBank* Accession Number: **M89651**.
1. A. Martin-Gallardo, W. R. McCombie, J. D. Gocayne, M. G. Fitzgerald, S. Wallace, B. M. Lee, J. Lamerdin, S. Trapp, J. M. Kelley, L. I. Liu, M. Dubnick, L. A. Johnstondow, A. R. Kerlavage, P. Dejong, A. Carrano, C. Fields and J. C. Venter (1992) "Human DNA from cosmid MMDA from chromosome 19q13.3 (obtained by automated sequence analysis)." *GenBank* Accession Number: **M63796**.

Invited Lectures and Presentations (Presenter is underlined. * Student mentored by BML.)

25. Brian M. Lee, *Biomolecular structure and function*. Chemistry Department Seminar for Communications in Physical Chemistry, Coastal Carolina University, Conway, South Carolina (February 14, 2020).

24. Brian M. Lee, *Regulation of Invasive Diseases by RNA Structure*, Coastal Biomedical Research Seminar Series, Coastal Carolina University, Conway, South Carolina (February 7, **2020**).
23. Cameron R. Carroll*, *Structural analysis of RNA elements spanning the ribosome binding site in mRNA transcripts of the streptolysin A associated gene from group A Streptococcus*. 3-Minute Madness at the 2019 Science Symposium, Columbia, South Carolina (January 25, **2020**).
22. Sara G. Nibar*, *Regulatory RNA structure in Streptococcus pyogenes: Terminator of streptolysin S associated gene A*. Women in STEM Fellowship: Research Fellows Symposium, Coastal Carolina University, Conway, South Carolina (November 18, **2019**).
21. Brian M. Lee, *Biomolecular structure and function*. Chemistry Department Seminar for Communications in Physical Chemistry, Coastal Carolina University, Conway, South Carolina (March 22, **2019**).
20. Lauren R. Angello*, *Isolation and characterization of the 5'UTR of Pel/sagA: A virulence-related small regulatory RNA of group A streptococcus*. Coastal Biomedical Research Seminar Series, Coastal Carolina University, Conway, South Carolina (November 9, **2018**).
19. Brian M. Lee, *Scientific literature and references*. INBRE SCoRE Summer Program, Coastal Carolina University, Conway, South Carolina (July 12, **2018**).
18. Brian M. Lee, *Biomolecular structure and function*. Chemistry Department Seminar for Communications in Physical Chemistry, Coastal Carolina University, Conway, South Carolina (March 23, **2018**).
17. Brian M. Lee, *Structure and interactions of conserved virulence factor A from Streptococcus pyogenes*. Coastal Biomedical Research Seminar Series, Coastal Carolina University, Conway, South Carolina (February 23, **2018**).
16. Brian M. Lee, *Structure and interactions of the conserved virulence factor A from Streptococcus pyogenes*. Presented at the 2016 CVM Faculty Research Symposium. College of Veterinary Medicine, Iowa State University, Ames, Iowa (January 6, **2016**).
15. Brian M. Lee, *Structure and interactions of the conserved virulence factor A from Streptococcus pyogenes*. Department of Biology, Indiana State University, Terre Haute, Indiana (November 17, **2015**).
14. Brian M. Lee, *Structure and interactions of the conserved virulence factor A from Streptococcus pyogenes*. Department of Biomedical Sciences, College of Veterinary Medicine, Iowa State University, Ames, Iowa (September 24, **2015**).
13. Brian M. Lee, *CyfA and the RNA Degradosome in Streptococcus pyogenes*, Collaborative Research Workshop, Center for Advanced Host Defense Immunobiotics and Translational Comparative Medicine, Department of Biomedical Sciences, College of Veterinary Medicine, Iowa State University, Ames, Iowa (April 20, **2015**).
12. Brian M. Lee, *Structural Studies of Translational Regulation by mRNA Binding Proteins*, Faculty Research Symposium, College of Veterinary Medicine, Iowa State University (January 7, **2015**).
11. Brian M. Lee, *NMR Spectroscopy of RNA Binding Proteins: ZZ Domain of CPEB1 and TFIIIA Bound to 5S rRNA*, ISU RNA Club Meeting, Iowa State University, Ames, Iowa (October 7, **2014**).
10. Brian M. Lee, *Research Interests: NMR Spectroscopy of Proteins and Nucleic Acids*, Collaborative Research Workshop, Center for Advanced Host Defense Immunobiotics and Translational Comparative Medicine, Department of Biomedical Sciences, College of Veterinary Medicine, Iowa State University, Ames, Iowa (September 25, **2014**).
9. Brian M. Lee, *NMR Spectroscopy of Zinc Finger and RNA Binding Proteins*, CAHDIT/PIIR Workshop, Center for Advanced Host Defense Immunobiotics and Translational Comparative Medicine, Department of Biomedical Sciences, College of Veterinary Medicine, Iowa State University, Ames, Iowa (March 10, **2014**).

8. Brian M. Lee, *ZZ domain of cytoplasmic polyadenylation element binding protein: Structure and potential role in ribonucleotide assembly*, Structural Biophysics Laboratory, National Cancer Institute, Center for Cancer Research, Frederick, Maryland (October 24, 2013)
7. Brian M. Lee, *ZZ domain of cytoplasmic polyadenylation element binding protein: Structure and potential role in ribonucleotide assembly*, Center for Advanced Host Defense Immunobiotics and Translational Comparative Medicine, Department of Biomedical Sciences, College of Veterinary Medicine, Iowa State University, Ames, Iowa (September 4, 2013)
6. Brian M. Lee, *Solution structure of the ZZ domain of cytoplasmic polyadenylation element binding protein*, Department of Biochemistry, Southern Illinois University Medical School, Carbondale, Illinois (October 12, 2012)
5. Brian M. Lee, *Solution structure of the binuclear zinc finger of cytoplasmic polyadenylation element binding protein*, Presented at the Colloquium Series, Department of Chemistry and Biochemistry, University of Mississippi, Oxford, Mississippi (April 4, 2012)
4. Brian M. Lee, *Towards the solution structure of the binuclear zinc binding domain of cytoplasmic polyadenylation element binding protein*, Presented at the SBS Seminars, School of Biological Sciences, University of Missouri – Kansas City, Kansas City, Missouri (March 8, 2012)
3. Brian M. Lee, *Towards the solution structure of the binuclear zinc finger of CPEB*, Presented at the Great Plains Regional Annual Symposium on Protein & Biomolecular NMR (GRASP-NMR 2011), University of Kansas, Lawrence, Kansas (October 28-29, 2011)
2. Brian M. Lee, *Improved water suppression techniques with pulse field gradients and mediation of spectrometer artifacts from temperature fluctuations and electromagnetic interference*. Presented at the Bruker NMR Mid-Atlantic Regional Users Meeting, Wilmington, Delaware (July 20-21, 1995).
1. Brian M. Lee, *Ribonucleic acid binding properties of nucleocapsid protein from human immunodeficiency virus type 1*. Presented at the Magnetic Resonance in Medicine and Biology, Gordon Research Conference, New England College, Henniker, New Hampshire (July 17-22, 1994).

Poster Presentations (Presenter is underlined. * Student mentored or co-mentored by BML.)

87. Cameron R. Carroll*, Alexis S. Brown*, Regan A. Finn*, Kayla J. Calderon*, Sara G. Nibar*, Gabriela C. Pérez Alvarado and Brian M. Lee, *Structural analysis of RNA elements spanning the ribosome binding site in mRNA transcripts of the streptolysin A associated gene from group A Streptococcus*. 2019 Science Symposium, Columbia, South Carolina (January 25, 2020).
86. Sara G. Nibar*, Kayla J. Calderon*, Regan A. Finn*, Cameron R. Carroll*, Alexis S. Brown*, Gabriela C. Pérez Alvarado and Brian M. Lee, *Regulatory RNA structure in Streptococcus pyogenes: Terminator of streptolysin A associated gene A*. 2019 Science Symposium, Columbia, South Carolina (January 25, 2020).
85. Alexis S. Brown*, Cameron R. Carroll*, Regan A. Finn*, Lauren R. Angello*, Sara G. Nibar*, Kayla J. Calderon*, Brian M. Lee and Gabriela C. Pérez Alvarado, *Studies of the 5' untranslated region of sagA/Pel in Streptococcus pyogenes*. 2019 Science Symposium, Columbia, South Carolina (January 25, 2020).
84. Kayla J. Calderon*, Sara G. Nibar*, Regan A. Finn*, Cameron R. Carroll*, Alexis S. Brown*, Brian M. Lee and Gabriela C. Pérez Alvarado, *Characterization of the 3' untranslated region of sagA mRNA from group A Streptococcus*. 2019 Science Symposium, Columbia, South Carolina (January 25, 2020).
83. Regan A. Finn*, Sara G. Nibar*, Lauren R. Angello*, Cameron R. Carroll*, Alexis S. Brown*, Kayla J. Calderon*, Brian M. Lee and Gabriela C. Pérez Alvarado, *Studies of the small regulatory RNAs FasX and Pel from Streptococcus pyogenes*. 2019 Science Symposium, Columbia, South Carolina (January 25, 2020).
82. Cameron R. Carroll*, Alexis S. Brown*, Regan A. Finn*, Kayla J. Calderon*, Sara G. Nibar*, Gabriela C. Pérez Alvarado and Brian M. Lee, *Structural analysis of RNA elements spanning the ribosome binding site in mRNA transcripts of the streptolysin A associated gene from group A Streptococcus*. The 71st Southeastern Regional Meeting of the American Chemical Society (SERMACS 2019), Savannah, Georgia (October 20 to 23, 2019).

81. Sara G. Nibar*, Kayla J. Calderon*, Regan A. Finn*, Cameron R. Carroll*, Alexis S. Brown*, Gabriela C. Pérez Alvarado and Brian M. Lee, *Regulatory RNA structure in Streptococcus pyogenes: Terminator of streptolysin S associated gene A*. The 71st Southeastern Regional Meeting of the American Chemical Society (SERMACS 2019), Savannah, Georgia (October 20 to 23, **2019**).
80. Alexis S. Brown*, Cameron R. Carroll*, Regan A. Finn*, Lauren R. Angello*, Sara G. Nibar*, Kayla J. Calderon*, Brian M. Lee and Gabriela C. Pérez Alvarado, *Studies of the 5' untranslated region of sagA/Pel in Streptococcus pyogenes*. The 71st Southeastern Regional Meeting of the American Chemical Society (SERMACS 2019), Savannah, Georgia (October 20 to 23, **2019**).
79. Kayla J. Calderon*, Sara G. Nibar*, Regan A. Finn*, Cameron R. Carroll*, Alexis S. Brown*, Brian M. Lee and Gabriela C. Pérez Alvarado, *Characterization of the 3' untranslated region of sagA mRNA from group A Streptococcus*. The 71st Southeastern Regional Meeting of the American Chemical Society (SERMACS 2019), Savannah, Georgia (October 20 to 23, **2019**).
78. Regan A. Finn*, Sara G. Nibar*, Lauren R. Angello*, Cameron R. Carroll*, Alexis S. Brown*, Kayla J. Calderon*, Brian M. Lee and Gabriela C. Pérez Alvarado, *Studies of the small regulatory RNAs FasX and Pel from Streptococcus pyogenes*. The 71st Southeastern Regional Meeting of the American Chemical Society (SERMACS 2019), Savannah, Georgia (October 20 to 23, **2019**).
77. Cameron R. Carroll*, Alexis S. Brown*, Regan A. Finn*, Kayla J. Calderon*, Sara G. Nibar*, Gabriela C. Pérez Alvarado and Brian M. Lee, *Structural analysis of RNA elements spanning the ribosome binding site in mRNA transcripts of the streptolysin A associated gene from group A Streptococcus*. Summer Coastal Research Experience 2019, Coastal Carolina University, Conway, South Carolina (August 7, **2019**).
76. Sara G. Nibar*, Kayla J. Calderon*, Regan A. Finn*, Cameron R. Carroll*, Alexis S. Brown*, Gabriela C. Pérez Alvarado and Brian M. Lee, *Regulatory RNA structure in Streptococcus pyogenes: Terminator of streptolysin S associated gene A*. Summer Coastal Research Experience 2019, Coastal Carolina University, Conway, South Carolina (August 7, **2019**).
75. Alexis S. Brown*, Cameron R. Carroll*, Regan A. Finn*, Lauren R. Angello*, Sara G. Nibar*, Kayla J. Calderon*, Brian M. Lee and Gabriela C. Pérez Alvarado, *Studies of the 5' untranslated region of sagA/Pel in Streptococcus pyogenes*. Summer Coastal Research Experience 2019, Coastal Carolina University, Conway, South Carolina (August 7, **2019**).
74. Kayla J. Calderon*, Sara G. Nibar*, Regan A. Finn*, Cameron R. Carroll*, Alexis S. Brown*, Brian M. Lee and Gabriela C. Pérez Alvarado, *Characterization of the 3' untranslated region of sagA mRNA from group A Streptococcus*. Summer Coastal Research Experience 2019, Coastal Carolina University, Conway, South Carolina (August 7, **2019**).
73. Regan A. Finn*, Sara G. Nibar*, Lauren R. Angello*, Cameron R. Carroll*, Alexis S. Brown*, Kayla J. Calderon*, Brian M. Lee and Gabriela C. Pérez Alvarado, *Studies of the small regulatory RNAs FasX and Pel from Streptococcus pyogenes*. Summer Coastal Research Experience 2019, Coastal Carolina University, Conway, South Carolina (August 7, **2019**).
72. Cameron R. Carroll*, Lauren R. Angello*, Sara G. Nibar*, Gabriela C. Pérez Alvarado and Brian M. Lee, *Design and synthesis of regulatory RNA structure from the coding region of streptolysin S associated gene A of group A streptococcus*. Undergraduate Research Competition, Coastal Carolina University, Conway, South Carolina (April 16, **2019**).
71. Lauren R. Angello*, Cameron R. Carroll*, Sara G. Nibar*, Gabriela C. Pérez Alvarado and Brian M. Lee, *Isolation and characterization of the 5'UTR of Pel/sagA: a virulence-related small regulatory RNA of group A streptococcus*. The 70th Southeastern Regional Meeting of the American Chemical Society (SERMACS 2018), Augusta, Georgia (October 31 to November 3, **2018**).
70. Cameron R. Carroll*, Lauren R. Angello*, Sara G. Nibar*, Gabriela C. Pérez Alvarado and Brian M. Lee, *Design and synthesis of regulatory RNA structure from the coding region of streptolysin S associated gene A of group A*

- streptococcus*. The 70th Southeastern Regional Meeting of the American Chemical Society (SERMACS 2018), Augusta, Georgia (October 31 to November 3, **2018**).
69. Sara G. Nibar*, Lauren R. Angello*, Cameron R. Carroll*, Gabriela C. Pérez Alvarado and Brian M. Lee, *Regulatory RNA design and synthesis: the 3'UTR of streptolysin S associated gene A and FasX, the small regulatory RNA*. The 70th Southeastern Regional Meeting of the American Chemical Society (SERMACS 2018), Augusta, Georgia (October 31 to November 3, **2018**).
 68. Lauren R. Angello*, Cameron R. Carroll*, Sara G. Nibar*, Gabriela C. Pérez Alvarado and Brian M. Lee, *Isolation and characterization of the 5'UTR of Pel/sagA: a virulence-related small regulatory RNA of group A streptococcus*. Science Symposium 2018, South Carolina INBRE Program, Columbia, South Carolina (August 10, **2018**).
 67. Cameron R. Carroll*, Lauren R. Angello*, Sara G. Nibar*, Gabriela C. Pérez Alvarado and Brian M. Lee, *Design and synthesis of regulatory RNA structure from the coding region of streptolysin S associated gene A of group A streptococcus*. Science Symposium 2018, South Carolina INBRE Program, Columbia, South Carolina (August 10, **2018**).
 66. Sara G. Nibar*, Lauren R. Angello*, Cameron R. Carroll*, Gabriela C. Pérez Alvarado and Brian M. Lee, *Regulatory RNA design and synthesis: the 3'UTR of streptolysin S associated gene A and FasX, the small regulatory RNA*. Science Symposium 2018, South Carolina INBRE Program, Columbia, South Carolina (August 10, **2018**).
 65. Lauren R. Angello*, Cameron R. Carroll*, Sara G. Nibar*, Gabriela C. Pérez Alvarado and Brian M. Lee, *Isolation and characterization of the 5'UTR of Pel/sagA: a virulence-related small regulatory RNA of group A streptococcus*. Summer Coastal Research Experience 2018, Coastal Carolina University, Conway, South Carolina (August 8, **2018**).
 64. Cameron R. Carroll*, Lauren R. Angello*, Sara G. Nibar*, Gabriela C. Pérez Alvarado and Brian M. Lee, *Design and synthesis of regulatory RNA structure from the coding region of streptolysin S associated gene A of group A streptococcus*. Summer Coastal Research Experience 2018, Coastal Carolina University, Conway, South Carolina (August 8, **2018**).
 63. Sara G. Nibar*, Lauren R. Angello*, Cameron R. Carroll*, Gabriela C. Pérez Alvarado and Brian M. Lee, *Regulatory RNA design and synthesis: the 3'UTR of streptolysin S associated gene A and FasX, the small regulatory RNA*. Summer Coastal Research Experience 2018, Coastal Carolina University, Conway, South Carolina (August 8, **2018**).
 62. José De La Espriella*, Katherine Turnbull*, Suryatej Akavaram*, Payton E. Wise, Charles E. Stewart Jr., Kyu Hong Cho, Gabriela C. Pérez-Alvarado, & Brian M. Lee. Structure and interactions of the conserved virulence factor A from *Streptococcus pyogenes*. 2016 Iowa One Health Conference, University of Iowa Center for Emerging Infectious Diseases, Iowa City, IA (November 5, **2016**).
 61. Katherine Turnbull*, Suryatej Akavaram*, José De La Espriella*, Payton E. Wise, Charles E. Stewart Jr., Kyu Hong Cho, Gabriela C. Pérez-Alvarado, & Brian M. Lee. Structure and interactions of the conserved virulence factor A from *Streptococcus pyogenes*. 30th Annual Gibbs Conference on Biothermodynamics, Touch of Nature Conference Center, Carbondale, IL (September 24-27, **2016**).
 60. Suryatej Akavaram*, Payton E. Wise, José De La Espriella*, Katherine Turnbull*, Charles E. Stewart Jr., Kyu Hong Cho, Brian M. Lee, & Gabriela C. Pérez-Alvarado. Structural basis for sRNA-mediated regulation of translation through interactions at the 5' UTR. 30th Annual Gibbs Conference on Biothermodynamics, Touch of Nature Conference Center, Carbondale, IL (September 24-27, **2016**).
 59. Suryatej Akavaram*, José De La Espriella*, Katherine Turnbull*, Payton E. Wise, Kyu Hong Cho, Gabriela C. Pérez-Alvarado and Brian Lee, *Stabilization of CnfA by binding of the metK2 substrate in Streptococcus pyogenes*. CVM Summer Scholar Research Day, Iowa State University, Ames, IA (August 5, **2016**).

58. José De La Espriella*, Suryatej Akavaram*, Katherine Turnbull*, Kyu Hong Cho, Gabriela C. Pérez-Alvarado and Brian Lee, *Purification and stability screens of conserved virulence factor A in Streptococcus pyogenes*. CVM Summer Scholar Research Day, Iowa State University, Ames, IA (August 5, **2016**).
57. Suryatej Akavaram*, José De La Espriella*, Katherine Turnbull*, Payton E. Wise, Kyu Hong Cho, Gabriela C. Pérez-Alvarado and Brian Lee, *Stabilization of CvfA by binding of the metK2 substrate in Streptococcus pyogenes*. Summer REU Poster Presentation, Iowa State University, Ames, IA (August 4, **2016**).
56. José De La Espriella*, Suryatej Akavaram*, Katherine Turnbull*, Kyu Hong Cho, Gabriela C. Pérez-Alvarado and Brian Lee, *Purification and stability screens of conserved virulence factor A in Streptococcus pyogenes*. 2016 Meriel-NIH National Veterinary Scholars Symposium, The Ohio State University, Columbus, OH (July 28-31, **2106**).
55. Gabriela C. Pérez-Alvarado, Valeria A. Copello, Taylor D. Griffith*, Catherine A. Carney, Katherine Turnbull*, Bryce Hilburn*, Charles E. Stewart Jr., Kyu Hong Cho and Brian M. Lee, *Structural determinants for the metal-dependent activity and substrate specificity of the phosphohydrolase HD domain in CvfA/RNase Y from Streptococcus pyogenes*. 2016 CVM Faculty Research Symposium, Iowa State University, Ames, IA (January 6, **2016**).
54. Katherine Turnbull*, Kyu Hong Cho, Gabriela C. Pérez-Alvarado and Brian M. Lee, *Structure and interactions of the conserved virulence factor A from Streptococcus pyogenes*. CVM Summer Scholar Research Day, Iowa State University, Ames, IA (August 7, **2015**).
53. Katherine Turnbull*, Kyu Hong Cho, Gabriela C. Pérez-Alvarado and Brian M. Lee, *Structure and interactions of the conserved virulence factor A from Streptococcus pyogenes*. Meriel-NIH National Veterinary Scholars Symposium, University of California Davis, School of Veterinary Medicine, Davis, CA (July 30 to August 2, **2015**).
52. Valeria A. Copello, Taylor D. Griffith*, Catherine A. Carney, Fanny Chu*, Kyu Hong Cho, Brian M. Lee and G. C. Pérez-Alvarado, *Substrate specificity and metal dependence of phosphohydrolase activity in the HD domain of CvfA from Streptococcus pyogenes*. 2014 Undergraduate Creative Activities and Research Forum, Southern Illinois University, Carbondale, IL (April 7, **2014**).
51. Valeria A. Copello, Taylor D. Griffith*, Catherine A. Carney, Fanny Chu*, Kyu Hong Cho, Brian M. Lee and Gabriela C. Pérez-Alvarado, *Substrate specificity and metal dependence of phosphohydrolase activity in the HD domain of CvfA from Streptococcus pyogenes*. 2014 Spring Symposium & Student Research Conference in STEM, Illinois Louis Stokes Alliance for Minority Participation Program (ILSAMP) & the Center for STEM Education and Research, Tinley Park Convention Center, Chicago, IL (February 14-15, **2014**).
50. Gavin Sowa*, Taylor D. Griffith*, Dalton Michels*, Bingxin Yuan*, Bohui Jiang*, Jinsai Shang*, Fanny Chu*, Stephanie Geiser*, Rebecca C. Weber*, Kyu Hong Cho, Gabriela C. Pérez-Alvarado and Brian M. Lee, *The specific interaction of mRNA with CvfA protein through the KH domain in Streptococcus pyogenes*. The Twenty-seventh Annual Gibbs Conference on Biothermodynamics, Touch of Nature Conference Center, Southern Illinois University, Carbondale, IL (October 5-8, **2013**).
49. Valeria A. Copello†, Taylor D. Griffith†, Catherine A. Carney, Fanny Chu*, Kyu Hong Cho, Brian M. Lee and Gabriela C. Pérez-Alvarado, *Studies of RNA recognition and catalytic domains in the conserved virulence factor A from Streptococcus pyogenes*. The Twenty-seventh Annual Gibbs Conference on Biothermodynamics, Touch of Nature Conference Center, Southern Illinois University, Carbondale, IL (October 5-8, **2013**).
48. Daniel Merkel*, Bingxin Yuan*, Sarah Wells*, Bryce Hilburn*, Fatima Elazzouzi and Brian M. Lee, *Solution Structure and potential interactions of the ZZ domain of cytoplasmic polyadenylation element binding protein*. Great Plains Regional Annual Symposium on Protein & Biomolecular NMR (GRASP-NMR 2012), University of Kansas, Lawrence, KS (November 2-3, **2012**).
47. Bingxin Yuan*, Fanny Chu*, Jinsai Shang*, Daniel Merkel, Gabriela Pérez-Alvarado, Kyu Hong Cho and Brian M. Lee, *Characterization of the mRNA binding to the KH domain of CvfA and the CPEB protein*. The

- Twenty-sixth Annual Gibbs Conference on Biothermodynamics, Touch of Nature Conference Center, Southern Illinois University, Carbondale, IL (September 22-25, **2012**)
46. Jinsai Shang*, Stephanie Geiser*, Rebecca Weber*, Gabriela Pérez-Alvarado, Kyu Hong Cho and Brian M. Lee, *Structure and interactions of the K homology domain in conserved virulence factor A from Streptococcus pyogenes*. The Twenty-sixth Annual Gibbs Conference on Biothermodynamics, Touch of Nature Conference Center, Southern Illinois University, Carbondale, IL (September 22-25, **2012**)
 45. Fanny Chu*, Kyu Hong Cho, Gabriela C. Pérez-Alvarado and Brian M. Lee, *Homology Modeling of the KH and HD Domains of CvfA in Streptococcus pyogenes*. NSF Sponsored Research Experience for Undergraduates Student Poster Presentations, Neckers Atrium, Southern Illinois University, Carbondale, IL (August 9, **2012**)
 44. Catherine A. Carney, Bryce C. Hilburn*, Rebecca C. Weber*, Paul Van Hoveln, Kyu Hong Cho, Brian M. Lee and Gabriela Pérez-Alvarado, *Characterization of the metal-dependent catalytic activity of the HD phosphohydrolase domain in conserved virulence factor A*. St. Louis Area Undergraduate Research Symposium, St. Louis Zoo, St. Louis, MO (April 21, **2012**)
 43. Catherine A. Carney, Bryce C. Hilburn*, Rebecca C. Weber*, Paul Van Hoveln, Kyu Hong Cho, Brian M. Lee and Gabriela Pérez-Alvarado, *Characterization of the metal-dependent catalytic activity of the HD phosphohydrolase domain in conserved virulence factor A*. 9th Annual Research Town Meeting and Fair, Southern Illinois University, Carbondale, IL (April 17, **2012**)
 42. Daniel Merkel*, Sarah Wells*, Bryce Hilburn*, Jeffrey Allen*, Fatima Elazzouzi and Brian Lee, *Structure of the ZZ domain of cytoplasmic polyadenylation element binding protein*, 9th Annual Research Town Meeting and Fair, Southern Illinois University, Carbondale, IL (April 17, **2012**)
 41. Catherine A. Carney, Bryce C. Hilburn*, Rebecca C. Weber*, Paul Van Hoveln, Kyu Hong Cho, Brian M. Lee and Gabriela Pérez-Alvarado, *Characterization of the metal-dependent catalytic activity of the HD phosphohydrolase domain in conserved virulence factor A*. Undergraduate Research Forum, Southern Illinois University, Carbondale, IL (April 16, **2012**)
 40. Jinsai Shang*, Stephanie Geiser*, Rebecca C. Weber*, Kyu Hong Cho, Gabriela C. Pérez-Alvarado and Brian Lee, *Characterizing the structure of the KH domain of CvfA in Streptococcus pyogenes*, Great Plains Regional Annual Symposium on Protein & Biomolecular NMR (GRASP-NMR), University of Kansas, Lawrence, KS (October 28-29, **2011**)
 39. Catherine A. Carney, Bryce C. Hilburn*, Rebecca C. Weber*, Paul Van Hoveln, Kyu Hong Cho, Brian M. Lee and Gabriela Pérez-Alvarado, *Structural characterization of the HD domain in CvfA from Streptococcus pyogenes and the correlation to its metal-dependent phosphodiesterase activity*, Great Plains Regional Annual Symposium on Protein & Biomolecular NMR (GRASP-NMR), University of Kansas, Lawrence, KS (October 28-29, **2011**)
 38. Daniel Merkel*, Bryce Hilburn*, Sarah Wells*, Jeffrey Allen*, Stephanie Geiser*, Oluwatobi Ajoku*, Fatima Elazzouzi and Brian Lee, *Characterizing the structure of the zinc finger in CPEB1*, Great Plains Regional Annual Symposium on Protein & Biomolecular NMR (GRASP-NMR), University of Kansas, Lawrence, KS (October 28-29, **2011**)
 37. Joseph McElyea, Song Ok Kang, Brian M. Lee, Gabriela C. Pérez-Alvarado and Kyu Hong Cho. *Endoribonuclease that regulates Streptococcus pyogenes virulence factors*. The 18th Annual Midwest Microbial Pathogenesis Conference, Ann Arbor, MI (October 21-23, **2011**)
 36. Jinsai Shang*, Stephanie Geiser*, Rebecca C. Weber*, Kyu Hong Cho, Gabriela C. Pérez-Alvarado and Brian Lee, *Characterizing the structure of the KH domain of CvfA in Streptococcus pyogenes*, The Twenty-fifth Annual Gibbs Conference on Biothermodynamics, Touch of Nature Conference Center, Southern Illinois University, Carbondale, IL (September 17-20, **2011**)

35. Catherine A. Carney, Bryce C. Hilburn*, Rebecca C. Weber*, Paul Van Hoveln, Kyu Hong Cho, Brian M. Lee and Gabriela Pérez-Alvarado, *Structural characterization of the HD domain in CvfA from Streptococcus pyogenes and the correlation to its metal-dependent phosphodiesterase activity*, The Twenty-fifth Annual Gibbs Conference on Biothermodynamics, Touch of Nature Conference Center, Southern Illinois University, Carbondale, IL (September 17-20, **2011**)
34. Daniel Merkel*, Bryce Hilburn*, Sarah Wells*, Jeffrey Allen*, Stephanie Geiser*, Oluwatobi Ajoku*, Fatima Elazzouzi and Brian Lee, *Characterizing the structure of the zinc finger in CPEB1*, The Twenty-fifth Annual Gibbs Conference on Biothermodynamics, Touch of Nature Conference Center, Southern Illinois University, Carbondale, IL (September 17-20, **2011**)
33. Rebecca C. Weber*, Jinsai Shang*, Stephanie Geiser*, Kyu Hong Cho, Gabriela Pérez-Alvarado and Brian M. Lee, *Structural characterization of the KH and HD domains of CvfA in Streptococcus pyogenes*, ACS Project SEED, High School Student Poster Presentations, Neckers Atrium, Southern Illinois University, Carbondale, IL (August 4, **2011**)
32. Jeffrey Allen*, Daniel Merkel*, Sarah Wells*, Bryce Hilburn*, Benjamin Hale*, Fatima Elazzouzi and Brian Lee, *Structural characterization of the zinc finger domain of cytoplasmic polyadenylation element binding protein*, NSF Sponsored Research Experience for Undergraduates Student Poster Presentations, Neckers Atrium, Southern Illinois University, Carbondale, IL (August 4, **2011**)
31. Catherine A. Carney, Pushpika S. Katugampola, Mateo C. Houle, Kyu Hong Cho, Brian M. Lee and Gabriela C. Pérez-Alvarado. *Structural characterization of the HD domain and the correlation to its metal-dependent enzymatic activity*. St. Louis Area Undergraduate Research Symposium, Touch of Nature Conference Center, Carbondale, IL (May 7, **2011**)
30. Stephanie Geiser*, Bryce Hilburn*, Rebecca Webber*, Gabriela Pérez-Alvarado, Kyu Hong Cho and Brian Lee, *The K homology domain in conserved virulence factor A from Streptococcus pyogenes*, REACH Undergraduate Research Forum, Southern Illinois University, Carbondale, IL (April 11, **2011**)
29. Catherine A. Carney, Pushpika S. Katugampola, Mateo C. Houle, Kyu Hong Cho, Brian M. Lee and Gabriela C. Pérez-Alvarado. *Structural characterization of the HD domain and the correlation to its metal-dependent enzymatic activity*. REACH Undergraduate Research Forum, Southern Illinois University, Carbondale, IL (April 11, **2011**)
28. Daniel Merkel*, Sarah Wells*, Bryce Hilburn*, Benjamin Hale*, Fatima Elazzouzi and Brian Lee, *Recognition of mRNA sequence versus mRNA secondary structural elements by cytoplasmic polyadenylation element binding protein (CPEB)*, Frontiers of NMR in Biology, Keystone Symposia, Big Sky, MT (January 9 – 13, **2011**)
27. Pushpika S. Katugampola, Stephanie Geiser*, Kyu Hong Cho, Brian M. Lee and Gabriela C. Pérez-Alvarado. *Structural characterization of the phosphohydrolase catalytic domain in CvfA from Streptococcus pyogenes*. Great Plains Regional Annual Symposium on Protein & Biomolecular NMR (GRASP-NMR), University of Kansas, Lawrence, KS (October 29-30, **2010**)
26. Stephanie Geiser*, Rebecca C. Weber*, Gabriela Pérez-Alvarado, Kyu Hong Cho and Brian M. Lee, *The K homology domain in conserved virulence factor A*. Great Plains Regional Annual Symposium on Protein & Biomolecular NMR (GRASP-NMR), University of Kansas, Lawrence, KS (October 29-30, **2010**)
25. Bryce Hilburn*, Daniel Merkel*, Sarah Wells*, Stephanie Geiser*, Haley Hoover*, Oluwatobi Ajoku*, Fatima Elazzouzi and Brian M. Lee, *Structural analysis of the C-terminal RNA binding domain of CPEB3*. Great Plains Regional Annual Symposium on Protein & Biomolecular NMR (GRASP-NMR), University of Kansas, Lawrence, KS (October 29-30, **2010**)
24. Daniel Merkel*, Bryce Hilburn*, Sarah Wells*, Stephanie Geiser*, Oluwatobi Ajoku*, Fatima Elazzouzi and Brian M. Lee, *Characterizing the structure of the zinc finger in CPEB1*. Great Plains Regional Annual Symposium on Protein & Biomolecular NMR (GRASP-NMR), University of Kansas, Lawrence, KS (October 29-30, **2010**)

23. Pushpika S. Katugampola, Stephanie Geiser*, Kyu Hong Cho, Brian M. Lee and Gabriela C. Pérez-Alvarado. *Structural analysis of the phosphohydrolase catalytic domain in CvfA*. The 24th Annual Gibbs Conference on Biothermodynamics, Touch of Nature Conference Center, Southern Illinois University, Carbondale, IL (September 25-28, **2010**)
22. Stephanie Geiser*, Rebecca C. Weber*, Gabriela C. Pérez-Alvarado, Kyu Hong Cho and Brian M. Lee, *The K homology domain in conserved virulence factor A*. The 24th Annual Gibbs Conference on Biothermodynamics, Touch of Nature Conference Center, Southern Illinois University, Carbondale, IL (September 25-28, **2010**)
21. Bryce Hilburn*, Daniel Merkel*, Sarah Wells*, Stephanie Geiser*, Haley Hoover*, Oluwatobi Ajoku*, Fatima Elazzouzi, Brian M. Lee, *Structural analysis of the C-terminal RNA binding domain of CPEB3*. The 24th Annual Gibbs Conference on Biothermodynamics, Touch of Nature Conference Center, Southern Illinois University, Carbondale, IL (September 25-28, **2010**)
20. Daniel Merkel*, Bryce Hilburn*, Sarah Wells*, Stephanie Geiser*, Oluwatobi Ajoku*, Fatima Elazzouzi, Brian M. Lee, *Characterizing the structure of the zinc finger in CPEB1*. The 24th Annual Gibbs Conference on Biothermodynamics, Touch of Nature Conference Center, Southern Illinois University, Carbondale, IL (September 25-28, **2010**)
19. Stephanie Geiser*, Rebecca C. Weber*, Gabriela C. Pérez-Alvarado, Kyu Hong Cho and Brian M. Lee, *The K homology domain in conserved virulence factor A*. NSF Sponsored Research Experience for Undergraduates Student Poster Presentations, Neckers Atrium, Southern Illinois University, Carbondale, IL (August 5, **2010**)
18. Rebecca C. Weber*, Stephanie Geiser*, Gabriela C. Pérez-Alvarado, Kyu Hong Cho and Brian M. Lee, *Finding the KH domain structure in CvfA gene of Streptococcus pyogenes*. ACS Project SEED, High School Student Poster Presentations, Neckers Atrium, Southern Illinois University, Carbondale, IL (August 5, **2010**)
17. Bryce Hilburn*, Daniel Merkel*, Sarah Wells*, Haley Hoover*, Stephanie Geiser*, Oluwatobi Ajoku*, Fatima Elazzouzi, Brian M. Lee, *Structural Studies of a Novel Zinc Finger Domain Required for Recognition of the Cytoplasmic Polyadenylation Element within the 3' UTR of mRNA*. Spring 2010 St. Louis Area Undergraduate Research Symposium, Touch of Nature Conference Center, Southern Illinois University, Carbondale, IL (May 1, **2010**)
16. Daniel Merkel*, Sarah Wells*, Bryce Hilburn*, Haley Hoover*, Henok Abshiro*, Fatima Elazzouzi and Brian M. Lee, *Structural Studies of a Novel Zinc Finger Domain Required for Recognition of the Cytoplasmic Polyadenylation Element within the 3' UTR of mRNA*. The 23rd Annual Gibbs Conference on Biothermodynamics, Touch of Nature Conference Center, Southern Illinois University, Carbondale, IL (October 3-6, **2009**)
15. Tequilla Manning*, Sarah Wells*, Daniel Merkel*, Brian M. Lee, *Determination of the Structural Identity of the Zinc Finger Region in CPEB Protein*. 2009 NSF Sponsored Research Experience for Undergraduates Student Poster Presentations, Materials Technology Center and Department of Chemistry and Biochemistry, Southern Illinois University, Carbondale, IL (August 6, **2009**)
14. Sarah B. Wells*, Benjamin S. Hale*, Fatima Elazzouzi and Brian M. Lee, *Structural Studies of a Novel Zinc Finger Domain Required for Recognition of the Cytoplasmic Polyadenylation Element within the 3' UTR of mRNA*. 22nd Annual Gibbs Conference on Biothermodynamics, Touch of Nature Conference Center, Southern Illinois University, Carbondale, IL (October 4-7, **2008**)
13. Benjamin S. Hale*, Sarah B. Wells* and Brian M. Lee *The zinc finger region of cytoplasmic polyadenylation element binding protein*. ACS Project SEED, High School Student Poster Presentations, Materials Technology Center, Southern Illinois University, Carbondale, IL (August 8, **2008**)
12. Sarah B. Wells*, Benjamin S. Hale*, Fatima Elazzouzi, Ian Odigie* and Brian M. Lee, *Structural characterization of the zinc finger region of CPEB*. NSF sponsored Research Experience for Undergraduates

Student Poster Presentations, Materials Technology Center, Southern Illinois University, Carbondale, IL (August 8, 2008)

11. Shannon Banning*, Brian M. Lee & Gabriela C. Pérez-Alvarado. *Characterization of the interaction between symplekin and the cytoplasmic polyadenylation element binding protein*. Undergraduate Research Forum, Southern Illinois University, Carbondale, IL (March 31, 2008)
10. Brian M. Lee, Jing Xu, Micah Gearhart, Bryan Clarkson, Maria Yamout, H. Jane Dyson, David Case, Joel M. Gottesfeld and Peter Wright, *Induced fit and "lock-and-key" recognition within the high affinity complex of transcription factor IIIA*. Frontiers of NMR in Molecular Biology IX, Keystone Symposia, Banff, Alberta, Canada (January 29 – February 4, 2005)
9. Brian M. Lee, Jing Xu, Laura S. Neely, Micah Gearhart, Maria Yamout, Bryan Clarkson, Mindy Landes, Melissa M. Allen, Ted Foss, H. Jane Dyson, David Case, Joel M. Gottesfeld and Peter Wright, *Transcription factor IIIA zinc fingers 4-6 bound to 5S rRNA from Xenopus laevis*. Frontiers in Structural Biology, Keystone Symposia, Snowbird, UT (April 13-19, 2004)
8. Brian M. Lee, Jing Xu, Laura S. Neely, Joel M. Gottesfeld and Peter E. Wright, *Transcription factor IIIA zinc fingers 4-6 bound to 5S rRNA from Xenopus laevis*. Frontiers of Structural Biology, Keystone Symposia, Breckenridge, CO (January 5-11, 2002)
7. Brian M. Lee, Jing Xu, Laura S. Neely, Steven McBryant, Joel M. Gottesfeld and Peter E. Wright, *5S rRNA recognition by transcription factor IIIA*. Frontiers of NMR in Molecular Biology VII, Keystone Symposia, Big Sky, MT (January 20-26, 2001)
6. Brian M. Lee, Jing Xu, Laura S. Neely, Joel M. Gottesfeld and Peter E. Wright, *Transcription factor IIIA recognition of 5S rRNA*. The 41st ENC: Experimental Nuclear Magnetic Resonance Conference, Asilomar, Pacific Grove, CA (April 9-14, 2000)
5. Brian M. Lee, Jing Xu, Laura S. Neely, Steven McBryant, Joel Gottesfeld and Peter Wright, *5S rRNA recognition by transcription factor IIIA*. Frontiers of NMR in Molecular Biology VI, Keystone Symposia, Breckenridge, CO (January 9-15, 1999)
4. Brian M. Lee, Jing Xu, Laura S. Neely, Steven McBryant, Joel Gottesfeld and Peter Wright, *5S rRNA recognition by transcription factor IIIA*. The 39th ENC: Experimental Nuclear Magnetic Resonance Conference, Asilomar, Pacific Grove, CA (March 22-27, 1998)
3. Brian M. Lee, Rossi Gitti, Jill Walker, Sanghee Yoo, Wesley Sundquist and Michael Summers, *Structure of the amino-terminal domain of capsid protein from HIV1*. Frontiers of NMR in Molecular Biology V, Keystone Symposia, Taos, NM (February 6-11, 1997)
2. Brian M. Lee and Michael Summers, *Structure and dynamics of the nucleocapsid protein from HIV1*. 32nd Eastern Analytical Symposium and Exposition, Somerset, NJ (November, 1993)
1. Brian M. Lee and Michael Summers, *Nucleic acid binding properties of nucleocapsid protein from HIV1*. 24th Southeastern Magnetic Resonance Conference, Raleigh, NC (October 1992)

Teaching Experience

Teaching Interest and Specialties

Biochemistry, Biophysical Chemistry, NMR Spectroscopy, Structural Biology, General Chemistry, Cell Biology, and Teachers Education Program.

Curriculum Development

9. New course proposals for CHEM 453 *Biomolecular Structure and Function* and CHEM 453L *Biomolecular Structure and Function Laboratory* to provide computational skills training for Chemistry and Biochemistry majors. These courses will meet upper level major requirements. Submitted: November 2019.

8. Revised the Biochemistry B.S. major elective course options to include BIOL 420/L *Neuroscience Foundations* and CHEM 453/L *Biomolecular Structure and Function*. Submitted: November **2019**.
7. Revised Prerequisites for CHEM 351 *Biochemistry I* and CHEM 353 Physical Biochemistry to allow either PHYS 206 *Introductory Physics for Life Sciences* or PHYS 211 *Essentials of Physics*. Submitted: October **2018**.
6. Illinois State Board of Education, Department of Certification and Professional Development, *Initial Application for the Chemistry Teacher Education Program*, prepared by Frackson Mumba and Brian Lee. 476 pages. Submitted: July **2012**. Resubmission pending SIUC COEHS curriculum revision.
5. *Chemistry Honors Description* (Reasonable and Moderate Extension) to add honors sections of general chemistry and define an honors track including honors seminar, undergraduate research and honors thesis requirements, initiated by Brian Lee after faculty approval. Fall **2011**.
4. *Updated Requirements for a Minor Degree in Chemistry* (Reasonable and Moderate Extension) to match academic standards of peer institutions and to better prepare students for post-graduate work, initiated by Brian Lee after faculty approval. Fall **2011**.
3. *Chemical Education Specialization* (Reasonable and Moderate Extension) to reestablish a Chemistry B.A. program that includes participation in the Teacher Education Program for future chemistry teachers in southern Illinois secondary schools, initiated by Brian Lee after faculty approval. Fall **2010**.
2. *Renumbering Courses* (Notice of Change of Academic Requirements) to clarify separation between Introductory Chemistry (200 level), Chemistry Foundation (300 level) and In-Depth Chemistry (400 level) courses, initiated by Brian Lee after faculty approval, Fall **2009**.
1. *Revisions to Comply with the 2008 ACS Guidelines* (Notice of Change of Academic Requirements) represent a major reorganization of the Chemistry curriculum to improve academic standards and to simplify degree options for the Chemistry B.S. (Comprehensive Chemistry, Biochemistry, Environmental Chemistry, Forensic Chemistry) or Chemistry B.A. (Business), initiated by Brian Lee after faculty approval. Fall **2008**.

Lecture and Laboratory Courses (course number, credit hours, section, number of students, textbook and term)

41. CHEM 353L-1 (02) Physical Biochemistry Laboratory (8 students) **Spring 2020**.
40. CHEM 353L-1 (01) Physical Biochemistry Laboratory (7 students) **Spring 2020**.
39. CHEM 353-3 (01) Physical Biochemistry (15 students), *The Molecules of Life*, **Spring 2020**.
38. CHEM 352-3 (01) Biochemistry II (29 students) *Fundamentals of Biochemistry*, 5th Ed., **Spring 2020**.
37. CHEM 351-3 (02) Biochemistry I (22 students), *Fundamentals of Biochemistry*, 5th Ed., **Fall 2019**.
36. CHEM 351-3 (01) Biochemistry I (26 students), *Fundamentals of Biochemistry*, 5th Ed., **Fall 2019**.
35. CHEM 353L-1 (02) Physical Biochemistry Laboratory (7 students) **Spring 2019**.
34. CHEM 353L-1 (01) Physical Biochemistry Laboratory (12 students) **Spring 2019**.
33. CHEM 353-3 (01) Physical Biochemistry (20 students), *The Molecules of Life*, **Spring 2019**.
32. CHEM 352-3 (01) Biochemistry II (23 students) *Fundamentals of Biochemistry*, 5th Ed., **Spring 2019**.
31. CHEM 453L-1 (01) Biomolecular Structure and Function Laboratory (4 students), **Fall 2018**.
30. CHEM 453-3 (01) Biomolecular Structure and Function (4 students), *The Molecules of Life*, **Fall 2018**.
29. CHEM 351-3 (02) Biochemistry I (29 students), *Fundamentals of Biochemistry*, 5th Ed., **Fall 2018**.
28. CHEM 351-3 (01) Biochemistry I (19 students), *Fundamentals of Biochemistry*, 5th Ed., **Fall 2018**.
27. CHEM 353L-1 (01) Physical Biochemistry Laboratory (16 students) **Spring 2018**.
26. CHEM 353-3 (01) Physical Biochemistry (16 students) *Physical Chemistry Principles and Applications in Biological Sciences*, 5th Ed., Tinoco, Sauer, Wang, Puglisi, Harbison and Rovnyak, **Spring 2018**.
25. CHEM 352-3 (01) Biochemistry II (25 students) *Lehninger Principles of Biochemistry*, 7th Ed., **Spring 2018**.
24. CHEM 351L-1 (02) Biochemistry I Laboratory (18 students), **Fall 2017**.
23. CHEM 351L-1 (01) Biochemistry I Laboratory (23 students), **Fall 2017**.
22. CHEM 351-3 (02) Biochemistry I (22 students), *Lehninger Principles of Biochemistry*, 7th Ed., **Fall 2017**.
21. CHEM 351-3 (01) Biochemistry I (21 students), *Lehninger Principles of Biochemistry*, 7th Ed., **Fall 2017**.
20. BMS 575-3 Cell Biology (51 students), *Molecular Biology of the Cell*, 6th Ed., **Fall 2016**. Team-taught with Ravindra Singh, Vellareddy Anantharam, Matthew Howell, Walter Hsu and Natalia Singh.

19. BMS 575-3 Cell Biology (37 students), *Molecular Biology of the Cell*, 6th Ed., **Fall 2015**. Team-taught with Ravindra Singh, Vellareddy Anantharam, Matthew Howell, Walter Hsu and Natalia Singh.
18. CHEM 350-3 Biological Chemistry (103 students), *Fundamentals of Biochemistry*, 4th Ed., **Spring 2014**.
17. CHEM 452-3 Advanced Biological Chemistry, *Fundamentals of Biochemistry*, 4th Ed., **Fall 2013**.
16. CHEM 350-3 Biological Chemistry (121 students), *Fundamentals of Biochemistry*, 4th Ed., **Spring 2013**.
15. CHEM 352-3 Advanced Biological Chemistry (3 students), *Fundamentals of Biochemistry*, 3rd Ed., **Fall 2012**.
14. CHEM 350-3 Biological Chemistry (121 students), *Fundamentals of Biochemistry*, 3rd Ed., **Spring 2012**.
13. CHEM 559-3 Advanced Topics in Biological Chemistry: Protein NMR Spectroscopy (5 students), *Understanding NMR Spectroscopy and Protein NMR Spectroscopy*, 2nd Ed., **Fall 2011**.
12. CHEM 350-3 Biological Chemistry (136 students), *Fundamentals of Biochemistry*, 3rd Ed., **Spring 2011**.
11. CHEM 352-3 Advanced Biochemistry (3 students), *Fundamentals of Biochemistry*, 3rd Ed., **Fall 2010**.
10. CHEM 350-3 Biological Chemistry (140 students), *Fundamentals of Biochemistry*, 3rd Ed., **Spring 2010**.
9. CHEM 559-3 Advanced Topics in Biological Chemistry: NMR for Physical and Biological Scientist (6 students), *NMR for Physical and Biological Scientist*, Pochapsky & Sondej-Pochapsky, **Fall 2009**.
8. CHEM 210-3 General and Inorganic Chemistry (110 students), *Chemistry*, 5th Ed., **Spring 2009**.
7. CHEM 350-3 Biological Chemistry (135 students), *Fundamentals of Biochemistry*, 3rd Ed., **Spring 2009**.
6. CHEM 350-3 Biological Chemistry (124 students), *Lehninger Principles of Biochemistry*, 4th Ed., **Spring 2008**.
5. CHEM 569-3 Advanced Topics in Physical Chemistry: Protein Chemistry (9 students), *Proteins: Structure and Molecular Properties*, 2nd Ed., Creighton, **Fall 2007**.
4. CHEM 350-3 Biological Chemistry (140 students), *Lehninger Principles of Biochemistry*, 4th Ed., **Spring 2007**. Team-taught with Gabriela Pérez-Alvarado.
3. CHEM 351-1 Biochemistry Laboratory (67 students), *Modern Experimental Biochemistry*, 3rd Ed., Boyer, **Spring 2007**. Team-taught with Gabriela Pérez-Alvarado.
2. CHEM 569-3 Advanced Topics in Physical Chemistry: Nuclear Magnetic Resonance Spectroscopy (10 students), *Understanding NMR Spectroscopy*, Keeler, **Spring 2007**. Team-taught with Gabriela Pérez-Alvarado and Boyd Goodson.
1. CHEM 350-3 Biological Chemistry (134 students), *Biochemistry*, 5th Ed., **Spring 2006**.

Supervised Research, Special Reading and Seminar Courses (Name of students and term indicated)

44. CHEM 499-1 Protein-RNA Structure-Function (Sara Nibar), **Fall 2019**.
43. CHEM 499-1 Protein-RNA Structure-Function (Cameron Carroll), **Fall 2019**.
42. CHEM 499-1 Protein-RNA Structure-Function (Shelby Gifford), **Spring 2019**.
41. CHEM 499-1 Protein-RNA Structure-Function (Cameron Carroll), **Spring 2019**.
40. CHEM 499-1 Protein-RNA Structure-Function (Felipe Mendoza Ramirez), **Fall 2018**.
39. CHEM 499-1 Protein-RNA Structure-Function (Shelby Gifford), **Fall 2018**.
38. CHEM 499-1 Protein-RNA Structure-Function (Cameron Carroll), **Fall 2018**.
37. CHEM 499-1 Protein-RNA Structure-Function (Felipe Mendoza Ramirez), **Spring 2018**.
36. BMS 490H-1 Independent Study, Honors (Suryatej Akavaram), **Fall 2016**.
35. HON 290H-1 Honors Research (Suryatej Akavaram), **Spring 2016**.
34. BMS 599-2 Creative Component (Joseph Ambrose and Natalie McAuliff), **Spring 2016**.
33. CHEM 595-1 Advanced Seminar – Biochemistry, **Fall 2013**.
32. CHEM 600-2 Dissertation (Bingxin Yuan), **Spring 2013**.
31. CHEM 600-4 Dissertation (Jinsai Shang), **Spring 2013**.
30. CHEM 598-1 Research (Bingxin Yuan), **Spring 2013**.
29. CHEM 593a-1 Graded Seminar (Bingxin Yuan), **Spring 2013**.
28. CHEM 496H-2 Honors Research (Bohui Jiang), **Spring 2013**.
27. CHEM 296-1 Introduction to Research (Gavin Sowa), **Spring 2013**.
26. CHEM 595-1 Advanced Seminar – Biochemistry (5 students), **Fall 2012**.
25. CHEM 600-5 Dissertation (Jinsai Shang), **Fall 2012**.
24. CHEM 598-3 Research (Bingxin Yuan), **Summer 2012**.
23. CHEM 598-3 Research (Daniel Merkel), **Summer 2012**.
22. CHEM 600-3 Dissertation (Jinsai Shang), **Summer 2012**.

21. CHEM 594e-2 Special Readings (Jinsai Shang), **Spring 2012**.
20. CHEM 598-1 Research (Bingxin Yuan), **Spring 2012**.
19. CHEM 598-5 Research (Jinsai Shang), **Spring 2012**.
18. CHEM 598-4 Research (Daniel Merkel), **Spring 2012**.
17. CHEM 599-3 Thesis (Daniel Merkel), **Spring 2012**.
16. CHEM 593a-1 Graded Seminar (Jinsai Shang), **Fall 2011**.
15. CHEM 593a-1 Graded Seminar (Daniel Merkel), **Fall 2011**.
14. CHEM 595-1 Advanced Seminar – Biochemistry (7 students), **Fall 2011**.
13. CHEM 598-3 Research (Daniel Merkel), **Fall 2011**.
12. CHEM 596-3 Master's Degree Research (Daniel Merkel), **Summer 2011**.
11. CHEM 598-3 Research (Jinsai Shang), **Summer 2011**.
10. CHEM 396-1 Undergraduate Research (Bryce Hilburn), **Spring 2011**.
9. CHEM 596-1 Master's Degree Research (Daniel Merkel), **Spring 2011**.
8. CHEM 596-1 Master's Degree Research (Daniel Merkel), **Fall 2010**.
7. CHEM 396-1 Undergraduate Research (Bryce Hilburn), **Fall 2010**.
6. CHEM 598-3 Research (Daniel Merkel), **Summer 2010**.
5. CHEM 596-1 Master's Degree Research (Daniel Merkel), **Spring 2010**.
4. UHON 499-3 Honors Thesis (Sarah Wells), **Spring 2009**.
3. CHEM 595-1 Advanced Seminar – Protein Engineering (15 students), **Fall 2008**.
2. CHEM 396-2 Undergraduate Research (Ian Odigie), **Fall 2007**.
1. CHEM 598-3 Research (Ping He), **Summer 2007**.

Faculty Directed Students with Completed Thesis or Dissertation

Daniel J. Merkel, (Chemistry, M.S.) “Structural determination of the ZZ domain of cytoplasmic polyadenylation element binding protein.” (2012).

Sarah B. Wells, (Physiology, B.S. and Honors Degree Thesis) “Structural characterization of the CPEB zinc finger domain.” (2009).

Thesis and Dissertation Committees (faculty advisor, major and date of degree, if completed, indicated) Dissertation for Ph.D.

Eric Ottesen (Ravindra Singh, Molecular, Cellular, and Developmental Biology) **2016**

Aamal Al-Saadi (Derek Fisher, Microbiology) **2015**

Frances Anne Anterola (Rodney Weilbaecher, Biochemistry)

Lei Chung (Qingfeng Ge, Chemistry) **2009**

Siddhartha Losalka (Blaine Bartholomew, Biochemistry)

Mekonnen Lemma Dechasa (Blaine Bartholomew, Biochemistry) **2010**

Ping He (Boyd Goodson, Chemistry) **2013**

George Hudson (Lichang Wang, Chemistry) **2012**

Megan Jones (Blaine Bartholomew, Biochemistry)

Panayiotis Nikolaou (Boyd Goodson, Chemistry) **2011**

Punit Prasad (Blaine Bartholomew, Biochemistry) **2010**

Pradeep Ramiah Rajasekaran (Punit Kohli, Chemistry)

Jinsai Shang (Brian Lee, Chemistry)

Jhanvi Sharma (Yuqing Hou, Chemistry)

Fan Shi (Boyd Goodson, Chemistry)

Samarth Upadhyay (Blaine Bartholomew, Biochemistry)

Guan Wang (Zhihua Du, Chemistry)

Yuhong Wu (Zhihua Du, Chemistry)

Jianhui Xiong (Zhihua Du, Chemistry)

Bingxin Yuan (Brian Lee, Chemistry)

Jiang Zhu (Gabriela Pérez-Alvarado, Chemistry)

Thesis for M.S.

Daniel Merkel (Brian Lee, Chemistry) **2012**

Mentoring (major, degree sought and period of mentorship indicated, * co-mentored)

High School Students

Rebecca Weber (Herrin H.S.) ACS Project SEED (Summer I and II), **2010, 2011.**

Benjamin S. Hale (Herrin H.S.), ACS Project SEED and Research Assistantship, **2008.**

Undergraduate Students

Cameron R. Carroll (Biochemistry), **2018-present.**

Sara G. Nibar (Biochemistry), **2018-present.**

Shelby Gifford (Biochemistry), **2018.**

Felipe Mendoza Ramirez (Biochemistry), **2018.**

Suratej Akavaram (Chemical Engineering), **2016-2017.**

Dalton Michels (Chemistry, B.S.), **2013-2014.**

Gavin Sowa (Chemistry, B.S.), **2013-2014.**

Bohui Jiang (Chemistry, B.S.), **2013.**

Taylor Griffith (Chemistry, B.S.), **2012-2013.**

Bryce Hilburn (Chemistry, B.S.), **2009-2011.**

Stephanie Geiser (Chemistry, B.S.) Research Rookies Program, **2010-2011.**

Sarah B. Wells (Physiology, B.S.) REACH Fellowship, **2007-2009.**

Haley Hoover (Chemistry, B.S.), **2009-2010.**

Oluwatobi Ajoku (Chemistry, B.S.), **2009-2010.**

Megan Czerniejewski (Chemistry, B.S.), **2008-2009.**

Ian Odigie (Physiology, B.S.), **2007.**

Summer at Coastal Research Experience (SCoRE)

Regan A. Finn* (Biology), **2019.**

Kayla J. Calderon* (Biology), **2019.**

Alexis S. Brown* (Biochemistry/Health Sciences), **2019.**

Lauren R. Angello (Biology), **2018.**

Cameron R. Carroll (Biochemistry), **2018.**

Sara G. Nibar (Biochemistry), **2018.**

Research Experience for Undergraduates (NSF-REU)

Fanny Chu (Chemistry/Psychology, B.S., Binghamton University), **2012.**

Jeffrey Allen (Chemistry/Mathematics, B.A., Carroll College) **2011.**

Stephanie Geiser (Chemistry, B.S.) **2010.**

Tequilla Manning (Chemistry, B.S., Grinnell), **2009.**

Sarah B. Wells (Physiology, B.S.), **2008.**

Biomedical Sciences One-Year Master of Science Creative Component

Joseph Ambrose (Biomedical Sciences, M.S.), **2015-2016.**

Natalie McAuliff (Biomedical Sciences, M.S.), **2015-2016.**

Veterinary Medicine Students and Summer Scholar Research Program

Katherine Turnbull (DVM), **2015-2017.**

José De La Espriella (DVM), **2016.**

Graduate Students

Bingxin Yuan (Chemistry, Ph.D), **2011-2013.**

Jinsai Shang (Chemistry, Ph.D.), **2010-2013.**

Daniel Merkel (Chemistry, M.S.), **2009-2012.**

Service and Professional Activities

Departmental Participation and Service

Coastal Carolina University

Biochemistry Assessment Planning and Reports, **2019-present.**

Assessment Committee for Department of Chemistry, **2018-present**.
Biochemistry Representative for the Career and Majors Expo, HTC Center, September 11, **2019**.
Undergraduate Advising, Department of Chemistry, (14 students) **2018-present**.
Biochemistry Representative for the Undergraduate Majors Fair, HTC Center, October 18, **2018**.
Information Seminar for Biochemistry Majors Session, January 8, **2018**.
NMR spectrometer acquisition planning in preparation for MRI grant application in Spring **2018**.
Biochemistry Representative for the Undergraduate Majors Fair, HTC Center, October 26, **2017**.
Biochemistry Curriculum and Assessment, **2017-present**.

Southern Illinois University Carbondale

Director of Undergraduate Studies, Chemistry and Biochemistry, **2008-2014**.
NMR Facility Committee and Spectrometer Oversight, SIUC, **2008-2014**.
Undergraduate Advisement and Curriculum, Chemistry and Biochemistry, (89 students) **2006-2014**.
Faculty Search Committees for COS 238, COS 239, COS 240, COS 254, **2008-10**.
Graduate Student Admissions Committee, Chemistry and Biochemistry, **2010-2013**.
Graduate Student Advisement Committee, Chemistry and Biochemistry, **2007-2014**.
REU Admissions Committee, Chemistry and Biochemistry, **2010, 2011**.
Commencement Committee, Chemistry and Biochemistry, **2008-9, 2011-12**.
Undergraduate Prerequisites, Chemistry and Biochemistry, **2008**.
Graduate Awards Committee, Chemistry and Biochemistry, **2007-10**.
IDEA Committee, Chemistry and Biochemistry, **2006-7**.

University Participation and Service

Coastal Carolina University

Site Visit to Thermo-Fisher Manufacturing in Florence, South Carolina, January 29, **2020**.
Faculty Senate Representative for Gupta College of Science, **2019-present**.
Curriculum Committee, Gupta College of Science, substitute for Dr. Drew Budner, December 9, **2019**.
South Carolina EPSCOR Seminar, Gupta College of Science, September 25, **2019**.
General Chemistry Student Learning Outcomes, Gupta College of Science, November 20, **2017**.
CCU-INBRE Research Faculty Member, **2017-present**.

Iowa State University

Macromolecular X-ray Crystallography User Group, Iowa State University, **2015-2017**.
Faculty Facilitator for Mentor Program Discussion Group, Honors Program, February 29, **2016**.

Southern Illinois University Carbondale

Undergraduate Education Policy Committee, Faculty Senate, **2011-2013**.
Curriculum Committee, College of Science, **2007-2014**.
MCAT 2015 Committee, College of Science, **2012-2013**.
Open House for Prospective Undergraduate Students, College of Science, **2008, 2011, 2012**.
SOAR Advisement Program for Incoming Students, College of Science, **2008**.

Community Participation and Service

Faculty Participation in Student Organizations

Advisor for the American Society for Biochemistry and Molecular Biology Student Chapter, **2019-present**.
Biochemistry and Chemistry Club Picnic, September 2, **2019**.
Chemistry Club Awards Night, April 26, **2019**.
Chemistry Club Awards Banquet, April 13, **2018**.

Student Travel and Outreach Visits

Nephron Pharmaceuticals Tour, SCoRE Summer Student Visit, July 19, **2019**.
Claflin University, SCoRE Summer Student Visit, June 28, **2019**.
Medical University of South Carolina, SCoRE Summer Student Visit, June 25, **2019**.
Claflin University Visit to Coastal Carolina University, June 22, **2018**.

Medical University of South Carolina, SCoRE Summer Student Visit, July 10, **2018**.

Judging Student Posters and Presentations

SC INBRE Science Symposium, University of South Carolina, Columbia, SC, January 25, **2020**.
Undergraduate Research Competition, Coastal Carolina University, Conway, SC, April 16-17, **2019**.
SC INBRE Science Symposium, University of South Carolina, Columbia, SC, August 10, **2018**.
Undergraduate Research Competition, Coastal Carolina University, Conway, SC, April 11-12, **2018**.
GRASP NMR 2015, Judging posters, November 13-14, **2015**.
Vaccines Against Antigenically Variable Viruses, Iowa State University, Ames, IA, November 5-8, **2015**.
Summer Scholar Research Day, Iowa State University, Ames, IA, August 7, **2015**.
St. Louis Area Undergraduate Research Symposium, Carbondale, IL, May 7, **2011**.
REACH Undergraduate Research Forum, Southern Illinois University, Carbondale, IL, April 11, **2011**.

Professional Participation and Service

Membership in Professional Associations

The Biophysical Society, **2009-present**.
The American Society for Biochemistry and Molecular Biology (ASBMB), **2013-present**.
The American Chemical Society (ACS), **2018-present**.

Meeting Organization and Service

Vaccines Against Antigenically Variable Viruses (VAAVV), Session Chair, November 5-8, **2015**.
Great Plains Regional Annual Symposium on Protein & Biomolecular NMR (GRASP-NMR), Organizing Committee and Session Chair, November 2-3, **2012**.
Symposium on Frontiers in Biomolecular NMR, Vanderbilt University, Session Co-Chair, Nashville, Tennessee, May 4-5, **2012**.
Gibbs Conference on Biothermodynamics, Local Apples Procurement, **2009-2013**.

Peer Reviewer for Journals and Grant Applications

Biochemistry (American Chemical Society), *Journal of Molecular Biology* (Elsevier), *Proteins: Structure, Function and Bioinformatics* (Wiley), *Scientific Reports* (Nature), *Structure* (Cell Press), and Swiss NSF, Berne, Switzerland

Workshops, Training and Seminars

CeTEAL University Finance and Budgeting 101, March 2, **2020**.
CeTEAL Assessment Institute: Analyzing and Reporting Assessment Results, November 20, **2019**.
Women in STEM Symposium, November 18, **2019**.
Lyndsay Young, Coastal Biomedical Research Seminar Series, November 15, **2019**.
CeTEAL Assessment Institute: Designing an Assessment Plan, October 30, **2019**.
CeTEAL Assessment Institute: Course Map and Assessment Audit, October 23, **2019**.
CeTEAL Assessment Institute: Overview of Assessment, October 16, **2019**.
Campus Labs Planning Training, October 15, **2019**.
Beacon Training, August 28, **2019**.
CeTEAL The Completion Agenda, August 5, **2019**.
CeTEAL Your Path to Promotion and Tenure, April 5, **2019**.
Women in STEM Information Meeting, January 28, **2019**.
Ryan Yoder, Coastal Biomedical Research Seminar Series, November 16, **2018**.
Student Research Presentations for CCU-INBRE Seminar Series, November 9, **2018**.
CeTEAL Chemistry Curriculum and Assessment Writing Circle, November 5, **2018**.
CeTEAL Chemistry Curriculum and Assessment Writing Circle, October 29, **2018**.
Jeremy Morgan, Coastal Biomedical Research Seminar Series, October 26, **2018**.
CeTEAL Chemistry Curriculum and Assessment Writing Circle, October 22, **2018**.
CeTEAL Chemistry Curriculum and Assessment Writing Circle, October 8, **2018**.
CeTEAL Chemistry Curriculum and Assessment Writing Circle, October 1, **2018**.

CeTEAL Chemistry Curriculum and Assessment Writing Circle, August 27, **2018**.
Academic Leadership/Career Development Workshop, June 14-15, **2018**.
EPR as a Teaching Tool in the Laboratory, June 6, **2018**.
Honorary Symposium for HHMI Professor Michael Summers (60th Birthday), May 18-19, **2018**.
Paul Floreancig, Coastal Biomedical Research Seminar Series, February 9, **2018**.
Undergraduate Research Conference, April 12, **2018**.
CeTEAL Your Path to Promotion and Tenure, April 6, **2018**.
Carl Sagan Day Lecture, Human Exploration of Mars, Coastal Carolina University, November 9, **2017**.
S.A.F.E. Training Seminar, Coastal Carolina University, October 12, **2017**.
Kimbel Library Faculty Luncheon, Coastal Carolina University, September 22, **2017**.
University College Coffee, Coastal Carolina University, September 20, **2017**.
New Faculty Orientation, Coastal Carolina University, August 15-16, **2017**.

Technical Experience

- Biomolecular NMR spectroscopy: pulse sequence programming, data acquisition and trouble-shooting with Bruker (900, 800, 750, 600, 500 MHz), Varian (500 MHz) and GE (600 MHz) spectrometers.
- Gene isolation, cloning, protein expression, and protein purification by liquid chromatography (FPLC)
- Verify protein quality and purity by analytical HPLC, mass spectrometry, size exclusion chromatography, gel electrophoresis, kinetic/functional assays, biophysical techniques, and NMR spectroscopy.
- RNA *in vitro* transcription and preparative purification by ion exchange HPLC for NMR spectroscopy.
- Biophysics of protein-RNA interactions by NMR and electrophoretic mobility shift assays (EMSA).
- Protein thermal shift assays (DSF) and crystallization screening for X-ray diffraction studies.
- Processing and interpretation of multidimensional NMR spectra with NMRPipe and NMRView.
- Structure calculation and refinement by torsion angle dynamics (CYANA), molecular dynamics (AMBER) based on NMR data (NOE, chemical shift, scalar and residual dipolar coupling)
- Molecular modeling (ROSETTA) of proteins, protein-protein interactions and RNA tertiary structure.