

**Rachel E. Rigsby Ph. D.**  
**Associate Professor of Chemistry**  
**Department of Chemistry & Physics**

**Academic Degrees**

Doctorate of Philosophy    Vanderbilt University                      Chemistry                      **2005**  
Dissertation Title: "Studies of a genomic fosfomycin resistance protein from *Pseudomonas aeruginosa*."  
Advisor: Dr. Richard N. Armstrong

Bachelor of Arts                      Kentucky Wesleyan College,                      Chemistry                      **2000**

**Positions Held**

Associate Professor of Chemistry, Department of Chemistry & Physics, Belmont University; Fall 2011-present  
Area of specialization: Organic and Biochemistry

Assistant Professor of Chemistry, Department of Chemistry & Physics, Belmont University; Fall 2005-Fall 2011  
Area of specialization: Organic and Biochemistry

**Honors and Awards**

Faculty Co-Advisor to Belmont's Student Members of the American Chemical Society (SMACS) chapter; it has been awarded annually for chapter activities:

Commendable Chapter Award: 2015, 2014, 2013, 2012, 2011, 2010, 2008

Honorable Mention: 2009

Belmont Student-Athlete Advisory Committee 2011-2012 Inspiration Award for inspiring athletes.  
May 2012

### Current Professional Memberships

- American Chemical Society (2006-present)
- Nashville Section of the American Chemical Society (2006-present)
- Tennessee Academy of Sciences (2006-present)
- Alpha Chi National Honor Society (2000-present)

### Peer-Reviewed Publications

Rigsby, R. E. and Parker, A. B. **2016**. Using the PyMOL Application to Reinforce Visual Understanding of Protein Structure. *Biochem. Mol. Biol. Educ.* In press.

Rigsby, R. E. and Daus, K. D. **2015**. The Power of Experiential Learning: Leveraging your General Education Curriculum to Invigorate your Chemistry Courses. In *The Promise of Chemical Education: Addressing our Students' Needs*. ACS Symposium Series 1193. Edited by Kimberlee Daus and Rachel Rigsby. Oxford University Press.

Rigsby, R. E., Brown, D. W., Dawson, E., Lybrand, T. P., and Armstrong, R. N. **2007**. A Model for Glutathione Binding and Activation in the Fosfomycin Resistance Protein, FosA. *Archives of Biochemistry & Biophysics* 464: 277.

Walsby, C. J., Telser, J., Rigsby, R. E., Armstrong, R. N., and Hoffman, B. M. **2005**. Enzyme Control of Small-Molecule Coordination in FosA as Revealed by <sup>31</sup>P Pulsed ENDOR and ESE-EPR. *J. Am. Chem. Soc.* 127: 8310.

Rigsby, R. E., Rife, C. L., Fillgrove, K. L., Newcomer, M. E., and Armstrong, R. N. **2004**. Phosphonoformate: A Minimal Transition State Analogue Inhibitor of the Fosfomycin Resistance Protein, FosA. *Biochemistry* 43: 13666.

### Other Publications

Rigsby, R. E. Teacher to Scientist and Back Again. In *Mom the Chemistry Professor* (invited contribution). Accepted November 2015.

Rigsby, R. E. and Daus, K. D. **2015**. An Introduction to Education Promises: Challenges and Strategies. In *The Promise of Chemical Education: Addressing our Students' Needs*. ACS Symposium Series 1193. Edited by Kimberlee Daus and Rachel Rigsby. Oxford University Press.

Daus, K, and Rigsby, R; *Organic Chemistry 2 Lab Manual*. Laboratory manual for use in CEM 2820 at Belmont University. December 2010. Updated annually.

Daus, K, and Rigsby, R; *Organic Chemistry 1 Lab Manual*. Laboratory manual for use in CEM 2810 at Belmont University. July 2010. Updated annually.

Magruder, R., Rigsby, R., Moore, A., and Robinson, S. "Increasing Chemistry and Physics Student Engagement at Belmont University Through Exploratory Learning," submitted to the National Science Foundation's TUES (Transforming Undergraduate Education in STEM) program May 2010.

Acree, G., Ragsdale, N., Rigsby, R., Panvini, D., and Grammer, R. "The Next Step: Engagement in Science, Technology and Mathematics," submitted to the National Science Foundation's STEP (STEM Talent Expansion Program) September 2009.

Rigsby, R; *Biochemistry Lab Manual, CEM 3510/BMB 3510*. Laboratory manual for use in Biochemistry at Belmont University; December 2006. Updated annually.

### **Presentations**

Rigsby, R. Encouraging scholarly productivity: Implementation of an inter-disciplinary writing group. 23<sup>rd</sup> Biennial Conference on Chemical Education. Greeley, CO, August 2016.

Moore, A. and Rigsby, R. "Teaching Center Lunch Discussion: Gen Ed and SoTL," April 21, 2015.

Daus, K. and Rigsby, R. "The Power of Experiential Learning: Leveraging your General Education Curriculum to Invigorate your Chemistry Courses," SouthEastern Regional Meeting of the American Chemical Society. Nashville, TN, October 2014.

Moore, A. and Rigsby, R. "How the BELL Core Does Multi-Disciplinary Learning Communities as the First Part of a Sophomore Year Experience," Lilly International Conference on College Teaching. Oxford, OH, November 2013.

Rigsby, R. "Protein Visualization throughout the Biochemistry Laboratory" 22<sup>nd</sup> Biennial Conference on Chemical Education. University Park, PA, August 2012.

Rigsby, R, and Daus, K; "Say 'Yes' to Organic: Connecting Organic Chemistry to a General Education Theme," 21<sup>st</sup> Biennial Conference on Chemical Education. Denton, TX, August 2010.

Rigsby, R; "Belmont Chemistry Outreach: Explosive Demonstrations and Hands-On Learning," Tennessee State Teacher's Association annual meeting. Nashville, TN, November 2009.

Panvini, D. and Rigsby, R; Women's Stories in Science, a Women's History Month convocation. Belmont University, March 2009.

Rigsby, R; "Belmont chemistry outreach: a combination of student demonstrations and hands-on activities," Girls Raised in Tennessee Science kick-off event. Middle Tennessee State University, September 2008.

Ragsdale, N, Yandell, L., and Rigsby, R; Perspectives on 'Awakenings', a Brain Week convocation. Belmont University, March 2007.

Rigsby, R. "Genomic fosfomycin resistance protein from *P. aeruginosa*." Invited lecture presented at the Indiana-Kentucky Border Section of the American Chemical Society. Owensboro, KY, April 2006.

### **Undergraduate Research Projects Supervised**

Sarah Maxwell: "The Isolation and Characterization of Catechins from *Malus pumila*" **2016**

Felicity Newton: "Mixed Catechin Solution from *Rosa centrifolia* Suggests Multiple Avenues for Tyrosinase Inhibition" **2015**

Robert Fira: "Preventing Cancer By Placement of Special Bacterial Carotenoids in Selected Natural Oils" **2015**

Kris Howard: "Sarcinaxanthin's Effects in Sunscreen" **2015**

Paul Hanna: "Inhibition of Lecithin-Cholesterol Acyltransferase by Reactive Aldehydes in Electronic Cigarettes" **2014**

Alina Bykova: "LCAT Inhibition by the Molecules of Cigarette Smoke" **2014**

Victoria Lim: "Synthesis of Novel Substrates for use in Enantioselective Iodolactonization via Carbon Dioxide Capture" **2014**

Lee McGill: "Effects of Chlorophyll and other Phytochemicals on the Kinetics of Superoxide Dismutase" **2013**

Emily Graham: "Astaxanthin Extraction Using Oils" **2012**

Soham Mody: "Making Paper Antifungal with Cinnamaldehyde" **2012**

William Proffitt: "Design of a Four-Fold Sequence and Structure Symmetric TIM-Barrel" **2010**

Nicole Smith: "Characterizing Compounds in Honey that May Inhibit Bacterial Growth" **2010**

Vinh Mai: "Determining the Bioavailability of Chemical Stimulants in Energy Drinks after Digestion" **2010**

Elizabeth Repasky: "Exploiting Symmetry in *de novo* Design of the  $(\alpha\beta)_8$  Barrel Fold" **2009**

Alyssa Merkel: "Estimation of the effects of hormone treatments on the bioavailability of lutein" **2008**

Jocelyn Lostetter: "The Effects of Carotenoids on Lung Cancer" **2008**

Emily Karr: "Isolation of Astaxanthin from *P. clarkia*" **2008**

Kelly Major: "Caffeine Determination of Folgers, Maxwell House, and Starbucks Coffee by HPLC: Does Preparation Change the Amount of Caffeine Present?" **2007**

### **Undergraduate Research Presentations & Publications**

Hanna, P. and Rigsby, R. "Inhibition of lecithin-cholesterol acyltransferase by reactive aldehydes in electronic cigarettes." American Chemical Society National Meeting. Spring 2015.

McGill, L. and Rigsby, R. "Effects of chlorophyll and other phytochemicals on the kinetics of superoxide dismutase." American Chemical Society National Meeting. Spring 2014.

Mody, S. and Rigsby, R. "Save your Bible the organic way." American Chemical Society National Meeting. Spring 2013.

Proffitt, W. and Rigsby, R. "Design of a four-fold sequence and structure symmetric TIM-barrel." American Chemical Society National Meeting. Spring 2011.

Karr, E. and Rigsby, R. "Isolation of Astaxanthin from *Procambarus clarkia*." *BURS Journal of Proceedings*, 19: 1-6 (2009).

Lostetter, J. and Rigsby, R. "The Effects of Carotenoids on Lung Cancer Cells." *BURS Journal of Proceedings*, 19: 7-13 (2009).

Rigsby, R. & K. Major; "Caffeine determination of Folgers, Maxwell House, and Starbucks coffee by HPLC: does preparation change the amount of caffeine present?" Tennessee Academy of Sciences Annual Meeting, November 2006.

### **Conferences and Workshops Attended**

American Chemical Society National Meetings:

- 2016: San Diego, CA (with students)
- 2015: Denver, CO (with students)

- 2014: Dallas, TX (with students)
- 2013: New Orleans, LA (with students)
- 2012: San Diego, CA (with students)
- 2011: Anaheim, CA (with students)
- 2010: San Francisco, CA (with students)
- 2009: Salt Lake City, UT (with students)
- 2008: New Orleans, LA (with students)
- 2007: Chicago, IL (with students)
- 2006: Atlanta, GA (with students)

Biennial Conference on Chemical Education meetings:

- 2016: Greeley, CO
- 2012: University Park, PA
- 2010: Denton, TX

Tennessee Academy of Sciences meetings:

- November 2015: Murfreesboro, TN
- April 2015: Nashville, TN
- November 2014: Morristown, TN
- April 2014: Nashville, TN
- November 2013: Tullahoma, TN
- April 2012: Nashville, TN
- April 2011: Nashville, TN
- April 2010: Nashville, TN
- April 2009: Nashville, TN
- November 2007: Gallatin, TN
- November 2006: Clarksville, TN

SouthEastern Regional Meeting of the American Chemical Society. Nashville, TN. October 2014

Association for General & Liberal Studies Annual Conference. Atlanta, GA. September 2014.

Lilly International Conference on College Teaching. Oxford, OH. November 2013

International Institute for Scholarship of Teaching and Learning Scholars and Mentors. Los Angeles, CA. June 2013.

Alpha Chi National Honor Society Super-Regional Convention. Little Rock, AR. March 2010.

National Science Foundation Day, a workshop for preparing NSF grant proposals. Murfreesboro, TN. December 2009.

AAC&U's 'Integrative Learning: Addressing the Complexities'. Atlanta, GA. October 2009.

**Other Significant Experience and Service While at Belmont**

Faculty Work Life Committee Chair: Fall 2016-present

CSM Representative to the Faculty Work Life Committee: Fall 2015-present

CAS/CSM T&P Advisory Committee: Fall 2012-present

Faculty, Bridges to Belmont Program; Summer 2013

Managing Editor, *Journal of the Tennessee Academy of Science*; March 2013-present

Biochemistry and Molecular Biology Program Coordinator; Fall 2010-May 2013

Co-faculty advisor for Student Members of the American Chemical Society; 2006-present

This student group is affiliated with the ACS, the most-recognized national professional organization for chemists.

Faculty advisor for Beta Chi, Belmont's Biochemistry & Molecular Biology student group; 2007-present

Member, Search Committees

Dean, College of Science and Mathematics, 2014

Chemistry Education (tenure track), 2013

Pharmacy (tenure track), 2010

Chemistry (tenure track), 2010

Chemistry (adjunct), 2009

Chemistry (adjunct), 2008

Physics (tenure track), 2007

Chemistry (temporary, 3 year position), 2006

Learning Community Leadership Team member (2006-present) & coordinator (2009-present)

"Sophomore Experience" QEP proposal team; Summer 2009

Co-faculty advisor for Belmont's Eta Chapter of Alpha Chi; 2007-2010

Interim editor for the Chemistry Section of the *Journal of the Tennessee Academy of Sciences*; Fall 2009-present

School of Sciences Strategic Planning & New Initiatives Committee; 2009

University Library Committee; 2006-2007

Leadership Team member of Girls Raised in Tennessee Sciences (GRITS) collaborative project, part of the National Girls Collaborative, a group of professionals who promote the participation of girls in science education and careers; 2006-2015.