

Sarah A. Kennedy, Ph.D.

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EDUCATION

Ph.D. Biological Chemistry	University of North Carolina at Chapel Hill	2004-2009
B.S. Chemistry	Westminster College, New Wilmington, PA	1998-2002

TEACHING EXPERIENCE

Visiting Assistant Professor of Chemistry at Westminster College 2009-2010

Teaching

- ♦ Instructing Organic Chemistry I and General Chemistry I students in the classroom and laboratory.
- ♦ Teaching biochemistry laboratory course.
- ♦ Incorporating audio/visual methods, guided inquiry learning techniques and demonstrations.
- ♦ Evaluating student performance and providing individual attention as necessary.
- ♦ Encouraging students to attend local chemistry meetings and seminars.

Curriculum Development

- ♦ Implement a new curriculum for the biochemistry laboratory course.
- ♦ Creating three-week biochemistry advanced laboratory experiment for 3rd year chemistry majors.

Research

- ♦ Directing undergraduate students to research northwest PA wines for *Brettanomyces* contamination.
- ♦ Developing contacts in the local area for wine chemistry and protein crystallography research.
- ♦ Presenting research at local and national meetings, including Pittcon 2010.

GAANN Fellow at the University of North Carolina at Chapel Hill 2007-2008

Teaching Fellow for Introductory Biochemistry

- ♦ Developed lecture material for nine contact hours of Introductory Biochemistry.
- ♦ Wrote exam and evaluated 180 students performance on mid-term and final exam.
- ♦ Incorporated video/audio materials and thinking questions during class.

Service Projects

- ♦ Provided three elementary schools with fun laboratory experiments at an after school program.
- ♦ Implemented a seminar series for GAANN fellows to learn about teaching at liberal arts colleges.

Mentor for Undergraduate Research at the University of North Carolina at Chapel Hill 2005-2009

Advisor for Undergraduate Researchers

- ♦ Designed independent research projects and mentored three undergraduate students.
- ♦ Provided references for two undergraduate researchers that resulted in research and travel scholarships.

Head Laboratory Teaching Assistant at the University of North Carolina at Chapel Hill 2004-2005

Laboratory Instruction

- ♦ Directed two general chemistry II laboratory sections for two semesters.
- ♦ Evaluated laboratory performance and worked with students individually to provide extra help.
- ♦ Provided the pre-lab lecture for 300 students each week for two semesters.

PROFESSIONAL EXPERIENCE

Postdoctoral Associate at the University of North Carolina at Chapel Hill

June-Aug 2009

Research and Product Validation

- ◆ Developing PEGylated human carboxylesterase to improve bioavailability as a nerve agent bioscavenger.
- ◆ Evaluated human carboxylesterase enzyme activity to validate a new enzyme production source.

Ph.D. in Chemistry at the University of North Carolina at Chapel Hill

2004-2009

Research Project Management

- ◆ Initiated mRNA processing thesis project that led to an entirely novel research area for the Redinbo group.
- ◆ Built and fostered collaborations with UNC biochemists, cell biologists, and geneticists to study Symplekin protein function resulting in a first author peer-reviewed publication and new grant opportunities.
- ◆ Directed the development and execution of plate-based enzyme kinetic assays.
- ◆ Solved two original x-ray crystal structures, each resulting in a peer-reviewed publication.

Written and Oral Communications

- ◆ Published two peer-reviewed journal articles with novel x-ray crystal structures and biochemical studies that improve understanding of mRNA processing and bacterial conjugation.
- ◆ Transformed a rejected manuscript, written by a previous postdoctoral associate, into an accepted article in two months by resolving the TraI crystal structure and examining the oligomeric state of the protein.
- ◆ Presented at departmental seminar, formal group meetings, and posters at national crystallography meetings.

Supervision and Leadership

- ◆ Mentored two rotation students and three undergraduate students, one of whom became a Beckman Scholar.
- ◆ Guided efforts to utilize remote x-ray data collection to eliminate travel costs.

Product Development Research Technician at Solvay Advanced Polymers, LLC., Alpharetta, GA

2002-2004

Management and Service

- ◆ Authored safety operating procedures (SOPs) and monthly progress reports.
- ◆ Chaired meetings with the analytical department to outline timelines and testing requirements to reach projects goals.
- ◆ Volunteered as a member of the site safety committee.

Product Development with Technology Transfer

- ◆ Conducted research to reduce the level of residual carcinogens and heavy metals in two high performance polymers to meet strict market standards and expand sales.
- ◆ Chaired meetings with production/research managers and directed plant employees during a scaled-up production run of a successful laboratory experimentation.
- ◆ Aligned research and plant laboratories to obtain comparable testing results.

RESEARCH PUBLICATIONS

Kennedy, S.A., Frazier, M.L., Steiniger, M., Mast, A.M., Marzluff, W.F., Redinbo, M.R.
Crystal Structure of the HEAT Domain of the Pre-mRNA Processing Protein Symplekin.
Journal of Molecular Biology. (2009) 292, 115-128.

Guogas, L.M., **Kennedy, S.A.**, Lee, J-H., Redinbo, M.R.
A Novel Fold in the TraI Relaxase-Helicase C-Terminal Domain is Essential for Conjugative DNA Transfer.
Journal of Molecular Biology. (2009) 386, 554-568.

INVITED SEMINARS

“*Careers as a Chemist: Insight into Industry, Graduate School, and Academia.*” Seton Hill University, Greensburg, PA. March 19, 2010.

“*Utilizing protein crystallography to understand cellular processes such as mRNA processing and bacterial conjugation.*” Slippery Rock University, Slippery Rock, PA. November 6, 2009.

“*Structure and dynamics of Symplekin, a protein involved in mRNA processing.*” Becton Dickinson, San Jose, CA. January 15, 2009.

ONGOING PROJECTS

Kennedy, S.A. Structural and functional characterization of hydroxycinnamate decarboxylase and vinylphenol reductase enzymes from wine contaminant yeast *Brettanomyces*. Ongoing project with undergraduate students.

Hall, M., **Kennedy, S.A.** Utilizing SPME-GC/MS to Analyze Northwest Pennsylvania concord wines for contamination by the spoilage yeast strain *Brettanomyces*. To be presented at 2010 national Pittcon meeting.

Slevin, L., **Kennedy, S.A.**, Tyrrell, J., Redinbo, M.R. (Continuing as consultant)
Comparison of serum and PEGylated recombinant human carboxylesterase as nerve agent bioscavengers.

ABSTRACT PUBLICATIONS

Kennedy, S.A., Steinger, M., Mast, A.M., Marzluff, W.F., Redinbo, M.R.
Crystal Structure of Pre-mRNA Processing Protein Symplekin HEAT Domain Reveals Unique Elements. American Crystallography Association National Meeting, Knoxville, TN, June 2008, and 38th Annual Mid-Atlantic Macromolecular Crystallography Meeting, Chapel Hill, NC, May 2008.

Kennedy, S.A., Boylan, H.
Comparison of Extraction Techniques for Quantification of Active Ingredients in Aucubin. 223rd American Chemical Society National Meeting, Orlando, FL (April 2002)

HONORS AND AWARDS

- ◆ Received Honorable Mention for the National Science Foundation Graduate Research Fellowship (2006)
- ◆ One of twelve UNC chemistry graduate students to receive the GAANN Fellowship (2007)
- ◆ One of eight UNC Venable Summer Research Fellows (2004)
- ◆ Received Westminster College's Outstanding Freshman Chemistry Student Award (1999) and Best Student in Organic Chemistry Award (2000)

TECHNICAL SKILLS

- ◆ Assay techniques: fluorescence intensity, fluorescence polarization and absorbance
- ◆ Biophysical techniques: isothermal titration calorimetry and dynamic light scattering
- ◆ Protein purification: AKTA Express FPLC, affinity, and size exclusion chromatography
- ◆ Molecular Biology: traditional and ligation-independent cloning, mutagenesis, bacterial protein expression
- ◆ X-ray crystallography: SAD, MAD, MR, data collection, refinement, crystallization
- ◆ Computers: Unix operating systems, molecule visualization programs, various crystallography programs