

# Shannon Anderson (Cumiskey)

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## Address:

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## Education:

<b>North Dakota State University</b> , Fargo, ND Ph.D. Chemistry Ph.D. STEM Education (dual major option) Advisor: Dr. Erika Offerdahl	Expected 2015
<b>Augustana College</b> , Sioux Falls, SD B.A. Chemistry B.A. English	2010 2010

## Research Experience:

<b>North Dakota State University</b> , Fargo, ND Graduate research assistant, PI: Dr. Erika Offerdahl <ul style="list-style-type: none"><li>• Currently investigating how students solve for structures from organic spectra</li><li>• Analyzing interview data with Nvivo</li><li>• Adapted an interview protocol to elicit students' thought processes while solving</li><li>• Conducted interviews with over 20 students as they solved for structures</li><li>• Obtained expedited IRB approval from two different universities</li><li>• Presented preliminary results in group meetings and departmental seminars, along with two oral and five poster presentations at conferences</li></ul>	August 2010 - Present
<b>North Dakota State University</b> , Fargo, ND Undergraduate research assistant, NIH COBRE REU, PI: Dr. Gregory Cook <ul style="list-style-type: none"><li>• Examined methodologies regarding indium-mediated enantioselective allylations of <math>\alpha</math>-ketoamides</li><li>• Ran and analyzed products via NMR</li><li>• Determined enantioselectivity with HPLC</li><li>• Conducted stoichiometric studies on ligand and substrate interactions</li><li>• Presented research results in small group meetings and poster sessions</li></ul>	May - August 2009
<b>Augustana College</b> , Sioux Falls, SD Undergraduate research assistant, PI: Dr. Jetty Duffy-Matzner <ul style="list-style-type: none"><li>• Examined the mechanism of intramolecular silyl nitronate cycloadditions of propargylic nitroethers</li><li>• Synthesized a novel dihydrofuran ketone compound, 1-[2-methyl-5-phenyl-2,5-dihydrofuran-3-yl]ethanone</li></ul>	May - August 2008

- Purified products via flash column and Prep TLC
- Ran and analyzed compounds with FT-IR, GC-MS,  $^1\text{H}$  and  $^{13}\text{C}$  NMR, along with DEPT, COSY and HETCOR
- Presented research results in small group meetings, poster sessions, and symposiums

**Augustana College**, Sioux Falls, SD

January 2008

Undergraduate research assistant, PI: Dr. Jetty Duffy-Matzner

- Examined the mechanism of intramolecular silyl nitronate cycloadditions of propargylic nitroethers
- Synthesized a novel nitroether compound, 4-[2-nitro-1-phenylethoxy]-2-pentyne
- Purified products by flash column and prep-TLC
- Characterized compounds with  $^1\text{H}$  and  $^{13}\text{C}$  NMR, along with DEPT, COSY, and HETCOR
- Compiled results in comprehensive reports

### Teaching Experience:

**North Dakota State University**, Fargo, ND

2010 - 2012

Graduate Teaching Assistant, Organic Chemistry I and II laboratory

- Taught eight sections (~20 students/section) of laboratory in Organic Chemistry I and Organic Chemistry II
  - Wrote quiz and exam questions to gauge student understanding
  - Graded laboratory reports, quizzes, and exams
  - Held office hours and helped students one-on-one to further their understanding of lecture materials

Graduate Teaching Assistant, Foundations of Biochemistry and Molecular Biology lecture Fall 2012

- Assisted in the teaching of Foundations of Biochemistry and Molecular Biology lecture (~350 students)
  - Led the instruction for the unit on carbohydrates and glycobiology, and designed class activities to actively engage students in lecture
  - Wrote and graded formative assessments such as in-class activities and progress checks
  - Wrote and graded quiz and exam questions
  - Held office hours to help students with course material

**Augustana College**, Sioux Falls, SD

2008 - 2010

Laboratory Assistant and Tutor

- Taught four semesters of laboratory in Organic Chemistry I and Organic Chemistry II
- Assisted in grading of laboratory reports and notebooks
- Prepared laboratory for experiments by making solutions, gathering materials, and creating instrumental methods for the analysis of compounds
- Ran and maintained instrumentation (IR, NMR, GC, GC-MS)
- Trained other students in using and maintaining instrumentation
- Tutored students in General and Organic Chemistries

### Presentations:

#### Oral Presentations:

**Anderson, Shannon Y.;** Offerdahl, Erika G. "Patterns of student reasoning while interpreting organic chemical spectra." *Biennial Conference on Chemical Education*, State College, PA; July 2012.

**Anderson, Shannon Y.;** Offerdahl, Erika G. "Patterns of student reasoning while interpreting organic chemical spectra." *NDSU ChemBio Graduate Student Association Brown Bag Seminar Series*, Fargo, ND; July 2012.

**Cumiskey, Shannon Y.** "A journey worth taking." *The Augustana College Association Annual Meeting*, Sioux Falls, SD; December 2009.

**Cumiskey, Shannon Y.;** Duffy-Matzner, Jetty L. "Further Investigation of the mechanism of intramolecular silyl nitronate cycloadditions of propargylic nitroethers." *The Augustana Symposium*, Sioux Falls, SD; April 2009.

#### Poster Presentations:

**Anderson, Shannon Y.;** Offerdahl, Erika G. "Patterns of student reasoning in solving structures from organic spectra." *40<sup>th</sup> Great Lakes Regional Meeting of the American Chemical Society*, La Crosse, WI; June 2013.

**Anderson, Shannon Y.;** Offerdahl, Erika G. "Patterns of student reasoning with solving structures from organic spectra." *CER Graduate Student Conference*, Oxford, OH; July 2013.

**Anderson, Shannon Y.;** Offerdahl, Erika G. "An instrument to uncover students' reasoning with organic chemical spectra." *NDSU Chemistry and Biochemistry Graduate Visitation Day*, Fargo, ND; October 2012.

**Anderson, Shannon Y.;** Offerdahl, Erika G. "An instrument to uncover students' reasoning with organic chemical spectra." *Conference on Transforming Research in Undergraduate STEM Education*, St. Paul, MN; June 2012.

**Anderson, Shannon Y.;** Offerdahl, Erika G. "An instrument to uncover students' reasoning with organic chemical spectra." *Biennial Conference on Chemical Education*, State College, PA; July 2012.

**Cumiskey, Shannon Y.;** Cook, Gregory R.; Balasubramanian, Narayanaganesh. "Indium-mediated enantioselective allylation." *239<sup>th</sup> National Meeting of the American Chemical Society*, San Francisco, CA; March 2010.

**Cumiskey, Shannon Y.;** Cook, Gregory R.; Balasubramanian, Narayanaganesh. "Indium-mediated enantioselective allylation." *44<sup>th</sup> Midwest Regional Meeting of the American Chemical Society*, Iowa City, IA; October 2009.

**Cumiskey, Shannon Y.;** Duffy-Matzner, Jetty L. "Further investigation of the mechanism of intramolecular silyl nitronate cycloadditions of propargylic nitroethers." *43<sup>rd</sup> Midwest Regional Meeting of the American Chemical Society*, Kearney, NE; October 2008.

#### Professional Service:

**North Dakota State University**, Fargo, ND

Graduate Student Representative on the Gateways to Completion (G2C) General Chemistry Course Improvement Committee 2014

President, NDSU ChemBio Graduate Student Association 2012 – 2013

Graduate Student Representative on the Search Committee for Account Technician in the Department of Chemistry and Biochemistry May 2013

Graduate Student Representative on the Ad-Hoc Committee for the Chair Evaluation in the Department of Chemistry and Biochemistry April – May 2013

Graduate Student Representative on the Search Committee for Dean of College of Science and Mathematics 2011 – 2012

Secretary, NDSU ChemBio Graduate Student Association 2011 - 2012

### **Funding:**

**North Dakota State University**, Fargo, ND  
STEM Education PhD Research Fellowship 2013 – Present

**Miami University**, Oxford, OH  
Chemistry Education Research Graduate Student Conference Travel Award July 2013

### **Honors and Awards:**

**North Dakota State University**, Fargo, ND  
Brown Bag Seminar Series: Outstanding Presentation August 2012

**Augustana College**, Sioux Falls, SD  
Outstanding Chemistry Laboratory Assistant 2009 - 2010  
Covenant Award for Liberal Arts 2009 - 2010  
American Chemical Society Sioux Valley Section Outstanding Research Poster 2009 - 2010  
Elliot Thoreson Scholarship 2008 - 2009  
Diversity Scholarship 2006 - 2010  
Heritage Scholarship 2006 – 2010  
Pro Musica Scholarship 2006 - 2010

### **Memberships/Affiliations:**

President, NDSU ChemBio Graduate Student Association 2012 – 2013  
Secretary, NDSU ChemBio Graduate Student Association 2011 - 2012  
NDSU ChemBio Graduate Student Association 2010 – Present  
The American Chemical Society 2008 - Present  
The Augustana Choir 2009 - 2010  
The Augustana Collegiate Chorale 2006 - 2009

### **Techniques and Instrumentation:**

*Instrumental Methods:* NMR, IR, UV-Vis, GC-MS, and HPLC.

*Separation and Purification:* Prep-TLC and column chromatography.

*Software:* Microsoft Office, ChemDraw, and Nvivo.

*Training:* Human Subjects Research (CITI Program certified since 2010)