

# Rachel A. Willand-Charnley

<b>Contact Information</b>		South Dakota State University Department of Chemistry and Biochemistry rachel.willand@sdstate.edu
<b>Research</b>		Immune cancer research; enzymology, glycobiology; chemical biology and organic chemistry and synthesis.
<b>Education</b>	2010-2014	University of Nebraska, Lincoln. Dissertation title: “The Peroxide: The underutilized but highly advantageous functional group.”
	2008	<b>B.S., Biology</b> Creighton University, Omaha NE.
<b>Awards</b>	2015-2017	National Institute of Health’s NIGMS’s Institutional Research and Career Development Award (IRACDA) fellow.
	2014	Norman Cromwell Research Award Outstanding Graduate Researcher in Organic Chemistry
<b>Fellowship</b>	2015-2017	National Institute of Health’s NIGMS’s Institutional Research and Career Development Award (IRACDA) fellow.
	2013	Preparing Future Faculty Fellow, University of Nebraska, Lincoln."Preparing Future Faculty Mentor: Professor Carolyn Bertozzi, University of California, Berkeley.
<b>Research Experience</b>	2015-2018	<b>Postdoctoral Scholar</b> Stanford University, Department of Chemistry, Stanford CA. Advisor: Professor Carolyn Bertozzi
		<b>Research focus:</b> At the intersect of glycobiology and immune cancer research. Investigation into how: different glycans, modifications to the canonical structure of glycans (and the genes responsible), and how different glycosylation patterns allowed cancer to evade the immune system.
	2015	<b>Visiting Scholar</b> University of California, Berkeley Department of Chemistry, Berkeley CA. Advisor: Professor Carolyn Bertozzi Research focus: Investigated new bioorthogonal reactions towards the development of theranostic multiplexed antibody drug conjugates (TMACS).
<b>Professional Experience</b>	2009-2010	<b>Research Assistant</b> University of Nebraska, Department of Biology, Omaha, Ne. Advisor: Professor William Tapprich Research Focus: Investigating how single nucleotide polymorphisms affect the Cocksackie Virus B3 (CVB3) Genome and virulence.

	2008	<b>Pathology Assistant</b> Creighton University Medical Center, Department of Pathology, Omaha NE.
	2009	<b>Cardiology Assistant</b> Creighton University Medical Center, Department of Cardiology, Omaha NE.
<b>Course Instruction</b>	<b>2018</b>	<b>Instructor of record, Organic Chemistry Lab (CHEM 33), Santa Clara University.</b>
	2017	Instructor of record, Biochemistry (CHEM 141), Santa Clara University.
	2017	Instructor of record, Organic Chemistry (CHEM 31), Santa Clara University.
	2017	Instructor of record, Biochemistry (CHEM 141), Santa Clara University. Co-
	2016	lecturer, Organic Chemistry (CHEM 112A), San Jose State University. Co-
	2013-2014	lecturer, Biochemistry (CHEM 130A), San Jose State University. Substitute
	2012-2014	Lecturer, Organic Chemistry I (CHEM 251), UNL Substitute Lecturer, Organic Chemistry II (CHEM 252), UNL Organic Chemistry Graduate Recitation Instructor, Organic Chemistry I (CHEM 251), UNL
	2010-2012	Organic Chemistry Graduate Recitation Instructor, Organic Chemistry II (CHEM 252), UNL Organic Chemistry Graduate Lab Instructor, (CHEM 253), UNL Organic Chemistry Graduate Lab Instructor, (CHEM 254), UNL
	2015	“Metal Mediated Biorthogonal Methodologies,” ChEM-H lecture, Stanford University.
	2014	“The Peroxide: The underutilized but highly advantageous functional group,” Creighton University
<b>Teaching/ Tutoring</b>	2016	Pedagogy lecture, “POGIL,” Pedagogy Journal Club, Stanford University.
	2010-2014	Chemistry Tutor, UNL
	2011-2014	General and advances sciences tutor for student athletes, UNL Athletic Dept.
	2008-2010	Math Science Learning Center, University of Nebraska, Omaha. Biology (BIOL: 1030, BIOL 1450, 1750, 2140, 2440, 2740, 3020, 4140), Anatomy & Physiology (BIOL 2740, 2840, 4270, 4450), Chemistry (CHEM: 1140, 1180, 1190, 2210, 2214, 2250, 3650, 3710, 4230, 4240, 4650) General and advanced sciences tutor, University of Nebraska, Omaha.
	2005-2008	Organic Chemistry tutor (CHM 321, CHM 323), Creighton University
	2004	General Biological sciences tutor, Metropolitan Community College
<b>Teaching in a Scientific Outreach Setting.</b>	2015-2018	Program Developer, coordinator, and teacher, Inspiring Future Scientist in Chemistry K-5 science outreach program, Stanford University <a href="https://chemoutreach.stanford.edu/k-5-program-0">https://chemoutreach.stanford.edu/k-5-program-0</a>
	2015-2018	Lecturer, Bay Area Scientists In Schools (BASIS), University of California, Berkeley
	2015-2018	Lecturer, Inspiring Future Scientists in Chemistry, Stanford University
	2015-2016	Member, Haas Science in Service, Stanford University
	2015-2016	Member, Coalition for Education and Outreach (CEO), University of California, Berkeley
	2010-2014	Lecturer, Chemistry Day, UNL
	2012-2013	Lecturer, Women in Science Conference, UNL.
	2012	Teacher, Nanodays, University of Nebraska, Lincoln.
	2012	Teacher, Maxey Middle School Chemistry Day, UNL,
	2011	Volunteer, Pfizer-LPS-Novartis Science Fair, Lincoln NE.

	2010	President and member, Phi Lambda Upsilon Chemistry Honor Society, UNL
<b>Professional Education</b>	2016	W16-ENGR-312-01/VPTL-312-01 - Science and Engineering Course Design, Stanford University.
	2016	Undergraduate teaching series for postdocs, Stanford University.
	2016	Preparing for Faculty careers course, Stanford University.
	2015	Team Science workshop, Stanford University.
	2016	Teaching for Postdocs, Stanford University
	2016	Scientific teaching workshop, Stanford University
	2016	Management Matters, Stanford University.
	2013	Preparing Future Faculty course, UNL
<b>Mentoring</b>	2016-2018	Taylor Harris, Bertozzi research group, Stanford University
	2015-2018	Alisa Horn, Moriah Locklear, Navid Rahmany, and Robert Denton, Dussault research group, University of Nebraska, Lincoln.
<b>Service/ Committees</b>	2016-2018	Pedagogy Journal Club Committee Member, Stanford University
	2015-2018	ChEM-H Postdoctoral Society Leadership Committee Member, Stanford University <a href="https://chemh.stanford.edu/programs/postdoc-programs">https://chemh.stanford.edu/programs/postdoc-programs</a>
	2015-2018	ChEM-H Postdoctoral Society, Stanford University
	2013-2014	Committee Member, Dept. of Chemistry Grade Appeals Committee, UNL
	2013-2014	Committee Member, Dept. of Chemistry Curriculum Committee, UNL
	2013-2014	Committee Member, Chemistry Day Planning Committee, UNL
	2013	President, Phi Lambda Upsilon Chemistry Honor Society University of Nebraska-Lincoln Chapter Invited speakers under my direction: Dr. Emily Balskus; Harvard University Professor Mark Meyerhoff; University of Michigan
	2013	Newsletter Editor, Phi Lambda Upsilon Chemistry Honor Society, (Rho Chapter, UNL)
<b>Journal Clubs</b>	2016-2018	Pedagogy Journal Club, Stanford University.
	2015-2018	Founder, Bioorthogonal Chemistry Journal Club, Bertozzi Research Group, University of California, Berkeley and Stanford University
<b>Selected Publications/ Patents</b>	2014	Highlighted in: Synfacts, <b>2014</b> , 10(7), 0744 DOI: 10.1055/s-0033-1339145. <b>Willand-Charnley, R.</b> , Puffer, B and Dussault, P.H. "A Novel Oxacycle Synthesis."
	2014	<b>Willand-Charnley, R.</b> , Puffer, B and Dussault, P.H. "Inter and Intramolecular Reaction of Carbanions with Peroxides: An Unpoled Approach to Cyclic Ethers" <i>J. Am. Chem. Soc.</i> <b>2014</b> 136, 5821-5823 DOI:10.1021/ja5026276
	2013	<b>Willand-Charnley, R.</b> and Dussault, P.H. "Synthesis of Cyclic Ethers by Intramolecular Reaction of Stabilized Carbanions and Organic Peroxides" US provisional patent application No. 61/938,246. <b>2013</b>
	2013	<b>Willand-Charnley, R.</b> and Dussault, P.H. "Tandem C-C Bond- Forming Reactions Involving Reductive Ozonolysis." <i>J. Org. Chem.</i> <b>2013</b> : 78, 42-

47. DOI: 10.1021/jo3015775

- 2012 **Willand-Charnley, R.**, Fisher, T., Johnson, B., Dussault, P.H., Org. Lett. **2012**: 14(9), 2242-2245. DOI: 10.1021/ol300617r.
- Manuscripts in preparation** 2019 **Willand-Charnley, R.**, and Bertozzi, C.R. "Modulation of SIAE Expression Influences Inhibitory Receptor Binding of Cancer Cells- A Potential Immune Evasion Pathway." Journal of Biochemistry (Patent Application to Follow with Stanford University).
- Abstracts** 2016 **Willand-Charnley, R.** and Bertozzi C.R. "Bioorthogonal palladium catalyzed sp<sup>2</sup> C-H activation of polyfluoro arenes." IRACDA conference.
- 2015 **Willand-Charnley, R.** and Bertozzi, C.R. "Development of CHAD-Linkers for theranostic multiplexed antibody constructs." Pacificchem
- 2013 **Willand-Charnley, R.**, Puffer, B., and Dussault, P.H. "Inter And Intramolecular Reaction of Carbanions With Peroxides: An Unpoled Approach To Cyclic Ethers." 43th National Organic Chemistry Symposium.
- 2013 **Willand-Charnley, R.**, Puffer, B., and Dussault, P.H. "Inter And Intramolecular Reaction of Carbanions With Peroxides: An Unpoled Approach To Cyclic Ethers." 133th Nebraska Academy of Science.
- 2012 **Willand-Charnley, R.** and Dussault, P.H. "Pyridine as an Organocatalyst for the Reductive Ozonolysis of Alkenes." 34<sup>TH</sup> Reaction Mechanisms Conference.
- 2012 **Willand-Charnley, R.**, and Dussault, P.H. "Tandem Reactions Involving Reductive Ozonolysis." 132<sup>ND</sup> Nebraska Academy of Sciences.
- 2012 **Willand-Charnley, R.**, Fisher, T., Johnson, B., Dussault, P.H., "Pyridine as an Organocatalyst for the Reductive Ozonolysis of Alkenes." 243<sup>RD</sup> American Chemical Society National Meeting & Exposition, Chemistry of Life.
- 2012 **Willand-Charnley, R.**, and Dussault, P.H. "Pyridine as an Organocatalyst for the Reductive Ozonolysis of Alkenes." NSF CHE and Sustainable Chemistry. University of Nebraska, Lincoln.

## Professional References

Professor Carolyn Bertozzi, Stanford University, Dept. of Chemistry, Stanford CA, 94305-4401. Tel: 650-721-4781. bertozzi@stanford.edu

Professor John Boothroyd, Stanford University, Department of Microbiology and Immunology Stanford University School of Medicine Stanford CA 94305-5124 Tel: 650-723-7984 email: jboothr@stanford.edu

Professor Colin R., Parrish College of Veterinary Medicine, Cornell University Ithaca, NY 14853, USA Tel: +1-607-256-5610 0