

# SHANNON R. WOODRUFF

Department of Chemistry | Southern Methodist University | 3215 Daniel Avenue, Dallas, TX 75275  
E-mail: shannon@woodruff.science | Website: www.shannonwoodruff.com

## SUMMARY

I am a creative and passionate scientist with a strong background in organic and polymer synthesis. I have extensive experience in controlled radical polymerization, small molecule synthesis, design of functional polymers for self-assembly, and a wide variety of synthetic methodologies. As a consultant, I have gained industrial experience in development of SOPs, experiment design, product development, and technical communication. I am also very involved with education initiatives and have extensive experience in teaching and outreach activities focused on the public understanding of science.

## EDUCATION & TRAINING

**Ph.D., Chemistry** **SOUTHERN METHODIST UNIVERSITY, DALLAS, TX** **2010-2015**

**Advisor:** Nicolay V. Tsarevsky, Ph.D.  
**Dissertation:** *Macromolecular Design of Well-Defined Epoxide-Containing Materials and Their Post-Polymerization Functionalizations*, July 2015  
**Activities:** President, Chemistry Graduate Council, 2012 - 2015  
Co-organizer, SMU Chemistry Camp (for 5th - 12th grade students), 2012 - 2015  
**Service:** Judge, Dallas Regional Science and Engineering Fair, 2013 - 2015

**B.S., Chemistry & Cell Biology** **UNIVERSITY OF MARY HARDIN-BAYLOR, BELTON, TX** **2006-2010**

**Advisor:** Darrell G. Watson, Ph.D.  
**Activities:** Demonstrator, Chemical Demonstrations for Local Elementary Schools, 2008-2010  
President, ACS Student Chapter (Sigma Pi Chemistry Club), 2007-2010  
Co-organizer, UMHB Chem Camp (for 3rd - 5th grade students), 2010  
Member, Student Organization Advisory Committee, 2008  
Member, ACS Student Affiliate Chapter (Sigma Pi Chemistry Club), 2006-2007

## PROFESSIONAL AFFILIATIONS

**Member** **AMERICAN CHEMICAL SOCIETY** **2007-PRESENT**

**Divisions:** Polymer Chemistry, Chemical Education, History of Chemistry  
**Activities:** Member, DFW Local Section, 2010-present  
President, University of Mary Hardin-Baylor Student Chapter, 2007-2010  
Member, Heart O' Texas Local Section, 2007-2010  
**Service:** Presider, PMSE Session on "General Papers/New Concepts in Polymeric Materials," 245th ACS National Meeting, April 7-11, 2013, New Orleans, LA.

## AWARDS & HONORS

**2015** Graduate Research Achievement Award, Southern Methodist University  
**2014** Semifinalist for Chemistry Champions Contest, American Chemical Society  
**2014** Department of Chemistry Citizenship Award, Southern Methodist University  
**2012** Ciba / BASF Travel Award in Green Chemistry, American Chemical Society, Green Chemistry Institute  
**2012** TEDxSMU Carole & Jim Young Fellow, Southern Methodist University  
**2012** Dean's Award for the Best Poster Presentation, Southern Methodist University Research Day  
**2011** Wiley-VCH Macromolecular Journals Award for Best Poster Presentation, 242nd ACS Nat'l Mtg.  
**2010** ACS Student Leadership Award, American Chemical Society  
**2010** Outstanding Senior Chemistry Major Award, University of Mary Hardin-Baylor  
**2009** Student Organization President of the Year, University of Mary Hardin-Baylor

## WORK EXPERIENCE

**Research Associate** **SOUTHERN METHODIST UNIVERSITY, DALLAS, TX** **2015-PRESENT**

• Writing research publications and finalizing data for NSF-funded grant on well-defined hydrogels for NMR applications

**Consultant** **RESOLUTION BIOMEDICAL, INC., TUSTIN, CA** **2012-PRESENT**

• Advisement on synthesis of proprietary polymer-based medium for specific cytology procedures  
• Suggestion of techniques, product development, explanation of chemical interactions, development of SOP, etc.

**Graduate Research Assistant** **SOUTHERN METHODIST UNIVERSITY, DALLAS, TX** **2011-2015**

• Synthesized well-defined functional polymer materials via controlled radical polymerization techniques  
• Studied various post-polymerization modifications and their utility in the development of functional materials  
• Developed hydrogel materials with unique architectures for use in advanced NMR spectroscopic techniques  
• Proficient in various polymer characterization techniques (e.g., NMR, GPC/SEC, DLS, TGA, FT-IR, UV-vis, etc.)

**Teaching Assistant** **SOUTHERN METHODIST UNIVERSITY, DALLAS, TX** **2010-2011**

General Chemistry Lab & Lecture · Advanced Inorganic Chemistry Lab · Quantitative Analysis Lab

**Undergrad. Research Assistant** **UNIVERSITY OF MARY HARDIN-BAYLOR, BELTON, TX** **2007-2010**

• Synthesized and studied photochemistry of various novel enamines and enaminones  
• Became proficient in advanced instrument maintenance (i.e., GC-MS, GC, 60-MHz NMR spectrometer)

**Teaching Assistant** **UNIVERSITY OF MARY HARDIN-BAYLOR, BELTON, TX** **2007-2010**

Organic Chemistry Lab · Physical Chemistry Lab · Advanced Instrumental Lab · Quantitative Analysis Lab

## PEER-REVIEWED PUBLICATIONS

### Journal Articles & Book Chapters

1. Woodruff, S. R.; Tsarevsky, N. V., "Synthesis of (bio)degradable polymers by controlled/"living" radical polymerization," in *Synthesis and Characterization of Biorelated Polymers*, **2015**, submitted.
2. Woodruff, S. R.; Wisian-Neilson, P. J.; Tsarevsky, N. V., "A look at low-catalyst-concentration ATRP and post-polymerization modifications in the undergraduate chemistry laboratory," *J. Chem. Educ.*, **2015**, submitted.
3. Garcia, M. E.; Woodruff, S. R.; Hellemann, E.; Tsarevsky, N. V.; Gil, R. R., "Di(ethylene glycol) methyl ether methacrylate (DEGMEMA)-derived gels align small organic molecules in methanol," *Magn. Reson. Chem.*, **2015**, accepted.
4. Woodruff, S. R.; Tsarevsky, N. V., "Synthesis of star polymers with epoxide-containing highly branched cores by low-catalyst concentration atom transfer radical polymerization and post-polymerization modifications," in *Controlled Radical Polymerization: Materials*; Matyjaszewski, K., Sumerlin, B. S., Tsarevsky, N. V., Chiefari, J., Eds.; ACS Symposium Series 1188; American Chemical Society: Washington, DC, **2015**; pp 149-167. (DOI: [10.1021/bk-2015-1188.ch011](https://doi.org/10.1021/bk-2015-1188.ch011))
5. Woodruff, S. R.; Davis, B. J.; Tsarevsky, N. V., "Epoxides as reducing agents for low-catalyst-concentration atom transfer radical polymerization," *Macromol. Rapid Commun.*, **2014**, *35*, 186-192. (DOI: [10.1002/marc.201300696](https://doi.org/10.1002/marc.201300696))
6. Snider, J. D.; Troche-Pesqueira, E.; Woodruff, S. R.; Gayathri, C.; Tsarevsky, N. V.; Gil, R. R., "New strategy for RDCs assisted diastereotopic proton assignment using a combination of *J*-scaled BIRD HSQC and *J*-scaled BIRD HMQC/HSQC," *Magn. Reson. Chem.*, **2012**, *50*, S86-S91. (DOI: [10.1002/mrc.3895](https://doi.org/10.1002/mrc.3895))
7. Woodruff, S. R.; Davis, B. J.; Tsarevsky, N. V., "Selecting the Optimal Reaction Conditions for Copper-Mediated Atom Transfer Radical Polymerization at Low Catalyst Concentration," in *Progress in Controlled Radical Polymerization: Mechanisms and Techniques*; Matyjaszewski, K., Sumerlin, B. S., Tsarevsky, N. V., Eds.; ACS Symposium Series 1100; American Chemical Society: Washington, DC, **2012**; pp 99-113. (DOI: [10.1021/bk-2012-1100.ch007](https://doi.org/10.1021/bk-2012-1100.ch007))

## CONFERENCE PROCEEDINGS AND OTHER NON-PEER-REVIEWED ARTICLES

### Preprints

1. Woodruff, S. R.; Tsarevsky, N. V., "Synthesis of well-defined polymers with epoxide groups by atom transfer radical polymerization and their use as precursors of functional materials," *Polym. Prepr.*, **2011**, *52*(2), 671-672.

## SELECTED PRESENTATIONS AND LECTURES

### Research

1. Woodruff, S. R.; Tsarevsky, N. V., "Macromolecular engineering of epoxide-containing materials and their post-polymerization functionalizations," Air Force Research Laboratory, Dayton, OH, September 21, **2015**, invited talk.
2. Woodruff, S. R.; Tsarevsky, N. V., "Macromolecular design of well-defined epoxide-containing materials and their post-polymerization functionalizations," Hewlett-Packard Company, San Diego, CA, July 9, **2015**, invited talk.
3. Woodruff, S. R.; Tsarevsky, N. V., "Synthesis, modification, and chain extension of highly functional branched polymers," ACS Southwest Regional Meeting, Fort Worth, TX, November 20, **2014**, poster 162.
4. Woodruff, S. R., "Chemistry to better deliver medicine inside cells," 248th ACS National Meeting, San Francisco, CA, August 10-14, **2014**, ACS Chemistry Champions Semifinals, invited talk.
5. Woodruff, S. R.; Tsarevsky, N. V., "Synthesis and modifications of epoxide-containing polymers," University of Mary Hardin-Baylor, Belton, TX, April 17, **2014**, invited talk.
6. Woodruff, S. R.; Swartz, K. B.; Tsarevsky, N. V., "Synthesis and modifications of branched epoxide-containing polymers," 247th ACS National Meeting, Dallas, TX, March 16-20, **2014**, talk POLY 658.
7. Woodruff, S. R., "Chemistry at play: A look at popularizing chemistry through kits and their effectiveness throughout the years," 247th ACS National Meeting, Dallas, TX, March 16-20, **2014**, talk HIST 10.
8. Woodruff, S. R.; Davis, B. J.; Tsarevsky, N. V., "Well-defined epoxide-containing polymers prepared by low-catalyst concentration atom transfer radical polymerization and their post-polymerization modifications," 46th ACS DFW Meeting-in-Miniature, Commerce, TX, April 27, **2013**, talk G17.
9. Woodruff, S. R.; Davis, B. J.; Tsarevsky, N. V., "Well-defined functional epoxide-containing polymers by low-catalyst concentration atom transfer radical polymerization," 245th ACS National Meeting, New Orleans, LA, April 7-11, **2013**, talk PMSE 197.
10. Woodruff, S. R.; Tsarevsky, N. V., "Synthesis of well-defined polymers with epoxide groups by atom transfer radical polymerization and their use as precursors of functional materials," 45th ACS DFW Meeting-in-Miniature, Dallas, TX, April 21, **2012**, talk G29.
11. Woodruff, S. R.; Tsarevsky, N. V., "Synthesis of well-defined polymers with epoxide groups by atom transfer radical polymerization and their use as precursors of functional materials," 242nd ACS National Meeting, Denver, CO, August 28 - Sept. 1, **2011**, poster POLY 198.
12. Popescu, D. L.; Woodruff, S. R.; Tsarevsky, N. V., "Well-defined electrochromic and fluorescent polymers by atom transfer radical polymerization (ATRP)," ACS Local Section Meeting: Meet DFW's New Young Investigators, Dallas, TX, January 29, **2011**, poster 17.
13. Woodruff, S. R.; Watson, D. G., "Preparation, characterization, and exploratory photochemistry of 3-(*N*-methylanylino)-2-butenic acid and its ester derivatives," 235th ACS National Meeting, New Orleans, LA, April 6-10, **2008**, poster CHED 585.

## Chemical Education

14. Tsarevsky, N. V.; Woodruff S. R., "Color chemistry," Turn Up at the Meadows Museum!, Dallas, TX, June 13, **2015**, chemical demonstration presentation, invited presentation.
15. Meadows, V. E.; Underwood, S. R.; Woodruff, S. R.; Watson, D. G., "Science Saturday: An outreach to the community," 239th ACS National Meeting, San Francisco, CA, March 21-25, **2010**, poster CHED 1413.
16. Lawson, A. A.; Woodruff, S. R.; Watson, D. G., "Women in science extravaganza: Celebrating women and their role in science," 239th ACS National Meeting, San Francisco, CA March 21-25, **2010**, poster CHED 1391.
17. Woodruff, S. R.; Phun, C.; Watson, D. G., "Safety video: Student-organized production to make chemical safety fun," 237th ACS National Meeting, Salt Lake City, UT, March 22-26, **2009**, poster CHED 1107.
18. Radwan, Z. A.; Woodruff, S. R.; Watson, D. G., "Green sheet: Second year of spreading the word on environmental issues," 237th ACS National Meeting, Salt Lake City, UT, March 22-26, **2009**, poster CHED 1077.
19. Lawson, A. A.; Woodruff, S. R.; Watson, D. G., "Demos in the dark: Fifteen years of a continuously successful NCW event," 237th ACS National Meeting, Salt Lake City, UT, March 22-26, **2009**, poster CHED 1064.

## Intra-Institutional Presentations

20. Woodruff, S. R.; Tsarevsky, N. V., "Synthesis, chain extension, and post-polymerization modification of highly functional branched polymers," Southern Methodist University Research Day, Dallas, TX, February 25, **2015**, poster 36.
21. Woodruff, S. R.; Davis, B. J.; Tsarevsky, N. V., "Well-defined functional epoxide-containing polymers by low-catalyst concentration atom transfer radical polymerization," Southern Methodist University Research Day, Dallas, TX, February 27, **2013**, poster 13.
22. Woodruff, S. R.; Tsarevsky, N. V., "Synthesis of well-defined polymers with epoxide groups by atom transfer radical polymerization and their use as precursors of functional materials," Southern Methodist University Research Day, Dallas, TX, February 10, **2012**, poster 20.
23. Woodruff, S. R.; LaGrone, K. A.; Moore, L. J.; Watson, D. G., "Preparation and characterization of several *N*-aryl enamino ketones," University of Mary Hardin-Baylor Student Scholar's Day and Research Symposium, Belton, TX, April 29, **2009**, poster 2.
24. Hamilton, J. M.; Montelongo, J. S.; Woodruff, S. R.; Wood, M. K., "Developmental effects of Adderall on chick embryos," University of Mary Hardin-Baylor Student Scholar's Day and Research Symposium, Belton, TX, April 29, **2009**, poster 17.