

# Megan Daschbach Eckhardt, Ph.D.

## Curriculum Vitae

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### Professional History

Senior Lecturer, Department of Chemistry, Washington Univ., St. Louis, MO	2016-present
Lecturer, Department of Chemistry, Washington Univ., St. Louis, MO	2011-2016
Director of the General Chemistry Peer-led Team Learning (PLTL) Program, Washington University	2011-present
Postdoctoral Research Fellow, Department of Chemistry and the Center for Nanoscience, University of Missouri, St. Louis	2010-2011
Graduate Research and Teaching Assistant, Department of Chemistry, Washington University, St. Louis, MO	2005-2010
Advisor: Professor George W. Gokel	
Participant in the 57th Meeting of the Nobel Laureates and Students, Physiology and Medicine, Lindau, Germany	July 2007

### Education

<b>Ph. D. Bioorganic Chemistry</b> , Washington University in St. Louis, MO	2010
<b>A. M. Bioorganic Chemistry</b> , Washington University in St. Louis, MO	2007
<b>B. S. Chemistry</b> , <i>summa cum laude</i> , Mount Saint Mary's University, MD	2004

### Current Teaching Responsibilities

#### **General Chemistry (Chem 111A)**

Lecture one of three large lecture sections of General Chemistry every year (course enrollment average: 825 students)

One member of a team of instructors for General Chemistry

Help manage the administration of the course in collaboration with another Lecturer and the Programs Coordinator for General Chemistry

In collaboration with other instructors, pioneered implementation of i>Clicker® technology into large, traditional lecture-style General Chemistry course to increase active learning during lecture, Fall 2013

In collaboration with other instructors, pioneered implementation of online homework to increase active learning during individual study, Fall 2014 (work was funded by an Arts & Sciences Classroom Innovation Grant, summer 2014)

In collaboration with other Lecturer and the Programs Coordinator for General Chemistry, developed original inquiry-based, student-centered recitation materials that (1) develop self-teaching habits and encourage active group-learning and (2) target a conceptual understanding of the course material, Fall 2017 (work was funded by an Arts & Sciences Classroom Innovation Grant, summer 2017).

### **Peer-led Team Learning (PLTL) Program**

Offered in both General Chemistry 111A and 112A (fall and spring semester, every year)  
Teach Practical Application of Academic Mentoring to 70 undergraduate peer leaders  
Oversee over 700 undergraduate participants in this group-study program  
Develop original content for PLTL problem-set packets every week, problems designed and structured to require a collaborative effort

### **General Chemistry (111A and 112A) Recitation Program**

Led both traditional- and process-oriented guided inquiry learning (POGIL)-style recitation subsections for lecture course  
Lead recitation subsections in the spring semester (Chem 112A) for the General Chemistry Transition Program. Students in this program identified as under-prepared and are often from under-represented and under-served groups. The program includes extended-length recitations focused on problem solving, integration into PLTL groups, and specialized semi-structured peer-mentored homework groups.

## **Academic Activities and Service**

### **The Process-oriented Guided Inquiry Learning (POGIL) Project**

Participant at the National POGIL Conference Summers 2014 - Present

POGIL is an internationally-known student-centered, active-learning pedagogy. (website: <https://pogil.org>)

Member of the POGIL Strategic Working group that seeks to increase Summer 2016 - Present

the diversity of the POGIL community and the students it serves. Helped realize a comprehensive database of demographic information for both POGIL practitioners and the student bodies of their institutions.

Facilitator-in-training for the 2018 South Central Regional Meeting of Summer 2018/Summer 2019  
the POGIL Project, Regional Coordinator for the 2019 South Central Regional Meeting

Will coordinate a 3-day regional meeting for the South Central Region for secondary and post-secondary educators interested in implementing the POGIL pedagogy into their classroom(s).

### **Community for Innovations in STEM Teaching, Inclusion, and Learning (CISTIL) Member**

Fall 2014-Spring 2016

Member of an HHMI Project Team, which is a collaboration with STEM faculty in introductory courses to design, implement and evaluate classroom innovations to improve inclusivity.

### **Washington University Chemistry Tournament (WUCT)**

Spring 2016-present

Faculty Advisor, *WUCT*, Washington University, St. Louis: a high school Chemistry tournament that was founded in the spring of 2016. This tournament is attended by over 200 high school students who have the opportunity to apply their classroom knowledge and implement their creative thinking and intellectual flexibility during the exams and activities throughout the day. We aim to highlight and foster a sense of collaboration and peer review that is critical to all scientific research.

**Washington University Women in STEM, a Scientista Group** Fall 2017-present  
Faculty Advisor, *Women in STEM*, Washington University, St. Louis:  
Wash U's branch of this organization was founded in the fall of 2017. Our group includes undergraduate, graduate, and post-doctoral scientists who identify as female. *Women in STEM* seeks to empower women in science through regular meetings and conferences.

**Faculty Associate** Fall 2012-present  
Program sponsored by the Office of Residential Life, designed to provide opportunities for significant faculty-student interaction outside of the classroom  
Work with Resident Advisors and a Residential College of about ninety first-year students  
Serve as a resource for students and provide informal advising and mentorship in both professional and personal matters

### Research Experience

**Doctoral Dissertation: Dynamic Aggregation and Amphiphilic Behavior of Synthetic Anion Transporters.** 2005-2010  
Characterized aggregation behavior and self-assembly dynamics of amphiphiles that form synthetic anion transporters (SATs). Synthesized novel indole-containing compounds and tetrameric macrocycles known as pyrogallol[4]arenes. Investigated stabilizing interactions between tryptophan-containing SATs and membrane-forming phospholipids and characterized the amphiphilic behavior of pyrogallol[4]arenes at the air-water interface using a Langmuir trough and Brewster angle microscopy.

**Undergraduate research: Atomic absorption spectroscopy and Inductively-coupled plasma spectroscopy.** 2003-2004  
Used to determine iron isotope composition of ancient Jewish coins to investigate their area of origin. Poster: C. S. Epstein, M. Daschbach, M. S. Epstein, N. W. Bower, and D. Hendin, "Using Spectrochemical Analysis to Solve an Ancient Numismatic Mystery", Paper #490-12P, Pittcon 2005, Orlando, FL, Feb 27 - Mar 4, 2005.

**Undergraduate research: Atmospheric Chemistry** Summer 2003  
National Institute of Standards and Technology Summer Undergraduate Intern Fellow, Chemical Kinetics and Thermodynamics Group, Dr. Askar Fahr, Presentation: "The Ultraviolet Absorption Cross Sections of 1,5-Hexadiyne: Temperature Dependent Gas Phase Measurements."

### Honors and Awards

**Delores K. Kennedy Award** Spring 2015  
In recognition of outstanding commitment to the first-year experience at Washington University in St. Louis

**Cornerstone Faculty Mentor Award** Spring 2014  
Student-nominated, presented to a member of the faculty who has made a difference for a graduating student.

**American Institute of Chemists Foundation Award**  
**CRC Press Freshmen Chemistry Award**  
Mount Saint Mary's University

2004

**Maryland Science and Technology Scholarship**  
Mount Saint Mary's University

2001-2004

## Publications

"Ion Transport through bilayer membranes mediated by pyrogallol[4]arenes." Negin, S.; Li, R.; Kulikov, O. V.; Daschbach, M. M.; Gokel G. W. *Inorganica Chimica Acta* **2014**, 417, 177-185.

"Anion Complexation and Transport by Isophthalamide and Dipicolinamide Derivatives in E. Coli." Atkins, J. L.; Patel, M. B.; Daschbach M. M.; Meisel J. W.; Gokel G. W. *Journal of the American Chemical Society* **2012**, 134(33), 13546-13549.

"Aggregation and Supramolecular Membrane Interactions that Influence Anion Transport in Tryptophan-containing Synthetic Peptides." Daschbach, M. M.; Negin, S.; You, L.; Walsh, M.; Gokel, G. W. *Chemistry – A European Journal*, **2012**, 18(24), 7608-7623.

"In Vivo Cell Death Mediated by Synthetic Ion Channels." Smith, B. A.; Daschbach, M. M.; Gammon, S. T.; Xiao, S.; Chapman, S. E.; Hudson, C.; Piwnica-Worms, D.; Gokel, G. W.; Leevy, W. M. *Chemical Communications*, **2011**, 47, 7977-7979.

"Pyrogallol[4]arenes Show Highly Amphiphilic Behavior at the Air-water Interface Dependent Upon Sidechain Length and Branching." Daschbach, Megan M.; Kulikov, O.; Long, Elizabeth F.; Gokel, George W. *Chemistry – A European Journal* **2011**, 17, 8913-8921.

"Pore Formation in Phospholipid Bilayers by Branched-chain Pyrogallol[4]arenes." Negin, Saeedeh; Daschbach, Megan M.; Kulikov, O.; Rath, Nigam; Gokel, George W. *Journal of the American Chemical Society* **2011**, 133, 3234-3237.

Gokel, G. W.; Daschbach, M. M. "Synthetic Amphiphilic Peptides that Self-assemble to Membrane-active Anion Transporters" in Bianchi, A.; Bowman-James, K.; Garcia-España, E. (eds.) *Supramolecular Chemistry of Anions*; Wiley-VCH: New York, 2011, *in press*.

"UV resonance Raman study of cation- $\pi$  interactions in an indole crown ether." Schlamadinger, Diana. E.; Daschbach, Megan M.; Gokel, George W.; Kim, Judy E. *Journal of Raman Spectroscopy* **2010**, online, DOI: 10.1002/jrs.2781.

"Self-assembled, cogged hexameric nanotubes formed from pyrogallol[4]arenes with a unique branched side chain." Kulikov, Oleg V.; Daschbach, Megan M.; Yamnitz, Carl R.; Rath, Nigam; Gokel, George W. *Chemical Communications* **2009**, 48, 7497-7499

"Aggregation Behavior and Dynamics of Synthetic Amphiphiles that Self-assemble to Anion Transporters." Elliott, Elizabeth, K.; Daschbach, Megan M.; Gokel, George W. *Chemistry, A European Journal*, **2008**, 14, 5871-5879.

"Coordination and Transport of Alkali Metal Cations through Phospholipid Bilayer Membranes by Hydrophile Channels." Gokel, George W.; Daschbach, Megan M. *Coordination Chemistry*, **2007**, 252(8+9), 886-902.

"The Effect of Midpolar Regime Mimics on Anion Transport Mediated by Amphiphilic Heptapeptides." Pajewski, Robert; Pajewska, Jola; Li, Ruiqiong; Daschbach, Megan; Fowler, Elizabeth; Gokel, George W. *New Journal of Chemistry*, **2007**, 31(11), 1960-1972.

## Abstracts

"Molecular assemblies beyond the crystal lattice: Dynamic air-water interfacial behavior and Brewster angle microscopy of short-chained pyrogallol[4]arenes." Daschbach, Megan M.; Gokel, G. W. Abstracts of Papers, 239th ACS National Meeting, San Francisco, CA, United States, March 21-25, 2010.

"Self-Assembled Capsules and Nanotubes: Solution and Solid State Studies." Gokel, G. W.; Carasel, I. A.; Daschbach, M. M.; Kulikov, O. V.; Li, R. Liu, J.; Negin, S.; Yamnitz, C. R. Abstracts, 44th Midwest Regional Meeting of the American Chemical Society, Iowa City, IA, United States, October 21-24, 2009.

"Characterizing the behavior of tryptophan-containing amphiphiles at the air-water interface." Daschbach, Megan M.; Elliott, Elizabeth K.; Gokel, George W. Abstracts of Papers, 235th ACS National Meeting, New Orleans, LA, United States, April 6-10, 2008.

"Characterizing the Amphiphilic Behavior of Synthetic Anion Transporters." Daschbach, Megan M.; Elliott, Elizabeth K.; Carasel, Ionut A.; Gokel, George W. Abstracts, 42nd Midwest Regional Meeting of the American Chemical Society, Kansas City, MO, United States, November 7-10, 2007.