


# Amanda Bongers


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## EMPLOYMENT

2019 – Present **Assistant Professor**, Queen's University

Research into learning and cognition using interviews, behavioural experiments, eye-tracking, and electroencephalography (EEG). Also studying how sustainability is taught in organic chemistry.

## EDUCATION

2016 – 2019 **Postdoctoral Fellow** in Chemistry Education

Royal Ottawa & University of Ottawa

*Advisors: Alison B. Flynn, Georg Northoff*

2011 – 2016 **Doctor of Philosophy** in Organic Chemistry

University of Ottawa

*Dissertation: "Intermolecular [3+2] Cycloadditions of Imino-isocyanates to Access  $\beta$ -Aminocarbonyl Compounds" doi:10.20381/ruor-655*

*Supervisor: André M. Beauchemin*

2006 – 2011 **Bachelor of Science** in Honours Biochemistry, Co-operative Program

University of Waterloo

*Graduation with Distinction, Dean's Honour List.*

*Supervisor: J. M. Chong*

## AWARDS

2020 Selected to represent Canada the First Commonwealth Chemistry Congress

2012 – 2015 NSERC Alexander Graham Bell Canada Graduate Scholarship – Doctoral

2011 – 2012 NSERC Canada Graduate Scholarship – Masters

2011 – 2016 University of Ottawa Excellence Scholarship

2006 President's Scholarship, University of Waterloo

2006 Waterloo County Entrance Scholarship, University of Waterloo

## RESEARCH GRANTS

2020 – 2025 **NSERC Discovery Grant**, \$120,000

2020 – 2021 **NSERC Discovery Launch Supplement**, \$12,500

Project: "Cognition in chemistry: Exploring how the brain encodes and manipulates scientific models"

2019 – 2024 **Research Initiation Grant**, Queen's University

Project: "Chemistry Education Research Program"

2019 – 2022 **Infrastructure Grant** (CFI equivalent), Queen's Faculty of Arts and Science

Project: "Chemistry Learning Laboratory"

2017 – 2018 **eCampusOntario Research and Innovation Funding**, \$32,500

Bongers (Co-Investigator), Flynn (PI)

Project: "Exploring learning outcomes when using multimedia for chemistry reaction mechanisms"

## PUBLICATIONS

### Peer Reviewed Journals:

1. A. Bongers, B. Beauvoir, N. Streja, G. Northoff, A. B. Flynn. "Building mental models of a reaction mechanism: the influence of static and animated representations, prior knowledge, and spatial ability." **Chem. Educ. Res. Pract.** **2020**, *21*, 496–512.
2. A. Bongers, A. B. Flynn, G. Northoff. "Is learning scale-free? Chemistry learning increases EEG fractal power and changes the power law exponent." **Neurosci. Res.** **2019**. doi:10.1016/j.neures.2019.10.011
3. A. Bongers, G. Northoff, A. B. Flynn. "Working with Mental Models to Learn and Visualize a New Reaction Mechanism." **Chem. Educ. Res. Pract.** **2019**, *20*, 554–569.
4. A. Bongers, C. Clavette, W. Gan, T. Markiewicz, P. Moon, L. Betit, K. Lavergne, N. Das Neves, A. Toderian, S. Gorelsky, A. M. Beauchemin. "Intermolecular Aminocarbonylation of Alkenes using Concerted Cycloadditions of Imino-isocyanates." **J. Org. Chem.** **2017**, 1175–1194.
5. A. Bongers, I. Ranasinghe, P. Lemire, A. Perozzo, J. F. Vincent-Rocan, A. M. Beauchemin. "Synthesis of Cyclic Azomethine Imines by Cycloaddition Reactions of N-Isocyanates and N-Isothiocyanates." **Org. Lett.** **2016**, 3778–3781.
6. A. Bongers, P. J. Moon, A. M. Beauchemin. "Kinetic Resolution of Azomethine Imines by Bronsted Acid Catalyzed Enantioselective Reduction." **Angew. Chem. Int. Ed.** **2015**, *54* 15516–15519.
7. K. Lavergne, A. Bongers, L. Betit, A. M. Beauchemin. "Modular Synthesis of Pyrazolones Using an Alkene Aminocarbonylation Reaction." **Org. Lett.** **2014**, 3612–3515.
8. C. Clavette, W. Gan, A. Bongers, T. Markiewicz, A. B. Toderian, S. Gorelsky, A. M. Beauchemin. "A Tunable Route for the Synthesis of Azomethine Imines and  $\beta$ -Aminocarbonyl Compounds from Alkenes". **J. Am. Chem. Soc.** **2012**, 16111–16114.

### Patents:

1. Electroactive Fluoroacylated Arylamines. USP 9070886, Issued June 30, **2015**.  
Xerox Research Centre Canada  
Inventors: A. Côté, R. A. Klenker, A. Bongers, G. P. McGuire.
2. Charge Transport Layer Comprising Fluoroacyl Arylamine. USP 8883383B2, Issued November 11, **2014**.  
Xerox Research Centre Canada  
Inventors: A. Côté, R. A. Klenker, A. Bongers, G. P. McGuire.
3. Method for Preparing Fluoroacylated Arylamines. USP 8754260B2, Issued November 11, **2014**.  
Xerox Research Centre Canada  
Inventors: A. Côté, A. Bongers.

## CONFERENCE & SYMPOSIUM ORGANIZATION

- 2020 **Symposium Organizer**, CCCE 2020, Winnipeg, Canada [cancelled due to COVID19]
- 2015 **Co-Lead Volunteer**, CCCE 2020, Ottawa, Canada
- 2011 **Co-Organizer**, SOUSCC, Waterloo, Canada

## COMMITTEES

- 2020 – Present **Co-chair**, Equity, Diversity, and Inclusion Committee  
Department of Chemistry, Queen's University
- 2019 – Present **Member**, Undergraduate Curriculum Committee  
Department of Chemistry, Queen's University
- 2019 – 2020 **Member**, Engineering Chemistry Systems Thinking Working Group  
Undergraduate Program Redevelopment at Queen's University

## TEACHING

- 2020 **Teacher**, ACS Green Chemistry Summer School 2020 [cancelled due to COVID19]
- 2020 **Instructor**, CHEM 803 "Principles of Scientific Communication", Graduate level
- 2020 **Instructor**, CHEM 112 "General Chemistry", Undergraduate level

## LEADERSHIP

- 2019 – Present **Faculty Advisor**, Leaders Overcoming Gender Inequality in Chemistry (LOGIC)
- 2015 – 2018 **Graduate & Mentor**, Mentor STEM Leaders Program, WISE Ottawa
- 2015 – 2016 **President**, *Chemistry Graduate Student Association*, University of Ottawa
- 2010 – 2011 **President**, *Undergraduate Chemistry Club*, University of Waterloo

## OUTREACH

- 2012 – 2019 **Science Ambassador** and Volunteer Researcher, *Evidence for Democracy*, Ottawa
- 2019 – 2020 **Equity, Diversity, Inclusion, and Indigeneity Fund**, \$2000  
Queen's University Faculty of Arts and Science. Funds were awarded to support and send 1-2 students from the Queen's University Chemistry Department to the LOGIC retreat.

## PRESENTATIONS

1. "Teaching what we practice: An analysis of organic chemistry textbooks using Green Chemistry metrics"  
**First Commonwealth Chemistry Congress – Partnership for the Goals, 2020** [postponed to 2021],  
University of West Indies, St Augustine, Trinidad & Tobago.

2. "Creating metrics for organic chemistry content from multiple lenses of sustainability" **CSC 2020**, Winnipeg, Canada [cancelled due to COVID19].
3. "Chemistry: Cognition of the Invisible." **Physics Teaching Discussion, 2020**, Kingston, Canada.
4. "How do organic chemistry textbooks/OERs portray or incorporate sustainability?" **CSC 2020**, Quebec City, Canada.
5. "Exploring how static and dynamic representations of reaction mechanisms affect learning, mental models, and brain activity" **CSC 2018**, Edmonton, Canada.
6. "Studying Students' Experience with Animations of Organic Reaction Mechanisms" **CSC 2017**, Toronto, Canada.
7. "Flynn research group's work in organic chemistry education: Exploring learning outcomes when using multimedia for chemistry reaction mechanisms" Bongers, Bode, Flynn. **University of Ottawa Cross-Faculty Symposium on SoTL, 2017**, Ottawa, Canada.
8. "Exploring Learning Outcomes when using Multimedia for Chemistry Reaction Mechanisms" **ACS National Meeting and Exposition, 2017**, San Francisco, California.
9. "Conversion of Alkenes into Enantioenriched  $\beta$ -Aminocarbonyl Compounds" **International Symposium on Challenges in Organic Chemistry, 2016** (Poster), Irvine, California.
10. "Intermolecular Aminocarbonylation of C=C and C=N Bonds" **CSC 2015**, Ottawa, Canada.
11. "Brønsted Acid Catalyzed Kinetic Resolution of Azomethine Imines" **QOMSB0C 2014** (selected as Best Oral Presentation), Toronto, Canada
12. "Kinetic Resolution of Azomethine Imines to Access Enantioenriched  $\beta$ -Aminocarbonyls" **International Symposium on Homogeneous Catalysis, 2014**, Ottawa, Canada.
13. "Enantioenriched  $\beta$ -Aminocarbonyl Compounds from Azomethine Imines" **QOMSB0C 2013** (Poster), Sherbrooke, Quebec.
14. "Accessing  $\beta$ -Aminocarbonyl Compounds" **CSC 2013** (Poster), Quebec City, Canada.
15. "Accessing  $\beta$ -Aminocarbonyl Compounds from Azomethine Imines" **Ottawa-Carleton Chemistry Institute Research Day, 2012** (selected as Best Poster Presentation), Ottawa, Canada.

### Student Presentations

1. H. Yang, A. Bongers. **Inquiry @ Queen's Conference, 2020**, Kingston, Canada.
2. K. Henderson, A. Bongers. **QOMSB0C 2019**, Ottawa, Canada.

### PROFESSIONAL EXPERIENCE

2011-2016 **Teaching Assistant** in Organic, Medicinal, and Analytical Chemistry  
University of Ottawa

2010 **Research Associate** (co-op) in Materials Chemistry  
Xerox Research Centre Canada, *Mississauga, Ontario, Canada*

2008 **R&D Analyst** (co-op) in the Quality Control Division  
Piramal Healthcare (formerly Torcan Chemical), *Aurora, Ontario, Canada*

2008 **Laboratory Technician** (co-op) in the Air Quality Division  
*Environment Canada, Ottawa, Ontario*