
BRIANNA M. GARCIA

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SUMMARY

I am a Ph.D. candidate whose research interests began in instrument design as an undergraduate and have transitioned into method development and biological applications of mass spectrometry-based untargeted metabolomics, and novel compound identification. My interests lie in connecting biological data with analytical measurements to gain insight into underlying biological phenomenon driving phenotypic and metabolic differences. I am highly involved in the early-career community and creating inclusive, safe environments for networking, engagement, and outreach. I thrive in highly collaborative environments, and enjoy the exchange of skills, knowledge, and experiences among my peers from different scientific fields of expertise.

EXPERTISE

Mass spectrometry (MS) specifically high resolution Orbitrap and FT-ICR, ultra-high-performance liquid chromatography (UHPLC), design of experiments (DoE), method development, compound identification, chemometrics, nuclear magnetic resonance (NMR), untargeted metabolomics, fine-structure analysis. Data processing using: Compound Discoverer, MZmine, XCMS, GNPS, SIRIUS, Metaboanalyst, and more. Experience with coding using: MATLAB and R.

PROFESSIONAL HISTORY

Graduate Research Assistant – University of Georgia, GA, USA

[2019-Present]

- Conducted graduate research in the field of untargeted metabolomics, *C. elegans* biology, and method development. My research focuses on three key areas of untargeted metabolomics: the use of design of experiments (DoE) for LC-MS extraction optimization, the bridging of LC-MS and NMR spectroscopy for identifying novel metabolites using semi-preparative HPLC fractionation and applying untargeted metabolomics to a diverse group of *C. elegans* biology (genetically diverse strains, developmental biology, etc.).
- Worked as part of the highly collaborative NIH Common Fund Metabolomics Consortium as part of the Compound Identification Core.
- Participated in working groups for NMR, Quantum Chemistry, and Internal Standards.

Glycoscience Training Program Fellow – University of Georgia, GA, USA

[2017-2019]

- The Glycoscience training program aims to train doctoral students rigorously and broadly in Glycoscience by integrating both chemical and biological approaches
- As an early doctoral student, I was given the opportunity to train in three different GTP faculty's labs to learn the wide range of applications of Glycoscience
- Took course work in Glycobiology, Glycochemistry, and Responsible Conduct in Research (with yearly ethics refresher course)
- Participated in and presenting at the weekly Glycoscience Journal Club

Research Experience – University of Georgia, GA, USA

[Summer 2017]

- Conducted Summer research in the lab of Jon Amster

- Learned FT-ICR background and fundamentals, gained hands-on FT-ICR, Orbitrap and capillary electrophoresis (CE) experience

**Chemistry Research Assistant – California State Polytechnic University Pomona, CA, USA (Cal Poly Pomona)
[2015-2017]**

- Conducted undergraduate research to design and construct a low frequency near-infrared Raman microscope for liquid and solid-state sample analysis under the advisement of Dr. Timothy Corcoran
- Designed instrument components using CAD software (Solidworks) which were later constructed using 3D printing

PREVIOUS WORK EXPERIENCE

**Los Angeles County Corrections Officer - Century Regional Detention Facility, Lynwood, CA, USA
[2013-2017]**

- Ensure all inmates housing standards and treatment met those required by California Code of Regulations Title 15. Assigned inmates to housing locations based on classification. Updated and maintained inmate's special handles and security levels. Worked with the Department of Mental Health and Medical Services regarding the housing of inmates under their care. Assisted in documentation of good time credits. Worked with Operation Safe Jail, Jail Liaison, sheriff stations, outside agencies, and the court system regarding housing and security of all inmates.

**Los Angeles County Sheriff Security Officer – LAC+USC Medical Center, Los Angeles, CA, USA
[2012-2013]**

- Assigned to County Services Bureau (LAC+USC Medical Center) to provide armed security in and around the County facility while working with sworn Deputy personnel. Responded to criminal calls including detaining persons, conducting searches, questioning parties involved, and investigating criminal acts.

EDUCATION

- **Ph.D. in Chemistry** **2017-Present**
University of Georgia, GA, USA **Expected Graduation:**
Advisor: Dr. I. Jonathan Amster & Co-advisor: Dr. Arthur S. Edison **May 2022**
Current GPA: 3.59/4.00
Tentative Thesis Title: *Development of Mass Spectrometry Methods for Unknown Compound Identification and Biological Applications in Untargeted Metabolomics*
- **B.S. in Chemistry (focus in Biochemistry)** **2013-2017**
California State Polytechnic University Pomona, CA, USA
Advisor: Dr. Timothy Corcoran
GPA: 3.44/4.00
Thesis: Design and Optimization of Raman Spectrometer and Analysis of Liquid and Solid-State Samples
- **A.S. Biological & Physical Science (& Mathematics)** **2009-2012**
A.S. Administration of Justice
A.A. Language Arts
Citrus College, Glendora, CA, USA
GPA: 3.37/4.00

OUTREACH AND COMMUNITY SERVICE:

- Inaugural Metabolomics Association of North America Early-Career Member Council (MANA ECM) – Financial Officer [2019-Present]
- Vice President of UGA Chemistry Graduate Student Organization (CGSO) – [2018-2020]
- Young Dogs Mentorship Program
- Research Experiences for Undergraduates (REU) mentor

- MANA ECM Social Media Manager and Content Creator
- Abstract Review for MANA 2020 Annual Conference

AWARDS:

UGA Chemistry Departmental Travel Award	2021
GTP 3-Minute Thesis Competition Winner	2021
Metabolomics Society Early-Career Travel Grant	2019
UGA Chemistry Departmental Travel Award	2018
Glycoscience Training Program (GTP) Fellowship	2018
Glycoscience Training Program Fall Research Rotation	2017
ACS Undergraduate Award in Physical Chemistry	2017
Dean's Honor List for Academic Excellence	2016-2017

CONFERENCES/PRESENTATIONS

Oral:

2021

- 3-Minute Thesis: Glycoscience Training Program Research Retreat, Athens, GA
 - Can We Confirm the Larval Stage of a *C. elegans* Mixed Population Using Flow Cytometry & FT ICR MALDI MS?

2020

- Glycoscience Training Program Research Retreat, Athens, GA
 - Sample preparation optimization for LARGE-SCALE untargeted multi-omic study.

2019

- Metabolomics Association of North America, Atlanta, GA
 - Optimization of Sample Preparation Mass Spectrometry-based Metabolomics Studies using Taguchi Design of Experiments (DOE) Approach
- North American FT MS Conference, Key West, FL
 - Optimization of *Caenorhabditis elegans* Homogenization and Extraction Methods for Non-targeted Metabolomics using Orbitrap and FT-ICR Mass Spectrometry

Poster:

2021 and Pending

- American Society for Mass Spectrometry, Philadelphia, PA
 - B.M. Garcia, C.K. Asef, F.E. Leach III, Z. Liu, A.O. Shaver, M.Z. Asif, Z. Hafeez, K.A. Nocilla, M. Shah, A.M. Morse, F.M. Fernández, L.M. McIntyre, I.J. Amster, A.S. Edison: 1Effect of UDP-glucuronosyltransferase (UGT) mutation on the untargeted metabolome and exogenous xenobiotic detoxification capabilities of *Caenorhabditis elegans*
- NIH Common Fund Metabolomics Consortium Fall Meeting (Virtual)
 - A.O. Shaver, B.M. Garcia, Z. Liu, R.M. Borges, G.J. Gouveia, C.K. Asef, F.E. Leach III, E.C. Andersen, I.J. Amster, F.M. Fernández, A.M. Morse, A.S. Edison, and L.M. McIntyre: *C. elegans* as a model system for uncovering variation in metabolism

2020

- NIH Common Fund Metabolomics Consortium Fall Meeting (Virtual)
 - B.M. Garcia, C.K. Asef, A.O. Shaver, G.J. Gouveia, F.E. Leach III, A.M. Morse, S. Das, K.M. Merz Jr, L.M. McIntyre, E.C. Andersen, F.C. Schroeder, I. J. Amster, F.M. Fernández, A.S. Edison: Feature Selection Strategies for Unknown Metabolite Identification by In Silico NMR and Ion Mobility Collision Cross Section Prediction
- Metabolomics Association of North America (Virtual)
 - B.M. Garcia, A.O. Shaver, A.S. Edison, I.J. Amster, and F.E. Leach III: Bridging Phenotypical and Analytical Data – Worm Development using Biosorter, Microscopy, and MALDI-MS of *C. elegans* Cuticle Extracts

2019

- American Society for Mass Spectrometry, Atlanta, GA
 - B.M. Garcia, B. Fox, G.J. Gouveia, F.E. Leach III, F.M. Fernández, F.C. Schroeder, A.S. Edison, I. J. Amster: Optimization of *C. elegans* Homogenization and Extraction Methods for LC-MS Untargeted Metabolomics
- Annual Conference of the Metabolomics Society, The Hague, NL
 - B.M. Garcia, B. Fox, G.J. Gouveia, F.E. Leach III, F.M. Fernández, F.C. Schroeder, A.S. Edison, I. J. Amster: Optimization of *Caenorhabditis Elegans* Homogenization and Extraction Methods for Non-targeted Metabolomics using Orbitrap and FT-ICR Mass Spectrometry
- NIH Common Fund Metabolomics Consortium Fall Meeting, NCI, Rockville, MD
 - B.M. Garcia, G.J. Gouveia, A.O. Shaver, B. Fox, F.E. Leach III, F.M. Fernández, F.C. Schroeder, I.J. Amster, A.S. Edison: Design of Experiments-based Sample Preparation Optimization for a Large-scale *C. elegans* Metabolomics Study
- North American FT MS Conference, Key West, FL
 - B.M. Garcia, B. Fox, G.J. Gouveia, F.E. Leach III, F.M. Fernández, F.C. Schroeder, A.S. Edison, I. J. Amster: Optimization of *Caenorhabditis Elegans* Homogenization and Extraction Methods for Non-targeted Metabolomics using Orbitrap and FT-ICR Mass Spectrometry

2018

- American Society for Mass Spectrometry, San Diego, CA
 - B.M. Garcia, P. Sanderson, F.E. Leach III, A.S. Edison, I.J. Amster: Metabolomic Profiling of *Caenorhabditis elegans* Using Capillary Electrophoresis Mass Spectrometry (CE-MS)
- Annual Conference of the Metabolomics Society, Seattle, WA
 - B.M. Garcia, P. Sanderson, F.E. Leach III, I.J. Amster, A.S. Edison: Metabolomic Profiling of *Caenorhabditis elegans* Using Capillary Electrophoresis Mass Spectrometry (CE-MS)

PUBLICATIONS

1. G.J. Gouveia, A.O. Shaver, B.M. Garcia, A.M. Morse, E.C. Andersen, A.S. Edison, and L.M. McIntyre: Long-Term Metabolomics Reference Material. *Analytical Chemistry*, doi: 10.1021/acs.analchem.1c01294 (2021)
2. B.M. Garcia, G.J. Gouveia, A.O. Shaver, I.J. Amster, A.S. Edison, F.E. Leach III: Taguchi Design of Experiments for Untargeted Metabolomics Extraction Optimization using Model Organism *C. elegans*. **[IN PREPARATION]**
3. A.O. Shaver, B.M. Garcia, Z. Liu, R.M. Borges, G.J. Gouveia, C.K. Asef, F.E. Leach III, E.C. Andersen, I.J. Amster, F.M. Fernández, A.M. Morse, A.S. Edison, and L.M. McIntyre: *C. elegans* as a model system for uncovering variation in metabolism. **[IN PREPARATION]**
4. S. Menachekanian, B.M. Garcia, T. Corcoran: Design and optimization of a low frequency near-infrared Raman microscope for liquid and solid-state sample analysis. **[IN PREPARATION]**