

LYNNA GABRIELA AVILA-BRONT

COLLEGE OF THE HOLY CROSS
DEPARTMENT OF CHEMISTRY
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CURRENT POSITION

Assistant Professor of Chemistry, College of the Holy Cross

EDUCATION

Ph.D. in Physical Chemistry from The University of Chicago, May 2014
M.S. in Physical Chemistry from The University of Chicago, August 2008
B.A. in Chemistry from Columbia College, Columbia University, May 2007

RESEARCH EXPERIENCE

Research as a Primary Investigator, *The College of the Holy Cross, September 2014 - present*

- The root of my research is to characterize the structure of a molecular surface system and determine what this structure informs us about the electronic and chemical relationship between the molecules on the surface. Once these relationships are established, my research is aimed at manipulating surface-molecule interactions to create customized surfaces. The concepts we learn from these customized surfaces can be applied in a variety of fields, from energy devices to surfaces with enantiomeric purity to be used in pharmaceutical applications.

Doctoral Research, *The University of Chicago, September 2007 – May 2014*

Advisor: Professor Steven Sibener, James Franck Institute and Department of Chemistry

Dissertation: Molecular Monolayer Structures Formed on Vicinal Surfaces as Investigated by Scanning Tunneling Microscopy

- Self-assembly of organic molecules on flat and vicinal gold surfaces. Projects sought to demonstrate how to create surfaces with low defect densities or predetermined structural properties.
- Development of a unique Scanning Tunneling Microscope to be coupled to a new molecular beam machine of my design.

Undergraduate Research

- *Columbia University, Department of Chemistry, September 2003 – May 2007*

Advisor: Professor George Flynn

Projects included the self-assembly of organic molecules and the structure of biological systems

- *Harvard University, Division of Engineering and Applied Sciences, Summer 2006*

Advisor: Professor Scot Martin

Project studied the hygroscopic growth of aerosols

- *University of Pennsylvania, Laboratory for Research on the Structure of Matter, Summer 2005*

Advisor: Professor Russell Composto

Project studied the modification of the physical properties of cross-linked polymers with nanoparticles

TEACHING EXPERIENCE

Assistant Professor of Chemistry, Department of Chemistry, College of the Holy Cross

2014 - present

- Chemistry 181: Atoms and Molecules with associated laboratory course
- Chemistry 231: Equilibrium and Reactivity with associated laboratory course
- Chemistry 335: Quantum Mechanics and Spectroscopy
- Chemistry 336: Chemical Thermodynamics
- Chemistry 405-406: Independent General Research

Teaching Assistant, Department of Chemistry, University of Chicago

Fall 2012 and Academic Year 2008

- General Chemistry Course I & II

Winter 2009

- Experimental Physical Chemistry

PUBLICATIONS

- Teugels, L.G. **Avila-Bront, L.G.** Sibener, S.J, *Chiral domains achieved by surface adsorption of achiral nickel tetraphenyl- or octaethylporphyrin on smooth and locally kinked Au(111)*, J. Phys. Chem. C, **2011**, 115(6), 2826.
- **Avila-Bront, L.G.**, Fleming, C., Whitfield, M., Kautz, N., Sibener, S.J, *Guiding the Formation of Enantiomerically Pure Surfaces from Achiral Molecules* (In preparation)

EDUCATIONAL OUTREACH ACTIVITIES

Assistant Professor

Academic Advisor for the Science Ambassadors, September 2014 – Present, College of the Holy Cross

- Served as the academic advisor for the student science outreach organization.

Women in Science Luncheon, April 2015 - Present, College of the Holy Cross

- Served as the academic advisor for the student science outreach organization.

Graduate Student

- *Student sponsor for a James Franck Institute Symposium, July 2010 and March 2012, University of Chicago*

Invited high-profile speakers for a student-hosted JFI Symposium. Responsibilities included inviting speakers, establishing schedules for their days, and facilitating meetings with speakers and graduate students and post doctoral fellows.

- *Cyber outreach to high school students at Sunset Park High School in Brooklyn, NY, 2010 – 2012*

Lab tours and scientific discussions were carried out over a videoconference. High school population was mostly underrepresented minority students.

- *Material science outreach to students at Andrew Carnegie Elementary in Chicago, IL, 2012*

Worked with elementary school students on weekly science experiments and activities.

- *Mentor in the Illinois Math and Science Academy: Student Independent Research, 2009*

Mentored high school students throughout their school year in an independent research project.

- *Mentor in the American Psychological Association Catalyst Program, University of Chicago, 2008*

Mentored high school students throughout their school year in an independent research project.

GRANTS

- *American Chemical Society Petroleum Research Fund* 2016-2018
Molecular Interactions of Alkanethiols, Aryl thiols, and C₆₀ Fullerenes in Multi-component Self-Assembled Monolayers as Probed by Scanning Tunneling Microscopy \$55,000

AWARDS AND MERITS

- *National Science Foundation* Graduate Research Fellowship
2009-2012
- *American Vacuum Society Prairie Chapter* Symposium-Wide Best Poster Prize
2011
- *University of Chicago, Chemistry Department* Graduate Student Teaching Award
2008
- *National Science Foundation* Honorable Mention Graduate Research Fellowship
2008

PRESENTATIONS

- *March 2016 ACS Central meeting: Presented a talk*
Molecular Interactions of Aryl thiols & C₆₀ Fullerenes in Multi-component Self-Assembled Monolayers as Probed by Scanning Tunneling Microscopy
Katherine Blanco, Brian Dougherty, Colleen Szytko, L. G. Avila-Bront, **L.G. Avila-Bront**
- *April 2016 251st ACS National Meeting: Student-presented poster*
Molecular interactions of aryl thiols and C₆₀ fullerenes in multi-component self-assembled monolayers as probed by scanning tunneling microscopy
Katherine Blanco, Brian Dougherty, L. G. Avila-Bront
- *April 2013 245th ACS National Meeting: Presented a talk*
Guiding the formation of single-handed enantiomeric porphyrin domains using kinked and chiral stepped surfaces
L.G. Avila-Bront, Christopher D. Fleming, Mark C. Whitfield, Lieve G. Teugels, S. J. Sibener
- *August 2011 AVS Prairie Chapter Symposium: Presented a poster, awarded Best Poster Prize*
Guiding the Chirality of Nickel Tetraphenyl Porphyrin on Chiral and Achiral Gold Crystals: An STM Study
L.G. Avila-Bront, C.D. Fleming, S.J. Sibener
- *June 2010 Physical Electronics Conference: Presented a talk*
Scanning Tunneling Microscopy Studies of C₆₀ Fullerenes on Porphyrins on an Au(111) Surface
L. Teugels, **L.G. Avila-Bront**, S.J. Sibener
- *August 2009 Gordon Research Conference: Dynamics at Surfaces: Presented a poster*
Scanning Tunneling Microscopy Studies of C₆₀ Fullerenes on Porphyrins on an Au(111) Surface
L. Teugels, **L.G. Avila-Bront**, S.J. Sibener