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## Background

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### Professional Experience:

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Aug. 2016-Present **Assistant Professor (Visiting)**  
*Grinnell College, Department of Chemistry, Grinnell, IA*

### Education:

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April 2016 **PhD, Chemistry**  
*Tulane University, New Orleans, LA*  
*Dissertation Title: Development of Oligonucleotide and Host-Guest Based Supramolecular Sensors for Biological Applications*  
*Advisor: Dr. Janarthanan Jayawickramarajah*

May 2009 **B.S. (Honors), *summa cum laude*, Chemistry**  
*University of Louisiana Lafayette, Lafayette, LA*  
*Thesis Title: Synthesis and Characterization of 6-Methyl-2-Nitrosopyridine*  
*Advisor: Dr. August A. Gallo*

### Honors & Awards:

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2016 Tulane 34 Award for Outstanding Graduates  
2011-2016 National Science Foundation Graduate Research Fellowship  
2009-2012 Louisiana Board of Regents Graduate Fellowship  
2009-2010 Distinguished Graduate Student in Chemistry (Tulane University)  
2009 David R. Andrew Award, University of Louisiana at Lafayette College of Sciences Outstanding Scholar

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## Teaching

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### Teaching Experience:

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#### Grinnell College:

Spring 2018 **Organic Chemistry 2** (1 section)  
Spring 2018 **Organic Chemistry 2 Lab** (2 sections)  
Spring 2018 **General Chemistry** (1 section)  
Fall 2017 **Organic Chemistry 1** (1 section)  
Fall 2017 **Organic Chemistry 1 Lab** (2 sections)  
Spring 2017 **Introduction to Biological Chemistry** (1 section)  
Spring 2017 **Introduction to Biological Chemistry Lab** (1 section)  
Spring 2017 **General Chemistry Lab** (1 section)  
Spring 2017 **Organic Chemistry 2 Lab** (1 section)  
Fall 2016 **Chemistry and Biology of Nucleic Acids** (1 section, lecture and lab)  
*Developed a special topics course as an upper level Biological Chemistry elective including an investigation-based lab (syllabus available on request).*

Fall 2016 **Organic Chemistry 1 Lab** (2 sections)

## Cooper Battle

### Tulane University:

- Spring 2016 **Chemistry of Nucleic Acids** (Graduate), Co-Instructor (15 lectures, 1 Semester)  
*Developed a "course within a course" introducing chemistry graduate students to core concepts within cellular and molecular biology, involving both regular lectures and a large lab component on practical analysis of nucleic acids.*
- Spring 2015 **Chemistry of Nucleic Acids** (Graduate), Guest Lecture (2 lectures, 1 Semester)  
2010-2014 **Chemistry in the Community**, Co-Instructor, Tulane University (5 Semesters)  
*The Chemistry in the Community class takes freshman chemistry majors to local schools to teach through demonstrations. Re-designed the course, prepared course materials (syllabus & course booklets), organized outreach with schools, taught preparatory labs prior to outreach, and oversaw all outreach.*
- Fall 2013 **Organic Chemistry 1 Lecture**, Guest Lecturer (Proton NMR) (1 Semester)  
2010-2015 **Organic Chemistry 1 Lecture**, Teaching Assistant, Tulane University (5 Semesters)  
*Responsibilities included proctoring exams and grading exams and quizzes.*

### **Teaching Development:**

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- Summer 2017 Grinnell CTLA, "Incorporating Cognitive Science Principles into Instruction and Advising" (3 Days)  
Summer 2016 Grinnell CTLA, "Assignment Workshop: Student Writing and Research" (3 Days)  
Fall 2014 Certificate with Distinction, CIRTL "Undergraduate STEM Teaching" Course (8 weeks)  
Spring 2014 Center for Effective Learning and Teaching Intensive Workshop (2 Days)  
Spring 2013 Teaching Workshop- Active Learning, Effective Classroom Management, Tulane University (2 Days)

### **Undergraduates Supervised:**

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#### Grinnell College:

Student research at Grinnell College is primarily through Mentored Advanced Projects (MAPs), which carry an initial requirement of 4 credits, with a variable credit continuation. During the summer, MAP's are 10-week full time research-intensive programs, with funding provided through internal applications.

- 2017-2018 **Emma Olson**  
*8 Credit MAP: Synthesis of Heterocyclic Naphthalene Mono-Imide Derivatives.*  
*Emma will also be continuing her work in Summer 2018 at the Wright-Patterson Air Force Base in Dayton, OH working with a collaborator.*
- Summer-Fall 2017 **Allison Brink**  
*8 Credit MAP: Optimization of Quadruplex Molecular Beacons for miRNA Sensing in Cancer.*
- Summer-Fall 2017 **Gwen Holtzman**  
*6 Credit MAP: Synthesis of Naphthalene Mono-Imide Derivatives.*
- Summer 2017 **Francisco Sanchez-Conde**  
*4 Credit MAP: Fluorescent miRNA Sensors for early detection of Melanomas.*  
*Note: Funded by NSF-LSAMP.*
- Spring 2017 **Chloe Briney**  
*4 Credit MAP: Optimization of Quadruplex to Duplex Transitions for use in DNA Computing.*  
*Chloe is currently an NIH Post-Bac at the National Cancer Center.*

#### Tulane University:

- 2014-2016 **Mark Gorelik**  
*Computational DNA-folding & Algorithms for predicting host-guest interactions.*  
*Mark recently graduated with his B.S. from Tulane, and is working on plant genetics in Israel.*

- 2015-2016 **Harrison Rahn**  
*Design of sensors for environmental toxins.*  
*Harrison developed this project into an MS Thesis, and graduated from Tulane with Honors, including a prestigious 1834 Award, in May 2017. Harry is currently an engineering intern at Advanced Polymer Monitoring Technologies.*
- 2011- 2013 **Aaron Coulon**  
*Micro-RNA induced activation of anti-cancer drugs.*  
*Aaron has recently graduated from Tulane Medical School, and is in residency.*
- 2010- 2013 **Richard Tang**  
*Project: Conjugation of DNA to silicon nanoparticles for drug delivery.*  
*Awarded Best Physical Sciences Presentation at 2012 Louisiana Academy of Sciences Meeting*  
*Richard has recently graduated from Tulane Medical School, and is in residency.*
- 2010- 2011 **Michael Caffery**  
*Synthesis of epoxide-based inhibitors.*

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## Research

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### Peer-Reviewed Publications:

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6. Aryal, G. \*; **Battle, C.\***; Grusenmeyer, T.; Jayawickramarajah, J. A Naphthalimide Derived Fluorescence Sensor for Solid-Phase Screening of Cucurbit[7]uril-Guest Interactions. *Chem. Comm.* **2016**, 52, 2307-2310. DOI: 10.1039/C5CC08350H  
*\*These authors contributed equally to this work.*
5. Chu, X.; **Battle, C. H.**; Zhang, N.; Aryal, G. H.; Mottamal, M.; Jayawickramarajah, J., Bile Acid Conjugated DNA Chimera that Conditionally Inhibits Carbonic Anhydrase-II in the Presence of MicroRNA-21. *Bioconjugate Chem.* **2015**, 26 (8), 1606-1612.
4. Su, X.; Kuang, L.; **Battle, C.**; Shaner, T.; Mitchell, B. S.; Fink, M. J.; Jayawickramarajah, J., Mild Two-Step Method to Construct DNA-Conjugated Silicon Nanoparticles: Scaffolds for the Detection of MicroRNA-21. *Bioconjugate Chem.* **2014**, 25 (10), 1739–1743.
3. **Battle, C. H.**; Chu, X.; Jayawickramarajah, J., Oligonucleotide-Based Systems for Input-Controlled and Non-Covalently Regulated Protein-Binding. *Supramolecular Chemistry.* **2013**, 25 (12), 848-862.
2. **Battle, C. H.**; Jayawickramarajah, J., Supramolecular Approaches for Inhibition of Protein-Protein and Protein/DNA Interactions. In *Supramolecular Chemistry: From Molecules to Nanomaterials*, Steed, J. W.; Gale, P. A., Eds. John Wiley and Sons: **2012**; Vol. 4, pp 1885-1908.
1. Mishur, R. J.; Griffin, M. E.; **Battle, C. H.**; Shan, B.; Jayawickramarajah, J., Molecular recognition and enhancement of aqueous solubility and bioactivity of CD437 by [beta]-cyclodextrin. *Bioorg. Med. Chem. Lett.* **2011**, 21 (2), 857-860.

### Presentations:

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6. **Battle, C.H.**, Chu, X.C., Jayawickramarajah, J. "Micro-RNA-21 responsive DNA nanostructures for sensing and therapeutics". Oral Presentation, 67<sup>th</sup> Annual Southeastern/71<sup>st</sup> Annual Southwestern Joint Regional ACS Meeting, November 7<sup>th</sup>, **2015**.
5. **Battle, C.H.** "Oligonucleotides as Input Responsive Scaffolds for Smart Therapeutics & Biosensors". Invited Seminar, University of Louisiana at Lafayette, April 19th, **2013**.

4. **Battle, Cooper H.** "Supramolecular Approaches to the Inhibition of Protein-Protein Interactions", Departmental Seminar, Tulane University, September 29th, **2010**.
2. **Battle, Cooper H.** "VT-NMR Analysis of Complex Organic Systems", Paper Presentation, Louisiana Academy of Sciences 83rd Annual Meeting, February 27, **2009**.
1. **Battle, Cooper H.** "Stereospecificity in Cu Catalyzed Allylic Amination", Paper Presentation, Louisiana Academy of Sciences 82nd Annual Meeting, March **2008**.

**Posters:**

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3. **Battle, C.H.**, Aryal, G.H., Grusenmeyer, T.A., Jayawickramarajah, J. "Investigation of CB[7] Binding Effects on Organic Chromophores". Poster Presentation, 251<sup>st</sup> National Meeting of the American Chemical Society, San Diego, CA, March 15<sup>th</sup>, **2016**.  
*3<sup>rd</sup> Place Poster Award in Supramolecular Chemistry: A Crown & Anchor Approach.*
2. **C.H. Battle**, T. Shaner, R. Tang, M. Fink, J. Jayawickramarajah. "Synthesis and characterization of DNA-silicon nanoparticle bioconjugates". Poster Presentation, 68th Southwestern Regional Meeting of the American Chemical Society, Baton Rouge, LA, November 7th **2012**.
1. Su, X., **Battle, C.**, Shan, B., Jayawickramarajah, J. "Synthesis, Characterization and Protein-Binding Studies of a Self-Assembled MMP-3 Inhibitor." Poster Presentation, 66th Southwest and 62nd Southeastern Regional Meeting of the American Chemical Society, New Orleans, LA, December 1st **2010**.

**Student Presentations & Posters:** (Presenting author(s) \*, student researchers underlined).

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5. Olson, E.C.,\* **Battle, C.H.** "Synthesis of water soluble rylene derivatives for sensor applications". Poster Presentation. Undergraduate Research Symposium in the Physical Sciences, Midstates Consortium for Math and Science, Chicago, IL, November 4<sup>th</sup> **2017**.
4. Olson, E.C.,\* **Battle, C.H.** "Synthesis of water soluble rylene derivatives for sensor applications". Poster Presentation, 2017 Midwest Regional Meeting of the American Chemical Society, Lawrence, KS, October 19<sup>th</sup>, **2017**.
3. Coulon, A.,\* **Battle, C.H.**, Gorelik, M., Su, X., Zhuang, Y., Jayawickramarajah, J. "Selective release of 5-fluorouracil in the presence of microRNA-21 using nuclease resistance". Poster Presentation, 72<sup>nd</sup> Annual Southwest Regional Meeting of the American Chemical Society, Galveston, TX, November 12<sup>th</sup>, **2016**.
2. Schmiechen, A.,\* Sanchez-Conde, F.,\* **Battle, C.H.** "Design and Characterization of a DNA Sensor for HSA-Let-7a miRNA in Breast Cancer Cells". Poster Presentation. Undergraduate Research Symposium in Biological Sciences & Psychology, Midstates Consortium for Math and Science, Chicago, IL, November 12<sup>th</sup>, **2016**.
1. Tang, R.,\* **C. Battle**, T. Shaner, M. Fink and J. Jayawickramarajah, TU. "Synthesis and Characterization of Silicon-Nanoparticle DNA Bio-Conjugates". Oral Presentation, Louisiana Academy of Sciences 86th Annual Meeting, March 3rd, **2012**.

*\*Awarded best presentation in physical sciences.*

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**Service**


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**Academic Service:**Grinnell College:

- October 2017 Panelist, "Faculty Friday" Career Development Series on "Successful Student-Faculty Scholarship".
- 2017-Present Health Professions Advisor Committee (HPAC)  
*Advising and committee letter writing for pre-professional students.*
- 2017-Present Early Career Faculty & Staff Group, Social Coordinator
- 2017-Present Grinnell Science Project- Lab Experiences in Biochemistry
- 2017-Present Faculty mentor for Grinnell's "Science Peer Mentor" program  
*The SPM program connects first-year students from under-represented groups in small groups with a faculty member and senior students as a support group.*
- Fall 2017 Faculty Representative to HHMI-Sponsored 2<sup>nd</sup> Year Science Student Retreat  
*The 2nd Year Science Student Retreat is aimed at helping retention for under-represented student groups at the start of the second year through the development of personal relationships with older students and faculty.*
- Nov 2016 & 2017 Faculty Chaperone, Grinnell College for the Midstates Consortium for the Math and Sciences.  
*Traveled with a group of students to present their research at a regional conference hosted at the University of Chicago.*

Tulane University:

- 2012-2016 Advisor, American Chemical Society Student Chapter
- 2013-2015 Tulane University Senate, Voting Member
- 2010-2015 Tulane Graduate Studies Student Association  
*President (2012-15)*  
*Vice President (2011-2012)*
- 2010-2015 Tulane Graduate and Professional Student Association  
*Administrative Vice President (2013-15)*  
*President (Spring 2014)*
- 2011-2015 Organizer, Tulane Interdisciplinary Graduate Colloquium Series (30 Colloquia, 52 Talks)  
*Bi-weekly seminar series for graduate research, focusing on cross talk between Science and Engineering and Liberal Arts & Humanities, with participation from over 20 academic departments.*
- 2012-2015 University Senate Standing Committee on Social Issues
- 2014-2015 Presidential Task Force on Alcohol Policy
- 2014-2015 University Senate Constitutional Review Committee
- 2012-2013 University Senate Standing Committee on Information-Technology
- 2011-2013 University Graduate Council

**Professional Societies:**

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- 2016-Present Council on Undergraduate Research
- 2004-Present American Chemical Society
- 2008-2016 Louisiana Academy of Sciences

**Professional Development:**

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- July 2017 Midstates Consortium for Math and Science: Early Career Faculty Success Workshop

**Community Service:**

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2016-Present Friends of International Students  
*Non-residential Host Family for students from Singapore and Japan.*

Post-Secondary STEM Outreach

Summer 2016 Tulane SMART REU Panelist, Graduate School Experiences  
2012 & 2013 Xavier University Chemistry REU Program Lab Tours  
Fall 2012 Southeastern Louisiana State University- Career Paths in the Physical Sciences Panelist  
Spring 2013 Panelist, Tulane Science & Engineering Week "Charting a Course to Graduate School"

Primary & Secondary School STEM Outreach

2013-2015 Dibert Community School  
2013-2014 Sci-Tech Academy  
2012-2013 Audubon Elementary  
2013-2014 Kipp Elementary School  
2011 & 2013 GIST- Girls in STEM at Tulane  
2010-2012 McMain High School

Other Community Involvement

2013-2014 Presidential Advisory Board, Tulane 750k hours Service Challenge  
April 2013 Tulane Influenza Symposium, Co-Organizer  
*Community Outreach symposium directed at springtime influenza awareness in the New Orleans Community. Co-organized with the Tulane School of Public Health & Tropical Medicine, and Tulane Medical School's Biomedical Sciences Program.*  
2011-2012 Greater New Orleans Science Fair, Judge  
2004-2009 Acadiana Regional Science Olympiad, Judge and Organizer