

Deborah C. D. Bromfield Lee

Florida Southern College, Department of Chemistry and Physics
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EDUCATION

Ph.D., Chemistry; North Carolina State University 2005-2009
Emphasis on Chemical Education (General and Organic Chemistry)
Raleigh, North Carolina
Advisor: Dr. Maria T. Oliver-Hoyo

M.S., Chemistry; Florida Atlantic University, Boca Raton, Florida 2002-2005
Emphasis on Organic Synthesis
Advisor: Dr. Salvatore D. Lepore

B.A. *cume laude*, Chemistry, Pre-medical sciences (minor); 1999- 2002
University of South Florida, Tampa, Florida
Advisor: Dr. Joseph Stanko

TEACHING EXPERIENCE

Florida Southern College - Assistant Professor (2012- present)

- Organic Chemistry Lecture and Laboratory I and II, CHE 2221L, 2222L, 2221L and 2222L
- Introduction to Research Methods, CHE 4100
- Introductory Chemistry, CHE 1000
- Introduction to General, Organic, and Biochemistry CHE 1012

Kennesaw State University, Kennesaw GA - Lecturer (2012-present)

- Organic Chemistry Laboratory II, CHEM 3362L (2012)
- Survey of Chemistry I (Chemistry for Nursing majors), CHEM 1151L (2012)
- Directed Applied Research, CHEM 4100 (2012).

Kennesaw State University, Kennesaw GA - Temporary Assistant Professor (2010-2012, 2 year term)

- General Chemistry I and II, CHM 1211 and 1212 (2010-2012)
- Teaching of Chemistry, CHED 4416 and 6416 (2010 - 2012)
- Teaching of Chemistry (6-12) Practicum (15 graduate students and 3 undergraduates students), CHED 4417 and 6417 (2010 - 2012)
- Teaching & Learning of Chemistry, CHEM 3400 and 5400 (2011)
- Teach of Chemistry (6-12) Practicum II (4 graduate and 1 undergraduate students), CHED 6475 (2011-2012)
- Organic Chemistry Laboratory I and II, CHEM 3361L and 3362L (2011-2012)

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- Survey of Chemistry II Laboratory (Organic Chemistry and Biochemistry for Nursing majors), CHEM 1152L (2011)
- Directed Applied Research, CHEM 4100 (2011).

Elon University, Elon, NC - Temporary Assistant Professor (2009-2010, 1 year non-renewal position)

- General Chemistry I and II course and laboratory, CHM 111, 112 and 113 (2009 -2010)
- Kitchen Chemistry course CHM 172 (2010, course proposed and developed by instructor)
- Modification and implementation of changes to CHM 113 pre and post laboratory questions.
- Assist with the development of the rubric for senior chemistry student seminar.

North Carolina State University, Raleigh, North Carolina - Graduate Student (2005- 2009)

- Assisting in Organic Chemistry I & II SCALE-UP Lecture class (2008)
- Sensorial experiments in General and Organic chemistry laboratories (2006-2008)
- SCALE-UP General Chemistry I for Majors, Teaching Assistant (2005)
- Mentored and supervising research projects of four undergraduate students and one graduate student (2006-2009)

Florida Atlantic University, Boca Raton, Florida - Graduate Student (2002- 2005)

- Trained and supervised a doctoral student (2005)
- Organic Chemistry I Recitation/Lab Coordinator's and Teaching Assistant (2004)
- Organic Chemistry I and II Lab Recitation Teaching Assistant (2003- 2004)
- General Chemistry II Lab Teaching Assistant (2002)

RESEARCH EXPERIENCE

Chemical Education and Organic Synthesis, Assistant Professor, Florida Southern College

- Further development and implementation of lecture-based sensorial class activities. Explore and evaluate the results of the studies.
- Study of students conceptual understanding in general and organic chemistry using tangible models and engaged activities.
- Development of greener synthetic strategies.

Chemical Education, Temporary Assistant Professor and Lecturer, Kennesaw State University

- Further development and implementation of lecture-based sensorial class activities. Explore and evaluate the results of the studies.
- Exploration into the mechanism of the commonly used cobalt chloride and aqua complexes and make comparison to other chloride and aqua metal complexes.
- Study of students conceptual understanding in general and organic chemistry.

Chemical Education, Temporary Assistant Professor, Elon University

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- Development and implementation of lecture sensorial class activities. *Sensorial class activities* rely on multiple or different senses to make quantitative determinations to explore and reinforce in-class material.
- Assessment of students' metacognitive and self-thinking systems in General Chemistry using webassign homework system.

Chemical Education, Research Assistant, North Carolina State University

- Development and implementation of sensorial experiments in undergraduate laboratories, primarily organic chemistry laboratories.
Sensorial experiments rely on multiple or different senses to make quantitative determinations in the laboratory to replace or used in addition to traditional experiments.
- Involves manipulation of the chemistry in order to produce experiments that are precise, reproducible, adaptable, and safe experiments.
- Incorporate inquiry-based exploration for investigative type experiments and promote collaborative group work.
- Development of assessments to evaluate conceptual understanding of the materials and interventions for the misconceptions.

Organic Synthesis, Graduate Assistant, Florida Atlantic University

- Development of a novel Diels-Alder reaction involving allenyl carbonyls as heterodienes to be applied toward the total synthesis of an iridoid natural product.
- Studies on the manganese-mediated isomerization of alkynyl carbonyls to allenyl carbonyls, which can then be used to obtain a variety of allenyl carbonyls for the use in Diels-Alder reactions.

OTHER WORK EXPERIENCE

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| University of South Florida Grant External Evaluator | 2014 |
| <ul style="list-style-type: none">- Review goals of the grants and the results- Judge posters of the REU students- Interview students involved in the grant- Write a report to summarize the result of the grant. | |
| Webassign Tutorial Author | 2013 |
| <ul style="list-style-type: none">- Write tutorials for Organic Content- Edit and Revise already developed tutorials | |
| Research Consultant, Alternex Power Systems; Kingston, Jamaica | 2008 -2013 |
| Organic Chemist, Custom Synthesis Incorporated, Delray Beach, Florida | 2005 |
| <ul style="list-style-type: none">- Synthesis and characterization of organic molecules for clients.- Research chemicals for and assist in development of synthetic route of organic compounds. | |

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Research Associate (Organic) - Dr. Lepore Group; Florida Atlantic University, 2005
Boca Raton, Florida

- Further studies on the manganese-mediated isomerization of alkynyl carbonyls to allenyl carbonyls as developed during master's degree.

PUBLICATIONS

Bromfield Lee, D. C. Tackling Common Misconceptions on Heat through a 'Hands-On' Activity: Comparing our Sense of Touch with Thermometer Readings, **2014**, In preparation.

Bromfield Lee, D. C. Assessing Conceptual Change in Pre-service Chemistry Teachers and Upper Level Chemistry Majors using the Learning Lab Report Format, **2014**, In preparation.

Bromfield Lee, D. C.; Oliver-Hoyo, M. T. Roque-Peña, J. E., Cintrón-Maldonado, J. Novel Acid-base and Redox Titration Olfactory Indicator, **2012**, Manuscript under review.

Bromfield Lee, D. C.; Oliver-Hoyo, M. T. An Integrated Thermometric Titration and Heat of Neutralization Determination, **2012**, Manuscript under review.

Oliver-Hoyo, M. T.; Bromfield Lee, D. C. A Sensorial Twist for Measuring Reaction Rates Using Aspirin, **2012**, Manuscript under review.

Oliver-Hoyo, M. T.; Bromfield Lee, D. C. Multi-sensory Chemical Equilibrium Investigation: A Learning Lab Report, *Chemical Educator*, **2010**, 15, 181-184.

Bromfield-Lee, D. C.; Oliver-Hoyo, M. T. Esterification Kinetics Experiment that Relies on the Sense of Smell, *J. Chem. Educ.* **2009**, 86, 82.

Hasan, S.; Bromfield-Lee, D.; Oliver-Hoyo, M. T.; Cintron-Maldonado, J. A. Using Laboratory Chemicals to Mock Illicit Drugs in a Forensic Chemistry Activity; *J. Chem. Educ.* **2008**, 85, 813.

Bromfield-Lee, D. C.; Oliver-Hoyo, M. T. A Qualitative Organic Analysis That Exploits the Senses of Smell, Touch and Sound; *J. Chem. Educ.* **2007**, 84, 1976.

Silvestri, M. A.; Bromfield, D. C.; Lepore, S. D.; Michael-Stork Addition of Cyclopentyl Enamine to Allenyl Ketones and Esters, *J. Org. Chem.*, **2005**; 70(20); 8239-8241.

Lepore, S. D.; Khoram, A.; Bromfield, D. C.; Cohn, P.; Jairaj, V.; Silvestri, M. A.; Studies on the Manganese-Mediated Isomerization of Alkynyl Carbonyls to Allenyl Carbonyls, *J. Org. Chem.*, **2005**; 70(18); 7443-7446.

PRESENTATIONS

Deborah C. D. Bromfield Lee

Deborah C. Bromfield Lee, Carmen Gauthier, Outreach is More than an Arm's Length: Scientific Exploration through Chemistry, International Conference on Chemical education. Toronto, Canada, July 15th, 2014. (Oral)

Deborah C. Bromfield Lee, Addressing Students' Understanding of Laboratory Content through the Learning Lab Report (Poster), Gordon Research Conference on Chemical Education, June 10, 2013.

Deborah C. Bromfield Lee, Addressing Students' Understanding in lab and lecture (Oral) Florida Annual Meeting and Exposition, Palm Harbor, Florida, *May 11th*, 2013.

Deborah C. Bromfield Lee

Addressing students' understanding of laboratory and lecture content through the learning lab report (Oral), 245th ACS National Meeting, New Orleans, Louisiana, *April 10th*, 2013.

Deborah C. Bromfield Lee

Development of Sensorial Experiments for Undergraduate Laboratories (Oral) Florida Southern College Chemistry Seminar Series, Lakeland, Florida, *April 22nd*, 2013.

Gregory T. Rushton, Scott E. Lewis, Michelle L Dean, Deborah C. Bromfield Lee, Improving the recruitment, retention, and progression of chemistry majors through the incorporation of chemistry education faculty members in a chemistry department, (Poster). 243rd ACS National Meeting, March 25th, 2012, San Diego, California.

Gregory Rushton, Deborah Bromfield Lee, Michelle Dean, Recruiting and retaining the next generation of chemistry teachers: Successes, challenges, and a call to action (Oral), 242nd American Chemical Society National Meeting, Denver, Colorado, August 31st 2011.

Lara Pacifici, Deborah Bromfield Lee, Gregory Rushton, Michael Dias, David Rosengrant Beyond Teaching "Science" Teachers: Reflections on Discipline Specific Methods Courses (Oral). The Annual Conference of the Southeastern Association for Science Teacher education, Decatur, Georgia, *October 9th*, 2010.

Deborah C. Bromfield Lee

Kitchen chemistry: A crash course for non-majors(Oral) Biennial Conference on Chemical Education, Denton, Texas, *August 4th*, 2010.

Joan Rogue Peña, Deborah Bromfield Lee, Maria Oliver-Hoyo Development of Three Novel Chemistry Experiments for Undergraduate Courses (Oral) Eighth Annual North Carolina State University Undergraduate Summer Research Symposium, *July 27th*, 2009.

Deborah C. Bromfield Lee, Maria T. Oliver-Hoyo

Development of Sensorial Experiments for Undergraduate Laboratories (Oral)

Deborah C. D. Bromfield Lee

University of South Florida, Tampa, Florida, *April 22nd, 2009.*

Joan Rogue Peña, Deborah Bromfield Lee, Maria Oliver-Hoyo
Olfactory Titrations using Glucosinolates Extracted from Rutabaga (Poster)
Annual Biomedical Research Conference for Minority Students, *November 8th, 2008.*

Joan Rogue Peña, Deborah Bromfield Lee, Maria Oliver-Hoyo
Olfactory Titrations using Glucosinolates Extracted from Rutabaga (Poster)
Seventh Annual North Carolina State University Undergraduate Summer Research Symposium,
August 1st, 2008.

Deborah C. Bromfield Lee, Maria T. Oliver-Hoyo
Development of Sensorial Experiments for Undergraduate Laboratories (Oral)
Biennial Conference on Chemical Education, Bloomington, Indiana, *July 28th, 2008.*

Deborah C. Bromfield Lee, Richard Kelley, et.al.
Wolfpack Women In Science: Answering the 'Impossible' Question - Innovative Thinking through
Themed Dialogues. (Oral) Glaxo Smith Kline: 6th Annual Women's Leadership Initiative
Conference, Cary, North Carolina, *March 17th, 2008.*

José Cintrón-Maldonado, Deborah Bromfield Lee, Maria Oliver-Hoyo
Rutabaga as an Indicator for Olfactory Titrations (Poster); Sixth Annual North Carolina State
University Undergraduate Summer Research Symposium, *August 2nd, 2007.*

Deborah C. Bromfield Lee, Maria T. Oliver-Hoyo
Development of Sensorial Experiments for Undergraduate Laboratories (Oral)
Local American Chemical Society Meeting, Duke University, North Carolina; *April 21st, 2007*

Maria T. Oliver-Hoyo, Deborah C. Bromfield Lee
Sensorial experiments: experiments that rely on senses other than eyesight (Oral)
American Chemical Society National Meeting – Chicago; *March 27th, 2007*

Deborah C. Bromfield Lee, Maria T. Oliver-Hoyo
Development of Sensorial Experiments for Undergraduate Laboratories (Poster)
Eighth Annual Poster Session, North Carolina State University, University Club, Raleigh, NC;
March, 2007

Deborah C. Bromfield, Maximilian A. Silvestri, Salvatore D. Lepore
New Chemical Methods for the Synthesis of Geniposidic Acid, An Anticancer Marine Natural
Product (Poster) Florida Marine Biotechnology Summit IV: BioFlorida Conference, Boca Raton,
Florida, *October 17th-18th 2004*

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Salvatore D. Lepore and Deborah C. Bromfield

Flanagan High School Science Club (Oral), Pembroke Pines, Florida; *October 11, 2004*

Maximilian A. Silvestri, Deborah C. Bromfield, Salvatore D. Lepore

New Chemical Methods for the Total Synthesis of an Iridoid Natural Product with Anticancer Activity (Oral); XI Marine Natural Products Symposium, Boca Raton, Florida; *December 2004*

Maximilian A. Silvestri, Deborah C. Bromfield, Salvatore D. Lepore

The Development of a Novel Diels-Alder Reaction Involving Allenyl Esters as Heterodienes: Studies toward the Total Synthesis of an Iridoid Natural Product (Oral)
XI Marine Natural Products Symposium, Sorrento, Italy, *August 2004*

Deborah C. Bromfield, Vinod Jairaj, Salvatore D. Lepore

Studies on the Manganese-Mediated Isomerization of Alkynyl Carbonyls to Allenyl Carbonyls (Poster), BioTech Meeting, Boca Raton, Florida; *March 2003*

PROPOSALS FUNDED

Georgia Space Grant Consortium - Pre-college STEM Enrichment - KSU NASA Pre-college STEM Enrichment Program (\$8,744); Co-PI; **2011.**

Georgia Space Grant Consortium - College STEM Enrichment - KSU NASA Applied Leadership Program (\$8,953); Co-PI; **2011**

Georgia Space Grant Consortium - Graduate STEM Enrichment - KSU NASA Fellows Program (\$6,000) Co-PI; **2011**

Co-PI Role in the above three Enrichment Grants— development and evaluation of STEM activities (primarily chemistry); training of the undergraduate who will teach high school students these activities; assessment of learning outcomes for pre-college and college students during this process.

Improving Teacher Quality State Grants Title II, Part A of the No Child Left Behind Act Administered by the University of Georgia - Improving the Chemistry Education for All (\$53,357.16), Co-PI, **2011.**

Co-PI Role - Co-project director and contributed to the design, planning, evaluation materials and organization primarily during the summer workshop and Fall follow-up workshops. This role involved co-directing and managing all of the summer workshop activities and some contact with the teachers in the Fall 2012 semester.

PROPOSALS SUBMITTED

Deborah C. D. Bromfield Lee

NSF ITEST: Collaborative Research: The Young Community Scientist: A Model for Learning STEM While Doing The Good Works of the Community (\$707,412), Co-PI, **2011**.

Walmart - Empowering Female Students to do Good Works for the Community through Science, Technology, and Math (STEM): A Sustainable and Eco-friendly Approach (\$129,390), Co-PI, **2011**

AT&T - The Young Community Scientist: A Model for Learning STEM While Doing The Good Works of the Community (\$76,472), Co-PI, **2011**. Not funded

NSF TUES-Type 1 Project: Kennesaw State University's One Write Laboratory System, (\$199,085). Co-PI, **2011**. Not funded

University System of Georgia STEM II Initiative - Development of Innovative Student Centered Opportunities to Increase STEM Majors Success and Recruit High Performing Students into Teaching and Research Careers **2011** (\$385,566) not funded

HONORS

Carl Storm Underrepresented Minority Fellowship (Summer 2013)

Faculty Honoree for MAT University Scholar (Spring 2012)

Faculty Honoree for Honor MAT Student at Graduation (August 2011)

Faculty Honoree for President's 4.0 Freshman Student (Spring 2011)

Eli Lilly/WCC Travel Grant Awards (Fall 2008)

Golden Key International Honor Society (Spring 2001)

National Society of Collegiate Scholars (Spring 2000)

AFFILIATIONS AND ORGANIZATIONS

American Chemical Society (Member: 2004-present)

Phi Lambda Upsilon National Chemistry Honor Society, PLU (National Secretary, 2010- present)

National Science Teachers Association, NSTA (2010-present)

Gamma Sigma Epsilon Chemistry Honor Society (2013-present)

SERVICE

- Florida Annual Meeting and Exposition High School Teacher Program Co-Chair (2014)
- American Chemical Society CHED Poster Session reviewer.
- Poster judge for Florida Annual Meeting and Exposition (2013-2014)

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- Poster judge for Castle Conference - USF (2013-2014)
- Faculty Advisor for Gamma Sigma Epsilon (2014)
- Florida Southern College Library and Archives Committee (2013-2014)
- ALEKS implementation ad-hoc committee (2014)
- Journal of Chemical Educator Reviewer (2009-present)
- MAT admissions interviewer (2010)
- Georgia Math Science Partnership (2010-2011)
- Co-Councilor of Beta Upsilon Student Chapter of Phi Lambda Upsilon (2010-present).
- Assisted elementary school teachers (Fred Olds Magnet Elementary School University Connections) with University Science Connections Learning Units, inflatable star lab, and science fairs. (2008-2009)
- Student Diversity Advisory Council Representative (2007-2008)
- Academic Coordinator for KSU STEM Scholars - NASA and LMPSA students (2011-present)
- KSU National Science Teachers Association Student Chapter Advisor (2011-present)
- Poster Judge at Castle Conference, University of South Florida 2013 and 2014

SKILLS

Laboratory Equipment: GC, HPLC, IR, NMR (H^1 NMR, C^{13} NMR, various 2D methods) CNO analyzer, UV-Vis, Microlab and other educational equipment, and other common organic equipment.

Computer Skills: Hyperchem Molecular Modeling, Rasmol, Mol-Mol, ChemDraw, Spartan Molecular Modeling; Windows OS, Microsoft Office, Adobe software, HTML-web based design.