

Education

- Massachusetts Institute of Technology – Cambridge, MA Expected 2013
Ph.D. Candidate in Molecular & Systems Toxicology (GPA 4.9/5.0), advised by Prof. Peter C. Dedon
Doctoral Thesis: *The Role of Unique tRNA Structures in the Survival Responses of Human Pathogens*
- University of Mississippi – Oxford, MS 2008
B.S. in Chemistry, Magna Cum Laude (GPA 3.89/4.0), Sally McDonnell Barksdale Honors College
Major Thesis: *Nanostructure Synthesis & Properties of Simple Organic & Organometallic Compounds*
Honors Thesis: *The Link between DNA Adduct Formation & Cytotoxicity in Human HCT116 Cells Exposed to Toxic Levels of Nitric Oxide*
- Brookhaven High School, Valedictorian (1st out of 171) – Brookhaven, MS 2004

Honors & Awards

- National Science Foundation Graduate Research Fellowship 2009
Eni-MIT Energy Fellowship (full funding for one year) 2008
Barry M. Goldwater Scholarship 2007
Phi Beta Kappa Honor Society 2007
Who's Who Among Students in American Universities & Colleges 2007
Phi Kappa Phi Honor Society 2006
National Society of Collegiate Scholars 2006
United States Achievement Academy National Collegiate Physical Science Award 2006
UM Carrier Foundation Scholarship (full funding for four years; two recipients annually) 2004
National Merit Scholarship Finalist 2004
Eagle Scout, Boy Scout Troop 911 – Brookhaven, MS 2003

Research Experience

- MIT Doctoral Thesis Research with Prof. Peter C. Dedon 2009-Present
Developing & utilizing ultrasensitive LC-MS/MS methods to identify & quantify unique tRNA structures in pathogenic species of *Helicobacter* & *Mycobacteria*; identifying novel biomarkers & therapeutic targets.
- UM Chemistry Thesis Research with Prof. T. Keith Hollis 2007-2008
Attempted synthesis & characterization of nanostructures (rods & tubes) formed by template wetting technique with simple, non-polymeric, organic & organometallic compounds.
- MIT Summer NSF REU Research with Prof. Peter C. Dedon 2006
Troubleshoot a novel gas-delivery chemostat for cell culture; studied mechanisms of cytotoxicity & DNA adduct formation in human HCT116 cells exposed to physiological levels of nitric oxide.
- UM Independent Research with Prof. Daniell L. Mattern 2005-2006
Completed partial synthesis of a perylenetetracarboxylic bisimide donor-sigma-acceptor molecule.

Laboratory Techniques

Organic synthesis, cell culture, DNA/RNA extraction, protein purification, SDS-PAGE, immunoblotting, mass spectrometry (QQQ, QTOF), spectroscopy (ICP-OES, NMR), & chromatography (affinity, GC, LC, HPLC).

Posters & Presentations

Brandon S. Russell, Kok-Seong Lim, Clement Chan, & Peter C. Dedon. *Defining the Role of RNA Secondary Modifications in the Response of Microbial Pathogens to Chemical Mediators of Inflammation*. American Chemical Society 240th National Meeting. Boston, MA. 2010.

Brandon S. Russell & Peter C. Dedon. *Investigation of Novel RNA Species in Human Pathogens*. MIT Department of Biological Engineering Annual Retreat. Newport, RI. 2010.

Brandon S. Russell & T. Keith Hollis. *Nanostructure Synthesis & Properties of Simple Organic & Organometallic Compounds*. UM Sigma Xi Poster Symposium. University, MS. 2008.

Brandon S. Russell, C. Eric Elmquist, Laura J. Trudel, & Peter C. Dedon. *The Relationship Between DNA Adduct Formation & Cytotoxicity in Human HCT116 Cells Exposed to Toxic Levels of Nitric Oxide*. Biomedical Engineering Society Fall Conference. Chicago, IL. 2006.

Teaching Experience

MIT Teaching Assistant for Analysis of Biological Networks Spring 2010
Wrote & graded problem sets & exams for 25 students; wrote & presented single-topic mini-lectures; led one-hour review sessions.

UM Teaching Assistant for Organic Chemistry I & II 2006-2007
Led weekly review sessions & administered graded quizzes to two groups of 20 students; led three- to four-hour exam review sessions for groups of 60+ students.

UM Teaching Assistant for General Chemistry Laboratory I Fall 2006
Worked in groups to prepare equipment & reagents for ~500 students on a weekly schedule; individually supervised & instructed 20 students in a variety of laboratory techniques.

Volunteer Activities

MIT Emergency Medical Services 2009-Present
Director of Ambulance Operations 2010-2011
Oversee daily operation of campus ambulance: scheduled & emergency maintenance; equipment stocking & ordering; quality assurance & discipline for 60+ student volunteers.
Volunteered 700+ hours as an emergency medical technician (NREMT-B) for campus ambulance service.

MIT Graduate Student Council Activities Committee Co-Chair 2009-2010
Organized monthly social events for hundreds of people; managed & disbursed a \$66,000 budget.

MIT Biological Engineering Department Graduate Student Board 2008-2010
Social Co-Chair 2009-2010
Organized monthly social events for groups of 50+ students.
First Year Representative 2008-2009
Organized social activities for 40 students during department's interview weekend.

UM Student Affiliates of the American Chemical Society 2004-2008
President 2006-2007
Conducted bimonthly meetings; designed & coordinated all activities with officers & faculty.
Vice-President 2005-2006
Organized field trips & community outreach programs for small groups of 15+ students.

Academic & Professional Societies

American Society for Mass Spectrometry 2010-Present
American Society for Microbiology 2010-Present
American Chemical Society 2004-Present