



Ereny Gerges

Majors: Biology (Biomedical)
Chemistry (Pre- Health Professions)

Class: Sophomore

Mentor: Dr. Paul Flowers, Ph.D.

Research Interests:

I am interested in biomedical research that relates to the improvement of human health.

Research Experience:

I am currently working with Dr. Flowers on a project whose goal is to develop a new clinical assay for bilirubin in body fluids such as blood plasma and urine. The assay is based on measurements of a sample's visible spectrum while it is being electrolyzed, a technique known as spectroelectrochemistry. Bilirubin is a clinically measured marker for many pathologies such as renal dysfunction and jaundice in infants. The medical background of this project is very interesting to me.

Honors:

- Chancellor list , fall 2014 – present
- Maynor Honors College Scholar, 2015-present
- NSF S-Stem COMPASS Program Scholar, 2015
- Rise Fellow, 2015
- CRC Freshman Chemistry Award Spring 2015(UNCP Department of Chemistry and Physics)
- Science Enrichment Preparation (SEP) Scholar at UNC- Chapel Hill, summer 2015.

Extracurricular Activities:

- Vice President of Pine Hall Council (RHA), 2014-2015.
- President of Oak Hall Council (RHA), fall 2015 – present.
- Peer Tutor, spring 2015- present.
- Site Leader: Office of Community and Civic Engagement, Fall 2015.
- 4th Grade counselor in Peterson Elementary school, Red Spring

Personal career goals:

I am interested in many careers. I am strongly interested in developing the health care system by contributing to the well-being of humans' health especially in the rural places that are in desperate need of primary care services. I am also interested in pharmacology, how medications interact with the human body and how their interactions with each other might cause further complications.



Carlisha Hall

Major: Environmental Science

Minor: Geology/Biology

Class: Senior

Mentor: John Roe, Ph.D.

Research Interests: My research interests are primarily on environmental issues, ecology and conservation. I am extremely passionate about preserving and protecting our environment and other organisms. Unfortunately, various species are endangered due to human impacts on the environment. I am determined to make a difference in this world by getting involved in wildlife and environmental studies.

Research Experience:

At the **University of North Carolina at Pembroke**, I've been conducting field work with Dr. John Roe studying Eastern Box turtles and their responses to prescribed wildfires. My research focuses on box turtle behavior during the overwintering season and management strategies to minimize impacts of fire on box turtles (2013-Present).

At the **University of North Carolina at Pembroke**, I also conducted field work with Dr. Lisa Kelly studying invasive fire ants in wetlands of Southeastern, NC (2015 summer). Currently, I am working in the lab with Dr. Kelly to genotype fire ants to determine their colony social form.

At **Indiana University**, I worked with a graduate student studying the impacts of food restriction on reproductive development in Siberian hamsters, a seasonally reproducing mammal that relies on the availability of food, photoperiod and other factors for reproduction.

Awards and Honors:

- National Institute of Health Post Baccalaureate
- University Honors List (Spring 2012, Fall 2013, Spring 2014)
- Chancellor's List (Fall 2011)
- PURC Poster Presentation, 3rd Place (Spring 2014)
- UNCP RISE Fellowship (2013-2016)
- Herpetology Conference Poster Presentation, 1st Place (Spring 2014)

Clubs and Professional Organizations:

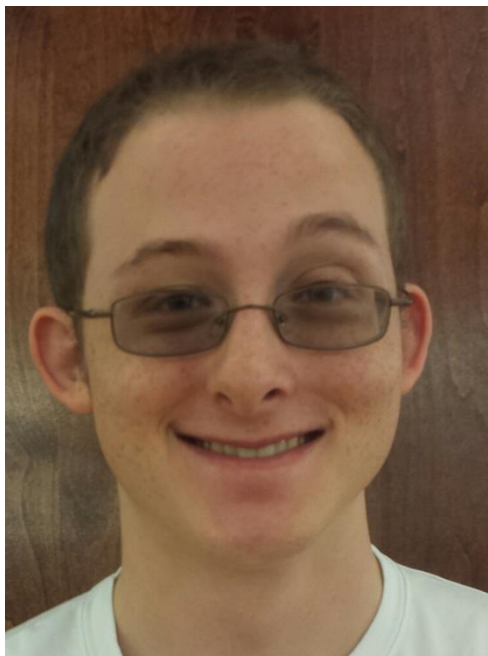
- NC Herpetological Society
- Society for Integrative and Comparative Biology
- Tri Beta (National Honors Society)
- The Critical Assessment of Scientific Literature Club
- UNCP-Biology Club
- UNCP-Housing as Residents Life

Presentations:

- Invasive Fire Ants (*Solenopsis invicta*) in wetlands of Southeastern North Carolina. (Poster: RISE Summer Research Symposium, Pembroke, NC, August 2015)
- Overwintering Behavior of Eastern Box Turtles (*Terrapene carolina carolina*) in a Fire-Managed Ecosystem. (Poster: Pembroke, NC, April 2015 and at the 2nd NC Congress of Herpetology Meeting, Asheboro, NC, May 2015)
- Overwintering Behavior of Eastern Box Turtles (*Terrapene carolina carolina*) in a Fire-Managed Ecosystem. (Oral: North Carolina Academy of Science, Winston-Salem, NC, March 2015)
- Food availability as a cue for seasonal reproduction: Delayed reproductive development in juvenile Siberian hamsters (*Phodopus sungorus*). (Poster: the Society for Integrative and Comparative Biology, West Palm Beach, FL, January 2015 and at the Annual Biomedical Research Conference for Minority Students, San Antonio, TX, November 2014)
- The impacts of food restriction on reproductive development in a seasonally-reproducing mammal, the Siberian hamster (*Phodopus sungorus*) (Poster: RISE Summer Research Symposium, UNCP, 2014 and Council on Undergraduate Research meeting, Arlington, VA, October 2014) (Oral: CISAB Summer Research Symposium, Indiana, 2014).
- How deep are Eastern Box Turtles (*Terrapene Carolina*) burying to escape severe winter conditions? (Poster: PURC, UNCP, 2014 and 37th Annual Herpetology Conference, Florida, 2014).

Science-Related Conferences/Symposiums:

- NC Herpetological Congress Meeting (2015)
- Center for the Integrative Study of Animal Behavior (CISAB 2014)
- Pembroke Undergraduate Research and Creativity Center (PURC 2014, 2015)
- 37th Annual Herpetology Conference (2014)
- North Carolina Academy of Sciences (2014, 2015)
- Annual Biomedical Research Conference for Minority Students (ABRCMS 2013, 2014)



Cary Mundell

Major: Molecular Biology

Classification: Junior

Mentor: Dr. Ben Bahr

Research Interest:

I am interested in various forms of Virology and Toxicology. Ever since I read the book *The Hot Zone* by Richard Preston I have been fascinated by the idea of working in a class 3 or higher Bio-safety lab. However my research at the Bahr lab has opened my eyes to the amazing process that is drug development and I am now considering a career in pharmaceuticals.

Research Experience:

Last year my work in the Bahr lab at Comtech was focused upon the oral dosing of mice with the compound z-phe-ala-diazomethylketone (PADK) which is being pursued as a potential therapeutic avenue for treatment of Alzheimer's Disease. I was most focused upon the toxicology of PADK alongside the behavioral data of the triple transgenic mice treated with PADK. This research culminated in a third place presentation at the North Carolina Academy of Sciences meeting. Over the summer I focused on the testing of several derivatives made from PADK. This work was made possible by the UNCP Summer RISE program. This year I will continue to focus on the derivatives and plan to present at the Annual Biomedical Research Conference for Minority Students. I look forward to the next summer where I plan to be involved in an internship relating to the fields of interest.

Awards:

UNCP RISE Fellowship- (2014-Present)

NCAS Third Place Poster- (2015)

Chancellors list (2013)



Walter Patterson

Major: Biotechnology

Class: Sophomore

Mentor: Ben Bahr, Ph.D.

Research Interests:

I have a deep fascination in how the brain is able to manufacture the psychology of an individual. Research on the subject of psychopharmacology, particularly in the areas of psychosis and suicidality is very appealing to me. The mechanisms of their cause, how they come about at a chemical level. From this fundamental understanding we might piece together not only treatment, but diagnostic methods free from possible misdiagnosis. I also have a great interest in the modeling of experimental systems, an important matter as we use these models as a corner stone in well-supported theory.

Research Experience:

Sartorius Stedim Biotechnology Laboratory (2013-2014)

- Batch Fed Bioreactor Operation (1L-30L)
- Microbial Multi-enzymatic Kinetics
- Role of Luciferase in-vivo
- Isolation of Anthraquinone and Pyroverdine Pigments

William C. Friday Laboratory (2015)

- In-silico Modeling of Compounds
- Application and Developing of Similarity Methods for Compounds
- In-vitro Enzyme Kinetics of Cathepsin B

Presentations:

- NCASM 2013
- SNCURCS 2013
- PURC Symposium 2014

Publications:

Walter Patterson, Devang Upadhyay, Sivanadane Mandjiny, Rebecca Bullard-Dillard, Meredith Storms, Michael Menefee, Leonard D. Holmes, "Attractant Role of Bacterial Bioluminescence of Photorhabdusluminescens on a Galleria mellonella Model", American Journal of Life Sciences. Vol. 3, No. 4, 2015, pp. 290-294. doi: [10.11648/j.ajls.20150304.16](https://doi.org/10.11648/j.ajls.20150304.16)

Goals:

There is a clear need for me to finish my bachelors education and acquire Doctorate degree. I hope to research the effect of compounds on the brain; regardless of what path my career takes. By this I mean whether I have to go into industry or academia.



Tamille Rhynes

Major: Chemistry (Concentration: Pre-health)

Classification: Sophomore

Mentor: Dr. Ben Bahr, Ph.D.

Research Interest:

Biochemistry, Neurobiology, Neurodegenerative Diseases, and Synaptic Physiology

Research Experience:

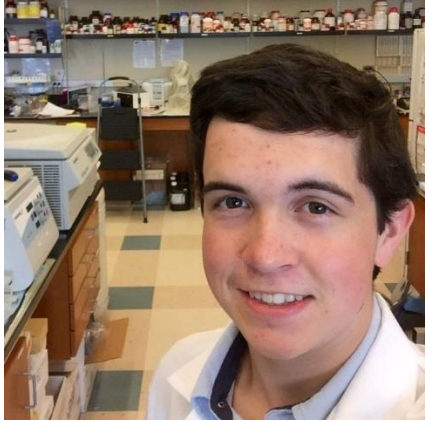
Alzheimer's Disease

Awards:

UNCP RISE Fellowship (2015)

Goals:

I wish to apply and gain acceptance into a PhD/MD Program at a prestigious college. I would like to earn my PhD in neuroscience and go to medical school to become a neurosurgeon specializing in brain and spinal tumors.



Ethan Sanford

Major: Biology

Minor: English

Classification: Senior

Mentor: Conner Sandefur, Ph.D.

Research Experience:

University of North Carolina at Charlotte (Summer 2015): Working in the Sokolova lab for ten weeks, I studied the interactive effects of cadmium pollution and hypercapnia on two species of marine bivalve, *Mercenaria mercenaria* and *Crassostrea virginica*. My research focused on two enzymes—pyruvate kinase and phosphoenolpyruvate carboxykinase—located, respectively, at a critical aerobic-anaerobic metabolic branchpoint.

University of North Carolina at Charlotte (Fall 2015—Spring 2016): Under the guidance of Dr. Conner Sandefur, I am working to develop a simplified mathematical model of nucleotide regulation on airway epithelia with the goal of eventually implementing this model to study patients with chronic obstructive pulmonary disease (COPD) and cystic fibrosis (CF).

Publications:

Co-author of a manuscript currently in preparation describing the effects of multiple environmental stressors on marine bivalves. First author: Chelsea Hawkins; PI: Inna Sokolova, Ph.D.

Academic Honors:

- Member, UNCP Maynor Honors College
- Executive committee student member for the Southern Regional Honors Council (SRHC)
- Listed on UNCP's "Chancellor's List" for every full-time semester completed at the institution
- Member, Tri-Beta National Biological Honor Society
- Member, Alpha-Chi National Honor Society
- One of five finalists for UNCP's 2015 "Outstanding Senior Award"
- UNCP-RISE Fellowship

Study Abroad:

I studied abroad for the fall 2015 semester at Prifysgol Bangor University in Gwynedd, Wales.

Career Goals: I am currently applying for Ph.D. programs in areas related to molecular and cellular biology. I hope to pursue a career in research, and I plan to apply my extensive experience with the humanities to my scientific interests.



Caleb Stubbs

Major: Molecular Biology

Classification: Senior

Mentor: Dr. Maria Santisteban, Ph.D.

Research Interests:

My research interests are in Molecular/Cellular Biology, mainly in areas involving genetics, cell signaling and regulation of cellular pathways.

Research Experience:

- University of North Carolina at Pembroke; Dr. Maria Santisteban, Ph.D. (2013,2014,2015)
My work has been studying histone genetics in *Saccharomyces cerevisiae* (yeast). Histones play major role in regulation of gene expression, and study of the different regulatory patterns of histones and their encoded genes, can provide further knowledge into the genetic regulation of our genes. This year will be three years of academic study on our question concerning two different mutations that has shown to cause a synthetic lethality, or the combination of two mutations causing cell death. One of those mutants, *htz1*, codes for a histone variant, and *RPB2-2*, which codes for the second largest subunit in RNA polymerase II. Both mutants are transcriptionally important genes that cause this phenotype, but is suppressed with a third mutant we have been working to identifying. The significance of understanding these genetic mutations in histones is important in translational work into investigation of diseases with gene regulatory issues.
- Pepperdine University, Malibu CA; Dr. Thomas Vandergon, Ph.D. (2014,2015)
Prior to my junior year of college, I had the opportunity to work with Dr. Thomas Vandergon at Pepperdine University where I looked into understanding the angiogenic pathway in HUVEC (Human Umbilical Vascular Endothelial Cells). Angiogenesis is the sprouting of new blood vessels from pre-existing ones in endothelial cells. Its importance is necessary when it comes to embryonic development and tissue repair but also plays an important role in tumor progression. My project was studying the ligand Jagged-1 in endothelial cells, whose function was not yet known, but has shown to be vital in the formation of well-developed blood vessels. I was able to learn many techniques such as Gene transfection, Western Blotting, qRT-PCR, and Flow Cytometry.

Current Research:

The current project I am working on is studying more about the Histones in *Saccharomyces cerevisiae* (Yeast) and relatable patterns concerning transcription of different genes throughout their genome. Currently we are working on identifying a possible suppressor of a synthetic lethality between two mutants of histone related genes (*RBJ2-2* and *htz1*).

Goals: In the future I plan on entering into a Cellular Biology Ph.D. program. My career goals would be to conduct research full time in a university setting.



Natasha Wells

Majors: Chemistry: Molecular Biotechnology

Biology: Biomedical Emphasis

Minor: Mathematics

Classification: Senior

Mentors: Dr. Paul Flowers, Ph.D.

Dr. Cornelia Tirla, Ph.D.

Research Interest:

I am interested in pharmacology, with an emphasis in neurological drug discovery and delivery. I would like to focus on the absorption and metabolism of compounds across the blood-brain-barrier.

Research Experience:

- **Dr. Paul Flowers Microiontophoresis Project: Spring 2015-present**
Our research aims to develop an in-vitro microspectrometric protocol that will permit both the quantification of iontophoretic ejections and real-time imaging of the process, affording a strategy for quantitative delivery of compounds during the in-vivo use of probes.
- **Dr. Cornelia Tirla Organic Synthesis Project: Spring 2015-present**
Through classical organic chemistry methods, modification of Z-Phenyl-Alanine-Diazomethylketone (PADK) derivatives to determine functional group efficiency, a collaboration with the William C. Friday Laboratory.

Academic Experience:

- Associates of Arts, Fayetteville Technical Community College, 2013
- Associates of Science, Fayetteville Technical Community College, 2014

Awards and Honors:

- Gamma Sigma Epsilon, Secretary
- GlaxoSmithKline Women in Science Scholar
- Arrowhead 1887 Scholar

Affiliations:

- Chemistry and Physics Club, Secretary
- American Chemical Society member

Goals: I would like to obtain a PhD in Medicinal Chemistry. Ultimately, I envision myself working in academic research sharing my passion for the scientific discipline with future generations.