



FSU-RISE NEWS

"The Mission of the FSU-RISE program is to provide RISE scholars high quality research training and professional development for competitive entry into graduate programs and careers in biomedical science field."

FSU-RISE Program

The Fayetteville State University Research Initiative for Scientific Enhancement (FSU-RISE) program is sponsored by the National Institutes of Health/ National Institute of General Medical Sciences (NIH/ NIGMS). The overarching goal of the program is to increase the number of well-prepared FSU minority students pursuing terminal degrees in biomedical and behavioral fields of study. FSU-RISE offers opportunities for faculty, staff and students to engage in professional development and creative scientific research. Students matriculate in FSU-RISE from their sophomore year through graduation. Developmental activities include seminars, hands-on biotechniques/bioinformatics workshop, intramural and extramural research, career trips, Graduate Record Exam (GRE) preparation, and an undergraduate research symposium. FSU-RISE also sponsors a four-week Pre-Freshman Summer Enrichment Program (PFSEP) to prepare Pre-RISE Scholars for college-level biology, chemistry and math courses, and to stimulate their interests in pursuing research careers. FSU-RISE and PFSEP scholars make presentations at local and/or national symposia.

FSU-RISE Scholar to Earn Ph.D.



Dr. Danielle Fortune

dissertation entitled "Investigating virulence determinants in the Lyme disease spirochete, *Borrelia burgdorferi*" focused on identifying genetic components the bacterium utilizes to promote mammalian virulence. As a graduate student, Dr. Fortune published two manuscripts in peer-reviewed journals, seven abstracts, and presented the results of her research at ten national or regional conferences. She also mentored undergraduates and several junior graduate students, volunteered as a science judge at elementary and high schools as well as guest-lectured at several local undergraduate institutions. Currently, Dr. Fortune is participating in postdoctoral work under the mentorship of Dr. Rita Tamayo, Department of Microbiology and Immunology at the University of North Carolina at Chapel Hill. Her research involves the investigation on how an obligate anaerobic bacterium, *Clostridium difficile* adapts to changing extracellular conditions to promote disease. Dr. Fortune is a UNC-SPIRE fellow supported by a competitive NIH-funded fellowship which provides resources to engage in extensive pedagogical workshops and obtain valuable teaching training and classroom experiences at a local underrepresented minority institution. Dr. Fortune's future goal is to become a faculty member and develop a learning environment that engages students using active learning, critical thinking, writing, and analytical skills through hands on research experiences in efforts to increase diversity in science



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You did it!
Congratulations

FSU-RISE GRADUATES

ON OUR WAY TO A Ph.D.



Rarnice Johnson
spring 2016



Michael Chery
spring 2016



Davesha Worrell
spring 2016



Robin Brice
spring 2016



Heather Larson
spring 2016



Christina Young
spring 2016



Andria Bell
spring 2016



Margie Stringfield
fall 2015



Stormie Monk
fall 2015



Christina DeJean
spring 2016



Algenis DeJesus

~ TREADING OUR PATHWAYS TOWARD a Ph.D. ~ Scholars Acceptances into Graduate Schools

A major objective of the FSU-RISE program is to provide prepare scholars for graduate studies. The following individuals were accepted into programs across the country. **Rarnice Johnson**, a spring 2016 graduate, was accepted into the Virginia Commonwealth University PREP program; **Michael Chery**, a spring 2016 graduate, was accepted into a Ph.D. program in the Department of Chemistry at Clark Atlanta University (CAU); **Davesha Worrell**, a spring 2016 graduate, was accepted into a Master of Health Science in Clinical Laboratory Sciences (MHS-CLS) at Augusta University; **Robin Brice**, a fall 2015 graduate, was accepted to the Masters in Biology program at Elizabeth City State University; **Heather Larson**, a Spring 2016 graduate, was accepted to participate in the UNC-Chapel Hill Medical Education Develop-

ment (MED) Program; **Christina Young**, a Spring 2016 graduate, was accepted into the Master of Science in Materials Science and Engineering at Tuskegee University; **Andria Bell**, spring 2016 graduate continues to complete applications for graduate school; **Margie Stringfield**, a fall 2015 graduate, was accepted into the Master of Biology program at North Carolina Central University; **Stormie Monk**, a 2015 fall graduate, was accepted into into the Master of Biology program at North Carolina A&T State University; **Christina DeJean**, spring 2016 graduate, continues to complete applications for graduate schools; and **Algenis DeJesus**, fall 2015

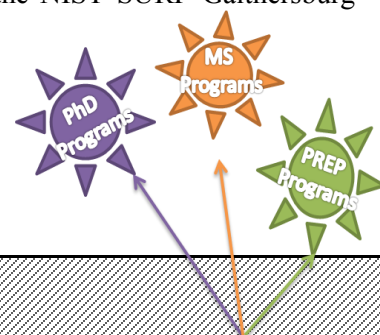


Extramural Research provides RISE Scholars research experiences for competitive entry into graduate research-intensive institutions.

Each summer FSU-RISE Scholars are required to complete at least five (5) applications to summer research internship at research-intensive institutions across the USA. This requirement was implemented to address the low number of FSU faculty with active research labs and grants. Scholars participate in paid research experiences ranging from \$3-\$5K for an 8-10 week training experience. The training experience includes a real-world, hands-on laboratory experience, enrichment seminars, Graduate Record Exam (GRE) practice, personal statement and research abstract preparation, as well as participation in poster presentations. Upon scholars' return to FSU for the fall semester, they are required to share their summer experiences with the newly accepted scholars to the RISE program as well as with local, regional, and national research conferences. The experiences speaks for themselves as our scholars

are excepted into research-intensive graduate schools upon FSU graduation. Five (5) RISE Scholars were accepted into competitive summer research internships while five (5) scholars were excepted into PREP, PhD and Master Programs for the fall 2016. The five undergraduate research interns include: **Shaaron Ochoa-Rios**, a junior, who was accepted into the Georgia Institute of Technology Emergent Behaviors of Integrated Cellular Systems (EBICS) Research Experience for Undergraduates (REU); **Brandon Murphy**, a junior biology major who was accepted to the University of Georgia 2016 Summer REU Program in Prokaryotic Biology; **Ky'ara Carr**, a senior, who was accepted into the CLIMB UP Summer Program at University at Buffalo; **Samuel Cooper**, a junior computer science major who was accepted into the NIST SURF Gaithersburg

FSU-RISE Program Success Pathways to:



ACADEMIC YEAR

SUMMER			EXTRAMURAL SUMMER RESEARCH EXPERIENCE	
SPRING		NC-LSAMP McNAIR other programs	INTRAMURAL RESEARCH EXPERIENCE & CRITICAL THINKING/TEST-TAKING STRATEGIES WORKSHOP	
			BIOTECHNIQUE WORKSHOPS	INTRAMURAL RESEARCH EXPERIENCE & CRITICAL THINKING/TEST-TAKING STRATEGIES WORKSHOP
FALL			RESEARCH SEMINARS & SCIENTIFIC MEETINGS	
			ENRICHMENT SEMINARS: Applications & Professional Development, Conference Presentations, Recruitment and Leadership Development	
			FSU-RISE PROGRAM	
SUMMER	LEAP/RISE (4-week) BIO, CHEM, MATH and English Enrichment Program			
	Pre-Freshman	Freshman	Sophomore	Junior
				Senior

PREP: An Alternative Pathway toward Doctoral Degrees

One of the factors for admissions to graduate or professional school is a competitive GPA. However, a common phrase we hear from graduates who do not apply to post undergraduate study is: “My GPA and test scores didn't really show my true academic abilities” The Post baccalaureate Research Education Program (PREP) is an enrichment and research training program to affords students to build the skills necessary to become competitive applicants to graduate or professional schools. PREP provides research training, community service, professional development activities to improve written and verbal communication skills, and GRE or MCAT preparation, depending on the program. Additionally, tuition, books, health/medical benefits, and a monthly stipend is provided by the program.

How serious is the spread of the Zika Virus in Florida?



Florida health officials concluded that a small area of Miami-Dade County is likely experiencing Zika virus transmission due to local mosquitoes. The conclusion is based on a preliminary investigation into four recent cases of Zika virus that do not appear linked to travel. “All the evidence we have seen indicates that this is mosquito-borne transmission that occurred several

weeks ago in several blocks in Miami,” Tom Frieden, director of the Centers for Disease Control and Prevention said in a statement. “We continue to recommend that everyone in areas where *Aedes aegypti* mosquitoes are present—and especially pregnant women—take steps to avoid mosquito bites.”

While no mosquitoes in the area have tested positive for the virus, the Florida Health Department released the neighborhood where the four cases are concentrated. Gov. Rick Scott’s office said this is the only area in the state where disease detectives are checking for local transmission. It is the hopes of CDC that infected mosquitoes will be destroyed before a major epidemic is caused by the spread and transmission of Zika across the US. The CDC has issued an alert for travel to areas where Zika virus is spreading. Travelers who are pregnant or considering pregnancy should consult a doctor. For more information, visit www.cdc.gov/zika.

What we know about Zika

- No vaccine exists to prevent Zika. Prevent Zika by [avoiding mosquito bites](http://www.cdc.gov/zika/prevention/prevent-mosquito-bites.html)(<http://www.cdc.gov/zika/prevention/prevent-mosquito-bites.html>).
- Mosquitoes that spread Zika virus bite mostly during the daytime.
- Mosquitoes that spread Zika virus also spread dengue and chikungunya viruses.
- Zika can be passed through sex from a person who has Zika to his or her sex partners. Condoms (and other barriers to protect against infection) can reduce the chance of getting Zika from sex.



2015 - 2016

FSU-RISE SCHOLAR AWARDS

Marissa Baccas

Shaaron Ochoa-Ríos - SCHOLARS OF THE YEAR

For outstanding scholarship and program participation

Marissa Baccas - HIGHEST GPA AWARD

For earning the highest GPA of 3.86

Brandon Murphy - DIRECTOR'S AWARD

For exemplifying outstanding attitude, motivation and high spirit

Fall 2015 Annual Biomedical Research Conference for Minority Students

The Annual Biomedical Research Conference for Minority Students (ABRCMS) has become the premier venue for students in the biomedical or behavioral sciences, including mathematics, to network with and learn from the best pioneers, thinkers and practitioners in the sciences. Seventeen (17) Fayetteville State University Research Initiative for Scientific Enhancement (FSU-RISE) scholars and one (1) North Carolina Louis Stokes Alliance for Minority Participation (NC-LSAMP) scholar attended the Annual Biomedical Research Conference for Minority Students (ABRCMS) in Seattle, Washington on November 11-14, 2015. Thirteen (13) of these students presented their intramural and extramural research projects in the conference poster presentation competition: including Algenis DeJesus, Andria Bell, Davesha Worrell, Shaaron Ochoa-Rios, Christina Young, Gerry Woodland, Marissa Baccas, Christina DeJean, Michael Chery, Heather Larson, Rarnice Johnson, Robin Brice and Kimberly West.

Now in its sixteenth year, ABRCMS is one of the largest, professional conferences for underrepresented minority students, military veterans, and persons with disabilities to pursue advanced training in science, technology, engineering and mathematics (STEM). We were very excited to have another winner this year, Marissa Baccas (see below). ABRCMS attracts approximately 4,050 individuals, including 2,100 undergraduate and postbaccalaureate students, 450 graduate students and postdoctoral scientists and 1,500 faculty, program directors and administrators.

Students come from over 350 U.S. colleges and universities. All are pursuing advanced training in science, technology, engineering and mathematics (STEM), and many have conducted independent research. The conference is designed to encourage underrepresented minority students to pursue advanced training in STEM and provide faculty mentors and advisors with resources for facilitating students' success. More than 650 representatives from graduate programs at US colleges and universities as well as scientists from government agencies, foundations, and professional scientific societies join ABRCMS in the exhibitors program to share information about graduate school and summer internship opportunities. These representatives present research opportunities, funding sources, and professional networks.



OUR WINNING STREAK CONTINUES AT **2015 Annual Biomedical Research Conference for Minority Students (ABRCMS)**



Marissa Baccas

Marissa Baccas, a rising junior biology major at Fayetteville State University, felt confident with her presentation since she knew her information and she had plenty of practice. However, the big question remained in her mind if she could bring home a win in the annual conference presentation competition at the Annual Biomedical Research Conference for Minority Students (ABRCMS) in Seattle, Washington, November 12-14, 2015. Names of winners from the Biochemistry category were the first to be called out of 14 categories. Marissa was one the names called! Marissa stated she was overjoyed by her achievement and she is also very proud to help carry the legacy of conference presentation winners for the RISE program and FSU. Marissa received a cash prize and a free full year membership into the Ameri-

can Society for Biochemistry. Marissa is a FSU Research Initiative for Scientific Enhancement (FSU-RISE) scholar, who participates in faculty-mentored research in the laboratory of Dr. Subir Nagdas. Her poster presentation at ABRCMS was entitled, "Fate and Expression of Peroxiredoxin-5 during Capacitation and the Acrosome Reaction of Bovine Sperm." Marissa was among 11 FSU-RISE scholars who presented their research work out of a total of 17 scholars who attended the conference. More than 3,600 students, faculty, administrators and 350 exhibit booths attended ABRCMS this year with more than 2,035 research presentations in 20 areas of biomedical and behavioral research. Since 2002, FSU-RISE scholars brought home 12 conference presentation awards.

2016 Biomedical Science Summer Camp

“Exploring Cellular Pathophysiology”

Twenty-two (22) rising high school freshmen through rising seniors participated in the FSU Biomedical Science Summer Camp (FSU-BSSC) from June 12-17. The goal of the one-week, residential math and science enrichment program is to prepare and increase students' interest in post-secondary education in science technology engineering, and mathematics (STEM). Campers engaged in intensive, laboratory-based studies in the biomedical sciences in which they learned to apply the Scientific Method and critical thinking skills to obtain laboratory results. Students also participated in seminars and workshops to broaden their understanding of health

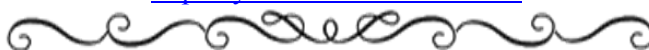
disparities and the critical need for more underrepresented minorities in biomedical research and health careers. Additionally, students attended a field trip to a biomedical research facility and the Industries for the Blind in Winston-Salem North Carolina. Finally, students took a comprehensive examination and made final group presentations on their science laboratory projects during the Closing and Awards Ceremony on the last day of the program. Outstanding performing students received awards, while all participants received certificates. Below are videos of the 2016 BSSC:

https://youtu.be/105P_iq1gcQ

<https://youtu.be/XPfDuaa1h4M>



Dr. James E. Raynor, Jr. assists BSSC students with preparing a wet mounts



Brain Teaser: What is the name of protein complexes, found inside all eukaryotes and archaea, and in some bacteria, which functions to degrade unneeded or damaged proteins?

— — — T — — — — — M — — —



Leslie Moore, lab assistant, shows BSSC students how to inoculate bacteria on agar

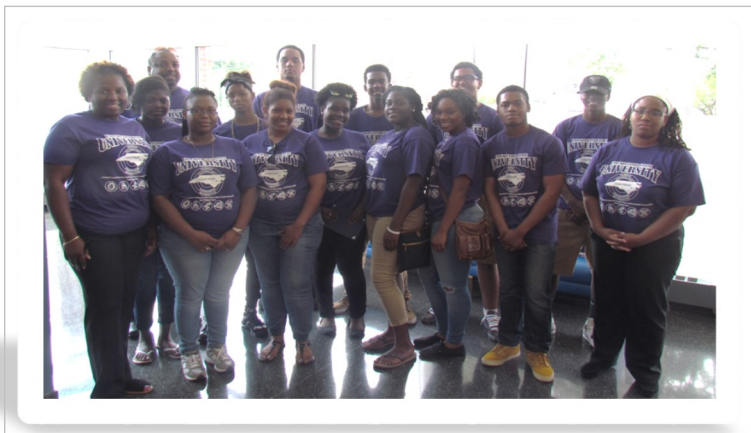


BioMedical Science Summer Campers visit the Industries for the Blind in Winston-Salem, North Carolina

2016 LEAP/RISE Pre-Freshman Summer Enrichment Program

Twelve Pre-freshman students participated in the *Learning and Engagement at an Accelerated Pace* (LEAP)/Research Initiative for Scientific Enhancement (RISE) Summer Enrichment Program at Fayetteville State University from July 10 - August 5, 2016. The 4-week, residential, bridge program was co-sponsored by FSU University College and the RISE program. The goal of the enrichment program is to prepare incoming freshmen for STEM majors. To this end, scholars participated in intensive academic enrichment activities in the classroom and hands-on laboratory activities in MATH 129 (Pre-Calculus), Principles of Biology (BIOL 150), CHEM 140 (General Chemistry), ENGL 110 (English Composition I) and UNIV 110 (University Studies). Scholars received academic support in all courses

in addition to presenting PowerPoint Presentations on what they learned in each course during weekly Enrichment Seminars on Fridays. The summer enrichment program has proven to provide pre-freshmen with the academic edge necessary to lead in the classroom academically during their freshman year, keep students on track in the STEM major, and facilitate early or on-time graduation. Each week, scholars were also engaged in professional development seminars and social activities to promote success in the STEM major and to help them become better student leaders. Finally, students received leadership training during a two-day Leadership Retreat in Myrtle Beach, South Carolina. The hallmark of the retreat was the Civic/Community Engagement & Service Learning project the scholars participated during the event. The students made flyers for upcoming events in September such as the Car Race Flier and Walk Flier. October events included the 3rd Annual "Homeless NOT Hopeless" Charity Walk. These events are held by the Sea Haven for Youth, Transitional Living Program and Street Outreach Center, Project Lighthouse 305-C Hwy 15, Hewitt Plaza, Myrtle Beach, South Carolina 29577. The culmination of the LEAP/RISE SEP is the Closing and Awards Ceremony in which scholars present what they have learned over the summer to faculty, students, family and friends. Scholars are also recognized for their program participation and outstanding achievements.



FSU-RISE FACULTY RESEARCH MENTORS & WORKSHOP INSTRUCTORS

We would like to thank our research mentors for giving RISE students the opportunity to train and gain basic research experiences that prepares them for extramural summer research experiences. In many cases, RISE scholars have opportunities to co-author research publications with their mentors. Additionally, RISE mentors are committed coaches who direct the

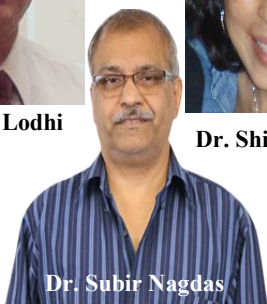
pathways of our students towards Ph.D. degrees. Mentors make a significant connection with students, inspiring them to work beyond the barriers to pursue and succeed in their endeavors. We cannot thank our mentors enough for their unwavering dedication and sacrifices. We appreciate the below 2015-16 research mentors and workshop instructors:



Dr. Khalil Lodhi



Dr. Shirley Chao



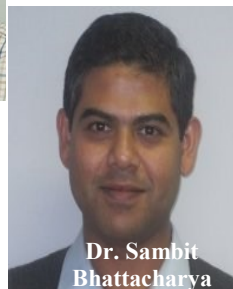
Dr. Subir Nagdas



Dr. Perry Gillespie



Dr. Zhiping Luo



Dr. Sambit
Bhattacharya



Dr. Kristen
Delaney-Nguyen

Publications

Recent **RISE** Scholar's Publications

Jairo Castillo-Chará, Tecarla S. Ikard*, Calculation of Molecular Properties of the $[Au_2-C60-Au_2]-n(n = 0, 1, 2, 3)$ Model Complexes, *J. Und. Chem. Res.*, 15(1), 1-5 (2016).

Jairo Castillo-Chará, Tecarla S. Ikard*, Calculation of Vertical Electron Affinities and Vertical Detachment Energies for the $[Au_2-C60-Au_2]-n(n = 0, 1, 2, 3)$ Complexes using the B3LYP/LANL2DZ Method, *J. Und. Chem. Res.*, 15(1), 6-11 (2016).

Chih Yuan Chen, Chien Wan Hun, Shih-Fan Chen, Chien Chon Chen, Jin Shyong Lin, Shardai S. Johnson, Niyoyankunze Noel*, Niyogushima Juliely*, and Zhiping Luo. Fabrication of Nanoscale Cesium Iodide (CsI) Scintillators for High-Energy Radiation Detection. *Reviews in Nanoscience and Nanotechnology*. Vol. 4, pp. 1-24, 2015.

Subir K Nagdas, Linda Smith, Allen Mcnamara, Luisa Hernandez-Encarnacion*, Ilza Medina-Ortiz*. Identification and Characterization of a Bovine Sperm Acrosomal Matrix Protein and its Mechanism of Interaction with Acrosomal Hydrolases. *Molecular and Cellular Biochemistry*.

Bin Qiu, Cuixia Xu, Dezhi Sun, Huan Yi, Jiang Guo, Xi Zhang, Honglin Qu, Miguel Guerrero, Xuefeng Wang, Niyoyankunze Noel*, Zhiping Luo, Zhanhu Guo, and Suying Wei. Polyaniline Coated Ethyl Cellulose with Improved Hexavalent Chromium Removal. [dx.doi.org/10.1021/sc5003209](https://doi.org/10.1021/sc5003209) | *ACS Sustainable Chem. Eng.* 2014, 2, 2070-2080.

Pankaj Chaturvedi, Anuradha Kalani, Ilza Medina*, Anastasia Familtseva, Suresh C Tyagi. Cardiosome Mediated Regulation of MMP9 in Diabetic Heart: Role of Mir29b and Mir455 in Exercise. *J. Cell. Mol. Med.* Vol XX, No X, 2015 pp. 1-9.

Dipendu Saha, Tara Moken, Jihua Chen, Dale K. Hensley, Kristen Delaney, Marcus A. Hunt, Karl Nelson, Amada Spurri, Lauren Benham, Robin Brice* and Martina Azoro. Micro-/mesoporous Carbons for Controlled Release of Antipyrine and Indomethacin. DOI: 10.1039/c5ra00251f. *RSC Adv.*, 2015, 5, 23699-23707.

Nagdas Subir, West Kimberly, Carr Ky'ara* and Raychoudhury. Biochemical Characterization of Two Major Proteins of the Hamster Sperm Acrosomal Matrix. *International Journal of Biochemistry & Physiology* 2016, 1(1): 000101.

*Names of FSU-RISE scholars are underlined

Unscramble the name of a major upcoming event at FSU!

U L A N Z I T S E N S Q E C I N E



Who's Who in the FSU-RISE Office

Dr. James E. Raynor, Jr., Director
Ms. Cathy Baldwin, Coordinator
Mrs. Amita Naik, Lab Manager

For Applications, visit us on the Web!
<http://www.uncfsu.edu/fsurise/>

