



OFFICE OF TRANSFORMATIONAL STUDENT EXPERIENCES (OTSE)

12th UNDERGRADUATE RESEARCH SYMPOSIUM

APRIL 19, 2024

Academic Excellence Through Undergraduate Research

VENUE

Billy C. Black Building,
(BCB)
ASU East Campus



KEYNOTE SPEAKER
MS. ANDREA TOWNS-BYRD,
LEAD CHEMIST- UNITED
STATES DEPARTMENT OF
AGRICULTURE (USDA)

SPONSORED BY
THE OFFICE OF TITTLE III

ALBANY STATE UNIVERSITY UNDERGRADUATE RESEARCH SYMPOSIUM SPONSORS

OFFICE OF INSTITUTIONAL ADVANCEMENT TITLE III PROGRAM

The mission of the Title III program is to facilitate and make available federally funded resources in order to strengthen the academic quality, student services and outcomes, institutional management and fiscal stability of the University. The ASU Title III Program aims to strengthen the infrastructure of the University and to enhance the delivery of academic programs while developing students from freshmen to senior year and beyond graduation by preparing students for career opportunities.

OFFICE OF ACADEMIC AFFAIRS

The Office of Academic Affairs at Albany State University upholds the standards and policies established by the faculty and administration while overseeing all aspects of the University curriculum and encouraging students to become involved global citizens. Also, Academic Affairs provides support to assist administrators, staff, faculty, and students to realize their academic goals in pursuit of high academic achievement. The Office of Academic Affairs at Albany State University oversees services related to the teaching, learning, and research activities on campus.

OFFICE OF TRANSFORMATIONAL STUDENT EXPERIENCES (OTSE)

The mission of the Office of Transformational Student Experiences (OTSE) is to foster transformational and excellent academic quality for student success by engaging them in High Impact Practices (HIPs), such as undergraduate research, global learning via curriculum internationalization, and scholarly fellowships.

OFFICE OF RESEARCH AND SPONSORED PROGRAMS (ORSP)

The mission of the Office of Research and Sponsored Programs is to provide support for the Albany State University community (including faculty, staff, and students) in the acquisition and successful administration of externally funded projects for research, teaching, and service.

DIVISION OF STUDENT AFFAIRS WITH RESIDENCE HALL

COLLEGE OF ARTS AND SCIENCES

COLLEGE OF BUSINESS, EDUCATION AND PROFESSIONAL STUDIES

DARTON COLLEGE OF HEALTH PROFESSIONS

PROGRAM AGENDA

Friday, April 19, 2024

ASU-EAST CAMPUS:

Billy C. Black

Auditorium Billy C.

Black Atrium

Billy C. Black Building 141, 143, 187

Dr. Anta'Sha Jones and Dr. N. Nora Osakwe, Presiding Officers

TIME	EVENT
8:30AM–9:00AM	Symposium Sign-In
9:00AM– 9:15AM	WELCOME & ACKNOWLEDGMENTS ASU Administrators: Dr. Marion Fedrick, ASU President Dr. Rhonda Porter, Interim Provost Dr. Valerie Melton, V.P. Inst. Advancement. /Title III Dr. Melanie Hatch, Dean COAS Dr. Peter Ngwafu, Dean CBEP Dr. Sarah Brinson, Dean DCHP Dr. Nneka Nora Osakwe, Director OTSE
9:15AM– 9:20AM	INTRODUCTION OF KEYNOTE SPEAKER Ms. Skyler Armstead, <i>Dept. Of Natural Science- Senior Biology Major</i>
9:20AM–9:55AM	KEYNOTE ADDRESS Ms. Andrea Towns-Byrd, Lead Chemist <i>National Science Laboratories, USDA</i>
10:00AM–10:10AM	KEYNOTE SPEAKER/QUESTION & ANSWER
10:10AM–10:15 AM	LIFE-TIME ACHIEVEMENT AWARDS Dr. JoAnn McCrary, PhD INTERMISSION
10:15AM–12:15AM	ORAL PRESENTATIONS 141, 143, & 187
12:15PM– 1:15PM	LUNCH BREAK
1:15PM– 2:25PM	POSTER PRESENTATIONS Billy C. Black Atrium
2:25PM– 2:30PM	INTERMISSION
2:30PM– 3:15PM	FINAL JUDGING & TABULATION <i>Judging Committee</i>
3:15PM– 3:45PM	ANNOUNCEMENT OF PLACEMENT & ADJOURNMENT Billy C. Black Auditorium



Office of the President

504 College Drive • Albany, GA 31705 • Telephone Direct 229.500.3500 | Main 229.500.2000

Greetings,

I am honored to welcome you to the 12th Undergraduate Research Symposium at Albany State University. The symposium showcases the academic excellence at the University while playing a critical role in assuring that you are equipped with the tools for success.

Undergraduate research ensures that students develop their critical thinking skills and advance their academic knowledge throughout the research process. As we continue our strategic commitment to student access and success, the knowledge, skills, and tools acquired throughout this process prepare scholars for the world ahead upon matriculation.

I am proud of each of you for taking the bold steps that have led to today. I encourage each of you to continue to uphold your spirit for innovation in all that you do as the research you complete leaves a mark on the University and beyond.

Thank you for engaging in research this academic year and I wish you all an excellent symposium.

Yours for ASU,

Marion Ross Fedrick, Ed.D.
President



UNIVERSITY SYSTEM OF GEORGIA

Academic Affairs

Office of the Provost

April 16, 2024

Dear Esteemed Scholars, Faculty, Staff and Guests,

Welcome to the 12th Annual Undergraduate Research Symposium at Albany State University. It is with great pleasure and immense pride that I extend greetings to each of you as we celebrate "Academic Excellence through Undergraduate Research."

This symposium not only showcases the rigorous and innovative research conducted by our undergraduate students but also highlights the vital role that academic inquiry plays in higher education. As we gather here today, let us reflect on the dedication and hard work that each student presenter has invested in their projects. Your efforts demonstrate the very essence of academic excellence that Albany State University continuously strives to promote.

I wish to extend my heart felt congratulations to all the students who are presenting today. You are not only participants in this symposium but also the torchbearers of knowledge and innovation for future generations. Your research endeavors contribute significantly to the academic fabric of our university and to the broader field of knowledge.

Special recognition is also due to the faculty Inventors whose guidance and expertise have been invaluable. Your commitment to fostering a nurturing and intellectually stimulating environment is what enables our students to push the boundaries of discovery and scholarship.

Furthermore, I would like to express my profound appreciation to the Office of Transformational Student Experiences for organizing and hosting this significant event. Your dedication to enhancing student experiences and academic careers through such transformative opportunities is commendable. As we proceed with today's activities, I encourage everyone to engage fully, share ideas, and build connections that extend beyond this event, let us all embrace the spirit of inquiry and collaboration that this symposium embodies.

Once again, welcome to the 12th Annual Undergraduate Research Symposium. Together, let us celebrate the achievements of our students and the enriching mentorships provided by our faculty. Here's to another year of outstanding research and academic success at Albany State University!

Warm regards,

A handwritten signature in black ink that reads "Rhonda C. Porter".

Dr. Rhonda Porter
Provost & Vice President of Academic Affairs



DARTON COLLEGE OF HEALTH PROFESSIONS

Greetings,

Welcome to the Albany State University Undergraduate Research Symposium. It is with great pleasure and excitement that I welcome you today to celebrate this culmination of diligent scholarship and intellectual curiosity.

This symposium serves as a testament to the unwavering commitment of our undergraduate students to push the boundaries of knowledge and innovation. Each research project presented here represents countless hours of dedication, critical thinking, and academic rigor.

As the Dean of the Darton College of Health Professions, I am immensely proud of the remarkable achievements of our students. Their contributions to their respective fields not only showcase their individual talents but also reflect the academic excellence that is the hallmark of Albany State University.

Today, we gather to celebrate not only the culmination of months, or even years, of hard work but also the beginning of new intellectual journeys. The research presented here embodies the spirit of inquiry and discovery that lies at the heart of higher education.

I extend my heartfelt congratulations to all the participants, mentors, and supporters who have made this symposium possible. Your dedication to the pursuit of knowledge inspires us all.

As we embark on this journey of exploration and discovery together, let us embrace the challenges and opportunities that lie ahead. May this symposium serve as a platform for meaningful dialogue, collaboration, and innovation.

Once again, welcome to the Albany State University Undergraduate Research Symposium. I wish you all an enriching and enlightening experience."

Sincerely,

Sarah Brinson

Dr. Sarah G. Brinson
Dean - Darton College of Health Professions



COLLEGE OF BUSINESS, EDUCATION, & PROFESSIONAL STUDIES

Welcome to the 12th annual undergraduate research symposium! Today, we gather to celebrate the spirit of inquiry and discovery that lies at the heart of academia. Research is not merely about finding answers; it's about asking the right questions. It's about challenging the status quo, pushing the boundaries of knowledge, and making meaningful contributions to our understanding of the world. As we embark on this journey together, let us remember that research is not just the pursuit of scholars; it is the responsibility of every curious mind.

For ASU students, engaging in research is more than just a requirement; it is an opportunity to cultivate critical thinking skills, foster creativity, and develop a deeper understanding of their chosen fields. It empowers them to become active participants in shaping the future and addressing the complex challenges that lie ahead. Through research, they not only expand their intellectual horizons but also contribute to the collective pursuit of truth and innovation. Today, as we showcase the remarkable work of our undergraduate researchers, let us reaffirm our commitment to fostering a culture of curiosity, inquiry, and excellence. Together, let us inspire and be inspired by the transformative power of research. Welcome, and let the exploration begin!

On behalf of my college, I extend my appreciation to all the participants: the students, the faculty, staff, and guests for taking out time to be part of this great annual event.

Thank You.

Peter Ngwafu, PhD

Dean, College of Business, Education, & Professional Studies.



OFFICE OF TRANSFORMATIONAL STUDENT EXPERIENCES (OTSE)

April 19, 2024

Greetings,

I am excited to welcome everyone to Albany State University's 12th Undergraduate Research Symposium, which is the hallmark of academic excellence in all institutions of higher education. Undergraduate research is one of the high impact practices in education because of its experiential nature culminating in enhanced learners' soft skills, perseverance, creativity and intellectual independence. No doubt, students who engage in research endeavors succeed and graduate in record time. In this regard ASU, prioritizes the annual undergraduate research symposium, which provides students opportunity to engage in a-year long research and share the results of their experience with the University Community and beyond.

The 60 students who are presenting their result in this symposium started their research process in fall of 2023 with the articulation of their research ideas, topics, then reading and engaging in the research project with advisement from their faculty-research mentors. Today, we have the opportunity to listen these students, who will share their outcomes through oral presentations and poster sessions in order to demonstrate the skills and knowledge they gained from the research process. The climax of the symposium activities is collating results from the faculty reviewers and judges and announcing the award winners. Both participating and non-participating students are expected to gain from this exercise.

I extend my appreciation to all the students, faculty mentors, and departments who have collaborated to make the symposium a success. Your support has made it possible to actualize ASU's goal of enhancing students' research skills and knowledge for successful academic engagement and graduation.

I equally acknowledge and appreciate the Keynote Speaker, Ms. Andrea Towns-Byrd for her presentation. Her presence as an alumna of ASU is a motivation to the students. To all our funders, supporter, volunteers, reviewers, judges, students, staff, and faculty, I thank you all for your efforts.

Sincerely,

Dr. Nneka Nora Osakwe, Professor of English

Executive Director, Office of Transformational Student Experiences (OTSE)

Keynote Speaker

Ms. Andrea Towns-Byrd, Lead Chemist, USDA



Ms. Andrea Towns-Byrd serves as a chemist and former oversight chemist for the United States Department of Agriculture's National Science Laboratories (NSL) in the Agricultural Marketing Services' Science and Technology division - Blakely, Georgia site. The National Science Laboratory network provides chemical, microbiological, and bio-molecular analyses on agricultural commodities intended to enter and be marketed in the domestic and international supply chain for food and other products based on U.S. regulations supported by federal law.

As one of the lead chemists and only female chemist at her lab site, Ms. Towns-Byrd specializes in the chemical analysis of domestic and imported agricultural products, pharmaceutical drugs, and other specialty agricultural products for naturally occurring toxins. In her role as an oversight chemist, Ms. Towns-Byrd provided federal oversight for private industry that utilized on site laboratories for the production and testing of agricultural products intended to be sold and marketed domestically or internationally to ensure USDA regulations were adhered to. She also assists the Quality Management System team, where she is one of the few people in charge of maintaining quality assurance and control within the NSL Blakely laboratory. She helps to develop and validate analytical methods used throughout the laboratory and supports as well as participates in the laboratory proficiency program through the American Oil Chemists' Society (AOCS). She does community education and outreach for the Lab through entities that include the Georgia Department of Education's STEAM program, Science Atlanta (Atlanta Science Festival), and local schools in southwest Georgia.

Ms. Towns-Byrd is a 2010 graduate and proud alumna of Albany State University, where she earned her Bachelor of Science degree in Forensic Science with a minor in Chemistry.

ORAL PRESENTATIONS
ROOM 141
College of Arts and Sciences

TIME	STUDENT & FACULTY RESEARCHERS/MENTORS	TITLE
10:15 AM–10:30 AM	Sumana Panuganti Sharif Ali Jabrell McPherson Shekniah Newby Ky' Juan Wright Piasha Roberts Dr. Robert S. Owor, Mentor/Researcher	Cultivating Life on Mars and Beyond
10:30 AM–10:45 AM	Shamar Swift Anthony Strachan Stephen Parker Professor Amiralca Johnson Mentor/Researcher	Crater Detection on Mars
10:45 AM–11:00 AM	Bailey Gray Dr. Alex Alochukwu Mentor/Researcher	Mathematical Models for Predicting the Freezing Point of Alkanes: Applications of Chemical Graph Theory
11:00 AM–11:15 AM	Ella Okoro Professor Jayanti R. Saha Mentor/Researcher	Experimental Investigation of Simple Harmonic Motion of a Pendulum
11:15 AM–11:30 AM	Emari Knowles Dr. Alex Alochukwu Researcher/ Mentor	A Comparative study of crime rates across major cities of South Africa and the United States
11:30 AM–11:45 AM	Morgan Quanevaya Dr. Liqui Zheng Researcher/Mentor	Comparative study on hole transporting layers in perovskite solar cells by numerical simulation
11:45 AM–12:00 PM	General Contributions	Questions & Answers

ORAL PRESENTATIONS
ROOM 143
College of Arts and Sciences

TIME	STUDENT & FACULTY RESEARCHER/MENTOR	TITLE
10:15 AM–10:30 AM	Ashten Little Torrance McConico Dr. Arun Saha Researcher/ Mentor	Experimental Investigation of Band Stop Material
10:30 AM–10:45 AM	Lauryn Davis Professor Abdelkrim Lagnaoui Researcher/ Mentor	Continued Fractions and Applications
10:45 AM–11:00 AM	Ajah Tolbert Dr. ND Niamul Kabir Researcher/ Mentor	Inactivation of Salmonella Serovars with Synergistic Effect of Elevated Hydrostatic Pressure and Caprylic Acid in Apple Juice.
11:00 AM–11:15 AM	Skyler A. Armstead Dr. Balasubramani S. Paranthaman & Dr. Yong Jin Lee Researchers/Mentors	Molecular Identification of Fungal Endophytes from Some Common Edible Fruits
11:15 AM–11:30 AM	Collin Phillips Dr. Kabir MD Niamul Researcher/ Mentor	Synergetic Effects of Mild Heat and Elevated Hydrostatic Pressure for Inactivation of <i>Listeria Monocytogenes</i> in Pasteurized Milk
11:30 AM–11:45 AM	Jerrianna L. Tate Balasubramani S Paranthaman, Researcher/ Mentor	Evaluating the Preservative Potential of Selected Organic Molecules in Fresh Fruit
11:45 AM–12:00 AM	General Contributions	Question & Answers

ORAL PRESENTATIONS

ROOM 187

*College of Business, Education and Professional Studies
&
Darton College of Health Professionals*

TIME	STUDENT & FACULTY RESEARCHER/MENTOR	TITLE
10:15 AM–10:30 AM	Shelly C. Woods Dr. Pamela Pittman Brown Researcher/ Mentor	Health Locus of Control and Proactive Lifestyle Changes
10:30 AM–10:45 AM	Emmanuel Faola Dr. Edgar Patani Researcher/ Mentor	Behavioral Economics Influence on Society an Income Management and Consumer Perspective
10:45 AM–11:00 AM	Savanna Gipson Dr. Kizzie Donaldson-Richard Researcher/ Mentor	The Impact of The Covid-19 Pandemic Quarantine on College Students
11:00 AM–11:15 AM	Ayanna Mitchell Professor Ann Gibbs & Professor Valarie Lee Researchers/ Mentors	HBCU Student Experiences in an Exercise: A Medicine Program
11:15 AM–11:30 AM	Kayla Johnson Dr. Ameachi Nwaokoro Researcher/ Mentor	Evaluating Financial Market by the Rate Sensitivity of AAA Bonds and Treasury Bills
11:30 AM–11:45 PM	Selamawit Geddes Professor Jasmine Smith Researcher/ Mentor	Identity and Self-Actualization: A mixed-method study at Albany State University
11:45 AM–12:00 PM	Chelsea Doswell Dr. Patrick Whitehead Researcher/ Mentor	The Relationship Between Student Athletics and Mental Health

POSTER PRESENTATIONS
COLLEGE OF ARTS & SCIENCES

PRESENTER(S)	TITLE
Sumana Panuganti Sharif Ali Jabrell McPherson Shekniah Newby Ky' Juan Wright Piasha Roberts	Cultivating Life on Mars and Beyond
Shamar Swift Anthony Strachan Stephen Parker	Crater Detection on Mars
Bailey Gray	Mathematical Models for Predicting the Freezing Point of Alkanes Applications of Chemical Graph Theory
Ella Okoro	Experimental Investigation of Simple Harmonic Motion of a Pendulum
Emari Knowles	A Comparative study of crime rates across major cities of South Africa and the United States
Morgan Quanevaya	Comparative study on hole transporting layers in perovskite solar cells by numerical simulation
Jerrianna L. Tate,	Evaluating the Preservative Potential of Selected Organic Molecules in Fresh Fruit
Ashten Little Torrance McConico	Experimental Investigation of Band Stop Material
Lauryn Davis	Continued Fractions and Applications
Ajah Tolbert	Inactivation of Salmonella Serovars with Synergistic Effect of Elevated Hydrostatic Pressure and Caprylic Acid in Apple Juice.
Skyler A. Armstead	Molecular Identification of Fungal Endophytes from Some Common Edible Fruits
Collin Phillips	Synergetic Effects of Mild Heat and Elevated Hydrostatic Pressure for Inactivation of Listeria Monocytogenes in Pasteurized Milk

Mya Harris Tra'mya Outley Brelyn Martin Tereza Thomas	The Impact of Temperature on a Super Absorbent Polymer
Aryanna Rivera Leah Cowen Christopher Carter	Antacid Efficacy Unveiled: Exploring Ingredients, Dosages, and Reaction Dynamics in Acid Neutralization
Kareena Karim-Manning Moriah Fleming Aryona Harts Sarah Holley	Organic vs Non-organic: Which has the most vitamin C?
Laila Dowdy Anielle Forrest Madyson Robinson Aniya Love	The Impact of pH level on a Super Absorbent Polymer
Jazmine Trowers Trinity Davis Heaven Hill Alaja Gillings	Pigmentation in Blue Sports Drinks

POSTER PRESENTATIONS

College of Business, Education and Professional Studies & Darton College of Health Professionals

PRESENTER(S)	TITLE
Shelly C. Woods	Health Locus of Control and Proactive Lifestyle Changes
Emmanuel Faola	Behavioral Economics Influence on Society an Income Management and Consumer Perspective
Ayanna Mitchell	HBCU Student Experiences in an Exercise: A Medicine Program

Kayla Johnson	Evaluating Financial Market by the Rate Sensitivity of AAA Bonds and Treasury Bills
Selamawit Geddes	Identity and Self-Actualization: A mixed-method study at Albany State University
Chelsea Doswell	The Relationship Between Student Athletics and Mental Health

Understanding Global Public Health Issues through Research

Dr. Anta'Sha Jones

Faculty Researcher/Mentor & Course Internationalization Fellow

STUDENT RESEARCHERS	TITLE & GLOBAL RESEARCH ISSUES
Taliyah Thomas & Aaron Francis	Cholera Crisis in Somalia Issue: Raising Awareness about Cholera in Somalia.
Jhasmine Billingslea & Caleb Dorsey	Cardiovascular Disease in Hungary Raising awareness about Cardiovascular Disease in Hungary for promoting Public Health.
Audriana Evans & Charity Madison	Malaria in Cameroon Raising awareness about Malaria in Cameroon to Implement Effective Prevention.

Jalesia Flowers-Steele & Andrew Saunders	Malaria in Nigeria Raising awareness on the growing occurrences of Malaria in Nigeria.
Eriel Walker & Chicosa Baltimore	Skin Cancer in Singapore Addressing Skin Care in Singapore to Mitigate Its Impact.
Aryanna Rivera & Nizjey Corker	Effects of Malnutrition in South Sudan Raising awareness on Malnutrition and its effects on South Sudan's Population.

Research Student-Participants of Internationalized Principles of Biology II (Biology 2108K) Course

7. HIV a Public Health Issue in Zimbabwe: **Zhanae Jenkins and William Ingram**
8. Cancer a Public Health Issue in South Korea : **Blessing Pierre and Joshua Clemons**
9. COVID-19 a Public Health Issue in Afghanistan: **Chalycea Graham and Sh'myiah Davis**
10. Chronic Heart Failure a Public Health Issue in Japan: **Tahir Chandler and Avery Dukes**
11. Mental Health a Public Health Issue in Columbia: **Katrina Randall and Ajanay Conner**
12. Cervical Cancer a Public Health Issue in Costal Rica: **Karmen Boatwright & Ryleigh Vaugh**
13. Limited Health Care Services a Public Health Issue in Haiti: **Sydney Laster & Jana Myric**
14. Water Sanitation a Public Health Issue in Ethiopia: **Cierrah Garrison & Tashard Johnson**
15. HIV a Public Health Issue in Indonesia: **Jayla Mizelle and Trinity Davis**
16. Cholera a Public Health Issue in Haiti: **Ashyanni Talabes & Mya Harris**
17. Chronic Obstructive Pulmonary Disease a Public Health Issue in Algeria: **Kninedrea Carswell and Amorie Washington**
18. Tuberculosis a Public Health Issue in India: **Tra'mya Outley and Alaja Gillings**
19. Water Sanitation a Public Health Issue in South Sudan: **Nijzey Corker and Aryana Rivera**
20. Mental Health a Public Health Issue in Japan: **Tereza Thomas and Lyonel Dabresil**

**STEM Initiative Grant funded by University System of Georgia.
Dr. Seyed Roosta, PI and Dr. Lee Co-PI.**

Title: Molecular Identification of Fungal Endophytes from Some Common Edible Fruits

Skyler A Armstead, Student Researcher
Dr. Balasubramani S Paranthaman and Dr. Yong Jin Lee, Faculty researchers/Mentors

Department of Natural Sciences

Title: Evaluating the Preservative Potential of Selected Organic Molecules in Fresh Fruits

Jerrianna L. Tate, Student Researcher
Dr. Balasubramani S Paranthaman, Faculty Researcher/Mentor
Department of Natural Sciences

**NSF Grant by Dr. Lyons-PI, Dr. Jones and Dr. Wrensford-CO-PIs
Technically Speaking Research Project Presentations**

Mya Harris

Tra'mya Outley

Brelyn Martin

Tereza Thomas

Title: The Impact of Temperature on a Super Absorbent Polymer

Aryanna Rivera

Leah Cowen

Christopher Carter

Title: Antacid Efficacy Unveiled: Exploring Ingredients, Dosages, and Reaction Dynamics in Acid Neutralization

Kareena Karim-Manning

Moriah Fleming

Aryona Harts

Sarah Holley

Title: Organic vs Non-organic: Which has the most vitamin C?

Laila Dowdy

Anielle Forrest

Madyson Robinson

Aniya Love

Title: The Impact of pH level on a Super Absorbent Polymer

Jazmine Trowers

Trinity Davis

Heaven Hill

Alaja Gillings

Title: Pigmentation in Blue Sports Drinks

**NASA MUREP II. Dr. Robert Steven Owor, PI
(\$500,000 grant for 5 years).**

**Purpose: To Expand the Engagement of Students in STEM from Grade 5 to grade 12 and
Among Undergraduates**

Student-Researchers

Sumana Panuganti

Sharif Ali

Jabrell McPherson

Shekniah Newby

Ky' Juan Wright

Piasha Roberts **Title: Cultivating Life on Mars and Beyond**

Dr. Robert S. Owor, Mentor/Researcher

Shamar Swift

Anthony Strachan

Stephen Parker **Title: Crater Detection on Mars**

Professor Amiralca Johnson

Mentor/Researcher

Student Research-Presenters

College of Arts and Sciences

Bailey Gray
Dr. Alex Alochukwu (Research Mentor)



I am Bailey Alexander Gray, a sophomore chemistry major and forensic science minor, and I will become a forensic pathologist.

Title

Mathematical Models for Predicting the Freezing Point of Alkanes : Applications of Chemical Graph Theory.

Abstract

The physical properties of chemical compounds are highly correlated to their geometric structure. Using indices that can accurately depict the shape of the molecules allows one to model these physical properties with surprising precision. Several graph topological indices have been used to predict the boiling and melting points of alkanes since they can be modelled as simple graphs. However, exploring such indices for compounds with multiple bonds poses challenges. In this study, we propose a graph-theoretical model for predicting the boiling point of alkenes and alkadienes. Our models are based on the number of carbon atoms, bond types, methyl and ethyl indices, the Randic and Wiener indices, and their weighted versions. Through regression analysis, we achieve high predictive accuracy with some of the models for the boiling points of alkenes and alkadienes, yielding coefficients of determination, $R^2 = 0.9847$ and 0.9725 respectively. Our model demonstrates favorable comparison with experimental data from the literature, offering significant implications for estimating boiling points of hydrocarbons with multiple bonds in the absence of experimental data.

Ella Okoro
Dr. Jayanti R. Saha (Research Mentor)



Ella Okoro, a rising Senior majoring in Computer Science, is making waves in the world of research alongside Professor Jayanti Saha. From a young age, Ella's fascination with technology ignited a journey marked by academic excellence and a passion for innovation. At Albany State University, Ella's exceptional academic record and innate curiosity propelled her to the forefront of her field.

Title: Experimental Investigation of Simple Harmonic Motion of a Pendulum

Abstract

Simple Harmonic Motion (SHM) is a very common topic in mathematics, physics and engineering. Any periodic motion can be classified as SHM and numerous studies have been conducted on this motion in regard to frequency, angular frequency, period, and energy [1-3]. In this project, a focus will be given on pendulum's linear velocity and angular velocity from a different point of view. At first, pendulum's displacement will be measured experimentally. Then displacement data will be used (a) to estimate linear velocity and linear acceleration with the help of calculus

**Ashten Little and Torrance McConico
Dr. Arun Saha (Research Mentor)**

My name is Ashten Little, and I am a freshman here at Albany State University. My Major here is Pre-Engineering. I was born in Columbus, Ga and was raised for Majority of my life in Atlanta, Ga or near the area. I have a lot of goals in life but in full honesty, I want a profession that I can find Joy within myself while being financially stable. Right now, my main priority is to graduate with an Engineering degree.



**Title: Experimental Investigation of Band Stop Material
Abstract 1**

In previous research, it was shown by simulation that a periodic array of thin metal strips printed on a dielectric substrate could suppress microwave signal of a particular band and the center frequency of that band was determined by inductance (L) – capacitance (C) resonant condition where inductance (L) was created by the length and width of metal strips and capacitance (C) was created by the gap between the strips [1-2]. In this project, experimental investigation was carried out to verify and validate the simulation result obtained previously

Abstract 2

Coupling coefficient between two resonators are considered as the key parameter to design a band pass filter. In this research, two microstrip resonators of same size were modeled in commercial 3D electromagnetic simulation software HFSS (High Frequency Structure Simulation) and determined the coupling coefficients between the two resonators. Simulation results showed that coupling coefficient increased when separation between resonators decreased and vice versa.

**Morgan Quanevaya
Dr. Liqui Zheng (Research Mentor)**

Title

Comparative study on hole transporting layers in perovskite solar cells by numerical simulation

Abstract

Perovskite solar cells could adopt various configurations and each of them achieved successes. Thus, many unanswered questions remain including: 1) Are there significant differences in the working principles among various configurations? 2) What are the physical electronic mechanisms that govern carrier separation, transport, extraction, and their recombination? In order to answer those questions, an investigation of hole transporting layers of carbon-based materials on the performance of organic-inorganic hybrid perovskite solar cells was systemically conducted by using the software called SCAPS, which is a one-dimensional solar cell simulation program. It was found that the thickness of graphene /carbon nanotubes as the hole transporting layer plays a critical role in the performance of solar devices. The thickness could regulate the hole transporting properties to easily extract carriers into the external circuit for better efficiency. The findings from this project would allow for better understanding of operating principle of perovskite solar cells, which ultimately guide on the rational design of solar cells to optimize the device practical performance.

Emari Knowles
Dr. Alex Alochukwu (Research Mentor)



I am a first-generation college student as well as first generation American pursuing a degree in computer science at Albany State University. My journey is marked by determination and resilience as I navigate through my academics. Eager to learn, I am committed to breaking barriers and forging a path that not only aligns with my passion for computer science but one that also inspires others within my community. I am a Sophomore My major is computer science and my career is in the confines of cybersecurity.

Title: A Comparative study of crime rates across major cities of South Africa and the United States

Abstract

Several studies have been published in recent years that show a rapid increase in crime in countries with a large number of tourists. Criminal behavior is defined and measured differently in each society, which makes comparative studies difficult. However, general conclusions can be drawn from the available data. This study compares crime patterns in major cities in South Africa (Johannesburg, Cape Town, and Durban) and the United States (New York, Los Angeles, and Atlanta) from 2005 to 2015, with the goal of identifying cross-national differences and similarities in crime trends and their implications. The study categorizes crimes into contact crimes (murder, assault), property-related crimes (burglary at residential premises, theft), and vehicle-related crimes, using data sourced from South African Police records and U.S. crime statistics. Through quantitative analysis of reported crimes, the study reveals distinct variations in crime rates and types between the cities, influenced by regional socio-economic conditions. The findings suggest that, despite varying urban dynamics, certain crime types exhibit surprisingly similar patterns across continents, underscoring the global nature of urban crime challenges and highlighting areas for targeted international policy interventions.

Shamar Swift
Dr. Amiralca Johnson (Research Mentor)

My name is Shamar Antwaun Swift I am a Computer Science major with a concentration in information assurance. My career goals are to use my degree to make sure I'm doing a fun job that I will make a difference. Doesn't matter what I'm doing as long as I'm having fun and using my computer science degree to make an impact in the tech world.

Title

Crater Detection on Mars

Abstract

Crater detection is a key aspect of conducting successful expeditions on Mars, especially in the era of exploration vehicles with the potential to navigate autonomously. Rovers such as Perseverance are increasingly capable of charting their own safe paths through unknown terrain using complex imaging systems while relying less on preset routes created by human planners on Earth. This creates a window for making discoveries that were previously infeasible; however, it also draws attention to the grave importance of effective crater detection systems. Failure to sense craters accurately could prove costly in terms of lost time, data, and/or equipment, but conversely, efficient and precise recognition could allow rovers to gather valuable insight regarding the topology and composition of a planetary body. Furthermore, craters can potentially be used as landmarks for a rover's localization capabilities. In previous years, our team worked on the initial development and subsequent iterations of a convolutional neural network capable of recognizing craters that was implemented with IBM Watson and TensorFlow. Our past innovations led to the creation of a functional model with limited capacity to categorize craters beyond their initial detection. As such, our current objective is to extend and advance this crater detection project with a focus on training our model to accurately measure parameters such as radius, depth, circumference, and rock composition utilizing LiDAR technology.

Anthony Strachan and Stephen Parker
Dr. Amiralca Johnson (Research Mentor)

Title

Crater Detection on Mars

Abstract

Our project aims to utilize AI to enhance Mars rover crater detection and classification, providing efficient insights into Martian geology and aiding in the selection of landing sites and the identification of potential signs of life. Leveraging remote sensing data and image processing techniques, coupled with AI and ML algorithms, we seek to detect and classify Martian craters based on characteristic patterns. Spectrometer analysis reveals Mars' past climatic conditions, volcanic history, and the presence of liquid water, while crater analysis offers insights into its geological layers. Additionally, AI-enabled creation of detailed 3D crater models improves rover crater detection and classification capabilities. This comprehensive approach demonstrates the potential of machine-learning algorithms to advance scientific research, exemplified by NASA's Jet Propulsion Lab's successful crater detection efforts.

**Sumana Panuganti, Sharif Ali, Jabrell McPherson,
Shekniah Newby, Ky' Juan Wright, Piasha Roberts
Dr. Robert Owor (Research Mentor)**

I'm Shekniah Newby, a 21-year-old student at Albany State University majoring in computer science with a concentration in business. My career goal is to become a contractor overseas, specializing in the IT, cybersecurity, or software engineering fields.



Title: Sustainable Agriculture in Space

Abstract

The research project investigates leveraging cyanobacteria and algae for sustainable food production in space and on Mars, addressing the limitations of traditional agricultural methods in harsh extraterrestrial environments. Through genetic modification and rigorous experimentation, the project optimizes bacterial growth and nutrient content. Results demonstrate the feasibility of sustainable agriculture on Mars, potentially reducing reliance on Earth resupply missions. In conclusion, this work signifies a crucial advancement towards sustaining human exploration beyond Earth, aligning closely with NASA's Artemis mission objectives and highlighting the importance of continued research and ethical considerations for extraterrestrial implementation.



Jerrianna Tate
Balasubramani S Paranthaman (Research Mentor)

Title: Evaluating the Preservative Potential of Selected Organic Molecules in Fresh Fruits

Abstract

Molecular Identification of Fungal Endophytes from Some Common Edible Fruits

Microorganisms play a very important role by maintaining a synergistic relationship with higher organisms. Several endophytes have been reported from plants. These endophytes enable the plant to produce the secondary metabolites, which improve the plants survivability and enhance the nutritional value of fruits. The composition of endophytes can vary due to environmental and geographical reasons. Our aim was to isolate and identify endophytic organisms from some of the common edible fruits. Last year some of my seniors had collected apple, plums, blueberries and Muscadine grape berries from Resora and have isolated about 20 endophytic fungus from them. Our objective this year was to do molecular identification of these fungi. After reviewing several protocols for DNA extraction, we developed an in-house method using zirconia beads for DNA extraction. We extracted genomic DNA from the pure cultures of all the twenty fungal species. The extracted DNA was subjected to gel electrophoresis for checking its quality and quantity. Further, we amplified the Internal Transcribed Spacer (ITS) region using primers (xxxxx and xxxx) which gave a xxxx bp product. The PCR amplicon was gel purified and subjected to Sanger sequencing. The sequence results will be subjected to BLAST analysis to identify the fungi at species level. Once identified, the fungi will be tested for its prebiotic and probiotic potential. There are scientific theories that all collectively state that no organism is strictly independent. Organisms such as humans are composed of trillions of microscopic organisms, which ultimately make the human a “superorganism,” along with a variety of other organisms, including plants. Not only are plants just superorganisms, but they also are necessary for the production of phytochemicals which are beneficial for health and maintenance of health. A few of the serviceable products that these phytochemicals can ultimately provide to the public are probiotics and prebiotics. Here we extracted DNA from the pure fungal isolates that were prepared prior to this experiment. We also amplified the DNA through PCR and characterizing the organisms by DNA sequencing (molecular identification).

Skyler Armstead
Dr. Balasubramani S Paranthaman and Dr. Yong Jin Lee
(Research Mentors)

Title: Molecular Identification of Fungal Endophytes from Some Common Edible Fruits

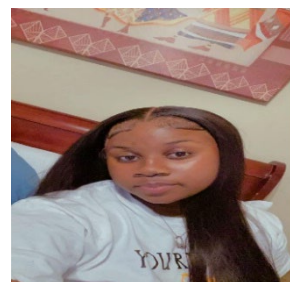
Abstract:

Several endophytic microorganisms have been reported from plants. These organisms reside in plant parts, and enable them to produce secondary metabolites, which improve the plants survivability and enhance the nutritional value of fruits. Our aim was to isolate and identify endophytic microorganisms from some of the common edible fruits. We have isolated 20 endophytic fungi from them. For molecular identification of these fungi, we extracted genomic DNA from the twenty fungal isolates. Further, we amplified the Internal Transcribed Spacer (ITS) region using primers (ITS1 and ITS2), which produced approximately 300 bp amplicons. The PCR amplicons will be purified using the QIAquick PCR Purification kit and sent for Sanger sequencing. The sequence results will be analyzed using NCBI BLAST tool to identify the fungi at the species level. Once identified, the fungal isolates are subject to tests for the potential prebiotic and probiotic activities so that they can be used as nutraceutical for humans and farm animals.

Ajah Tolbert,

Dr.MD Niamul Kabir (Research Mentor)

My name is Ajah Tolbert. I am 22 years old and my major is Biology. I am from Cordele, GA. I graduated in 2021 with an Associates in Health Science. I will be receiving my Bachelors in Biology in December of 2024. My plans are to become a Pediatrician. Not only just to help babies but to focus on pregnant women to prevent kids from having disorders or any type of disease.



Title: Inactivation of Salmonella Serovars with Synergistic Effect of Elevated Hydrostatic Pressure and Caprylic Acid in Apple Juice.

Abstract

The current study investigated Salmonella serovar bacterial inactivation using elevated hydrostatic pressure inoculated in sterile orange juice. A four-strain of Salmonella pathogen mixture was exposed to 0 (control) and up to 5 min with different pressure intensities at 4 °C and 45 °C. Elevated hydrostatic pressure at 200 - 500 MPa (Hub880 Explorer, Pressure Bioscience Inc., Easton, MA, USA) were used in the trials. Data arrangements were done using Microsoft Excel. In this study we observed that there was no significant difference between pressure and synergism of caprylic acid against Salmonella at 4 °C, compared to the control at 400 and 500MPa showed 3 and 4 log CFU/ML reduction. At 45 °C compared to the control at, 300, 400 and 500MPa showed 3 and 4 log CFU/ML reduction. The results of our study, thus, exhibit that practitioners and stakeholders of pressure-based technologies could benefit from synergism of mild heat and high-pressure pasteurization treatments to achieve microbial safety and economic feasibility comparable to traditional heat-treated products.

Collin Phillips

Dr. Kabir MD Niamul (Research Mentor)

My name is Collin Phillips, and I am from Albany, Georgia. I am senior biology major at Albany State University. I have always a passion for medicine and after graduating from Albany State University, I plan to pursue a career in medicine as an anesthesiologist.



Title: Synergetic Effects of Mild Heat and Elevated Hydrostatic Pressure on the Inactivation of Listeria Monocytogenes in Pasteurized Milk

Abstract

Up to 99% of illnesses caused by Listeria monocytogenes are reported from contaminated foods, and 94% of those infected require hospitalization. Listeria monocytogenes is responsible for 266 deaths annually in adults living in the US. The utilization of high-pressure processing (HPP) provides decontaminated food without altering the quality of the food in the way that heat pasteurization does. This experiment investigates the effects of elevated hydrostatic pressure (200-500 MPa) and caprylic acid at 4°C and 45°C for the decontamination effectiveness of Listeria monocytogenes in raw milk. Treatments utilizing varying pressures only and synergism with caprylic acid were conducted at 0, 3, and 5 minutes at 4°C and 45°C. This study shows that longer treatments using mild heat and high pressure are increasingly effective for the inactivation of Listeria monocytogenes in milk. This result is amplified when antibiotics are added to the treatment. The results of this experiment could be important to the future of food decontamination protocols as it shows an effective alternative to the popular methods currently utilized in food safety management systems working to mitigate the burden of listeriosis.

College of Business, Education, and Professional Studies

Savanna Gipson **Dr. Kizzie Donaldson-Richard (Research Mentor)**

Savanna Gibson, Sophomore, Mass Communication Major / Concentration in Film and Media, Born and Raised in Milwaukee Wi: Currently Lives in Metro Atlanta



Title: The Impact of The Covid-19 Pandemic Quarantine on College Students

Abstract

This research project examines the impact of the COVID-19 pandemic on the mental health and well-being, as well as learning behaviors, of college students. Through surveys and secondary data analysis, it seeks to understand the multifaceted effects of the pandemic on this demographic. The study employs a mixed-methods approach, combining qualitative and quantitative measures to provide a comprehensive analysis. Initial findings indicate a significant disruption in students' academic performance and socioemotional development. Overall, this research underscores the urgent need for targeted interventions and support systems to mitigate the adverse effects of the pandemic on college students' mental health and educational journeys.

Kayla Johnson **Dr. Ameachi Nwaokoro (Research Mentor)**

Title

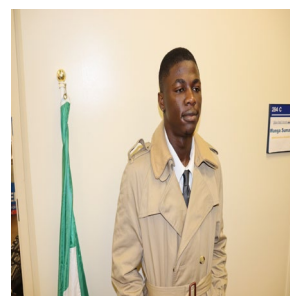
Evaluating Financial Market by the Rate Sensitivity of AAA Bonds and Treasury Bills

Abstract

Most Americans understand the labor (job) market where the most aggregated incomes are earned but marginally aware of the financial market. Particularly, African Americans need to increase their participation in the financial market to enhance their incomes beyond the labor incomes. This study encourages the marginal investors to make financial decisions by understanding how the most referenced bonds, Treasury Bills rate influences the AAA bonds rate. The impact of other rate shifters such as the asset's default risk, asset's liquidity, tax on earnings, inflation rate, and wage rate are considered for maximizing the returns in a diversified portfolio of investments.

Emmanuel Faola
Dr. Edgar Patani (Research Mentor)

Emmanuel Faola is a 22-year-old Nigerian native with a passion for economics and a keen interest in macroeconomics and policy analysis. Currently, he is a senior student at Albany State University, where he has been dedicated to expanding his knowledge and understanding of economic principles.



Emmanuel is not only committed to his academic pursuits but also actively engages in real-world application of his skills. He works at a think tank research company, where he contributes to analyzing economic trends and crafting policy recommendations. Through this experience, he is gaining valuable insights into the intersection of theory and practice in economics.

Looking forward, Emmanuel aspires to further his education through graduate studies in economics, aiming to deepen his expertise and contribute meaningfully to the field. With his dedication, passion, and analytical skills, he is poised to make significant contributions to the world of economics and policy analysis in the future.

Title: Behavioral Economics Influence on Society: An Income Management and Consumer Perspective.

Abstract

This research delves into the realm of behavioral economics to explore its impact on financial decision-making. Drawing from the principles outlined in Thaler's (2015) "Misbehaving: The Making of Behavioral Economics," this study investigates how key behavioral factors influence the decision-making process among individuals regarding financial matters. The research aims to identify systematic errors in financial decision-making and propose strategies to mitigate negative behavioral factors for more effective financial decisions.

Department of Sociology and Psychology

Shelly C. Woods

Dr. Pamela Pittman Brown (Research Mentor)

Title: Health Locus of Control and Proactive Lifestyle Changes

Abstract

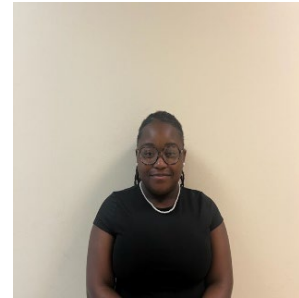
The research examined the concepts of lifestyle interventions to reduce the risk of Alzheimer's disease or other related dementia. The study used the health locus of control scale to investigate the relationship between health locus of control and the adoption or the lack of adoption of health behaviors. Health locus of control is used to assess if the individual has external or internal control over their outcomes. We also assessed if religious belief plays a part in the external or internal control over the health diagnosis or outcome. We also assessed if self-care or self-management of lifestyle changes is tied to higher locus of control. As Jarvik, L., et al. (2008) noted, more research is needed into the population of adult children of persons with AD (AD offspring) as they grow older, as well as those who have AD/ORD relatives (children/siblings/parents).

Per the World Health Organization, the adoption of a healthy lifestyle can assist in slowing physical and cognitive decline in middle-aged adults. Weinstein (1988) noted that using a precautionary adoption process model suggests that the perceived vulnerability to health decline can encourage preventative health behaviors. Additionally, those individuals who exhibit an internal locus of control (LOC) are more likely to engage in problem focused behaviors when confronted with the possibility of having a life-threatening disease/illness. Thus, we believe that adult children of parents who have a diagnosis of AD/ORD will alter their behaviors (both environmental/sociological) to negate or postpone the effects of AD/ORD. We do not know how or if adults who do not have parents with AD/ORD will alter their behaviors. This project investigated this topic; however, we believe that those with an internal locus of control will consider altering their lifestyle behaviors for longevity or better health.

Department of Health and Human Resources

**Ayanna Mitchell,
Dr. Ann Gibbs and Valarie Lee, MEd. (Research
Mentors)**

My name is Ayanna Mitchell and I am a 22-year-old graduating senior. My major is health and human performance. After graduation I plan to attend graduate school for clinical mental health counseling or exercise science.

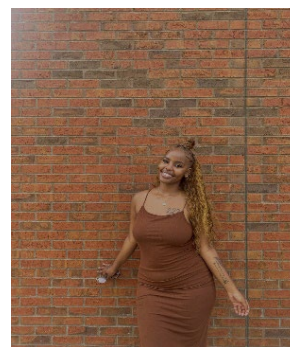


Title: HBCU Student Experiences in an Exercise: A Medicine Program

Abstract

In the scholarship of campus wellness, research exploring programming at Historically Black Colleges and Universities (HBCUs) has remained unequivocally low when compared to Predominantly White Institutions (PWIs) (Forrester, 2015). HBCU students demonstrate higher rates of overweight and obesity than non-HBCU students (Sa et al., 2020), which may be attributed to physical inactivity (Sa et al., 2016). The Exercise is Medicine on Campus program (EIM-OC) is an initiative headed by the American College of Sports Medicine (ACSM) to promote physical activity across colleges and universities. The purpose of this case study is to investigate student experiences with the Exercise is Medicine on Campus program at single HBCU. Data collection consisted of questionnaires, which highlighted the positive impact EIM-OC had on student interest in engaging in exercise on campus. Although limitations require further research, this study provided valuable insight for implementing wellness programming among HBCU students.

Selamawit Geddes
Professor Jasmine Smith (Research Mentor)
Academic Advising and Retention



Hello everyone, my name is Selamawit Geddes. I am a freshman here at Albany State majoring in health sciences and my career goal is nursing. I was born in Ethiopia and grew up in many places in Georgia including Ellenwood, Kennesaw, and graduated high school in McDonough. My research study is Identity and Self Actualization in first gen students.

With my study, I am hoping to shine a light on the students who feel misplaced, misunderstood, etc. when coming to college as a first gen student.

Title: Identity and Self-Actualization: A mixed-method study at Albany State University

Abstract

According to the National Center for Education Statistics, 1/3 of all college students in the US are first generation students (NCES, 2016). Furthermore, 43% of all first-generation undergraduate students enrolled the same year were also first -generation immigrants (NCES, 2016). First generation students from diverse populations attending a Historically Black College and University (HBCU) public 4- year institution located in the southeastern region of the United States overall experience lower levels of retention and college satisfaction than return generation students in the same region. The purpose of this mixed methods research was to explore Charles' Darwin's theory of evolution by natural selection, which states "organisms that are better suited for their environment will survive and reproduce while those that are poorly suited for their environment will die off" (Openstax, 2020) and further address the needs of first-generation students. and provide recommendations to better equip first generation students of color for academic and career success by self- actualization. Maslow's hierarchy of needs model provided the framework for this study (Maslow, 1943). A sample of 50 surveys were randomly distributed on campus, pencil to paper form. The anonymous surveyors were asked to provide their email address if they were open to providing more insight about their experience. Then, a sample of 5 students were invited to complete in-depth interviews recorded over web-ex in a confidential manner. The transcripts and surveys were coded using Coding Analysis Toolkit to combine data and analyze themes. I analyzed the data using themes and comparison. In the methodology, each interview and survey were analyzed as received and discarded if they did not fit the criteria for "first generation student between the ages of 18-22

**Charmaneise Laster
Dr. Md Niamul Kabir**

Title

Evaluating synergistic effect of elevated high pressure, carvacrol and caprylic acid against *Escherichia coli* O157:H7 inoculated in apple juice.

Abstract

Shiga-toxin-producing *Escherichia coli* O157:H7 is a well-known food-borne pathogen that can cause food borne diseases in humans. *E. coli* O157:H7 has been linked to foodborne disease in a number of different foods, including apple juice, plant foods, milk and dairy products, and beef-based products. This investigation's goal was to evaluate the survival and growth of a -strain mixture of salmonella (ATCC® numbers 43894, 43890, 35150, and 43889) against the synergist effect of high-pressure processing (HPP) (150 – 450 MPa), 0.5% carvacrol and 0.1% caprylic acid inoculated in autoclaved apple juice treated for 0. 3 and 5 minutes at 4°C and 45°C. Data arrangements were done using Microsoft Excel. Our study indicates that synergism of high pressure and mild temperature can reduce more than 3 log reduction of *E. coli* compared to control. Also, synergistic effect of HPP and antimicrobials did not show any difference in log reduction of *E. coli* compared to control with antimicrobial only. The result of this study has great public health significance for assuring the safety of raw agricultural commodities.

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Undergraduate Research Committee Members

Thank You Moderators, Reviewers, and Judges

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