

Research Mini-Symposium

RISE at Rutgers

Research Intensive Summer Experience

and

Partner Programs

REU in Advanced Materials

REU in Cellular Bioengineering

Ernest Mario School of Pharmacy -

Summer Undergraduate Research Fellowship (SURF)

REU in Green Energy Technology (GET-UP)

INSPIRE Training Program

Protein Data Bank

Sponsored by Rutgers, The State University of New
Jersey

School of Graduate Studies

July 22, 2022

Biomedical Engineering Building Rooms 102 and 116

Busch Campus

Welcome to the 2022 RISE at Rutgers and REU Scholars' 5-Minute Presentation (5MP) Mini-Symposium!

The **5-Minute Presentation (5MP)** is modeled after the acclaimed national and international 3MT (3 Minute Thesis) competition. 3MT prepares students to communicate clearly, concisely, and effectively to both specialists and non-specialists and promotes engagement across disciplines. Since launching a successful 3MT at Rutgers in 2019, the School of Graduate Studies has extended this opportunity to our Summer Scholars.

The Mini-Symposium highlights the scholarship and research of the undergraduate participants of several cooperating summer programs. Rutgers faculty mentors, often assisted by post-doctoral fellows, graduate students, research staff or other undergraduates, guide the summer students. The participants include undergraduates from Rutgers and from institutions across the US and its territories. In addition to 10 weeks of immersion in Rutgers research laboratories, students engage in workshops and developmental activities related to communication skills, career awareness, and professional and scientific development, along with social activities.

The core "**RISE (Research Intensive Summer Experience) at Rutgers**" program, supported through the Rutgers School of Graduate Studies (SGS) and other sources, accepts students from a broad range of disciplines, and serves as the coordinating unit for recruitment and many of the activities of the Partner Programs, each with its unique focus.

Each student presenter below is identified by the program in which they participate (Note: REU – "Research Experience for Undergraduates"):

RISE: Students participate in the core "**RISE at Rutgers**" program. Funding comes from a variety of sources, including the Rutgers School of Graduate Studies, other institutional sources, grants, external partnerships. See complete acknowledgements below. Director: Evelyn Erenrich, Ph.D.

RISE/PDB: Students participating in the core RISE development seminars and activities, and supported by RISE for logical aspects, with funding and research mentoring through the RCSB Protein Data Bank, the US data center for the global PDB archive of large biological molecules essential for research and education in fundamental biology, health, energy, and biotechnology. RISE Liaison: Christine Zardecki.

Advanced Materials: REU in Advanced Materials: The interdisciplinary nature of this REU provides a rich environment for research in a broad array of materials topics ranging from graphene composites to the application of computational materials concepts to advanced catalysts for use in the pharmaceutical and petroleum industries. Supported by the National Science Foundation. Co-Directors: Meenakshi Dutt, PhD and Deirdre O'Carroll, PhD.

CB: REU in Cellular Bioengineering: This program provides research opportunities that articulate with a range of cutting-edge, multidisciplinary areas, including stem cell engineering, systems and

computational biology, cell-active biomaterials, and micro/nanoscale biosystems. Supported by the National Science Foundation. Director: David Shreiber, Ph.D. with Valerie Tutweiler, PhD (Innovation & Entrepreneurship component) and Maribel Vazquez, PhD, (Health Care Disparities component.)

SURF: The Ernest Mario School of Pharmacy -Summer Undergraduate Research Fellowship (SURF) serves undergraduates interested in research related to Pharmacology and Toxicology, Environmental Health Sciences, Pharmaceutics, Medicinal Chemistry, Chemical Biology, and Clinical Pharmacy. Director: Lauren Aleksunes, Pharm.D., Ph.D.

GET UP: REU in Green Energy Technology Undergraduate Program GET UP research projects focus on emerging energy and power issues that center around three research thrusts: nanotechnology and materials for energy storage and conversion; renewable and sustainable fuels; and devices and energy management systems for energy generation, conversion and storage. Supported by the National Science Foundation. Director: Kimberly Cook-Chenault, Ph.D.

INSPIRE: (IRACDA New Jersey/New York for Science Partnerships in Research & Education) is a post-doctoral training program that provides a combination of a mentored research experience, as well as training in educational methods and mentored teaching at partner Minority-Serving Institutions. Undergraduates from those institutions participate as RISE scholars under the mentorship of INSPIRE postdoctoral fellows. Supported by the NIGMS/NIH and the Office of the EVPAA, Rutgers. Directors: Martha Soto, Ph.D. and Gary Brewer, Ph.D., INSPIRE Administrator Dr. Jianping Xu, Ph.D.

Waksman Institute of Microbiology: The Waksman Institute of Microbiology is an interdisciplinary research institute focusing on developmental biology, cell biology, biochemistry, structural biology, genetics, and genomics. Waksman supports the educational and DEI missions of Rutgers University. Director: Kenneth Irvine, Ph.D.

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- NIH MARC, U-RISE, ADAR and IRACDA Programs
- NSF Research Experiences for Undergraduates (REU) Program
- Faculty cost-share from NSF CAREER Awards and other research grants and supplements
- Society of Toxicology and ASPET
- Kean University Office of the Provost

Our research program would not be possible without the **dedicated faculty mentors** who have donated their time, energy, and laboratory supplies and space. In addition, we thank the **graduate students and postdoctoral near-peer mentors** for their invaluable guidance and commitment.

With much gratitude, we acknowledge our tireless staff:

RISE Program Coordinator: Ms. Dawn Lopez, MBA

RISE Program Assistant: Ms. Victoria McCormick

RISE Graduate Assistants: Ms. Amanda Sie, Ms. Dawn Ogali-Frederic, Mr. Keith Perkins

Administrator, Cellular Bioengineering: Ms. Linda Johnson

Graduate Student Teaching Fellows: Ms. Jessica Johnson, Ms. Zakiyah Henry, and Ms. Zoey Eddy, Mr. Akash Banerjee, Ms. Sneha Sreekumar

Graduate Student Resident Advisors: Mr. Grant King and Ms. Zeinab Kone

5MP Moderators and Judges

Moderators	Session	Room	Name	Back-up
	A	BME 102	Alkash Banerjee,	Lauren Alesunes
	B	BME 116	Zoey Eddy	Christine Zardecki
	C	BME 102	Zakayah Henry	
	D	BME 116	Jessica Johnson	

Judges	Session	Room	Name	Back-up
	A	BME 102	Dr. Itzamare Chevere-Torres	Dr. Karla Esquillin-Lebron
	B	BME 116	Dr. Lorne Joseph	Amanda Sie
	C	BME 102	Navar Mercer White	Dr. Karla Esquillin-Lebron
	D	BME 116	Dr. Lorne Joseph	Dawn Ogall-Frederic

BME = Biomedical Engineering Bldg, Busch Campus

Sessions A & B: 9:15-10:50 (arrive by 9 am)

Coffee break: 10:50 - 11:10

Sessions C & D: 11:10 - 12:50 (arrive by 10:55 am)

Lunch: 1 pm in BSC Multipurpose Room

	Section A: 9:15-10:50AM BME 102	Section B: 9:15-10:50AM BME 116
9:15	<p>Daniela Bermeo Grajales <i>SURF/RISE</i> Kean University</p> <p>Cathleen Doherty, PhD and Brian Buckley, PhD <i>Heavy Metal Detection and Quantification on Blow Fly (Diptera: Calliphoridae) Larvae and Potential Forensic Entomotoxicology Applications</i></p>	<p>Julie Bondy <i>Advanced Materials</i> Trinity University</p> <p>Haoran Zhang, PhD <i>Effect of erythromycin and cell-lysis gene on Escherichia coli cell growth and phenol production</i></p>
9:22	<p>Michael O'Donnell <i>Advanced Materials</i> Georgia Institute Technology</p> <p>Lisa Klein, PhD <i>Sol-Gel Process and Application of Melting Gel to Metabolic Sensors for Smart Connected Health</i></p>	<p>Shea Kreinbrink <i>Cellular Bioengineering</i> Trine University</p> <p>Joseph Freeman, PhD <i>Generating PD-L1 expressing stem cells for immunoprotection in regenerative medicine</i></p>
9:27	<p>Chelsea Obade <i>GET-UP</i> Rutgers University</p> <p>Kimberly Cook-Chennault, PhD <i>Multimodal approaches to understand students engaging in engineering serious learning games</i></p>	<p>Rev Derek Baluyut <i>RISE/Waksman</i> Northern Michigan University</p> <p>Andrea Gallavotti, PhD <i>Functional Characterization of Two Maize Genes Regulating Meristem Development</i></p>
9:34	<p>Hafer Ali <i>Cellular Bioengineering</i> College Of New Jersey</p> <p>Valerie Tutwiler, PhD <i>The Effect of PAI-1 on Clot Structure and Fibrinolysis</i></p>	<p>Opetunde Akeju <i>INSPIRE/RISE</i> New Jersey City University</p> <p>Premal Shah, PhD and Alex Cope, PhD <i>Re-examining the relationship between codon usage and protein structure using population genetics models: a response to Rosenberg et al. Nat. Comm. 2022</i></p>

9:41	<p>Victoria Casimir RISE UPR-RP</p> <p>James Simon, PhD</p> <p><i>Aroma volatiles of basil (Ocimum spp) as impacted by variety and time of day</i></p>	<p>Benjamin Mendoza RISE</p> <p>California State University Fullerton</p> <p>Jessica Hamilton, PhD</p> <p><i>Parental Rules In Adolescent Social Media Use and Mental Health</i></p>
9:48	<p>Nyla Howell RISE</p> <p>Univ Maryland Baltimore County</p> <p>Robin Leichenko, PhD</p> <p><i>The Impact of Disaster Subcultures on Business and Community Preparedness in Coastal New Jersey</i></p>	<p>Essence Gandy RISE</p> <p>Kean University</p> <p>Julie Lockwood, PhD</p> <p><i>Social Media's Influence on Exotic Wildlife Interest</i></p>
9:53	<p>Alejandra Medina Vázquez GET-UP</p> <p>Univ Puerto Rico Mayaguez</p> <p>Kimberly Cook-Chennault, PhD</p> <p><i>Understanding the mechanical properties of hydroxyethyl methacrylate-based hydrogels subjected to compression and shear loading conditions</i></p>	<p>Ebony Oenga Advanced Materials</p> <p>University At Albany-Suny</p> <p>Meenakshi Dutt, PhD</p> <p><i>How Non-covalent Interactions Influence Conformation of Lipase</i></p>
10:00	<p>Emma Chavez RISE/PDB</p> <p>Hendrix College</p> <p>Stephen Burley, MD and Sagar Khare, PhD</p> <p><i>Computational Analysis of Potential SARS-CoV-2 Main Protease Mutations Resistant to Paxlovid</i></p>	<p>Mark Hachicho RISE</p> <p>Cuny Brooklyn College</p> <p>Harini Sampath, PhD</p> <p><i>Dietary regulation and gene expression of intestinal lipid metabolizing enzymes SCD1 and SCD2 in a mouse model</i></p>

10:07	<p>Sophia Bizink <i>Advanced Materials</i> Kean University Sagar Khare, PhD</p> <p><i>Stabilization of PETase using an unnatural amino acid to help break down PET</i></p>	<p>Jesenia Rosa Miranda RISE Inter-American University Pr Aguadilla Malin Pinsky, PhD</p> <p><i>Variations in morphological traits of the larval stage for a poleward moving marine species</i></p>
10:14	<p>Sanaa Bahket INSPIRE/RISE New Jersey City University Vanessa Routh, PhD and Gwynndoln Vail, PhD</p> <p><i>Irisin: Mechanistic insights for sex differences in central regulation of glucose utilization during exercise</i></p>	<p>Esther Colon RISE University of Puerto Rico-Rio Piedras Kathe Newman, PhD</p> <p><i>Has the Gold Coast Expanded: Change in Three Communities Between Hoboken and Jersey City</i></p>
10:21	<p>Juan Gutierrez <i>Cellular Bioengineering</i> Univ Calif Santa Barbara Li Cai, PhD</p> <p><i>Gsx1 Gene Therapy Study for Chronic Spinal Cord Injury</i></p>	<p>Jackson Kaszas <i>Advanced Materials</i> University of Connecticut Richard Rimann, PhD</p> <p><i>Creating Environmentally Friendly Cement</i></p>
10:28	<p>Nicole Rodriguez Ortiz RISE/Waksman Montclair State University Kim McKim, PhD</p> <p><i>New Genes Required for Fertility</i></p>	<p>Isabela Cruz-Vespa RISE Bard College Samantha Farris, PhD</p> <p><i>Emotion Dysregulation and Nicotine Consumption: Assessing the Moderating Role of Physical Activity Among Female Daily Smokers</i></p>

10:35	<p>Michaela Greenlee SURF/RISE New York University Zorimar Rivera-Nunez, PhD <i>Neighborhood Stress and Anxiety and Depression in Pregnant Women</i></p>	<p>Kaleigh Smith <i>Cellular Bioengineering</i> Hendrix College Jeffrey Zahn, PhD <i>Effect of PEDOT:PSS on Electrode Conductivity and Impedance of Multielectrode Array Brain-on-a-Chip Models</i></p>
10:42	<p>Amanda Derrell RISE Bard College Jenny Wang, PhD <i>Promoting awareness of core numerical ability and its influence on math anxiety</i></p>	<p>Faythe Cooper SURF/RISE Oberlin College Lauren Aleksunes, PharmD, PhD <i>Pro-inflammatory Cytokine Expression and Toxic Heavy Metals in the Human Placenta</i></p>
10:49	<p>20 Min Coffee/ Water Break with Light Refreshments</p>	

	Section C: 11:10-12:50PM, BME 102	Section D: 11:10-12:50PM, BME 116
11:10	<p>Cynthia Guerrero INSPIRE/RISE William Paterson Univ</p> <p>Martha Soto, PhD, Molly DeHart, PhD, and Luigi Cordova Burgos, PhD</p> <p><i>Searching for the GEF that activates Rac1/CED-10 upstream of F-actin during ventral enclosure in Caenorhabditis elegans</i></p>	<p>Grace Palahnuk <i>Cellular Bioengineering</i> College Of New Jersey</p> <p>Adam Gormley, PhD</p> <p><i>Thermal stabilization of glucose oxidase for continuous glucose monitoring</i></p>
11:17	<p>Elvin Cordero <i>Advanced Materials</i> Univ Puerto Rico Humacao</p> <p>Deirdre O'Carroll, PhD</p> <p><i>Sulfonation and Solvothermal Carbonization of Polypropylene for the Formation of Carbon Nanomaterials</i></p>	<p>Sarah Sywanycz RISE Rutgers University - Sebs</p> <p>Paul Breslin, PhD</p> <p><i>The anti-inflammatory drug Ibuprofen inhibits sweet taste</i></p>
11:24	<p>Emely Arizaga-Molina RISE Farmingdale State University</p> <p>Jessica Hamilton, PhD</p> <p><i>Sleep and Suicide Risk Among Adolescent Latinas</i></p>	<p>Zachary Kobs SURF/RISE St. Mary's University</p> <p>Troy Roeplke, PhD</p> <p><i>The impact of maternal diet on flame retardant related gene expression in neonatal mice</i></p>
11:31	<p>Janelle Lugo <i>Cellular Bioengineering</i> Univ Connecticut</p> <p>Francois Berthiaume, PhD</p> <p><i>Healing Burn Injuries and Preventing Conversion Using an Iron-Scavenging Protein Cocktail</i></p>	<p>Kelsey Boyle <i>Advanced Materials</i> Bucknell University</p> <p>Shishir Chundawat, PhD</p> <p><i>Study the transglycosidase enzyme reaction kinetics using TLC and HPLC</i></p>

11:38	<p>Aarush Sood GET-UP Rutgers University Jonathan Singer, PhD</p> <p><i>Effect of Melting Gels on Corrosion Through Electro spray Deposition</i></p>	<p>Kylie Bond RISE Delaware State University Max Haggblom, PhD</p> <p><i>Analytical method development of ethyl-4-bromopyrrole-2-carboxylate and derivatives: substrates for anaerobic dehalogenating bacteria</i></p>
11:45	<p>Sarina Lau Advanced Materials Simmons University Ashutosh Goal, PhD</p> <p><i>Structural Design of Phosphate Bioactive Glasses for Tissue Engineering</i></p>	<p>Kadiatou Bah INSPIRE/RISE Cuny Medgar Evers College Detlev Boison, PhD and Benton Purnell, PhD</p> <p><i>Understanding the role of adenosine in epilepsy, seizures, and how it contributes to sudden unexpected death in epilepsy (SUDEP)</i></p>
11:52	<p>Jacob Knight RISE Ramapo College New Jersey Spencer Knapp, PhD</p> <p><i>Synthesis of Novel Antimalarial Compounds</i></p>	<p>Luis Remache RISE Rochester Institute of Technology Lisa Rodenburg, PhD</p> <p><i>Evidence for the Photolysis of Brominated Flame Retardants During Atmospheric Transportation</i></p>
11:59	<p>Ruth Meletz SURF/RISE Univ Calif Riverside Lauren Aleksunes, PharmD, PhD</p> <p><i>Effect of Perfluorinated "Forever" Chemicals on the Expression of Intestinal Xenobiotic Transporters</i></p>	<p>Sachely Antuna Cellular Bioengineering College Of New Jersey Sagar Khare, PhD</p> <p><i>Degradation of the Environmental Hazard 1,2,3-Trichloropropane (TCP) Using the Thermal Stabilized DhA31 Haloalkane Dehalogenase.</i></p>

	<p>Jordania Urquiza-Aguilar RISE/PDB Rutgers University-Newark</p> <p>Stephen Burley, MD and Sagar Khare, PhD <i>Computational Modeling of Potential Drug-Resistant Mutations in the SARS CoV-2 Main Protease</i></p>	<p>Daphne Vega RISE San Diego State University</p> <p>Monica Driscoll, PhD <i>Exopher Production in C. Elegans Expressing ALS Disease Proteins</i></p>
12:13	<p>Angela Appiah-Kubi <i>Cellular Bioengineering</i> Kean University</p> <p>Charles Roth, PhD <i>Disrupting Biofilms in Cystic Fibrosis with Polyelectrolyte Surfactants</i></p>	<p>Alexander Hidalgo INSPIRE/RISE William Paterson Univ</p> <p>Vikas Nanda, PhD <i>The Dynamics of Electron Transfer: Applications of Data Science to Biochemical Processes</i></p>
12:20	<p>Victoria Brown RISE/Waksman Kenyon College</p> <p>Juan Dong, PhD <i>Functional characterization of BSL₂ a novel Polarity Protein</i></p>	<p>Rachel Vladimirovsky GET-UP Rutgers University</p> <p>Jonathan Singer, PhD <i>Investigation of Methylcellulose Composite Sprays through Self-limiting Electrospray Deposition</i></p>
12:27	<p>Flynn Anderson <i>Advanced Materials</i> Suny Binghamton</p> <p>Ashutosh Goel, PhD <i>Impact of Mixed Alkaline Effect on the Crystallization Behavior of Model High-Level Waste Glasses</i></p>	<p>Orlan Oconer <i>Advanced Materials</i> Univ Texas Austin</p> <p>Ryan Silis, PhD <i>Modeling Intergranular Fracture in Heterogeneous Ceramics</i></p>

12:34	<p>Tien Vo RISE University of Wisconsin-Madison Daniel Giménez, PhD <i>Aggregation and Carbon Storage in Forested and Grazed Pasture Soils from New Jersey</i></p>	<p>Kaitlyn Fang SURF/RISE Cornell University Dina Fonseca, PhD <i>Where did the mosquitoes that transmit bird malaria in Hawaii come from?</i></p>
12:41	<p>Jailen Doyle RISE Dillard University Bozena Michniak-Kohn, PhD <i>Development and Characterization of Diclofenac Loaded Liposomes</i></p>	<p>Burton Carbino Cellular Bioengineering Duquesne University David Shreiber, PhD <i>Modeling the Effects of Peritoneal Stiffness on Ovarian Cancer Metastasis using Collagen Methacrylamide (CMA) and Cultured Spheroids</i></p>
<p><i>Special Thanks to the Faculty and Other Mentors</i></p>		
1:00PM	<p>Lunch, BSE Multi-Purpose</p>	