

RISE at Rutgers

Research **I**ntensive **S**ummer **E**xperience

2022 Summer Research Symposium
August 3, 2022



Featuring Poster Presentations by RISE and REU Summer Scholars

Sponsored by:
School of Graduate Studies
Rutgers, The State University of New Jersey

"Symposium website and Scholar Abstracts."



Wednesday, August 3, 2022
Busch Campus Center
604 Bartholomew Road
Busch Campus, Rutgers University, Piscataway, NJ

9:00 – 9:30 AM Registration and Coffee Fireside Lounge

9:30 – 9:40 AM Welcome Center Hall

Dr. Carolyn Moehling
Vice Provost for Undergraduate Education and Professor of Economics

9:40 – 9:50 AM Winners, 5-Minute Presentation (5MP) Competition

Amanda Derrell
Bard College
“Promoting awareness of core numerical ability and its effects on affective responses to math and math performance”

Sarah Sywanycz
Rutgers University
“The Anti-Inflammatory Drug Ibuprofen inhibits sweet taste”

9:50 – 10:50 AM Keynote Address Center Hall

Dr. Jeffrey Robinson
Provost and Executive Vice Chancellor, Rutgers University - Newark
Prudential Chair in Business
“The Five People You Should Meet On the Way to the Top”

11:00 – 11:55 AM Student Research Posters-Odd numbers Rooms 116, 120, 122

12:00 – 12:55 PM Student Research Posters-Even numbers Rooms 116, 120, 122

1:00 PM Networking Buffet Luncheon Multipurpose Room

Sponsored by
RISE (Research Intensive Summer Experience) at Rutgers
and Partner Programs

REU in Cellular Bioengineering: From Biomaterials to Stem Cells
REU in Advanced Materials at Rutgers Engineering
REU in Green Energy Technology – Undergraduate Program (GET-UP)
Ernest Mario School of Pharmacy Summer Undergraduate Research Fellowship Program
INSPIRE Postdoctoral Research and Education Program
Protein Data Bank
Waksman Institute of Microbiology

PLENARY SPEAKER



Dr. Jeffrey Robinson

*Provost & Executive Vice Chancellor of Rutgers- Newark
Prudential Chair in Business*

“The Five People You Should Meet On the Way to the Top”

Dr. Jeffrey A. Robinson is an award-winning business school professor, international speaker, and entrepreneur. Since 2008 he has been a leading faculty member at Rutgers Business School, where he holds the Prudential Chair in Business and is the Academic Director of The Center for Urban Entrepreneurship & Economic Development. His research specialty lies at the intersection of business and society. His projects and initiatives address topics such as diversity, economic inclusion, inclusive entrepreneurship, and innovation especially in urban metropolitan areas in the United States and abroad. As of July 1, Professor Robinson assumed the role of Provost and Executive Vice Chancellor of Rutgers – Newark.

Welcome to the 2022 RISE at Rutgers and REU Symposium!

The 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, hosts 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 participate in the core RISE development seminars and activities and are supported by RISE for logical aspects, with funding and research mentoring through the RCSB Protein Data Bank. The PDB is 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.

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.

REU in Cellular Bioengineering (CB): 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.

REU in Green Energy Technology Undergraduate Program (GET UP): 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 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.

ACKNOWLEDGEMENTS

We gratefully acknowledge financial support from:

~ Institutional sources ~

School of Graduate Studies

Office of the Chancellor-New Brunswick

Office of the Executive Vice President for Academic Affairs

Ernest Mario School of Pharmacy

Waksman Institute of Microbiology

~ External ~

Aman Armaan Ahmed Family

NASA New Jersey Space Grant Consortium

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

Kean University Office of the Provost

Society of Toxicology

ASPET

WITH MUCH GRATITUDE, WE ACKNOWLEDGE OUR TIRELESS STAFF
LISTED ON PAGES 9-10

~Special Thanks~

Our research programs would not be possible without the support of the dedicated faculty members who have donated their time, materials and laboratory space. We are also extremely grateful for the financial support that some of our mentors provided through research grants or supplements.

We thank the graduate students and post-docs for their invaluable guidance as “near-peer” mentors.

GUEST SPEAKERS

Responsible Conduct of Research: The Devil in the Details: Integrity of Record Keeping, Data Collection and Reporting.

Professor Kimberly Cook- Chennault, Director, Get-Up REU

Mentoring Up (or How to Manage Your Boss)

Dr. Xenia Morin, Teaching Professor & Sr. Associate Dean for Learning, SEBS

Graduate School: How to Get in, Get Funding and Succeed

Professor Jessica Hamilton
Assistant Professor Department of Psychology

Professor Jeff Zahn
Professor Biomedical Engineering

Professor Jerry Shan
Professor/Graduate Program Director, Mechanical & Aerospace Engineering

Christen Crosta
PhD candidate, Neuroscience, Rutgers University

Samuel Adeniyi Adeleye
PhD candidate, Yadavalli lab, Rutgers University

Talia Seymore
PhD candidate | Cardiovascular and Reproductive Toxicology, Rutgers University

Robert Rosen
MD/PhD Candidate at RWJMS/Princeton

Erika McCarthy
Ph.D. student, Chemistry & Chemical Biology

Fellowships & Funding: Position Yourself for Success

Teresa Delcorso- Ellman
Director, GradFund and Assistant Dean, School of Graduate Studies

STEM to STEAM: The Chemistry of Art

Dr. Geeta Govindarajoo
Teaching Professor, Chemistry, in Collaboration with Zimmerli Art Museum

Create a Stand-out Professional Identity: LinkedIn & Social Media

Airelle Smith and Ava Aulisi
Career Exploration & Success

Extending Your Research: Innovation & Entrepreneurship, Community Engagement, and Social Justice

Dr. Dunbar Birnie
Professor, Materials Science & Engineering

Dr. Briana Bivens
Postdoctoral Associate, School of Graduate Studies

Ria Sarkar
PhD Student, Earth & Planetary Sciences

5-Minute Presentation Competition Judges

Dr. Itzamare Chevere-Torres, Director, Office of Postdoctoral Advancement

Dr. Gregg Crichlow, Biocurator, Protein Data Bank

Dr. Briana Bivens, Postdoctoral Associate

Dr. Karla Esquilin-Lebron, Teaching Instructor, Microbiology

Dr. Lorne Joseph, Director of Engineering and STEM Research Initiatives at Douglass WiSE

Amanda Sie, Graduate Assistant and PhD candidate, Sociology

Zachary Finkel, PhD candidate in Biomedical Engineering

Dawn Ogali-Frederic, Graduate Assistant and PhD candidate, Higher Education

Navar Mercer White, Ph.D.candidate in Chemistry and Chemical Biology

SUMMER PROGRAM FACULTY & STAFF

PROGRAM DIRECTORS

RISE

Dr. Evelyn Erenrich, Director
Associate Dean and Chief Diversity Officer, School of Graduate Studies

REU - Cellular Bioengineering (CB)

Dr. David Shreiber, Director
Professor and Chair, Biomedical Engineering

Dr. Maribel Vazquez, Health Disparities component
Dr. Valerie Tutwiler, Innovation & Entrepreneurship component

REU – Advanced Materials

Dr. Meenakshi Dutt, Co-Director,
Associate Professor, Chemical & Biochemical Engineering
Dr. Deirdre O’Carroll, Co-Director,
Associate Professor, Materials Science & Engineering

REU - Green Energy Technology Undergraduate Program (GET UP)

Dr. Kimberly Cook-Chennault, Director
Associate Professor, Mechanical & Aerospace Engineering, and Associate Dean, School of Engineering

Ernest Mario School of Pharmacy Summer Undergraduate Research Fellowship (SURF)

Dr. Lauren Aleksunes, Director
Associate Professor, Pharmacology and Toxicology,

Protein Data Bank

Ms. Christine Zardecki, RISE Liaison

INSPIRE

Dr. Martha Soto, Associate Professor & Dr. Gary Brewer, Professor, Robert Wood Johnson Medical School,
Dr. Jianping Xu, Coordinator

STAFF

Program Coordination and Administration

School of Graduate Studies, 25 Bishop Place, College Ave Campus

Ms. Dawn Lopez, MBA, Program Coordinator

Ms. Victoria McCormick, Program Assistant

Mr. Keith Perkins, Graduate Assistant

Ms. Amanda Sie, Graduate Assistant

Ms. Dawn Ogali-Frederic, Graduate Assistant

Biomedical Engineering

Ms. Linda Johnson, CB Program Administrator

RISE Teaching Fellows

Ms. Zoey Eddy, PhD student, Social Psychology,

Ms. Zakiyah Henry, PhD student, Toxicology,

Ms. Jessica Johnson, PhD student, Materials Science & Engineering

Photographer

Mr. Keith Perkins

Website and Digital Archive

Ms. Lily Todorinova, Undergraduate Experience Librarian

Mr. Isaiah Beard, Digital Data Curator

Advanced Materials Graduate Assistants

Mr. Akash Banerjee,

Ms. Sneha Sreekumar

Graduate Student Resident Advisors

Mr. Grant King

Ms. Zeinab Kone

POSTER PRESENTATIONS

ROOM# 116, 120, & 122

Odd-numbered Posters: 11:00am - 12:00pm

Even-numbered Posters: 12:00 - 1:00pm

Summer Scholar's name	Poster #	Title	Room
Akeju, Opetunde J. <i>INSPIRE</i>	1	Re-examining the correlations between codon usage and dihedral bond angles using population genetics models	116
Ali, Hajer <i>Cellular Bioengineering</i>	2	The effect of PAI-1 on clot structure and fibrinolysis	116
Anderson, Flynn L. <i>Advanced Materials</i>	3	Impact of mixed alkali effect on the crystallization behavior of model high-level waste glasses	116
Antuna, Sachely <i>Cellular Bioengineering</i>	4	Degradation of the environmental hazard 1,2,3-trichloropropane (TCP) using the thermal stabilized DhaA31 haloalkane dehalogenase.	116
Appiah-Kubi, Angela <i>Cellular Bioengineering</i>	5	Observing polyelectrolyte surfactants and their interactions with Pseudomonas Aeruginosa Biofilms in Cystic Fibrosis	116
Arizaga-Molina, Emely P. <i>RISE</i>	6	Sleep and Suicide Risk in Latina Adolescents	116
Bah, Kadiatou <i>INSPIRE</i>	7	Understanding the role of adenosine in epilepsy, seizures, and how it contributes to sudden unexpected death in epilepsy (SUDEP)	116
Bakhet, Sanaa S. <i>INSPIRE</i>	8	Irisin: Mechanistic insights for sex differences in central regulation of glucose utilization during exercise	116

POSTER PRESENTATIONS

ROOM# 116, 120, & 122

Odd-numbered Posters: 11:00am - 12:00pm

Even-numbered Posters: 12:00 - 1:00pm

Baluyut, Rev Derek M. <i>RISE/Waksman Institute of Microbiology</i>	9	Functional characterization of two maize genes regulating meristem development	116
Bermeo Grajales, Daniela SURF	10	Heavy metal detection and quantification on Blow Fly (Diptera: Calliphoridae) larvae and potential forensic entomotoxicology applications	116
Bizink, Sophia K. <i>Advanced Materials</i>	11	Stabilization of PETase using an unnatural amino acid to help break down PET	116
Bond, Kylie JF <i>RISE</i>	12	Analytical method development of ethyl-4-bromopyrrole-2-carboxylate and derivatives: substrates for anaerobic dehalogenating bacteria	116
Bondy, Julie L. <i>Advanced Materials</i>	13	Effect of antibiotic and cell-lysis gene on Escherichia coli cell growth and phenol production	116
Boyle, Kelsey <i>Advanced Materials</i>	14	Study the transglycosidase enzyme reaction kinetics using TLC and HPLC	116
Brown, Victoria V. <i>RISE/Waksman Institute of Microbiology</i>	15	Functional characterization of BSL, a novel polarity protein	116
Casimir-Montan, Victoria M. <i>RISE</i>	16	Aroma volatiles of basil (Ocimum spp.) as impacted by variety and time of day	116
Carbino IV, Burton J. <i>Cellular Bioengineering</i>	17	Modeling the effects of peritoneal stiffness on ovarian cancer metastasis using Collagen Methacrylamide (CMA) and cultured spheroids	116

POSTER PRESENTATIONS

ROOM# 116, 120, & 122

Odd-numbered Posters: 11:00am - 12:00pm

Even-numbered Posters: 12:00 - 1:00pm

Chavez, Emma <i>Protein Data Bank</i>	17	Computational Analysis of Potential SARS-CoV-2 Main Protease Mutations Resistant to Paxlovid	116
Colon-Bermudez, Esther <i>RISE</i>	18	Has the gold coast expanded? change in three communities between Hoboken and Jersey City	116
Cooper, Faythe M. <i>SURF</i>	19	Cytokine expression and toxic heavy metals in human placentas	116
Cordero-Figueroa, Elvin <i>Advanced Materials</i>	20	Sulfonation and solvothermal carbonization of polypropylene for the formation of carbon nanomaterials.	116
Cruz-Vespa, Isabela I. <i>RISE</i>	21	Emotion dysregulation and nicotine consumption: Assessing the moderating role of physical activity among female, daily smokers	116
Derrell, Amanda <i>RISE</i>	22	Promoting awareness of core numerical ability and its effects on affective responses to math and math performance	116
Doyle, Jailen H. <i>RISE</i>	1	Development and characterization of diclofenac sodium loaded liposomes	120
Engel, Serenity M. <i>Physics & Astronomy</i>	2	Charged-current neutrino-nucleus cross-section measurements using a liquid argon time projection chamber detector	120
Fairchild, Caleb, W <i>Physics & Astronomy</i>	3	Analysis of dimuon mass excess in Higgs boson decay to the $b\bar{b}\mu\mu$ final state	120

POSTER PRESENTATIONS

ROOM# 116, 120, & 122

Odd-numbered Posters: 11:00am - 12:00pm

Even-numbered Posters: 12:00 - 1:00pm

Fang, Kaitlyn M. <i>SURF</i>	4	Where did the mosquitoes that transmit bird malaria in Hawaii come from?	120
Gandy, Essence A. <i>RISE</i>	5	Social media's influence on exotic wildlife interest	120
Greenlee, Michaela D. <i>SURF</i>	6	Neighborhood stress and prenatal anxiety and depression	120
Guerrero, Cinthia M. <i>INSPIRE</i>	7	Searching for the GEF that activates the GTPase Rac1/CED-10 during cell migrations in <i>C. elegans</i>	120
Gutierrez, Juan C. <i>Cellular Bioengineering</i>	8	Gene therapy for chronic spinal cord injury	120
Hachicho, Mark <i>RISE</i>	9	The dietary regulation and gene expression of intestinal lipid metabolizing enzymes, SCD1 and SCD2, in a mouse model	120
Hidalgo, Alexander R <i>INSPIRE</i>	10	The dynamics of electron transfer: applications of data science to biochemical processes	120
Howell, Nyla I. <i>RISE</i>	11	The impact of disaster subcultures on business and community preparedness in coastal New Jersey	120
Kang, Ann <i>Physics & Astronomy</i>	12	STM investigation of surface reconstruction of FeSn	120

POSTER PRESENTATIONS

ROOM# 116, 120, & 122

Odd-numbered Posters: 11:00am - 12:00pm

Even-numbered Posters: 12:00 - 1:00pm

Kaszas, Jack D. <i>Advanced Materials</i>	13	Creating environmentally friendly cement	120
Knight, Jacob R. <i>RISE</i>	14	Synthesis of novel antimalarial compounds	120
Kobs, Zachary A. <i>SURF</i>	15	The Impact of Maternal Diet on Flame Retardant Related Gene Expression in Neonatal Mice	120
Kovach, Io K. <i>Physics & Astronomy</i>	16	Examining bias in models of gravitational lenses with galaxies from the IllustrisTNG simulation	120
Kreinbrink, Shea R. <i>Cellular Bioengineering</i>	17	Generating PD-L1 expressing stem cells for immunoprotection in regenerative medicine	120
Lau, Sarina P. <i>Advanced Materials</i>	18	Composition-structure-solubility relationships of pyrophosphate-based glasses	120
Lugo, Janelle <i>Cellular Bioengineering</i>	19	Healing burn injuries and preventing conversion using an iron-scavenging protein cocktail	120
Medina Vázquez, Alejandra M. <i>GET-UP</i>	20	Understanding the mechanical properties of hydroxyethyl methacrylate-based hydrogels subjected to compression and shear loading conditions	120
Meletz, Ruth M. <i>SURF</i>	1	Effect of perfluorinated "forever" chemicals on the expression of intestinal xenobiotic transporters.	122

POSTER PRESENTATIONS

ROOM# 116, 120, & 122

Odd-numbered Posters: 11:00am - 12:00pm

Even-numbered Posters: 12:00 - 1:00pm

Mendoza, Benjamin <i>RISE</i>	2	Parental Rules In Adolescent Social Media Use and Mental Health	122
Miskiewicz, Sophia L. <i>Physics & Astronomy</i>	3	Walk corrections for the beam monitor of the MUSE experiment	122
Morningstar, Elizabeth H. <i>Physics & Astronomy</i>	4	Low temperature electrical property of a thin film quantum material	122
O'Donnell, Michael, F. <i>Advanced Materials</i>	5	Sol-gel process and application of melting gel to metabolic sensors for smart connected health	122
Obade, Chelsea S. <i>GET-UP</i>	6	Using multimodal approaches to understand the attention and focus of students engaging in engineering serious learning games	122
Oconer, Orlan J. <i>Advanced Materials</i>	7	Modeling intergranular fracture in heterogeneous ceramics	122
Oenga, Ebony N. <i>Advanced Materials</i>	8	How non-covalent interactions influence conformation of lipase	122
Palahnuk, Grace E. <i>Cellular Bioengineering</i>	9	Thermal stabilization of glucose oxidase for continuous glucose monitoring	122
Remache, Luis S. <i>RISE</i>	10	Evidence for the photolysis for brominated flame retardants during atmospheric transportation	122

POSTER PRESENTATIONS

ROOM# 116, 120, & 122

Odd-numbered Posters: 11:00am - 12:00pm

Even-numbered Posters: 12:00 - 1:00pm

Rodriguez Ortiz, Nicole <i>RISE/Waksman Institute of Microbiology</i>	11	New genes required for fertility in <i>Drosophila Melanogaster</i>	122
Rosa Miranda, Jesenia <i>RISE</i>	12	Variations in morphological traits of the larval stage for a poleward moving marine species	122
Simpson, Alyssa <i>Physics & Astronomy</i>	13	Development of a high-resolution inverse photoemission instrument	122
Smith, Kaleigh A. <i>Cellular Bioengineering</i>	14	Effect of PEDOT:PSS on electrode conductivity and impedance of multielectrode array brain-on-a-chip models	122
Sood, Aarush <i>GET-UP</i>	15	Effect of Melting Gels on corrosion through electrospray deposition	122
Sywanycz, Sarah M <i>RISE</i>	16	The anti-inflammatory drug Ibuprofen inhibits sweet taste	122
Tempkin, Jenna P. <i>Physics & Astronomy</i>	17	Using Community Cultural Wealth to understand experiences in physics bridge programs	122
Urquizo, Jordania <i>Protein Data Bank</i>	18	Computational modeling of potential drug-resistance mutations in the SARS CoV-2 main protease	122
Vega, Daphne A. <i>RISE</i>	19	Exopher production in <i>C. elegans</i> expressing ALS protein disease	122

POSTER PRESENTATIONS

ROOM# 116, 120, & 122

Odd-numbered Posters: 11:00am - 12:00pm

Even-numbered Posters: 12:00 - 1:00pm

Vladimirsky, Rachel M. <i>GET-UP</i>	20	Investigation of methylcellulose-MXene composite sprays through self-limiting electrospray deposition	122
Vo, Tien <i>RISE</i>	21	Aggregation and carbon storage in forested and grazed pasture soils from New Jersey	122
Whitesell, Lillian E <i>Physics & Astronomy</i>	22	Star formation histories across the Small Magellanic Cloud from Hubble Space Telescope imaging	122