

# Rhode Island INBRE

IDEA Networks for Biomedical Research Excellence

## NEWS AND EVENTS

### 2015 Summer Undergraduate Research Fellows (SURF) Conference

Laura Arrighi

The 8th Annual SURF Conference was held on Friday, July 29, 2015 at URI's College of Pharmacy and nearby Center for Biotechnology and Life Sciences in Kingston. This Conference was held in collaboration with the RI NSF EPSCoR Program which also offers a SURF program.

This year's conference drew the largest attendance with 137 students from institutions throughout the state presenting posters. The 400 plus participants consisted of students, faculty, and administrators representing URI, Brown University, Bryant University, Providence College, Rhode Island College, Roger Williams University, Salve Regina University, and the Community College of Rhode Island. Governor Gina Raimondo provided the welcoming remarks and hailed her appreciation for the role of science, technology and engineering, stating "it has to be the fundamental component in our next wave of economic development in Rhode Island." URI

Provost and Vice President for Academic Affairs Dr. Donald DeHayes thanked the faculty for providing research opportunities to the students. Dr. Zahir Shaikh (RI-INBRE) and Dr. Carol Thornber (RI NSF EPSCoR) highlighted their respective programs and Dr. Brenton DeBoef (RI-INBRE Training Core Coordinator) said "these are some of the best young minds in our state, and they are working with excellent faculty mentors, at URI and the primarily undergraduate schools." Craig Irving, a doctoral degree candidate at URI and a former RI-INBRE SURF participant, spoke about the positive influence of SURF Program on his educational and career paths.

The presentations by the undergraduate students summarized their research accomplishments over the 10-week period. Technology demonstrations included: Microscopy by Dr. Al Bach (Centralized Research Core Facility) and 3D Visualization of Drug Action by Dr. Bongsup Cho (Biomedical & Pharmaceutical Sciences). In addition, a tour of URI's Medicinal Plant Garden was offered. Informational tables were set up by CoresRI, and various graduate programs at URI and Brown University. The objective of the RI-INBRE SURF Program is to provide research experiences to undergraduates and motivate them toward future careers in the biomedical sciences. These students create a pipeline of trained individuals who are poised to enter the doctoral and professional degree programs as well as state's workforce.



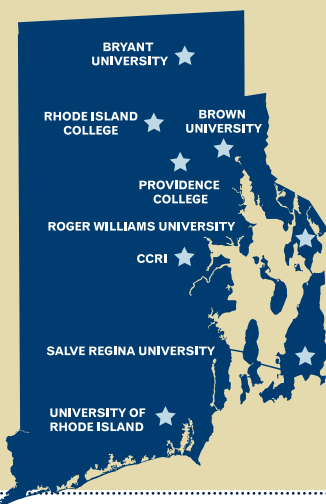
2015 SURF Conference

### In this Issue

- News and Events .....1-9, 11
- From the Director .....2
- Program Updates .....3
- New Investigators.....4-8
- Bridges to Graduate School.....8
- Teaching Postdocs .....10
- Awards and Recognitions .....12

### OUR MISSION

The Rhode Island network, one of the 24 INBRE networks nationwide, supports and develops talented scientists, especially junior investigators, trains students and postdoctoral fellows as future workforce, and builds a multi-institutional program for collaborative research in molecular toxicology, cancer biology, and neuroscience.



## FROM THE DIRECTOR

The RI-INBRE program has had a significant impact on the biomedical research capacity in the state over the past 15 years. This year, 38 faculty at the network institutions received funding for research through the Early Career Development (ECD), Collaborative Proposal Development, Proposal Development, Pilot Proposal Development, and SURF Training award mechanisms. The ECD grant award recipients Drs. Jodi Camberg, Stephen Kennedy, and Deyu Li from the University of Rhode Island, Drs. Peter Belenky, Alexandra Deaconescu, Amanda Jamieson, and Ashley Webb from Brown University, Dr. Victoria Templer from Providence College, and Dr. Jason Spas from Rhode Island College are featured in this Newsletter.

A new Teaching Postdoctoral Fellows program was launched in phase 3 of RI-INBRE and four such positions were filled at Providence College, Rhode Island College, and Salve Regina University. The purpose of this program is to train next generation teacher-scholars for primarily undergraduate institutions. One of these fellows, Dr. Heather Axen, has already secured a tenure-track faculty position at Salve and is highlighted in this issue.

I am happy to share the news that two of our investigators, Drs. Samantha Meenach of the University of Rhode Island, and Brett Pellock of Providence College were successful in receiving multi-year independent research grants from the National Science Foundation. Samantha and Brett are featured in this Newsletter. Hopefully, we will have more success stories to report next year.

Our Program Assistant vacancy was filled in June by Ms. Laura Arrighi. Similarly, the vacancy created by the departure of Bioinformatics Core Coordinator was filled in October by Dr. Christopher Hemme. Both Laura and Chris have been great additions to our program. If you have not already met them, please extend them a warm welcome.

We also added two new members to our Scientific Executive Committee this year. They are: Dr. Angela Slitt of the University of Rhode Island and Dr. Nicanor Austriaco of Providence College. Both Angie and Nic bring molecular toxicology expertise to the Committee. Nic also contributes the undergraduate institution perspective during the review of grant proposals.



Dr. Zahir Shaikh

The Summer Undergraduate Research Fellows Program was organized once again in collaboration with the RI EPSCoR Program. At the culmination of the program, nearly 100 posters were presented by the RI-INBRE Fellows at the SURF Conference. This event is the largest of its kind in the state.

In November, the RI-INBRE Program underwent a program assessment by a panel of experts convened by the Research Competiveness Service of AAAS. The panel acknowledged the remarkable state-wide changes that have continued to occur during phase 3 of the INBRE Program and provided recommendations that could further improve the Program.

A major change in the administration of the RI-INBRE Program is that Dr. David Rowley stepped down from this position at the end of April after having served as the Program Coordinator for almost three years. I am thankful to Dave for his many contributions. He will undoubtedly remain a participant in the program in other capacities. The new Program Coordinator is Dr. Bongsup Cho of the University of Rhode Island who had held this position previously from 2009 to 2012. I look forward to reporting the progress of our network next year.



2015 SURF Conference



## PROGRAM UPDATES

### Dr. Christopher Hemme, Bioinformatics Core Coordinator

Mary Grady, *Contributing Writer*



Dr. Christopher Hemme, a Microbiologist, came to URI last year from a research position at the University of Oklahoma to take charge of INBRE's Bioinformatics Core. The Core provides expert assistance to researchers who need to analyze complex data sets. "This job gives me an opportunity to explore some new fields of study and learn some new techniques outside of my past experiences," Dr. Hemme said. When any researcher needs help with a bioinformatics issue they can consult with Dr. Hemme, and they can use the program's resources. "And if we can't provide what they need, we will connect them with someone who can," says Dr. Hemme.

Dr. Hemme is working on transferring all the software from older desktop computers and consolidating these resources on a single server, which researchers will be able to access online. "That way they can do their work from their own desktops, and won't need to come here to URI to use our computers," Dr. Hemme said. As that project wraps up, Dr. Hemme said he'll be spending more time on outreach. "I'll start offering workshops to teach skills — sequence analysis for DNA or proteins, molecular modeling, scientific programming — whatever the researchers might need." Dr. Hemme said he also can help researchers craft their grant proposals to include bioinformatics.

More details and contact information can be found at: <http://web.uri.edu/inbre/ri-inbre/bioinformatics/>

### Laura Arrighi, RI-INBRE Program Assistant

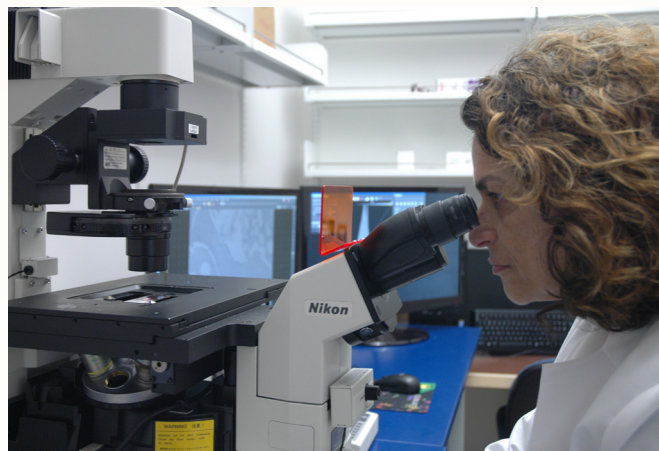
Mary Grady, *Contributing Writer*

Laura Arrighi, the new Program Assistant for RI-INBRE, came to this position last summer with a varied background that has turned out to be just the right fit. "I spent over 10 years in management positions at GTECH and American Express," she says. "After taking some time off to raise my daughter, I taught Biology for eight years at The Prout School, in Wakefield. I loved teaching and I loved science, but I was ready for a new challenge."

In her short time at URI, Laura found that she draws on all the experience she acquired along the way. "I'm so excited about the science and the research here; that's one of the things that attracted me to the job." Her management skills also have proved valuable. "My job is managing all the various facets of the grant," she says. "When I was first hired, I organized the Summer Undergraduate Experience Day and Picnic and then organized the SURF Conference. That was followed by planning for the AAAS site visit and Winter Retreat. Now I'm working on getting new research proposals ready for submission to NIH. It's something different every day."

She also provides the "first line of communication" for anyone who has questions about INBRE or SURF. "I'm a resource for the PIs and students'. They can contact me for questions or problems and I will assist in finding a solution." Laura stated, "I'm working on a list of FAQs for researchers and students that I plan to post online." Another ongoing project is maintaining INBRE's website. "I plan on upgrading the platform to expand the content and make it more attractive," she said, "I promote events, news, and research on Face book and I'm connecting with past students via LinkedIn." Laura is working with the others to track students after they leave the program. She said, "I'd like to introduce the program to the local high schools to plant the seed early with these kids, and promote the undergraduate research and facilities that INBRE supports at seven of the Rhode Island institutions."

With just over ten months' experience at INBRE, Ms. Arrighi says she still has a lot to learn. "But that's what I love about the job, there's so much going on," she said. "It's an awesome place to be."



## NEW RI-INBRE INVESTIGATORS

### DR. JODI CAMBERG

University of Rhode Island  
Mary Grady, *Contributing Writer*

Dr. Jodi Camberg, an Assistant Professor of Cell and Molecular Biology, had already been working at the University of Rhode Island (URI) for a couple of years when the newest RI-INBRE initiative, which includes a focus on neuroscience and neurodegenerative diseases, intersected with her research. "Our project on protein conformation studies, which is relevant to neurodegenerative diseases like Alzheimer's disease, fits really well with RI-INBRE's goals," she says.

"I feel the timing was lucky, because RI-INBRE provided the support to really get this research off the ground," she says. "That helped us to move along faster and to prioritize our work in the lab. Dr. Nasser Zawia, the mentor for this project, really helped us to move along into in vivo models a lot faster than we would have otherwise. And it's great to have the Core Facility right here; we've used that equipment a lot."



Dr. Camberg says the RI-INBRE grant has provided lab supplies, support for two graduate research assistants, and part-time support for two other students to help out in the lab. The team now has several proposals under review at NIH and NSF, and is working on submitting the protein-study project to NIH in the spring. Before coming to URI Dr. Camberg was a postdoctoral fellow at the National Cancer Institute in Bethesda, Maryland, part of the National Institutes of Health. She earned a doctorate in Biochemistry from George Washington University, in Washington, D.C.

### DR. STEPHEN KENNEDY

University of Rhode Island  
Mary Grady, *Contributing Writer*

Dr. Stephen Kennedy, an Assistant Professor of Biomedical and Chemical Engineering at URI, is designing materials that can communicate with biological systems using electromagnetic principles. "For example, we work in the lab to create soft spongy materials that hold drugs, so they can be locally delivered," he said. Once the materials are implanted, they can respond to electric, magnetic, and ultrasonic signals, to deliver drugs very precisely to the targeted tissues. "We definitely feel these materials can have an impact in cancer treatments," Dr. Kennedy said.



RI-INBRE has supported his lab's pilot work first with a Proposal Development award and then with an Early Career Development grant. "The RI-INBRE funding has paid for a graduate research assistant and two undergraduate researchers," says Dr. Kennedy. The grants also provided money for supplies and equipment in the lab. Dr. Kennedy trained as an Electrical Engineer, "using electrophysics in a biomedical context," he says, at the University of Wisconsin. He completed a postdoctoral fellowship in Biomaterials Science at Harvard University in Cambridge. He's now finishing up his second year at URI, and plans to use the data from this initial work to apply for larger grants.

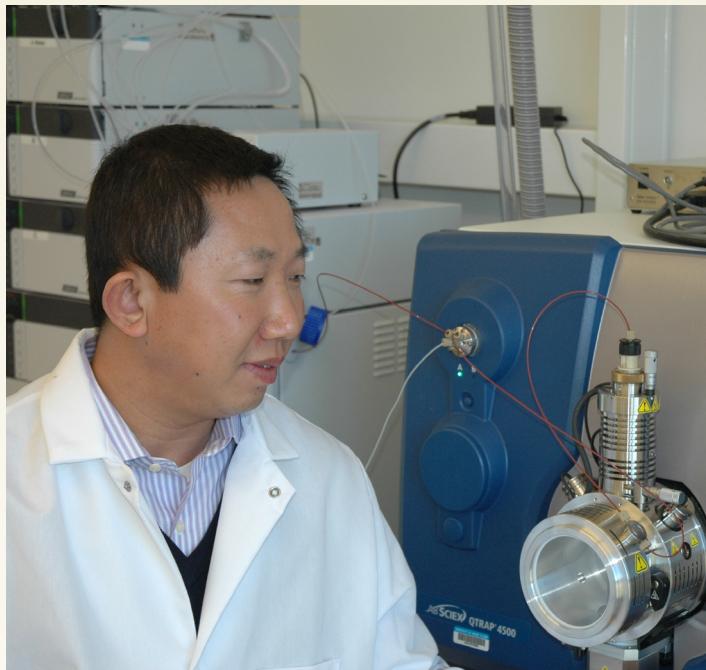


**DR. DEYU LI**

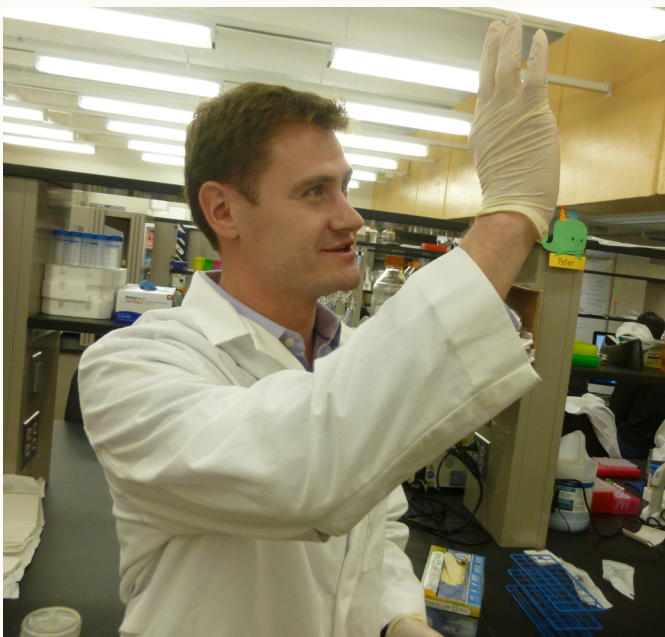
University of Rhode Island  
Mary Grady, *Contributing Writer*

Dr. Deyu Li, an Assistant Professor of Biomedical and Pharmaceutical Sciences at URI, is studying DNA damage and repair, in relation to cancer. The genome is constantly being damaged, he says, from sunshine, chemicals, drugs, toxins, and more. "If we don't repair these genes, that damage can ultimately lead to cancer," he says. "That's why organisms have developed so many mechanisms to repair the genome." The enzyme he is studying, ALK-B, can help to restore damaged DNA. "We're studying the mechanism of that," he says, "to try to find some cure to make the cells healthier and increase the repair capacity."

Dr. Li graduated from Brown University with a Ph.D. in Chemistry, and then worked as a postdoctoral fellow at MIT on DNA and cancer and anti-viral drugs before coming to URI two years ago. RI-INBRE has helped with his research, he says, by supporting three graduate students and two postdoctoral fellows, as well as providing access to the Core Facility. "Without help from RI-INBRE this couldn't happen," he said. "I got great help from the directors, they've been very supportive. It's much more than I expected."

**DR. PETER BELENKY**

Brown University  
Mary Grady, *Contributing Writer*



Dr. Peter Belenky, an Assistant Professor of Molecular Microbiology and Immunology at Brown University, is working to develop drugs to help treat fungal infections. "Antibiotics are not effective against fungi," he said. Fungi, such as *Candida*, can cause common problems like thrush or diaper rash in children or vaginal infections in women. But in people with compromised immune systems, which can result from a range of diseases, these infections can be very dangerous. The current treatment for these extreme conditions is considered a "drug of last resort," he said, because it's quite toxic to the patient.

"Our goal is to find treatments that are less toxic to the patient and more toxic to the infection," says Dr. Belenky. He's pursuing this work with the help of a graduate student and a research assistant who are funded by RI-INBRE. "The best part about RI-INBRE is that when I applied for the grant, I had really cool data that needed to be pursued, and this grant lets me do the work needed to apply for a federal grant," he says.

Dr. Belenky has recently submitted an NSF grant, and he is also working on an NIH grant to fund further research based on his RI-INBRE results. Dr. Belenky was studying Architecture at Brandeis University when he got a fellowship to work in a lab and switched to science. His doctorate is from Dartmouth Medical School, and he continued his scientific training as a postdoctoral fellow at Boston University.

## NEW RI-INBRE INVESTIGATORS *continued*

### DR. ALEXANDRA DEACONESCU

Brown University

Mary Grady, *Contributing Writer*

Dr. Alexandra Deaconescu, an Assistant Professor of Molecular Biology, Cell Biology and Biochemistry at Brown University, is working to understand how cells detect and repair damage in DNA. These mechanisms are important in tumor formation in cancers and in neurodegenerative diseases. The lab is working with a gene from bacteria that seems to be involved in adaptive mutagenesis, she said.

"I hope this work will help us to understand how DNA damage is recognized in the cell and how repairs happen," she said. "We need to solve the structures of the genes, which we are trying to do using electron microscopy and X-ray crystallography. RI-INBRE has funded an undergraduate lab assistant and a research technician to work on the project. I hope now to recruit a postdoctoral fellow so we can make progress a little faster," says Dr. Deaconescu. "And I think having a grant is also a vote of confidence, which makes a difference, too, and I'm very grateful for it."

Dr. Deaconescu is now preparing a grant proposal to the NIH and also is looking for funding from private foundations. She's also developed collaborations with other labs that have complementary expertise. Before coming to Brown, Dr. Deaconescu studied Chemical Engineering at the Cooper Union for the Advancement of Science and Art, and earned her doctoral degree in Molecular Biophysics from The Rockefeller University. She conducted postdoctoral studies at Brandeis University and at the HHMI Janelia Farm Research Campus.

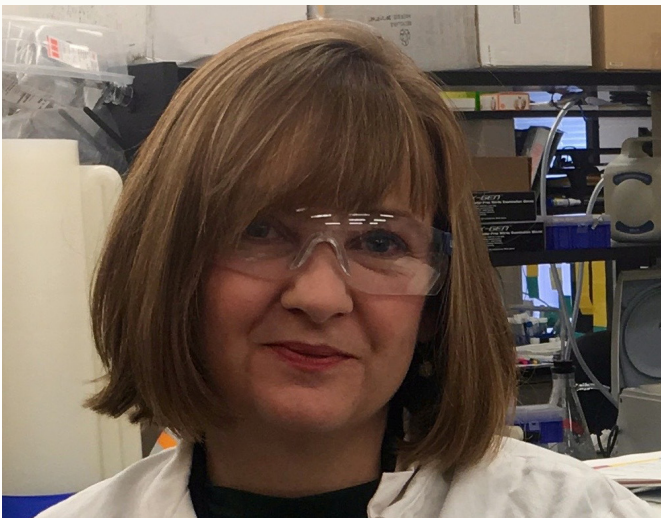


### DR. AMANDA JAMIESON

Brown University

Mary Grady, *Contributing Writer*

Plenty of research has been done on the health effects of cigarettes, but e-cigarettes are a fairly new product and reliable data is scarce. Dr. Jamieson's lab is moving into that field, with a novel protocol to find out how e-cigarettes affect the lungs. "We've developed a device in the lab to extract e-cigarette vapor, and we're testing its effect on cells in the lab," she says. "This is a really new field, so it's kind of exciting."



"Initially we want to look at the immune response, how the lung responds," she says. For the next phase of the research, they're working with an engineer to make a machine that will expose mice to e-cigarette vapor, to see how it affects the whole organism. "I really started this entirely because of the RI-INBRE grant, it really enabled me to start this project," she says. "I have one undergraduate and one graduate student working on the project. We've generated quite a bit of data in a short amount of time, so hopefully that will help us in applying for bigger grants. We're planning to aim for an NIH grant next."

Dr. Jamieson earned her doctorate at the University of California, Berkeley, and then moved to Vienna for five years, for her husband's career. She was able to continue her research in a lab there, she says, and also taught at the University of Vienna. She's now an Assistant Professor of Molecular Microbiology and Immunology at Brown.

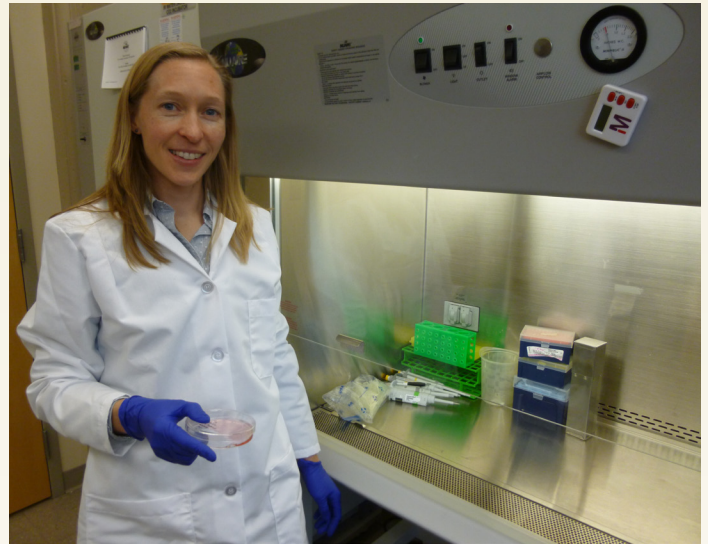


## DR. ASHLEY WEBB

Brown University

Mary Grady, *Contributing Writer*

Dr. Ashley Webb, an Assistant Professor of Molecular Biology, Cell Biology and Biochemistry, and Neurology, at Brown University, is working to investigate the molecular mechanisms of aging and longevity. “We’re trying to understand why neurogenesis declines with age,” she says. “So we’re really focused on looking at neural stem cells, which give rise to new neurons through neurogenesis.” As people get older, there’s a reduced ability of these neural cells to activate. “We don’t really know why that is, and it’s been a difficult problem to study,” she says. The cells are inaccessible in human brains. So Dr. Webb and her team have been working with mice, to try to learn more about these cells and how they operate. “This summer, with funding from RI-INBRE, my lab found that we could treat these stem cells with a protein, BMP-4, that would get the cells to enter a quiescent state,” she said. Ultimately, she hopes this work will lead to the discovery of interventions that could improve the function of people with brain disorders.



Dr. Webb earned her B.Sc. from McGill University and her Ph.D. in Molecular and Cellular Biology from the University of Washington. She completed postdoctoral training at Stanford University, where she began her work investigating the genome-wide transcriptional mechanisms underlying neural stem cell homeostasis during the aging process.

## DR. JAYSON SPAS

Rhode Island College

Mary Grady, *Contributing Writer*

Smoking has decreased over the years, and is much less visible, but about one in five Americans still smoke. Dr. Spas and his lab assistants are working to find ways to help people quit. “The two most significant behavioral causes of preventable death and disability in the U.S. population are smoking and obesity,” says Dr. Spas. “So my team and I are working to develop and test a novel intervention that aims to treat smoking and weight loss simultaneously.”



Many smokers cite weight gain as an important disincentive to quitting, says Dr. Spas, and clinical evidence shows that about one-third of quitters will gain up to 10 or 20 pounds after they stop smoking. So in his current research, he’s incorporating the nicotine patch along with behavioral therapy, to help patients to both stop smoking and maintain a healthy weight. “My approach is called acceptance and commitment therapy,” says Dr. Spas. “It’s mindfulness-based, enhancing the ability to be present-focused.”

Phase one is a pilot study to finalize the intervention protocol, and phase two will be a preliminary randomized control trial. “We already have one peer-reviewed publication out and one in preparation,” says Dr. Spas. “RI-INBRE was really a great opportunity for me to pursue this work. RI-INBRE is supporting three undergraduates, two SURF

students, and one master’s student, all working on this project. The data we generate will serve for me to apply for an NIH grant, in about a year and a half.”

Dr. Spas studied at the University of Connecticut and earned his doctorate in Clinical Psychology at the University of Rhode Island. He completed a postdoctoral fellowship in Psychiatry at Brown University. He’s now an Assistant Professor of Psychology at Rhode Island College.

## NEW RI-INBRE INVESTIGATORS *continued*

### DR. VICTORIA TEMPLER

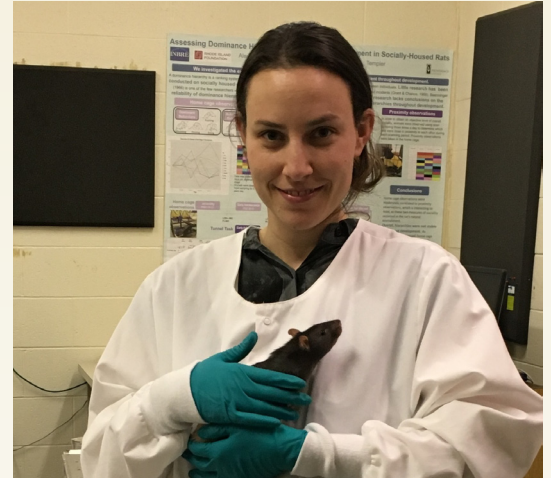
Providence College

Mary Grady, *Contributing Writer*

Dr. Templer says her undergraduate research in Psychology, working with monkeys at Franklin & Marshall College, in Pennsylvania, was a key in motivating her career choices. "I had really great faculty mentors as an undergraduate," she says. "And that's really my goal, to provide undergraduates here at PC [Providence College] with a great research experience." At PC, she's transitioned from working with monkeys to rats. Her main project, which she's been working on for about a year, explores social cognition. "There's evidence that in humans, social enrichment can help protect us from dementia as we age," she says. "We know that from epidemiological studies, but we don't really know much about the cognitive or neural mechanisms that might produce that protective benefit."

Her work at PC aims to explore the difference between rats that are kept in solitary cages and rats that are housed in groups of up to 10 or 12. Does the increased social interaction affect their cognitive abilities as they age? Her students do just about everything in the lab. "I treat them like graduate students," Dr. Templer says. "They collect data, help design the experiments, do statistical analysis, and draft presentations for conferences. I give them quite a bit of independence; I think that fosters more ownership of the project."

RI-INBRE "helped jump-start my lab," says Dr. Templer, providing funding for three students over the summer, and also a laboratory manager. She hopes the results from her current work will help her to apply for larger grants soon. Dr. Templer is now an Assistant Professor in Psychology at PC. She earned her doctorate at Emory University.



## BRIDGES TO GRADUATE SCHOOL

Mary Grady, *Contributing Writer*



In the summer of 2015, the Bridges to Graduate School program provided 10 weeks of research experience and salaries for two former SURF students who were accepted at URI to enter Ph.D. programs in the fall.

**Nick DaSilva** graduated from URI in 2014, with a bachelor's degree in Pharmaceutical Sciences. He then spent a year as a research technician in the multiple-melanoma research program at the Dana Farber Cancer Institute, in Boston. "It was an amazing year," he says, working with world-class scientists on the cutting edge of research. "All of the training and experience I had gained in the lab, from the work I did during SURF training, prepared me for that work. I felt that SURF had brought me to a certain place, and Dana Farber brought me to the next level."

The experience made him realize that to get where he wanted to go in his career, he would need an advanced

degree. "I knew I wanted to be involved in teaching and training and mentoring the next generation of scientists," he says. "So I came back to URI, to study Pharmacognosy." During the summer, Nick worked in Dr. Navindra Seeram's lab. They are conducting research with pomegranates to seek out potential preventions and treatments for cancer.

**Emily Martel**, another alumnus of the SURF program, also spent last summer in the lab, funded by Bridges to Graduate School. "It's definitely pretty awesome," she says. She worked with Dr. Angela Slitt, using mice to test the effects of Perfluorooctane sulfonate, a chemical found in consumer products. "We actually got some very interesting results," she says, showing that the chemical affected





liver function. She's now continuing that work, looking for the mechanisms that caused the effects. "It's very preliminary, but this work might have a real impact down the road," she says.

The Bridges program also provided summer support for Craig Irving (featured in the Spring 2015 newsletter), who continues working toward a Ph.D. in Neuroscience with Dr. Abraham Kovoor at URI. Craig had previously been a SURF student at Salve Regina University. Dr. Brenton DeBoef, Director of RI-INBRE's Training Core, says Craig's trajectory reflects the impact of RI-INBRE across the state. "This is a big part of our mission, working to develop research opportunities at the primarily undergraduate institutions," says Dr. DeBoef. "If there hadn't been this research focus at Salve, Craig might have never gotten on this track."

## NEWS AND EVENTS *continued*

### **Summer Retreat**

The Summer Retreat for the investigators was held on July 29 at URI's Coastal Institute. The discussion focused on "Sharing Success" and included best practices on applying for "Independent Funding in Difficult Times." Dr. Nicanor Austriaco of Providence College shared his experience of applying for and receiving two NIH R15 grants. Dr. William Renehan, the Director of Research at URI's College of Pharmacy, highlighted strategies for successful NIH grants, and Dr. Brett Pellock of Providence College shared his experience in receiving an NSF RUI grant.

### **Northeast Regional IDeA Conference**

On September 23-25, the Northeast Regional IDeA Conference was held in Bar Harbor, Maine. The RI-INBRE Program was well represented by program administrators, investigators, students, and postdoctoral fellows.

### **Fall Seminar Series**

The Fall 2015 seminar series featured Dr. Soldano Ferrone from Massachusetts General Hospital and the Harvard Medical School, and Dr. John Essigmann of the Center for Environmental Health Sciences at the Massachusetts Institute of Technology.

### **New Scientific Executive Committee Members**

We are pleased to welcome Rev. Nicanor Austriaco from Providence College and Dr. Angela Slitt of the University of Rhode Island to the RI-INBRE Scientific Executive Committee.

### **Winter Retreat**

On a snowy February 5th the Winter Retreat for the investigators was held at the Young Building/Pell Center at Salve Regina University. The roundtable discussion was very productive and focused on "Best Practices for Mentoring Undergraduate Researchers" and "Tracking Student Success." Dr. Sean Mulcahy of Providence College shared his best practices for mentoring students. Dr. Kris Monahan, also from Providence College, shared data from the Student Clearing House and highlighted the pros and cons of using this database to follow students, noting if they are not enrolled in a higher education program, they are not in the database. Dr. J.D. Swanson from Salve Regina University offered suggestions on guiding students to write scientific papers. We thank everyone for making the extra effort it required to attend the retreat on this snowy day.

### **RI NIH IDeA Symposium**

The annual Rhode Island NIH IDeA Symposium is a gathering to share best practices and better coordinate the translational research and faculty development programs across the state. It was held on March 17th at the Alpert Medical School in Providence and Jack Elias, MD, Dean of Medicine and Biological Sciences provided the Welcoming Remarks. Dr. Mark Gillespie from the University of South Alabama was the Keynote Speaker, and the symposium included three poster sessions and several other speakers throughout the day.

### **Spring Seminar Series**

The Spring 2016 seminar series featured Dr. Jason Richardson, from the Northeast Ohio Medical University, Dr. Sarah Delaney from Brown University, and Dr. Amal Kaddoumi from the University of Louisiana at Monroe.

## TEACHING POST-DOCS



Heather Axen (SRU)

In the latest 5-year phase of the RI-INBRE grant, which started in 2014, a new program was launched to help support teaching-postdoctoral fellows at Rhode Island's undergraduate institutions. This mechanism supports new doctoral degree graduates who teach classes as well as pursue research agenda in a faculty member's laboratory. "This was our idea," says Dr. Brenton DeBoef, who has taken on the role of overseeing the program. There have been national programs like this before, but funding for many of them has dried up. We saw this as kind of a gaping hole that we wanted to fill."

This year, the program is funding four two-year teaching-postdoctoral fellow positions at three institutions. "Our goal is for these fellows are to be trained as teacher-scholars while enhancing both teaching and research at the state's undergraduate institutions," Dr. DeBoef said. "We want these schools to become what Salve Regina is now, an effective undergraduate research institution. To do that, they need trained faculty. So that's what we're trying to do." Also, when the post-doctoral fellows take on teaching loads from the regular faculty, those professors are freed up to pursue their research projects, adding to the program's impact.

The first graduate to be funded for the two-year program was Dr. Heather Axen, who had graduated from the University of Vermont, and was looking for a post-doc opportunity. "It was just luck, I heard about this post-doc position at Salve Regina, which is exactly the kind of undergraduate institution where I hoped to work," Dr. Axen says. "I had already been out of grad school for three years. In my first post-doc, I didn't get much mentorship, but I really did here. Dr. J.D. Swanson was a great mentor, and helped me with grant-writing. I learned how to manage a lab, students, and time."

During Dr. Axen's first year in the program, a full-time tenure-track assistant professor position opened up at the school, and after a national search, she got the job. "At first we were taken aback," says Dr. DeBoef. "But we quickly realized this is just what we wanted to happen! She's a post-doc-training success story." Dr. Axen now is teaching at Salve, and also working to develop her own independent research program, using fire ants as a model to understand how sickness is transmitted in social systems. The Teaching Post-Doctoral Fellows program has also funded four more such positions: Dr. Stephanie Forschner-Dancause and Dr. Katchen Pereira-Silva, both at Salve Regina; Dr. Toni-Marie Achili, at Rhode Island College, and Dr. Marius Draeger, at Providence College.



## NEWS AND EVENTS *continued*

### NEW GRANTS

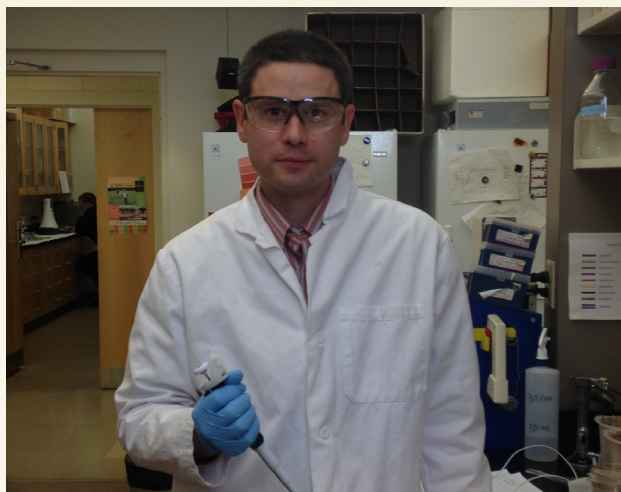
#### NSF Funds Genetic Research

Brett Pellock, Providence College

Dr. Brett Pellock, an Assistant Professor in Microbiology at Providence College, built a research program during his first six years on staff, with help from INBRE. This year, that groundwork helped him to win a \$200,000 grant from the National Science Foundation.

“This grant is designed to support fundamental research at undergraduate institutions,” says Dr. Pollock. “The funding will cover three years of expenses to run my lab, including supplies, contract services, my summer-session salary, and most importantly, it will pay for several student stipends.” Those students will work full time in the lab for 10 weeks over the summer. The grant also provides funding for the students and Dr. Pellock to go to conferences and publish their work.

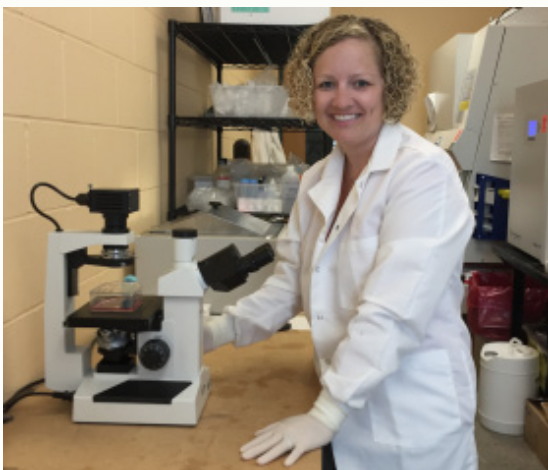
The lab is working with *Shewanella* bacteria, which “have a really neat physiology,” Dr. Pellock says. They can “breathe” metals, such as chromium, iron, and manganese. “They convert those metals into energy, in the same way we take in oxygen and use it to create energy,” he says. Engineers are interested in using this type of organism for a variety of applications, such as helping to remove pollutants from water. But Dr. Pellock’s lab is focused on understanding the organism’s fundamental biology. “We’re looking at how this bacterium adapts to oxidative stress, how it grows, and what mechanisms it uses to be adaptive,” he says. “Anything we learn about how cells adapt to stress, we can generalize it to understand our own human processes. It’s very rewarding work for me, and it’s very rewarding for the students too. They learn to be rigorous critical thinkers. The outcomes are very tangible and very positive.”



#### Cancer Research Benefits From NSF Grant

Samantha Meenach, University of Rhode Island

Dr. Samantha Meenach, an Assistant Professor of Chemical Engineering and Biomedical and Pharmaceutical Sciences at the University of Rhode Island, and an RI-INBRE Early Career Development Awardee, won a \$310,000 three-year grant from the National Science Foundation in May. “Essentially, what we’re doing is growing model 3-D mini-tumors in the lab, which are physiologically similar to actual tumors,” says Dr. Meenach. “It’s better than an animal model for testing new cancer therapies, because the lungs of mice and rats aren’t that similar to human lungs.”



The tiny globe-like tumors, each one about the size of a pencil dot, are grown in a specially-developed 3-D-printed mold. “The research has shown that these spheroids do act like real tumor tissue, as far as their physiological properties,” says Dr. Meenach. She originally came up with this idea when she was still a post-doc, she says. “It was kind of a side project. We got some preliminary data, and then kept at it.” Now the NSF grant will fund both a post-doc and a graduate student to carry on the research. Dr. Meenach hopes to also get more funding to add undergraduates to the lab over the summer.

The mini-tumors are not hard to make, but finding an easy, fast way to make them was difficult, and took a long time. “Four or five of us tried several different methods over several years before finally figuring this out,” says Dr. Meenach. “It’s challenging to form the models in a way that’s efficient, uniform, and easy to replicate. The key was using the 3-D-printed mold. It was such a brilliant, simple solution. And it’s something very tangible for the students to work on.”

## AWARDS and RECOGNITIONS

### Total Extramural Grant Awards (2001 – 2016)

Our investigators have received 3 awards from the NIH. An additional 12 awards were received from NSF, the R.I. Foundation, and other external funding agencies. The total extramural funding received by the RI-INBRE investigators is over \$51 million thus far.

### University of Rhode Island

**Dr. Stephen Kennedy's** students Tanner Barnes and Rob Blease received 2nd and 3rd place poster awards at the American Institute of Chemical Engineers conference. Dr. Kennedy's publication entitled "Sequential Release of Nanoparticle Payloads from Ultrasonically Burstable Capsules" was highlighted in an article entitled "Polymer capsules deliver nanoparticles on time" in *Materials Today*. Dr. Kennedy received a grant entitled "Remotely-activated Biomaterials for Regenerating Mature Vascular" from the RI Foundation.

**Dr. Deyu Li** received a grant entitled "Mechanism of Nickel's Toxicity on DNA Repair Enzymes and Its Carcinogenicity" from the RI Foundation.

**Dr. Kunal Mankodiya** received a grant entitled "Cloud-connected Mobile Speech Analysis System for People with Parkinson's Disease" from the RI Foundation. Dr. Mankodiya also received a grant entitled "Wearable internet of things" from VentureWell.

**Dr. Samantha Meenach** received a grant entitled "3D Air-grown Lung Cancer Spheroid Models for the Evaluation of Aerosol" from the RI Foundation. Dr. Meenach also received a 3-year grant entitled "UNS: 3D Air-Grown Lung Cancer Spheroid Models for the Evaluation of Aerosol Anticancer Therapeutics" from NSF.

**Dr. Lynn Trzoss** received a grant entitled "Development of Tissue-specific Nrf2 Inhibitors Towards Chemoresistance and Target Therapy" from RI Foundation.

**Dr. Ying Zhang** received a grant entitled "Constructing an Integrated Database of PPI Molecular Regulation" from RI Foundation.

### Brown University

**Dr. Amanda Jamieson** received a grant entitled "Tolerance of HIV-related Immune Reconstitution Inflammatory Syndrome" from NIAID, NIH. Dr. Jamieson also received a grant entitled "The Lung Microbiome and Pulmonary Disease Resilience" from the RI Foundation.

**Dr. Karla Kaun** received a grant entitled "Neuronal Mechanisms Underlying Rewarding Memories of Alcohol Intoxication" from the RI Foundation.

**Dr. Ashley Webb** received the Glenn Award for Research in Biological Mechanisms of Aging. Dr. Webb received a grant entitled "Preservation of Adult Neural Stem Cells by the Prolongevity FOXO3 Transcription Factor During Aging" from the American Federation for Aging Research. Dr. Webb also received a grant from the Glenn Foundation for medical research to support research on "Biological Mechanisms of Aging".

### Bryant University

**Dr. Christopher Reid** and collaborator, **Dr. Amit Basu** of Brown University, filed a provisional US patent on small molecule inhibitors of bacterial N-acetylglucosaminidases as antibiotics against gram-positive pathogens. Dr. Reid will speak at the 2016 ACS National Meeting in San Diego in a session entitled "Carbohydrate Research at Predominantly Undergraduate Institutions".

### Providence College

**Dr. Nicanor Austriaco** received a grant entitled "Genetic Dissection of Yeast Bax Inhibitor Function in UPR and Calcium Signaling" from the NIGMS, NIH.

**Dr. Joseph DeGiorgis** published two articles entitled "The Amyloid Precursor Protein of Alzheimer's Disease Clusters at the Organelle/Microtubule Interface on Organelles that Bind Microtubules in an ATP Dependent Manner" in *PLoS One*, and "ATP-binding Cassette Transporters and Sterol O-Acyltransferases Interact at Membrane Microdomains to Modulate Sterol Uptake and Esterification" in *FASEB J*.

**Dr. Seann Mulcahy** published an article with his students Jonathan Varelas, Satyam Khanal, and Michael O'Donnell in *Organic Letters* entitled "Concise Synthesis of Annulated Pyridro [3,4-b]indoles via Rh(I)-Catalyzed Cyclization".

**Dr. Brett Pellock** received a 3-year NSF RUI award entitled "Hfq and sRNA Function in *Shewanella oneidensis* Growth and Adaptation to Stress".

**Dr. Victoria Templer** received a grant entitled "An Animal Model for Sociality and Cognitive Processing to Treat Memory Disorders" from the RI Foundation.

**Dr. Marla Tipping** received a grant entitled "Establishing in Situ Metabolic Approaches for the Study of Gliomas in *Drosophila*" from the RI Foundation.

### Rhode Island College

**Dr. Thomas Meedel** received a grant entitled "A Proteomics Approach to Analyzing Phenotypic Plasticity versus Adaptation in the Response of Marine Invertebrates to Climate Change" from the R.I. Science and Technology Advisory Council. Two of Dr. Meedel's students, Taylor Ferrare and Emmanuel Asiedu, received awards for their posters at the 8th BIONES Conference held at Roger Williams University.

**Dr. Geoffrey Stilwell** received a grant entitled "Protecting Honey Bees from the Small Hive Beetle in Rhode Island" from the R.I. Department of Environmental Management.

### Roger Williams University

**Dr. Avelina Espinosa** became a member of the Steering Committee for the North American Chapter of International Society for Protistsologists (ISoP). She was also an ISoP Program Committee Chair. Dr. Espinosa's student Joshua Leitao, was awarded a fellowship to pursue a graduate career in microbiology by the American Society for Microbiology.

### Salve Regina University

**Dr. Susan Meschwitz's** student Emily Poulin received 2nd place for her presentation entitled "Inhibition of Bacterial Quorum Sensing by Various Beta-Keto Esters" at the 26th Annual Harry C. Allen Jr. Symposium at Clark University in Worcester, MA



Rhode Island INBRE, Center for Molecular Toxicology, College of Pharmacy  
University of Rhode Island, 7 Greenhouse Road, Kingston, RI 02881



The RI INBRE Program is supported by a grant from the National Institute for General Medical Sciences, National Institutes of Health