

Rhode Island INBRE

IDeA Networks for Biomedical Research Excellence

NEWS AND EVENTS

2013 Summer Undergraduate Research Fellows (SURF) Conference

The 12th Annual SURF Conference was held in collaboration with the RI NSF EPSCoR Program on Friday, August 2, 2013 at the College of Pharmacy and the Center for Biotechnology and Life Sciences on the University of Rhode Island's Kingston Campus. The majority of the 300 plus participants consisted of students, faculty, and administrators representing the University of Rhode Island, Brown University, Bryant University, Providence College, Rhode Island College, Rhode Island School of Design, Roger Williams University, Salve Regina University, and the Community College of Rhode Island. Welcoming remarks were given by the Lieutenant Governor of the State of Rhode Island, Elizabeth Roberts, University of Rhode Island President, Dr. David Dooley, Dr. Zahir Shaikh (RI-INBRE Program Director), and Dr. Jennifer Specker (RI NSF EPSCoR Project Director). Dr. Lisa Zuccarelli, Chair of Biology and Biomedical Sciences and Chemistry at Salve Regina University, addressed the impact of undergraduate research on higher education. Dr. Dioscaris Garcia, a former RI-INBRE

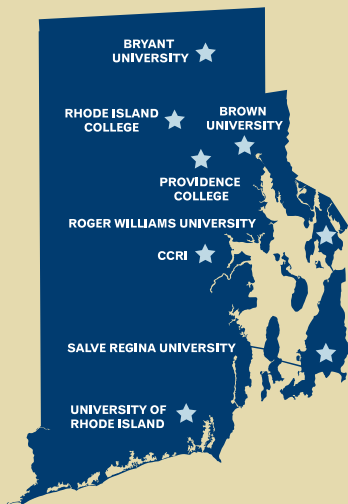
SURF participant that went on to earn his Ph.D. at Brown University, spoke on the impact of the SURF Program on his educational and career path. A total of 117 scientific posters were presented, of which 80 were presented by RI-INBRE Undergraduate and Graduate Fellows.

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OUR MISSION

The Rhode Island network, one of the 24 INBRE networks nationwide, seeks to support and develop talented scientists, especially junior investigators, and build a productive multi-site program for collaborative research in molecular toxicology, cell biology, and behavioral science.



University of Rhode Island Students from left to right: Stephanie Komjian (URI College of Pharmacy Dean's Fellow), Nicholas Lemme (RI STAC Governor's Fellow), Brianna Kimball (URI College of Pharmacy Dean's Fellow), and Sierra Valois (URI Provost's Fellow)

FROM THE DIRECTOR

The present 5-year NIH grant that supports the RI-INBRE program will be ending on April 30, 2014, bringing to completion the 13th year of the program. The application for the next 5-year competitive renewal of the program was submitted to NIH in June, 2013 and is awaiting the notice of grant award. The scientific themes for the next phase of the program will be Molecular Toxicology, Neuroscience and Cancer Research. While toxicology has been a reoccurring theme of the program, the new themes were chosen based on growing interest at the University of Rhode Island and in the state on neurodegenerative diseases and cancer. With a \$15 million private gift, the University recently announced the formation of the Ryan Institute for Neuroscience. Similar initiatives at Brown University and Rhode Island Hospital are already in place. So this is a fertile area for RI-INBRE to invest in the future, along with cancer research which is also gaining momentum.

Since its inception in 2001, the RI-INBRE program has had a significant impact on the biomedical research capacity in the state. Over 100 faculty from the seven higher education institutions that comprise the network have received support for their research projects. To enhance research capabilities of the participating primarily undergraduate institutions, grant funds also supported such activities as equipment purchases, laboratory renovations, establishment of a state-wide Centralized Research Core Facility, a Bioinformatics Core Facility, academic year and summer research opportunities for more than 1,000 students and post-docs, and workshops and seminars by eminent scholars. As a result, supported faculty and students have made over 1,100 presentations at scientific meetings, published more than 400 peer-reviewed articles, and received nearly \$47 million in external research grant funding.

scientific themes for the next phase of the program will be Molecular Toxicology, Neuroscience and Cancer Research

We are proud to share the news that this year two junior faculty in the RI-INBRE program, Dr. Steven Threlkeld of Rhode Island College and Dr. Wei Lu of the University of Rhode Island, have each received multi-year NIH grant awards. They are featured in this Newsletter. We look forward to building on these successes and reporting more in the future.

We were sorry to see Dr. Keykavous Parang, our Program Coordinator for 2012-2013, leave Rhode Island. He started with the program as an investigator, graduated upon receiving his independent funding, but stayed involved in various capacities. We wish our dear friend and colleague Key the best in his new pursuit as the Associate Dean for Graduate Studies and Research at Chapman University where he is involved in the

establishment of a new College of Pharmacy. The RI-INBRE program welcomes Dr. David Rowley as its new Program Coordinator. Like Key, Dave also joined the program at its inception as an investigator and followed a similar path. Until summer 2013, he was the Coordinator of our SURF program which has seen tremendous growth during his stewardship. Dave brings lots of energy and enthusiasm to the Program Coordinator position. We look forward to his continued contributions towards advancing biomedical research in Rhode Island.



Dr. Zahir Shaikh

supported faculty and students have made over 1,100 presentations at scientific meetings, published more than 400 peer-reviewed articles, and received nearly \$47 million in external research grant funding

During the past year, we welcomed five newcomers to the RI-INBRE program. Dr. Sean Mulcahy, Assistant Professor of Chemistry, Providence College, Dr. Marla Tipping, Assistant Professor of Biology, Providence College, and Dr. Colleen Marlow, Assistant Professor of Physics, Rhode Island College received Student Training Pilot Project awards. At the University of Rhode Island, Dr. Mathew Kiesewetter, Assistant Professor of Chemistry, and Dr. Samantha Meenach, Assistant Professor of Chemical Engineering and Biomedical & Pharmaceutical Sciences were the Proposal Development Pilot Project awardees. We wish them all great success in their research and student training activities.

Other newsworthy items include the initiation of a fee structure for the non-INBRE users of the Centralized Research Core Facility. This facility has operated free of charge and modest fees are a step toward attaining self-sustenance in the future. Also, our website has received a much needed overhaul. Over the past few months, Dr. Hany Alashwal and Mr. Jeff Ulricksen have worked diligently on this project. The new website (web.uri.edu/inbre) which is much improved, both in its appearance as well as functionality, is being unveiled along with the release of this Newsletter.

PROGRAM UPDATES

“We Can Help Launch Successful Careers”

Mary Grady

Contributing Writer



Dr. David Rowley

Dr. David Rowley's career at URI has come full circle -- he started out as one of the university's first INBRE-supported junior researchers when he joined the College of Pharmacy in 2001, and this year, he took on the role of RI-INBRE Program Coordinator, replacing Dr. Keykavous Parang. “RI-INBRE helped to launch my independent research career,” Dr. Rowley says. “I loved my former job as coordinator of the SURF Program. But when I was asked to take on this new role, I said yes, because I can help to support the careers of junior faculty.” As program coordinator, Dr. Rowley will oversee the portfolio of grants and support investigators across the network of Rhode Island research institutions. “It's a different role for me, but it's a really important one, and I'm excited about it,” he said.

Dr. Rowley will be working with young researchers who are a lot like he was when he arrived in Kingston. After studying at the Scripps Institute of Oceanography, in San Diego, he was recruited to URI to help discover new drugs by studying microbes found in the marine environment. “I was a new faculty member with a lot of ambition, but without all the knowledge and resources needed to start a research program,” he says. “RI-INBRE can recognize promising projects and provide financial resources, as well as scientific instrumentation through our Core Facility, and help to launch the careers of successful scientists.”

Dr. Rowley's work now is focused on finding new molecules from nature that can be developed into effective treatments for infections. “We've been studying bacteria that come from some of the deepest parts of the world's oceans,” he says. “We're attempting to better understand the potential of the deep ocean as a new frontier for drug discovery. We're also looking at molecules from a variety of other sources, including terrestrial plants, that might be useful to prevent bacteria from harming the body and help strengthen the body's immune system.

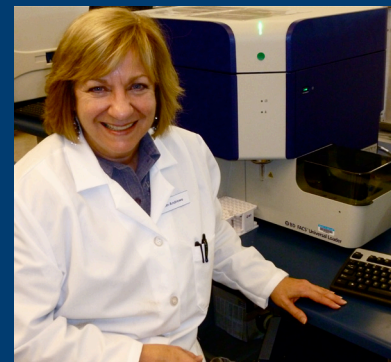
RI-INBRE funding can help to catalyze the pace and the quality of research statewide, Dr. Rowley said. “We want to use the funding to help Rhode Island researchers become as competitive as any other place in the country. I believe we have incredible potential here. We've already seen what's possible by supplying resources to researchers -- there's a real culture change going on right now at some of our member institutions, where undergrads are now doing research, because research has become a priority.” RI-INBRE already has established some strong facilities, and it's important to maintain and expand them, Dr. Rowley said. “But I think the main focus is, how do we enable the faculty and students we're working with to achieve their goals. We want to see researchers at all of the network institutions succeed.”

Dr. Rowley can be reached at drowley@uri.edu or 401-874-9228.

Centralized Research Core Facility

New Equipment and Software

The existing inverted Nikon E2000 microscope in the facility was upgraded to a Nikon C2-Confocal microscope. So, the microscope now has both fluorescence and confocal capabilities. A new qPCR ViiA-7 from Life Technologies was also acquired.



Kim Andrews joins the RI-INBRE Centralized Research Core Facility

Mary Grady

Contributing Writer

Researchers who want to make use of the RI-INBRE Centralized Research Core Facility at URI will find a helpful resource in the expertise of Kim Andrews, the new Research Associate in the Core Facility. Andrews, who trained as a cell biologist, came to the Core Facility in March, after working 25 years at Pfizer in Groton, Connecticut. “It's nice to come back to academia and interact with grad students, post-docs, and faculty,” she says. “I really enjoy being considered a resource for others.” The lab houses various analytical instruments including mass spectrometers, microscopes, FACS and cell culture facility. Andrews can train researchers to use the equipment, or she will conduct analyses for them according to their protocols. “If they've been trained, they're free to schedule the equipment and use it themselves. We want the RI-INBRE community to utilize this lab as much as possible.” she says. The equipment is cataloged on the lab website, and can be reserved online at web.uri.edu/inbre/.

Continued on Page 4

PROGRAM UPDATES *continued*

User Fees

The facility operation has been supported by a combination of grant funds and contributions from the participating institutions. Recently, nominal core facility user fees were implemented for users who are not directly supported by the RI-INBRE grant. List of fees for various technologies is available at web.uri.edu/inbre/.

Seminars and Outreach

The Centralized Research Core Facility staff has been involved in campus visits, seminars and outreach activities for participating RI-INBRE undergraduate institutions. On December 4, as part of the outreach initiative, Kim Andrews, Research Associate and Dr. Aftab Ahmed, Facility Coordinator visited Salve Regina University and met with faculty and students. The participants were updated on the technologies available in the facility and student training in key technologies was discussed. Similar visits are planned to other network institutions.



Dr. Aftab Ahmed,
*RI-INBRE Centralized Research
Core Facility Coordinator*

Workshops

On May 30, Susan Bove, Field Application Scientist at Life-Technologies presented a seminar, entitled "Introduction to qPCR: What ensure Real-Time PCR success?". Following the seminar Susan provided a hands-on workshop on the newly-acquired Real-Time PCR and explained setting up an experiment, software operation, and data analysis.

Bioinformatics Core

As Bioinformatics becomes more important and critical in conducting successful biomedical research, especially in areas where large volume of data are being generated at a rate that has not been seen before, such as genomics and proteomics, the RI-INBRE Bioinformatics Core will play an essential role in developing strategies for data analysis.



Dr. Hany Alashwal
Bioinformatics Coordinator

New Software and Hardware

Access to commercial Bioinformatics software installed on Dell workstations at URI was provided to RI-INBRE investigators at the network institutions. However, web-based tools and applica-

tions are freely available for most common Bioinformatics tasks such as sequence analysis. It is also anticipated that there will be a steady move towards free open-source internet-based and/or stand alone tools that are linked to most sequence and data repositories worldwide. RI-INBRE investigators are encouraged to utilize these tools. Additionally, the Core has acquired a new server that will host a wide variety of free open-source applications and commercial software that might be needed by the RI-INBRE community. This server is being setup so that it can be accessed remotely.

Educational Activities

This fall, Dr. Hany Alashwal taught a course entitled "Programming for Scientists" in collaboration with the Computer Science department. This course was designed for graduate students who are not Computer Science majors and had no previous computing experience. The goal was to introduce students to programming techniques, algorithm development and computing concepts. Examples from life sciences were used to emphasize logical and algorithmic thinking in problem solving. Programming and Computer Science are major components in all Bioinformatics applications. Therefore, students from Life Sciences who acquire programming skills are more likely to use Bioinformatics approaches in their research. With advancement in Computers Science and Technology, it is becoming accessible and easier for non-Computer Science students to learn programming skills using popular scripting languages such as Perl, Python and R which provide modularity, expandability, and rapid application development. Building on the success of this course, the Bioinformatics Core plans to collaborate with the Computer Science department in offering "Bioinformatics I" course in the spring semester. Students from Computer Science and Engineering will work together with those from Life Sciences on Bioinformatics related projects.

During the past year, the Core organized three Bioinformatics seminars and four workshops, aiming to promote Bioinformatics and its application among the investigators within the RI-INBRE network. The Core is also committed to providing support and consultation for RI-INBRE investigators for their funded research and during preparation of grant applications.

SURF-ing Through Summer

Mary Grady
Contributing Writer

When a program has the power to change lives, boost career tracks, and serve the needs of students as well as researchers and institutions, that's a successful program. And the program known as SURF -- Summer Undergraduate Research Fellowship program -- is delivering on all those goals. Five hundred and sixty-nine students have benefitted from SURF since its launch in summer 2002, and biomedical and behavioral research projects throughout the RI-INBRE network have advanced thanks to their work.

The program provides funding for the students to work full-time for 10 weeks in a research lab over the summer. In the lab, students learn skills and gain experience, but they also contribute valuable data. "They have a real impact on the faculty members' research," says Jeff Ulricksen, the RI-INBRE Program Assistant. "In some cases, the student might take on a small piece of a bigger project and make it their own. It's not unusual for our undergraduates to be listed as co-authors on publications in major peer-reviewed journals."

Since its first summer the program has grown every year, and in 2008 began to collaborate with a similar program organized by RI NSF EPSCoR which is funded by the National Science Foundation. "Mixing the students from the two programs together helps to broaden everyone's horizons," says Ulricksen. In 2013, the collaborative program supported 123 students from nine schools. Of these, 89 were RI-INBRE SURF students.

Besides working in the labs, the SURF students also participate in a broad-based career-enrichment program. They attend workshops and seminars on topics such as lab safety, data management, scientific writing, and how to apply to graduate school. They tour the Core Research Facility at URI and visit the Pfizer research campus in Groton, Connecticut. For some students, says Ulricksen, the program can open up possibilities they may never have considered otherwise.

"You see students come in who thought they would just get lab experience to add to their resume, but once they start doing research, they get hooked," says Ulricksen. "They want to continue to be involved with research, even if they don't change track completely." Key to the program's success is the opportunity it creates to develop new connections and new collaborations, and spread ideas and technology among all the participating institutions. It also helps undergraduates to learn more about graduate school by creating opportunities for them to interact with graduate students and research faculty.

The summer research program wraps up with the Annual Rhode Island SURF Conference, which has grown into one of the biggest events of the year on the URI campus. Students from both RI-INBRE and RI NSF EPSCoR present the results of their research in poster sessions. "The conference draws not just students and faculty, but top administrators from the schools in the network, and leaders from state government," says Ulricksen. "This summer, over 300 people attended, and besides the posters, we had speakers and exhibits, tours of the Core Facility and the new medicinal garden, and a lot of opportunities for networking."

The program continues to grow and evolve and recently has attracted funding from other sources for four more fellowships. The program hopes to find additional outside funding, and also aims to increase the numbers of women and minority students. "We're always looking for further opportunities to diversify and to leverage and augment what we're already doing," says Ulricksen. "A lot of networking and collaboration is happening all around the state as a result of this program. We've come a long way, but we hope to grow even more."

More details about the SURF program and application forms can be found at the INBRE website at web.uri.edu/inbre/.



For CCRI Student, A Fresh Perspective

Mary Grady

Contributing Writer

"My story is a little bit different," says Ana Ortez. She came to the United States just three years ago, from El Salvador. She already had a bachelor's degree in chemical engineering and was working in her field, but when family obligations drew her to the U.S., she decided to continue her education here. "I wanted to learn about biotechnology, and enrolled in a certificate program at the Community College of Rhode Island," she says. While there, she heard about the RI-INBRE SURF Program. She applied and was selected for a fellowship. "I did my research with Dr. Aftab Ahmed at the RI-INBRE Centralized Research Core Facility," she says. "My project was about isolation, purification, and characterization of proteins from ginger. I liked that I had a lot of freedom. I got my own results, and created a poster for the Annual Rhode Island SURF Conference."

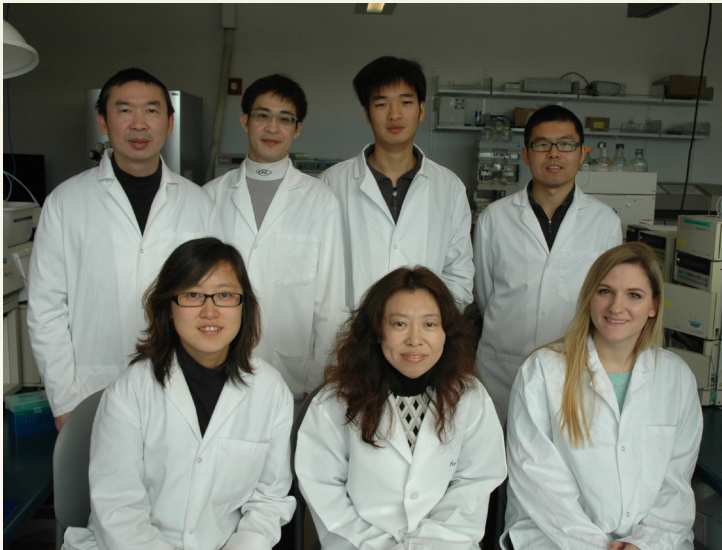
Ana is now working as an intern in Dr. David Rowley's lab at URI this year while finishing her program at CCRI, and plans to apply to graduate school at URI next year, with the goal to earn her doctorate degree in biomedical sciences. Her summer at the Core Lab was a great opportunity, she said. "You get to work with known scientists, doing important projects, and you learn to use instruments that are really common everywhere you might go in the future." Coming from a small country where such resources are unavailable, she appreciates the access she's had here. "If I can say something to students like me, it would be, 'Apply!' You're working, and at the same time you're learning. And you work with the grad students during the summer, so you get a good sense of what grad school is like. It's amazing."

FEATURED INVESTIGATORS

Working To Defeat A Deadly Cancer

Mary Grady

Contributing Writer



Dr. Xiaoqun Dong, University of Rhode Island
(Front Row, Center) and Lab Members

Pancreatic cancer is an aggressive killer, the fourth-leading cause of cancer deaths in the U.S., with the lowest five-year survival rate of all malignancies. Dr. Xiaoqun Dong hopes, with RI-INBRE support, to change those odds. It's challenging work, but she is well prepared for it. When Dr. Dong arrived on campus in 2012, she already had been working for several years as a post-doc at the University of Texas MD Anderson Cancer Center. Previously, she studied at the Chinese Academy of Medical Sciences, where she earned both a Ph.D. and an M.D. degree.

Dr. Dong's recent work is focused on seeking novel therapies. "Pancreatic cancer is relatively asymptomatic, so about 80 to 85 percent of patients don't get diagnosed at an early stage," she says. "By the time the cancer is discovered, it's already at a late stage, when it's too late for surgery. It's also very aggressive and drug-resistant. We need to find some new, targeted therapy that could improve the efficacy of the chemotherapy or chemoradiation." In her most recent work, Dr. Dong is studying the oncogenic properties of a specific gene, liver receptor homolog 1, or LRH1, in pancreatic cancer development and progression.

Her work so far has found that the LRH1 gene is over-expressed in a high percentage of patients with pancreatic cancer, but it is not expressed in a normal pancreas. "This is a big difference," she says. "We did a series of experiments to study the function and we found this gene can promote cell proliferation, invasion, migration, tumor formation, and liver metastasis. We think it is a driving factor for pancreatic cancer growth and progression." The results are promising and a paper is currently under review.

"Now we are working to see if we can identify some new small molecule inhibitor that could inhibit the function of the gene,

and could be used in a pre-clinical trial in the animal model," Dr. Dong said. "If we succeed, then we could proceed with a clinical trial with patients." Her lab will also collaborate with scientists at Brown University and the Massachusetts General Hospital, a major affiliate of Harvard Medical School, to study and map the structure of the molecule. "Hopefully, we can progress quickly," Dr. Dong said. She has been working with two Ph.D. students and a post-doc. She also supervised Christina Nadolny, a recent graduate from Bryant University who worked in the lab over the summer in the new Bridges to Graduate School program and has joined the laboratory this fall as a graduate student.

RI-INBRE support has been critical for her work to advance, Dr. Dong said. "As young faculty members, we need to prove that we can carry out a big project. So to have RI-INBRE support at this stage is very important, it's critical. They really care about my progress and they want me to succeed, so I really appreciate it. And we use the Core Facility very frequently, and it is a great asset for us."

At RIC, Undergraduates Help Advance Brain Research

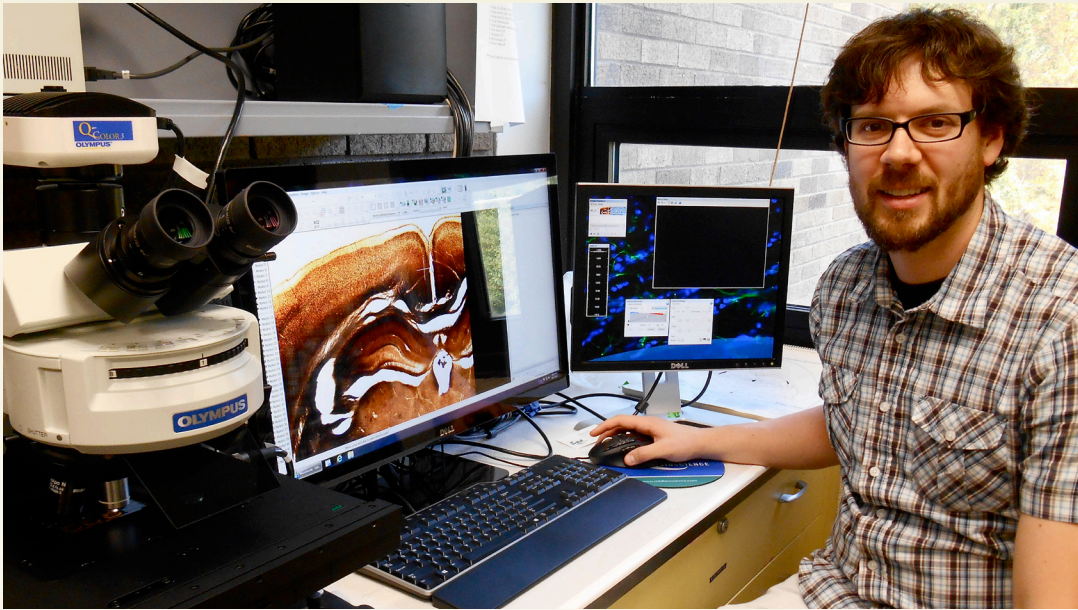
Mary Grady

Contributing Writer

Tens of billions of neurons interact in every human brain, creating a complex and fascinating puzzle for researchers, whether they are seeking fundamental understanding of how the brain works or searching for ways to help people with brain injuries. At Rhode Island College, Dr. Steven Threlkeld, an assistant professor of psychology, has been working for several years, to better understand how behavioral impairments associated with brain injuries in premature at risk infants can be assessed and perhaps prevented.

Thanks to the support of an RI-INBRE Collaborative Research Award, Dr. Threlkeld was able to work with Dr. Barbara Stonestreet at Women & Infants Hospital and Dr. Yow-Pin Lim of ProThera Biologics, a new Rhode Island biomedical company, to examine the effects of early intervention in treating the injuries that result in perinatal brains from a shortage of oxygen. Such injuries can be difficult to detect in humans, and the results can affect learning and behavior over a lifetime. "This study effectively combined my experience with behavioral assessment and neuro-anatomy with Dr. Stonestreet's expertise in inflammation and brain injury," Dr. Threlkeld said. The research aimed to determine if certain anti-inflammatory proteins could improve behavioral and neurological outcomes in a rodent model of developmental brain injury.

The research also depended on the contributions of RIC undergraduate students, who were involved in every phase of the work. "It's essentially a collaboration," Dr. Threlkeld said. "I've had three students do honors projects related to the RI-INBRE project. They get a lot of training on basic techniques in the lab,



Dr. Steven Threlkeld, Rhode Island College

microscopy methods, research design, neuroanatomy, and methods for behavioral assessment. About a dozen students participated by taking a seminar or working in the lab, and one master's student wrote a thesis. We've developed a new minor in behavioral neuroscience, which was implemented last year. Students are really engaged and excited about what we're doing here at RIC."

With the RI-INBRE research completed, Dr. Threlkeld and his students are working on articles for publication. "The data that we collected was very interesting, and we are still doing some of the analysis," he said. Using laboratory rats as models, the researchers tested the effects of Inter-Alpha inhibitor protein on brain injury in new born rats. The animals were tested for both physical changes in the brain tissue and behavioral changes. The tests were conducted after 72 hours and again when they reached adulthood. "We found huge, huge effects from the treatment," he says. "These were really promising signs."

One exciting result showed that the difference between treated and non-treated animals increased over time, and at adulthood, the treated animals performed significantly better than those that had not been treated. "This study shows maturation is really critical," says Dr. Threlkeld. "You have to look across the lifespan to get an accurate picture of how the drug will affect performance." To gain the maximum benefit from the treatment, doctors could administer the protein prophylactically to at-risk infants in utero, Dr. Threlkeld said, but it would require years of testing and clinical trials before that could be approved.

It's these collaborations, supported by RI-INBRE that laid the foundation for a grant application to the Eunice Kennedy Shriver National Institute of Child Health and Human Development at the National Institutes of Health earlier this year. Dr. Threlkeld's efforts were rewarded with an NIH Academic Research Enhancement Award (AREA), otherwise known as an R15, totaling \$329,762 to help buy equipment, expand his research, and train additional undergraduate students. This grant will help Dr. Threlkeld continue his work with rodents and brain injury. It will also pay for undergraduate students to assist in the lab, and has already financed the purchase of a new 3-D microscope. "The microscope will allow us to quantify changes in neurons across our different treatment groups and reconstruct them three-dimensionally, so we'll have models of these brain cells," said Dr. Threlkeld. "It also creates opportunities for us to co-operate with researchers at other institutions. It's a very powerful system, and a pretty big catch for RIC."

Dr. Threlkeld joined the RIC faculty in 2010 and specializes in teaching research methods in experimental psychology and behavioral neuroscience. He is also the coordinator for RIC's new minor in behavioral neuroscience. He earned a Ph.D. in behavioral neuroscience from the University of Connecticut and did his postdoctoral training in Dr. Stonestreet's lab.

Winning An NIH Grant

Mary Grady

Contributing Writer

Getting a grant from the National Institutes of Health is challenging and very competitive, but the potential rewards are high. Dr. Threlkeld offers the following advice.

1. Practice Your Grant-writing Skills

Take advantage of training opportunities where you can practice grant-writing with tutors, instructors, and mentors. RI-INBRE helps by offering workshops and connecting new researchers to mentors.

2. Do Your Homework

"I found it really important that my proposal was evaluated by the appropriate institute," says Dr. Threlkeld. He could have submitted the proposal to several different study sections, but worked to find the right one that was both most appropriate and least competitive. Seek out advice at conferences, through colleagues and administrators, and contact a program officer directly at the NIH, he says. "Shop your aims around," and make sure the granting institution is on board throughout the process.

3. Give Yourself Time

"Start the grant process at least a year in advance," says Dr. Threlkeld. Lay the groundwork well, and do all you can to maximize the probability that you're going to get reviewed by a receptive committee. "Be sure you have prepared everything they expect," he says. "Then you have the best chance that your proposal will be evaluated on its merits."

FEATURED INVESTIGATORS *continued*

URI Researcher Wins \$1.3 Million NIH Support

Mary Grady
Contributing Writer

Dr. Wei Lu, an assistant professor in URI's College of Pharmacy, has worked with RI-INBRE support for three years to study the role of nanoparticles in fighting cancer. This work will continue, thanks to a \$1.3 million grant from the National Institutes of Health (NIH). "We formulate small nanometer-size particles of gold and copper sulfide, which have specific optical properties," says Dr. Lu. "They can absorb light and convert it into heat. We try to target this particle into a tumor, and shine laser light on the tumor. The particles then act as transducers, heat up and cook the cancer cells. So this is photothermal ablation therapy." The particles also can be used to carry drugs directly to cancerous tissue.

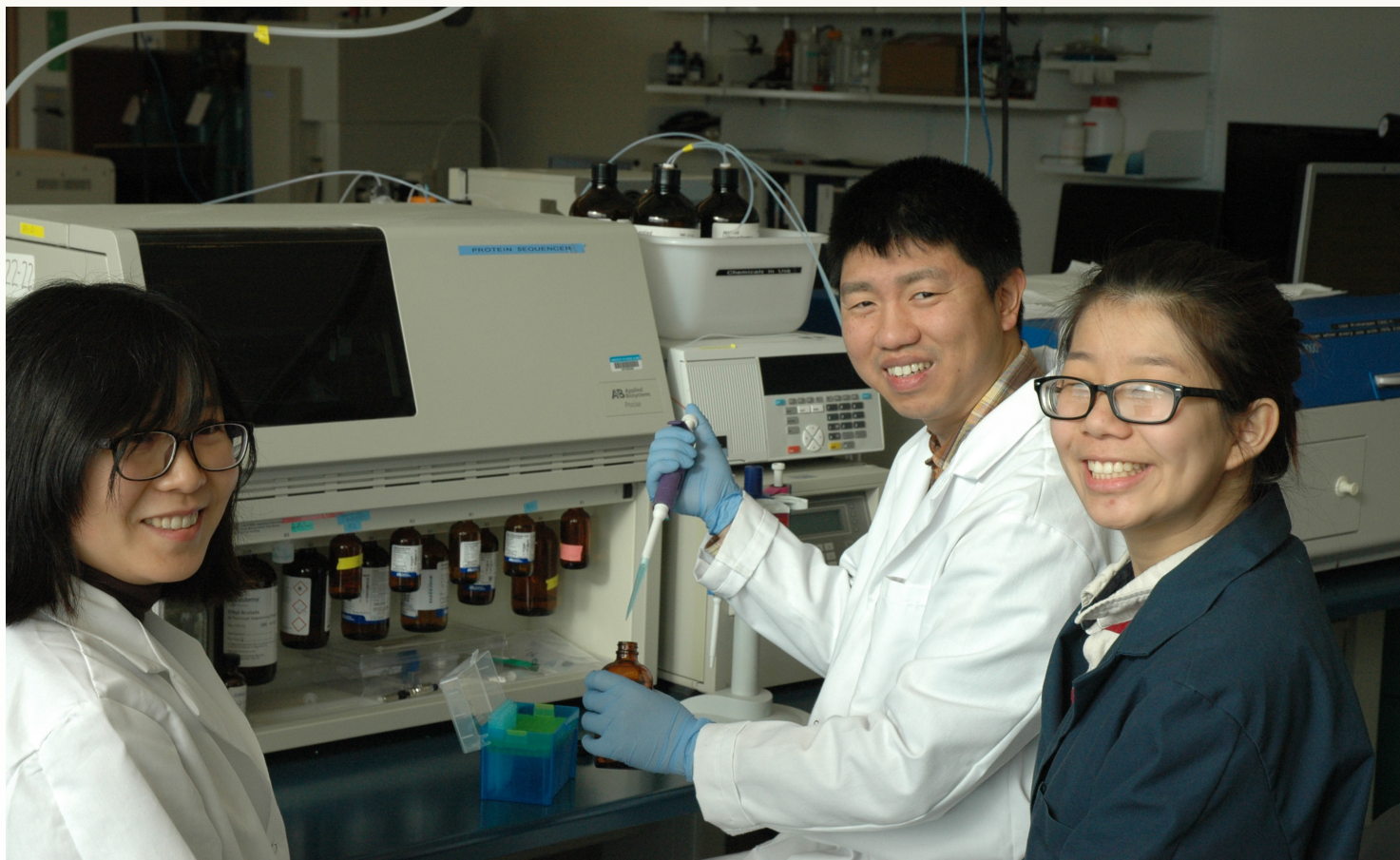
Dr. Lu said the support provided by RI-INBRE was critical to enable him to pursue his experiments. "I used the RI-INBRE funding to hire a post-doc, to generate preliminary data, and to conduct the animal studies that led to the NIH grant," he says. "RI-INBRE helped to fund some expensive equipment for chemical analysis and optical imaging that really helped my research." Dr. Lu said the SURF students who staffed the lab in the summer helped to generate data, and the guidance from his mentor, Dr. Vincent Rotello, a chemist at the University of Massachusetts, was also

key in winning the NIH support.

"Dr. Rotello helped me not only for the detailed research design but also for the grant writing," says Dr. Lu. "I really appreciated that, because he is a really well-known and experienced researcher. So I benefited both from his scientific knowledge and from his experience in grant writing. I think my success with NIH is thanks to the RI-INBRE program and that mentorship. The funding accelerates my research progress; this support is really critical."

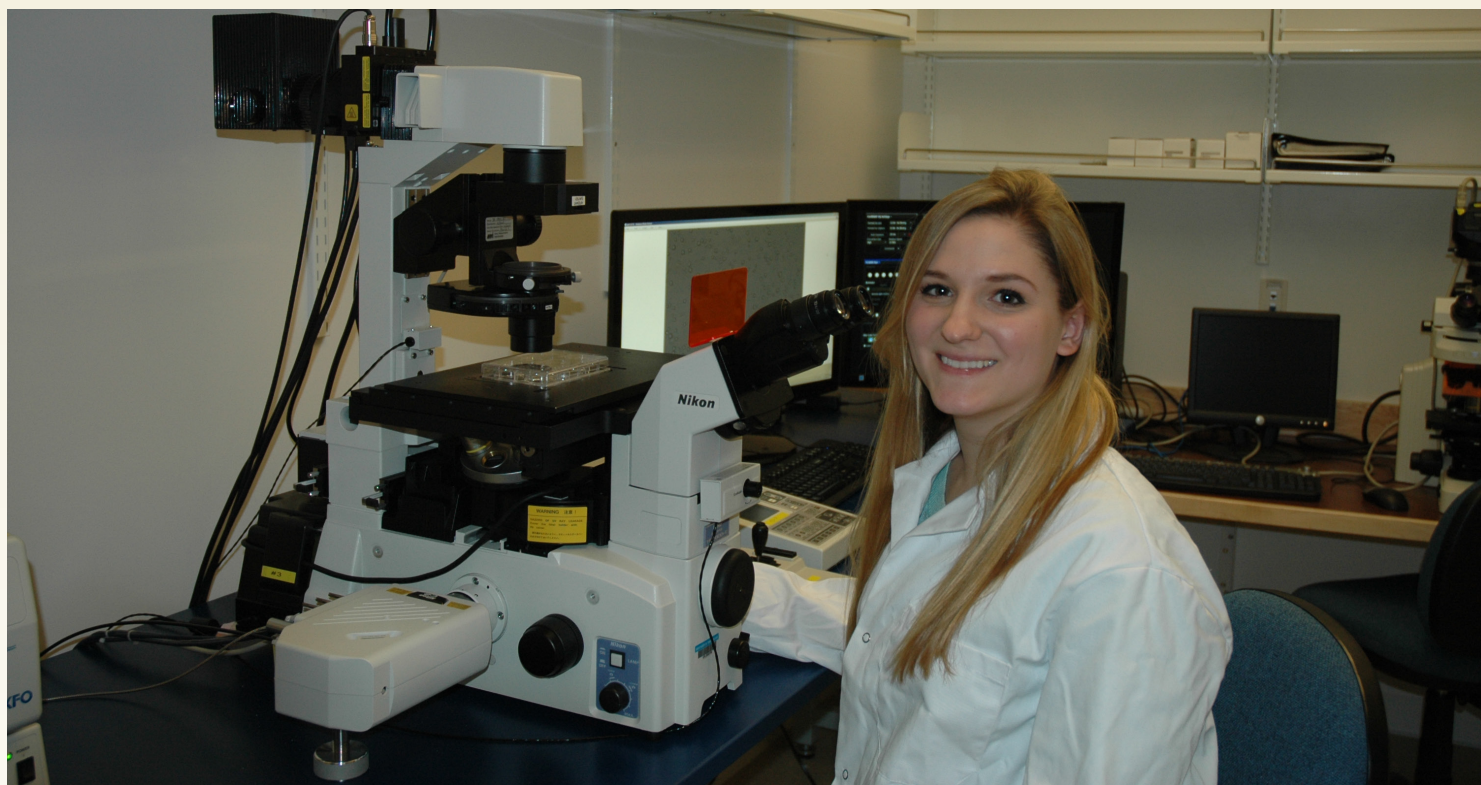
Nanomedicine has great clinical potential because the treatment can be specifically targeted to the cancer tissue, to maximize specificity and minimize side effects. The near-infrared laser light is minimally absorbed in the human body, so it can penetrate deep into tissues until it encounters the nanoparticles. The therapy is also promising to overcome chemo-resistant cancer cells, making chemotherapy more effective.

The four-year NIH grant will fund continuing research into photothermal nanoparticle therapies, Dr. Lu said. It will pay for student lab workers, a post-doc researcher, and the expenses of running lab experiments that include using small rodent models. Dr. Lu earned his doctorate degree at Fudan University in Shanghai, and worked as a post-doctoral fellow at the University of Texas M.D. Anderson Cancer Center from 2006 to 2009 prior to joining URI.



Dr. Wei Lu, University of Rhode Island (Center) and Lab Members

FEATURED RESEARCH FELLOW



Christina Nadolny, University of Rhode Island

Bridges To Graduate School

Mary Grady

Contributing Writer

While the RI-INBRE SURF Program can provide an enriching lab experience for undergraduates during the summer, the summer between finishing a four-year degree and starting graduate school can be a challenging time for students to find support. RI-INBRE's new Bridges to Graduate School program aims to help fill that gap, providing funding for students to work in a research lab during that transitional summer and get a jump-start on their graduate studies. "The idea is to create a pipeline that helps keep students on track and supported as they pursue a career in scientific research," says Jeff Ulricksen, program assistant for RI-INBRE at URI. "We want to provide opportunities that will help to keep talented students right here in our Rhode Island schools."

Among the first to benefit from this new program was Christina Nadolny, a recent graduate of Bryant University. During the summer after her junior year, she worked in Dr. Christopher Reid's lab at Bryant University as part of the SURF Program. She helped with a research project that aimed to identify new lead compounds that might represent a new class of antibacterial agents. "That really clinched it for me," Nadolny says. "I wasn't sure if research was something I needed to do, but I'd never worked in a lab before. It was really exciting! It's so rewarding, when you're actually doing it and interpreting the results and then figuring out how to test it."

Prior to her SURF experience, Nadolny wasn't sure she wanted to pursue science at all. "I started out at school as an accounting major," she says. "I took some biology and anatomy classes as electives, and found out I liked those better." Once she got into the lab, she was sure of her choice. She graduated with a double major in biology and psychology and was accepted into the doctoral program at URI to study with Dr. Xiaoqun Dong, who also receives support from RI-INBRE. The new Bridges to Graduate School program helped her to get a jump-start over the summer. "It was a real help to get to know things ahead of time, before you start classes and everything," she said. "I got kind of a head start with Dr. Dong. We worked in the lab all summer on pancreatic cancer cells, specifically LRH1 and its oncogenetic properties. It was a very good experience to work with the other graduate students and postdocs, they helped a lot teaching me to do different things and to understand things."

Nadolny is already thinking about what she might do next -- her research in the lab might progress to looking at liver cancer in addition to pancreatic cancer. "It's very exciting," she said. Her plan is to finish her Ph.D. and then find a job in industry, maybe a pharmaceutical company. "But I guess we'll see," she said. "My professors say, you might change your mind and decide to stay in academia." Nadolny already has learned that things might turn out differently than you expect when you start down a path -- and that can be a good thing.

NEWS AND EVENTS *continued*

Dr. Joseph Danek speaking at the Winter Retreat

2013 RI-INBRE Winter Retreat

The 9th Annual Winter Retreat was originally scheduled for noon to 5:00 PM on Friday, February 8th on Bryant University's Smithfield Campus. Unfortunately, the retreat was postponed due to severe winter weather and was rescheduled for April 5, 2013 at the University of Rhode Island's College of Pharmacy. Welcoming remarks were provided by Dr. Keykavous Parang, the former RI-INBRE Program Coordinator. This was followed by a workshop entitled "Funding Opportunities and Proposal Development for PUI Faculty". The workshop consisted of two sessions and was moderated by Dr. Joseph Danek of The Implementation Group, Inc. and Dr. Joann Sullivan from the Medical University of South Carolina. The first session was entitled "Funding Opportunities and Agency Review Process at NSF and NIH" and reviewed the programs of greatest interest to faculty at the PUIs with emphasis on NSF Research in Undergraduate Institutions (RUI), NIH Academic Research Enhancement Award (AREA) (R-15), NSF Faculty Early Career Development (CAREER) Program, NIH New and Early Investigator Programs, and other opportunities. The second session was entitled "Proposal Development" and presented helpful hints for developing a competitive proposal. Both before and after the workshop sessions, the PUI investigators participated in one-on-one counseling sessions with the workshop moderators designed to improve the quality of their R15 applications for resubmission to NIH.

5th Biennial Northeast Regional IDEa Conference

The 5th Biennial Northeast Regional IDEa Conference was held at the University of Delaware, Newark, DE on August 14 – 16, 2013. In addition to the RI-INBRE program staff, Drs. Christopher Bloom, Seann Mulcahy, and Brett Pellock from Providence College, Dr. Colleen Marlow from Rhode Island College, Drs. Susan Meschwitz, J.D. Swanson and Steven Symington from Salve Regina University, and 25 RI-INBRE-supported students participated in this meeting. Together, this group of faculty and students made 15 presentations. Two students from the laboratory of Dr. Deborah Britt at Rhode Island College were awarded "Best Poster" for their poster entitled "Defining a Role for BCP1 in the DNA Damage Response". In addition, a poster entitled "Microfluidic Based Immunosensor for Electrochemical Detection of Protein Cancer Biomarkers p53 and VEGF in Serum" from the laboratory of Dr. Bernard Munge at Salve Regina University was selected as one of the Lunchtime Poster Highlights. Morgan Smith, and undergraduate in Dr. Munge's laboratory, gave an impressive 5-minute oral presentation on the significance of the research presented in the poster. It is also noteworthy that Morgan was the only undergraduate student to be included in the lunchtime highlights.



Dr. Deborah Britt, Sabrina Elgar, and Sarah Bilida
(Photo courtesy of Rhode Island College)

SURF Students Win Regional Award

For two Rhode Island College (RIC) undergraduate biology majors, the summer of 2013 ended on a high note -- the two represented their lab at the Northeast Regional Institutional Development Award (IDeA) Conference in Delaware, and won First Place for "Best Poster" at the event. "We didn't even know there would be a competition," said Sabrina Elgar. "We were just talking to people about our poster, and the work the lab was doing. And then they announced these awards – Students from Dartmouth took second place, and we were first. We were so surprised!"

Sabrina Elgar and Sarah Bilida both had worked in Assistant Professor Deborah Britt's lab at RIC during the SURF program. They created a poster for the SURF Conference, then soon afterward, represented their RIC lab and RI-INBRE at the regional event. "It was so exciting to be there," said Sabrina. "At one of the sessions, they talked about how important it is to fund undergraduate research, and I thought, what if I hadn't had these opportunities, because the funding wasn't there? And I realized what a difference it makes."

Dr. Britt said RI-INBRE "has done wonderful things" to help research to grow at RIC. "That support is particularly important at a place like RIC, where we don't have a Ph.D. program in biology," she said. "The students might not have these opportunities otherwise." According to Sabrina, that works to her advantage: "We [undergraduates] get to do the research," she said. "It's my favorite part about school, for sure." The team's project explored how cells repair damaged DNA, and studied a protein that might help to suppress tumors in cancer patients.

Seminar Series

The 2013 RI-INBRE Seminar Series is under way and the seminars organized for the Fall semester were dedicated to the thematic area of Neuroscience. Three speakers, Dr. Leonard White from Duke University Medical Center, Dr. Mark Zervas from Brown University, and Dr. Frank Tarazi from Harvard University and McLean Hospital provided exceptional talks on various Neuroscience topics. Planning is currently underway on seminars for the Spring semester with a focus on Cancer as the thematic area. Watch www.uri.edu/inbre/ for details as they become available. If you are interested in hosting a seminar at your institution, contact Dr. Hany Alashwal, the RI-INBRE Bioinformatics Core Coordinator for information and assistance.

Cores RI



Brown University, Bryant University, Care New England – Women and Infants Hospital the Community College of Rhode Island, Lifespan – Rhode Island Hospital, Providence College, the Providence VA Medical Center, Rhode Island College, Rhode Island School of Design, Roger Williams University, Salve Regina University, and the University of Rhode Island have partnered to create an online directory of core research facilities, services, and instrumentation available to researchers throughout Rhode Island. Both the RI-INBRE Centralized Research Core Facility and Bioinformatics Core are included in this new directory along with shared resources at many of our Network institutions. The directory is available at <http://coresri.org/> or look for the CoresRI logo at web.uri.edu/inbre/.

AWARDS and RECOGNITIONS

Total Extramural Grant Awards (2001 – 2012)

Our investigators have received 15 R01, 2 R21, 2 R03, 6 R15, and 3 K awards from NIH. Over 140 additional awards from NSF and other external funding agencies list RI-INBRE investigators as PI or Co-PI. The total extramural funding received by RI-INBRE investigators is nearly \$47 million thus far.

University of Rhode Island

Dr. Wei Lu received an R01 grant award from NIH.

Bryant University

Dr. Christopher Reid published an article entitled "Functional Analysis of SleC from *Clostridium difficile*: an essential lytic transglycosylase involved in spore germination" in *Microbiology*.

Providence College

Dr. Jennifer Van Reet published an article entitled "Conflict Inhibitory Control Facilitates Pretense Quality in Young Preschoolers" in the *Journal of Cognition and Development: Official Journal of the Cognitive Development Society*.

Dr. Seann Mulcahy published an article entitled "Three-step synthesis of an annulated carboline via palladium catalysis" in *Tetrahedron Letters*.

Rhode Island College

Dr. Steven Threlkeld received an R15 grant award from NIH.

Sarah Bilida and Sabrina Elgar, Undergraduate Research Fellows in the laboratory of Dr. Deborah Britt, were awarded Best Poster at the 5th Biennial Northeast Regional IDeA Conference.

Roger Williams University

Dr. David Taylor was awarded a 2013 Rhode Island Research Alliance Collaborative Research Grant from the Rhode Island Science and Technology Advisory Council. He is teaming with Dr. Jeremy Collie at the University of Rhode Island on a project entitled "Temperature-Mediated Changes in RI's Benthic Community".

Salve Regina University

A poster presentation entitled "Microfluidic Based Immunosensor for Electrochemical Detection of Protein Cancer Biomarkers" by **Morgan Smith**, an Undergraduate Research Fellow in the laboratory of Dr. Bernard Munge, was selected as a Lunchtime Poster Highlight for the 5th Biennial Northeast Regional IDeA Conference.

Dr. J.D. Swanson was awarded a 2012 Rhode Island Research Alliance Collaborative Research Grant from the Rhode Island Science and Technology Advisory Council. He is teaming with Dr. Carol Thornber at the University of Rhode Island on a project entitled "Climate-Driven Impacts on the Formation and Persistence of Macroalgal Blooms".



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