

Rhode Island INBRE

IDEA Networks for Biomedical Research Excellence

NEWS AND EVENTS

RI SURF CONFERENCE

The SURF program this year was a joint venture between the RI-INBRE and the RI EPSCoR programs. Together, these two programs awarded more than 80 Fellowships to the undergraduate students. In addition, two high school science teachers were recruited through the NIH-funded Science Education Partnership Award (SEPA) at Brown University, entitled Advancing RI Science Education (ARISE). The teachers worked in Dr. Marcia Marston's lab at Roger Williams University for 4 weeks, presented a joint poster at the SURF Conference on August 3rd, and took back research ideas and experiences that they will share with their students.

Approximately 200 INBRE fellows, faculty, and institutional administrators participated in the Annual Conference at the University of Rhode Island's Ryan Center in Kingston on August 3. The Conference was the culmination of the 10-week summer program. The Fellows presented the results of their summer research project in the form of scientific posters. Rhode Island's Lieutenant Governor, Elizabeth Roberts, gave the welcoming remarks at the Conference.

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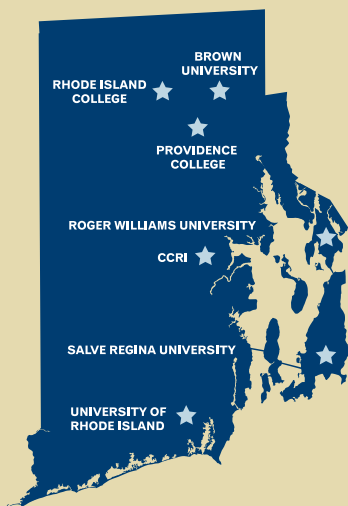
Christine Barbaras and Alline Lelis



Elizabeth Roberts, Lieutenant Governor

OUR MISSION

The Rhode Island network, one of the 23 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.



2009 SURF Conference Poster Session, The Ryan Center, URI

FROM THE DIRECTOR

I am pleased to present the first issue of our newsletter which is intended for the RI-INBRE investigators, postdoctoral, graduate, and undergraduate fellows, and others who may wish to stay informed about this program. In this issue we have feature stories on the investigators and their trainees, highlighted special awards and recognitions, and provided summaries of program activities. Publications, presentations, photos from past events and other program information are available on our website (www.uri.edu/inbre).

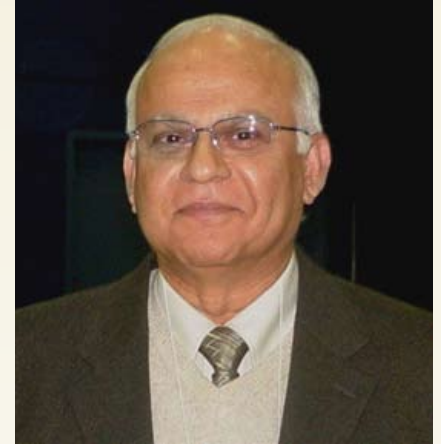
“continuation of the program allows us to further strengthen and expand the research efforts within the State-wide network”

Building on the foundation that we established since the inception of the program in 2001, we successfully renewed the RI-INBRE program in May for the next five years with an \$18 million award from NIH. Continuation of the program allows us to further strengthen and expand the research efforts within this state-wide Network. As we enter the new phase of the program, the central goals include recruitment, training and development of faculty, undergraduate and graduate fellows and postdoctoral fellows; providing greater access to state-of-the-art equipment and bioinformatics resources; and developing new initiatives and collaborations with other infrastructure development programs in the State such as the Experimental Program to Stimulate Competitive Research (EPSCoR), the SEPA Program, and the Rhode Island Research Alliance under the State's Science and Technology Advisory Council. Achievement of the above-mentioned goals will be accomplished by the collaborative efforts of the faculty investigators within the Network who are engaged in research and training activities in the two pre-existing biomedical focus areas of molecular toxicology and cell biology, along with the new behavioral science focus area.

There is considerable interaction between the INBRE programs in the northeast region. These programs are lead by the University of Vermont, Mount Desert Island Biological Laboratory, and the University of Delaware. In this regard, it is important to mention the creation of the Northeast Cyberinfrastructure Consortium (NECC) that also includes the interested groups in New Hampshire. Through the collective efforts of this Consortium, NIH recently awarded all five states Administrative Supplements to collectively enhance the regional cyber network in order to improve opportunities for collaborative research involving large data sets. RI-INBRE's Supplemental Award of \$1.28 million is for providing a high capacity fiber connection between URI's Kingston campus and the existing fiber loop in the northern part of the State, and support for a full-time bioinformaticist (see related story on Dr. Joanna Fueyo in this issue).

At present, the RI-INBRE program is supporting 21 research projects at six of the Network institutions. While a majority of the projects are aimed at undergraduate student training, others include collaborative research with senior faculty at Brown University to seek external funding, faculty development projects for recently hired faculty, and proposal development projects for faculty seeking independent extramural grants. The distribution of these research projects is: 6

at Rhode Island College, 4 at Providence College, 4 at Salve Regina University, 4 at Roger Williams University, and 3 at the University of Rhode Island (URI). In addition, 4 senior faculty at Brown University are supported for collaborative projects with the 3 investigators (Drs. Almeida, Taylor and Wan) at the primarily undergraduate institutions (PUIs). Students at the Community College



Dr. Zahir Shaikh

of Rhode Island and at URI's College of Continuing Education in Providence participate in the RI-INBRE Summer Undergraduate Research Fellowship (SURF) program at URI and Brown University. This year, we anticipate providing financial support to at least 80 undergraduate students, 4 graduate students, and 4 postdoctoral fellows through the RI-INBRE program.

The most recent investigator to join our program is Dr. Christopher Bloom, Assistant Professor of Psychology at Providence College. There are several additional faculty at the PUIs who wish to join the RI-INBRE program and it is conceivable that we could be supporting as many as 25 research projects this year.

On August 3, the Summer Undergraduate Research Fellows (SURF) Conference provided us an opportunity to highlight the hard work of our summer students and their mentors from all of our Network institutions. Over 200 students, faculty, and administrators attended this annual Conference held at URI's Ryan Center. For the second year in a row, we organized our SURF activities jointly with the RI-EPSCoR program which made it an even bigger event. Lieutenant Governor Elizabeth Roberts delivered the welcoming remarks. The immense success of this event was no doubt due to the careful planning and organization of our SURF Coordinator, Dr. David Rowley, Program Assistant, Jeff Ulricksen, and the rest of the program staff.

Our Mentoring Committee system of evaluating and advising the investigators is working well and is beneficial to both the investigators and the RI-INBRE Administrative Core. The next round of these biannual meetings is scheduled in late October.

The RI-INBRE website continues to improve and provides a calendar of upcoming events, program updates, and photos from the previous RI-INBRE activities. The Network participants are encouraged to submit additional photos from the scientific meetings they have attended to add to this permanent collection.

Please send us your comments, suggestions and stories for the next issue of the newsletter.

Zahir Shaikh

PROGRAM UPDATES

BIOINFORMATICS CORE

With a renewed emphasis on bioinformatics, strengthened by increased material and personnel support, we have substantially improved the data mining and processing capabilities of the RI-INBRE participants. We have brought on board a new Bioinformatics Core Coordinator, Dr. Joanna Fueyo. She has already visited all participating investigators and held individual meetings with them to assess their bioinformatics needs, and she has initiated collaborations within the Network and in the NECC.



Dr. Joanna Fueyo

Dr. Fueyo joined the program in June and is appointed as a Research Assistant Professor (Bioinformatics) in the Department of Biomedical and Pharmaceutical Sciences at URI's College of Pharmacy. She is responsible for assisting the RI-INBRE investigators at all participating institutions with their bioinformatics needs, including sequence analysis and annotation. She is also responsible for organizing the RI-INBRE Seminar Series, which will include speakers in bioinformatics. A series of workshops are being planned to provide hands-on experience in this subject. Please visit the RI-INBRE website for more information. Dr. Fueyo is also contributing to the bioinformatics teaching activities at URI.

Dr. Fueyo received her Ph.D. in Pharmacology in 2002 from the University of Pennsylvania where she was an NIH and NSF fellow and trained in Computational Biology. She comes to URI with a comprehensive experience in genomics and proteomic sequence analysis and annotation. In her previous research, she predicted novel virulence factors in pathogenic bacteria using bioinformatics methods, designed and led the build of genome comparison, analysis, and visualization software, and identified novel therapeutic targets which were patented. She worked in the Pharmaceutical Industry, co-founded a biotechnology corporation, and led a team in the Healthcare and Life Sciences Division at IBM to develop algorithms for neuroimaging and clinical data which resulted in six patents.

Dr. Fueyo's current research interest is in examining the functional connectivity of the brain in diseased states. She is also interested in developing databases and algorithms, based on patient presentation in complex data sets that will assist physicians in a more intelligent pharmacoremediation of the disease. To inquire about bioinformatics

or to suggest a seminar speaker, you may contact Dr. Fueyo by e-mail at: joanna_fueyo@mail.uri.edu.

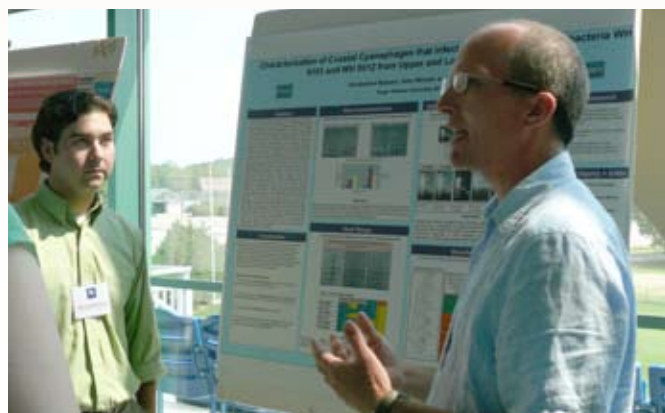
LOCAL & REGIONAL COLLABORATIONS

In the interest of gaining efficiency and enhancing the capacity of both programs, the RI-INBRE and RI-EPSCoR programs have combined their efforts and resources in several focus areas. The greatest emphasis currently has been on student training. RI-INBRE recently initiated a new high school outreach program in collaboration with Project ARISE which is centered at Brown University and funded by a SEPA from NCRR, NIH.

“The major goal of the collaboration with ARISE is to provide experiential training to a select group of high school science teachers.”

The major goal of the collaboration with ARISE is to provide experiential training to a select group of high school science teachers. This past summer, two local teachers were given the opportunity to participate in a four-week laboratory experience, mentored by Dr. Marcia Marston at Roger Williams University as part of the 2009 RI-INBRE SURF program. Christopher Munzert of Mt. Hope High School in Bristol and John Wemple of William B. Cooley HST High School in Providence worked together on a project entitled “Characterization of coastal cyanophages that infect *Synechococcus cyanobacteria* WH 8101 and WH 8012 from upper and lower Narragansett Bay”. The purpose of the investigation was to help characterize viral populations that infect specific coastal bacterial hosts. This could provide information about host-phage interactions, host specificity, and location-specific variations. Over the course of the investigation, they gained valuable laboratory skills and experiences that will be incorporated into their lesson plans during the academic year, thus increasing the exposure of their high school students to the biomedical sciences.

RI-INBRE is also involved with other INBRE programs in the northeast region. For example, one of its investigators, Dr. Stoner, is being mentored by Dr. Karen Lounsbury who is a member of the Vermont INBRE. Similarly, a member of the Maine INBRE, Dr. Rebecca Sommers, has agreed to serve on the Mentoring Committee starting this fall. From the RI-INBRE, Dr. Joanna Fueyo has accepted the invitation from the Vermont INBRE to give a seminar and a series of lectures in their bioinformatics and outreach programs.



Christopher Munzert and John Wemple

FEATURED INVESTIGATORS

David Taylor, Ph.D., Roger Williams University



Dr. David Taylor

Dr. Taylor is a field ecologist who studies recruitment dynamics and early life history of marine fish, finfish and shellfish habitat restoration, and environmental toxicology. His research focuses on Narragansett Bay, RI, where local fisheries are important dietary and commercial resources for inhabitants of the state. Most of his research occurs during the summer, as much of it includes collecting specimens from the Bay for subsequent mercury analyses. Dr. Taylor credits the INBRE grant with helping him establish a functional and productive research laboratory. This is his fifth year with the RI-INBRE program. His current project is a collaborative project with Dr. Warren Prell and Dr. David Murray of Brown University. Together, they are investigating Rhode Island land use/watershed characteristics and potential point sources of mercury that will be correlated with measured values of mercury from site-specific collections of sediment and certain marine fish and invertebrate species. They plan to use these data within the framework of a geographic information system to create predictive models and analyze spatial relationships between land use and watershed characteristics, mercury pollution, and contamination in the marine food web.

Dr. Taylor states that he has been fortunate to attract motivated students who excel in research. He emphasizes independence and rewards his students by taking them to regional and national scientific meetings to present their results. They are also given the opportunity to publish as coauthors.



L-R: Jennifer Linehan, Maria Piraino, and Joseph Szczebak

Three of his former INBRE students, Loong Fat Ho, Stacey Helming and Eric Payne, started their research experiences in his lab as freshmen or sophomores. Loong and Stacey graduated from RWU in May 2008 and are currently pursuing their graduate degrees at the Florida Institute of Technology and University of Albany, respectively. Eric currently works as a research technician at the New England Aquarium in Boston, MA. All three students are contributing authors to Dr. Taylor's recent publications and have received both academic and travel awards as a result of INBRE funding.

Two recent graduates, Maria Piraino and Joseph Szczebak, are attending graduate school at Auburn University. Joseph is enrolled in the Marine Biology Program and Maria is in the Fisheries Science Program. His current students include Jennifer Linehan, Nichole Ares, and Elizabeth Futoma.

Yinsheng Wan, Ph.D., Providence College



Dr. Yinsheng Wan

Dr. Wan is a highly dedicated teacher and shares his passion for research with his students. He tells a story about one of his former students, Ashley Amaral, who was originally an economics major. After taking Dr. Wan's biology course for non-science majors, she "converted" to a biology minor, and is now in medical school at Tufts University.

Dr. Wan's research involves investigating the carcinogenic effects of chronic UV exposure. UV radiation from sunlight is a major etiologic factor of non-melanoma skin cancer that constitutes almost half of the skin cancers in the United States and is a serious social and economic concern. If left untreated, skin cancer can be life-threatening. While more efficient strategies against skin cancer are under development, the molecular mechanisms of UV-induced skin cancers are still not well understood. Dr. Wan collaborates with other researchers in Rhode Island, nationally, and internationally. He is an extremely productive researcher. He credits RI-INBRE funding in 19 of his recent publications.

Dr. Wan concentrates on teaching his students how to read research papers, design experiments, execute them, collect data, make graphs and organize the results for publication. He is a firm believer in including the undergraduates as coauthors in his publications.



L-R: John Taras, Tyrone Tamakloe, Shan Lu, Dr. Wan, Paul Poidomani, Ari Nalbandian, Andrew Bagdasarian, and Michael McCauley

This spring Dr. Wan had four students actively working in the lab, while several freshmen observed. Two of his former students, Tyrone Tamakloe and Pete Costa, graduated in May. Tyrone is enrolled in graduate school at the University of Massachusetts Medical Center in Worcester and says that "Dr. Wan taught us to combine fun with work". His other student, Pete, was accepted by four medical schools, but remains undecided. This summer, Dr. Wan trained Michael McCauley, Ari Nalbandian, and Gabriella Brum as part of the SURF program at PC.

Over the years, he has also had several high school students in his lab. One of these students, Philip Chen, is now at the Boston College School of Law and another, Rob McConeghy, is at the University of Chicago in the Biology program.

Brenton DeBoef, Ph.D., University of Rhode Island



Dr. Brenton DeBoef

Behind the glasses and the big white smile is a very engaging and highly-motivated young chemistry professor. Dr. DeBoef recently received a major award (\$550,000) from NSF for "Synthesis of Biaryls via Oxidative Coupling". The overarching goal of this project involves the synthesis of small molecule inhibitors which could result in promising new treatments for cancer. The precursor to this proposal was initially a pilot project he started with seed money from RI-INBRE and serving as a mentor in the SURF program. This work led to a second project which ultimately resulted in his recently-funded NSF

proposal. Dr. DeBoef explained that his first RI-INBRE summer student, Nicholas Rue, was highly talented and was instrumental in the success of that project, and was a second author on a manuscript that was the sixth most downloaded paper from the Organic Letters (9, 3137-3139, 2007) website.

Dr. Brenton DeBoef's most recent RI-INBRE pilot project was entitled "Synthesis of Next-Generation Inhibitors of Botulinum Neurotoxin". This toxin (BoNT) is a protein that is produced by *Clostridium botulinum*, known to be the most poisonous protein in the world. The active site of BoNT includes a zinc endopeptidase. Dr. DeBoef's work has resulted in the invention of a new reaction to synthesize several promising inhibitors of this zinc endopeptidase. One of his current graduate students, Shathaverdhan Potavathri, was a major contributor to their successful patent on the synthesis methodology for such inhibitors. Inhibitors of this toxin are scarce and are of great interest to the biomedical and defense community as possible anti-toxin agents.

Dr. DeBoef boasts several other highly successful former students from his laboratory. Ashley Dumas, who worked on his first RI-INBRE project, left with a master's degree and is now employed with Millenium Pharmaceuticals in Cambridge, MA. Timothy Dwight, a graduate student on the second pilot project also graduated from URI with a master's degree, and is now employed at Ariad in Cambridge, MA. Another former SURF student from the same project, Stephanie Tumdajski, is currently working on her Ph.D. at MIT. Dr. DeBoef maintains a keen acknowledgement of his students and their efforts, including those of an outstanding undergraduate member of his laboratory, Sarah Decato. He is excited about the dedication and hard work she applies to their ongoing projects. His SURF 2009 student, Kathryn Marks from Providence College, synthesized molecular imaging agents for visualizing the dopamine transporter. These agents could assist in the diagnosis and study of Parkinson's disease, depression and drug addiction.



Shatha Poavarian

FEATURED RESEARCH FELLOW

Andrea Hodgson, University of Rhode Island



Andrea Hodgson

Andrea Hodgson, a December 2008 URI graduate in Microbiology, came to URI geared to learn “real lab” experience as opposed to only course-associated labs. Her first research experience at URI involved working in the laboratory of Dr. Albert Kausch in the Department of Cell and Molecular Biology. She subsequently met Dr. Matthew Stoner an RI-INBRE-supported investigator in the URI Department of Biomedical and Pharmaceutical Sciences. Andrea worked in Dr. Stoner’s lab during the academic year and as part of the SURF program on a project screening novel chemical entities for their anti-estrogenic potential in a breast cancer cell line. She won a poster award at the Bio Northeast conference in 2008. While doing research in Dr. Stoner’s lab, she also received support from LSAMP and the Norman and Alicia Tashash fund. Dr. Stoner explained that “Andrea was an extremely polite, personable, professional, talented and motivated individual. She worked tirelessly in my laboratory and screened new compounds which could potentially be further exploited to treat breast cancer. In a short time, Andrea mastered multiple molecular biology techniques, compiled a detailed laboratory notebook and maintained an excellent GPA in her coursework. Andrea presented her work in poster form on at least three occasions, both in-state and out-of-state. Andrea was an invaluable asset to my laboratory and I depended on her more and more to carry out essential functions that are normally performed by graduate students and postdoctoral fellows. I am confident that as she embarks in her graduate studies at Johns Hopkins, she will be well-equipped to make significant contributions to basic research projects aimed at improving public health.”

Andrea is starting graduate school at the Bloomberg School of Public Health, Johns Hopkins University, this fall in the Molecular Microbiology and Immunology program. While waiting to enter graduate school, Andrea worked for Clean Harbors, an environmental testing company, at the Bristol Myers Squibb facility in Princeton, NJ as a microbiology lab technician, making media and testing water samples.

NEWS AND EVENTS CONTINUED

Northeast Regional IDeA Meeting

The Institutional Development Award (IDeA) program’s Northeast Regional Meeting was held August 7th and 8th in Whitefield, Vermont and about 150 participants from NH, DE, ME, RI, and VT attended the meeting. Twenty eight Investigators, Core Leaders and students represented the RI-INBRE program and presented 5 platform talks and 16 posters. The participation by Salve Regina University was commendable as Drs. Bernard Munge, Alison Shakarian and Steve Symington brought 15 of their students. The next Regional Meeting will be hosted in Rhode Island in 2011 by RI-INBRE.



L-R: Zahir Shaikh, Joanna Fueyo, Bongsup Cho, Wan Student, Matt Stoner, Alison Shakarian, Steve Symington, Deanna Salter, Linnea Anderson, Amy Coffey, Yinsheng Wan, Jessica Barowski, Aftab Ahmed, Jaimee Doucette

Summer Faculty Retreat

As part of the Summer Faculty Retreat, a grant writing workshop for faculty was held immediately following the SURF Conference. Dr. Mary Allen of Wellesley College gave the keynote speech entitled “Balancing teaching and research at PUIs.” Dr. Rebecca Sommer of Bates College gave a presentation entitled “Components of a successful AREA grant.” Dr. Sommer was formerly an investigator the Maine INBRE. She has successfully achieved independent researcher status and now serves as a mentor for others. Dr. Vicki Cameron of Ithaca College, who is well known to the RI-INBRE participants as a Mentoring Committee consultant, shared her experience in obtaining research grants in her talk entitled “NSF-RUI: strategies and tips for success.” The Retreat was well-attended and lively discussion followed the excellent talks. The presentations and the hand-out material are available on the RI-INBRE website.

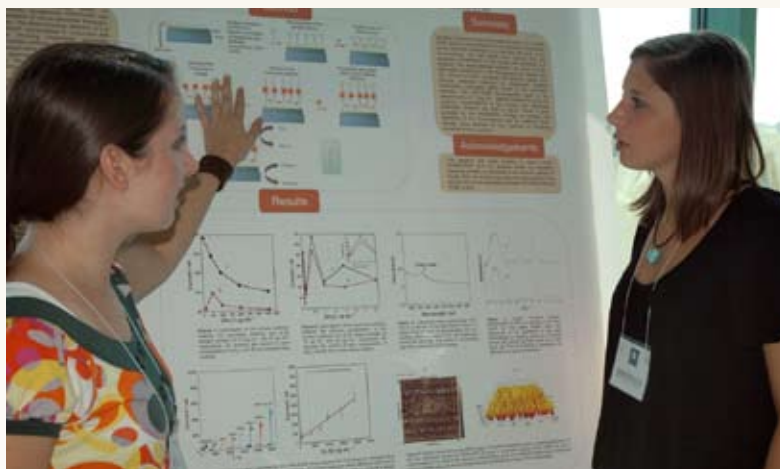
SURF PHOTOS



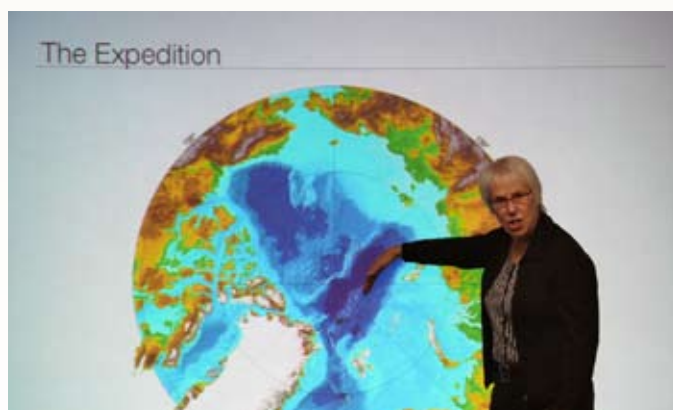
Chris Benzak of Newport Biodiesel speaks about alternative fuels at Beaver Tail, RI, during a field trip.



Picnic at URI's Center for Biotechnology and Life Science.



L-R: Amy Coffey and Jaimee Doucette of SRU at the SURF Conference.



Dr. Kate Moran, URI Professor of Oceanography and Senior Policy Analyst to President Obama on Oceans, the Arctic and Climate Change, speaking about "Arctic Ocean & Climate Change".



Dr. Harold Bibb, Associate Dean of URI's Graduate School, explaining "Selecting & Applying to Graduate School".

AWARDS and RECOGNITIONS

Dr. Karen Almeida, RIC

Dr. Almeida received the Honor Roll Alumni Award from RIC. Her RI-INBRE student, Priscila Falcao, received the Best Poster Award from the Molecular Toxicology Division at the Eastern Colleges Sciences Conference at Wagner College in April.

Dr. Nicanor Austriaco, PC

Dr. Austriaco's students, Breton Roussel and Joshua Malouin, received the Best Oral Presentation and Best Poster Presentation awards, respectively, at the 63rd Eastern Colleges Science Conference in April. Joshua also received the Outstanding Full-length Paper Award at the same conference. Two other students, Yi Cao and Erik Gravel were REU Summer Fellows at the University of Arizona, Tempe and the Memorial Sloan Kettering Cancer Center, New York, respectively.

Dr. Niall Howlett, URI

Dr. Howlett's graduate student Jeanne Beesmer successfully defended her M.S. thesis titled "High-resolution whole-genome chromosome instability in Fanconi Anemia".

Dr. Thomas Malloy, RIC

Dr. Malloy served on a grant review panel for the National Cancer Institute, NIH. His student Rosalie Berrios-Candeleria was awarded a fellowship through an NSF program for Advanced Training in Quantitative Methods for Members of Under-represented Groups (QTUG) in psychology.

Dr. David Taylor, RWU

Dr. Taylor received the RWU Foundation to Promote Scholarship and Teaching Award. A recent graduate, Joseph Szczebak, received the Outstanding Marine Biology Senior award. He also completed his senior thesis with distinction. Maria Piraino also completed her senior thesis with honors. Jennifer Linehan received the Outstanding Undergraduate Student Platform Presentation award for her poster at the North Atlantic Chapter of the Society of Environmental Chemistry and Toxicology in June.

Dr. Rebeka Merson, RIC

Tyler Zalobowski, an RI-INBRE student in Dr. Merson's lab, received a travel award to present his poster at the Annual Meeting of the Society of Toxicology in Baltimore, MD in March. He graduated in May magna cum laude and received Biology Department's Honor for his thesis. Amanda Albanese also graduated magna cum laude and received honors for her thesis. In addition, she received the Theodore Lemeshka Award bestowed upon a graduating senior honors student who demonstrated leadership skills. Daniel Reeves received the Anne and Bob DeStefano Fund for Undergraduate Research.

Dr. Alison Shakarian, SRU

Dr. Shakarian's student, Mark Byrne, earned the Second Place Poster Award at the first meeting of the North American Section of the International Society of Protozoologists held at the Roger Williams University, Bristol, RI in June.



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