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Spring 2014

csam NEWSLETTER

COLLEGE OF SCIENCE AND MATHEMATICS: A SPECTRUM OF POSSIBILITIES

In this Issue

The CSAM Newsletter is published semi-annually by the College of Science and Mathematics

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Back issues are available at:
http://montclair.edu/csam/about-us/newsletters

Drug Discovery in CSAM

New Jersey remains a major hub for the pharmaceutical industry research and development. What is less well known is that the College of Science and Mathematics is also home to important drug discovery research through our Sokol Institute for Pharmaceutical Life Sciences. Dr. David Rotella, a medicinal chemist with more than 20 years of industrial experience, is one of two Sokol Chairs in the Department of Chemistry and Biochemistry who specializes in drug discovery research. His laboratory synthesizes small organic molecules that are tested for biological activity by collaborators for use in cancer, Alzheimer's Disease, hepatitis C virus and parasitic disease studies. One drug discovery project underway at Montclair State, supported by Celgene Corporation is aimed at a potential treatment for lymphatic filariasis. It was initiated by Dr. John Siekierka, our other Sokol Chair and Director of the Sokol Institute, whose laboratory identified an enzyme that plays an important role in the life cycle of Brugia malayi, a causative agent in lymphatic filariasis. This disorder afflicts millions of people worldwide, particularly in Africa, leading to painful inflammation that can prevent them from working or functioning normally. Compounds are synthesized by researchers in Dr. Rotella's lab and tested against the enzyme and the organism in Dr. Siekierka's laboratory. The team at Montclair includes Drs. Ronald Goldberg, Sreedhar Tummalapalli, Rohit Bhat, and Agnieszka Chojnowski and Tamara Kreiss. A compound has been identified with potent inhibition of the B. malayi enzyme, excellent activity in parasitic culture and acceptable drug like properties. Plans are being made to test this compound in an animal model of lymphatic filariasis through a collaboration with Celgene Global Health.

The second project is supported by a new 2.5 million dollar, five year grant from the Defense Threat Reduction Agency to synthesize inhibitors of botulinum protease (BoNTX). This enzyme causes the paralysis associated with exposure to botulism toxin, a major bioterrorism concern. The aim is to identify a treatment suitable for use in humans to prevent or treat botulism and includes scientists at the US Army Research Institute for Chemical Defense (USAMRICD), Brookhaven National Laboratory, the University of Massachusetts at Dartmouth, the Naval Research Laboratory, and two small pharmaceutical companies, Ossianix, headquartered in Ireland and Hawaii Biotech, located in Hawaii. The project to discover BoNTX inhibitors will be a multifaceted one. The team will explore small molecules as well as larger biomolecules in an attempt to choose candidates for testing in humans. Like all drug discovery efforts, the team includes contributors with complimentary essential skills needed to complete the many different tasks needed to understand all of the properties of a drug like molecule. Chemists synthesize new molecules and submit them to biologists and pharmacologists for testing in simple model systems. Dr. Rotella's laboratory will also work with Dr. Siekierka's group on this project to test selected new compounds

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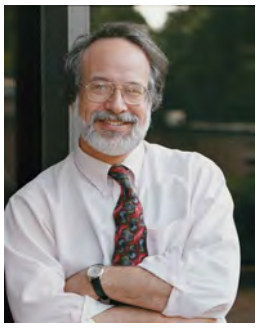
From Dean Prezant



I was going to write about our ongoing extreme weather, climate change, continuing remarkable research in our College. I was going to laud the new $2.5 million dollar Department of Defense grant given to our Sokol Institute for Pharmaceutical Life Sciences. I was going to comment on the outstanding new degree programs in sustainability that the Department of Earth and Environmental Studies now offer. I was going to, that is until I read yet another relatively recent Gallop Poll that shows 46%, that's FORTY SIX percent of the American public believe that humans were created a mere 6,000 years ago [http://www.gallup.com/poll/21814/Evolution-Creationism-Intelligent-Design.aspx]. CREATED a mere SIX THOUSAND YEARS AGO. This number was 40% in 2011 and is now up 6%. How can this be? It is not easy to pigeonhole here into conservative vs liberal. Even now, after serious defeats and some victories, another approach to bring religion into science classrooms is emerging. This new approach is under the guise of "truth in education". Take a look at part of a recent bill (that apparently will not make it through the political process) that has emerged in Denver:

"... teachers of institutions of higher education shall endeavor to create an environment within institutions of higher education that encourages students to explore scientific questions, learn about scientific evidence, develop critical thinking skills, and respond appropriately and respectfully to differences of opinion about controversial issues. The educational authorities of higher education in Colorado shall also endeavor to assist teachers to find more effective ways to present science curriculum where it addresses scientific controversies." Colorado HB 13-1089

Sounds "fair and balanced" but is a clear entry point for teaching creationism and intelligent design. This, by any other name, equals religion in the science classroom and just another attempt to malign and obfuscate science and fact with religion. And, when the United States seeks to refocus on science and regain our leadership in educating students in the sciences, what a shame for our young and impressionable minds in K-12 classrooms. At a time when science, perhaps more than ever, can help us better understand and seek solutions towards global threats that include climate change, bioterrorism, pandemics...a subset of politicians seek to obscure the process, reality and thus importance of basic science tenets. I've underestimated these forces and their influence. Two decades ago I never would have predicted that we'd still be fighting this battle. Never did I expect to be writing about efforts to pawn science fiction as science in our education system in 2014. Today, with politics and religion trying to make artificial inroads into the sciences, solid science education is more important than ever. If we are to make progress in the value of science in our society and in the pivotal role science plays in our national security and future, we cannot lose sight of the fact that this artificial and false construct remains very much alive and all we do in the College of Science and Mathematics matters. We remain at the forefront of insuring our students understand what science is and what it is not. ♦

Weight Management Clinic Open

By Diana Thomas, Director

The mission of the Montclair State University Center for Quantitative Obesity Research is to facilitate the application of quantitative methods that promote collaborative inter-disciplinary research related to obesity related health issues. Located in Stone Hall room 226 biology and nutrition students, along with Montclair State staff, have begun working to help and guide people to lose weight.

Thus far, it has been a winter that induces hibernation and we know how tough it is to lay off comfort food on snow days. This is why we are pleased to announce the opening of the Clinic in Stone Hall 226. Students from biology and nutrition have been working with some of the staff already to gain practice using calculators to guide weight loss and feel they are prepared to open up to a larger set of clients; hence this message to CSAM.

The students were trained using ideas discussed in the "In the Zone" article prepared by MSU (see link below): http://www.montclair.edu/news/article.php?ArticleID=10243.

So far the results have been outstanding; clients are pleased, and every single client has lost weight. There is a one-time fee of $20 to cover overhead. We also have pedometers for sale in the clinic and soon hope to have available more exciting weight management tools.

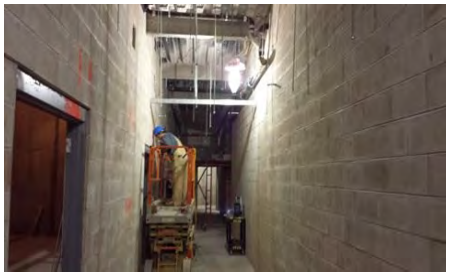
Make your appointment today!
Contact us at
weightloss@mail.montclair.edu
or me directly
(thomasd@mail.montclair.edu) if you would like more information. ♦

CELS: Update

One can say that Christmas may have come early to CSAM. In late November, the frame of the new Center for Environmental Life Sciences looked like a huge wrapped box for all to enjoy for decades to come. It is no surprise what this present is, especially as you look closely and notice the shape of our new building—CELS. This image may not be exciting, but what is going on inside is moving at a rapid and productive speed, as illustrated in these pictures.

Building plumbing installed

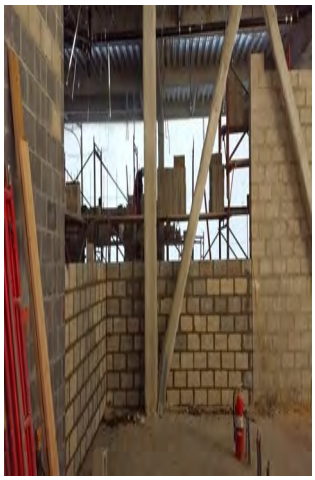
Atrium floor radiant heat



Inside walls erected

Fireproofing completed

Air handling units installed

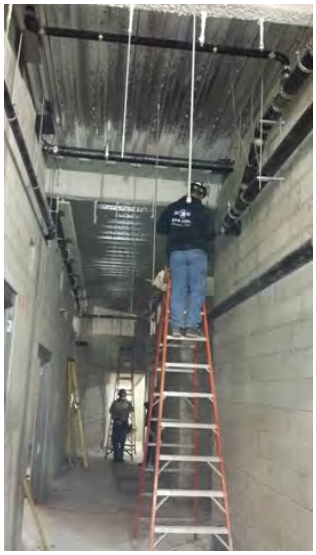


Inside walls

Wall framing

Framimg

Concrete floors poured



Seismic bracing

Condensate tanks

The beginnings of the Lecture Hall

PharmFest 2014: The Decade Ahead

PharmFest is a multipurpose daylong event designed to explore the pharmaceutical, health and medical technology industry and to broaden awareness of the current and future state of the industry. The event is hosted by Montclair State University in cooperation with the HealthCare Institute of New Jersey and the NJ pharmaceutical, health and medical technology industry.

Plenary Speaker: Dr. Richard Evans, Founding Partner and Research Analyst at Sector & Sovereign Research and author of "Health and Capital"

Lunch and Keynote Speaker: Mr. John Castellani, President and CEO of The Pharmaceutical Research and Manufacturers of America (PhRMA)

Session A: *Exploring New Paradigms in Drug Discovery*
Drug discovery is moving from a highly centralized structure to a more diverse and collaborative environment. This includes participation by contract research organizations, university laboratories and private research foundations engaged with large and small pharmaceutical companies. This session will discuss the opportunities and benefits associated with such a paradigm, as well as possible limitations and potential solutions that confront contributors in these arrangements.

Session B: *The Evolution of the Biotech and Pharmaceutical Sectors: Skills, Attributes and Capacities for the 21st Century:*
There are several new and dynamic competitive factors and financial conditions in the global landscape that have resulted in the transformation of the biotech and pharmaceutical industries. New scientific discoveries, the outsourcing of traditional research and discovery protocols and an evolving regulatory environment, for example, have fundamentally altered both the market and the model for this global sector. As such, the skills, capacities and the very worldview of 21st century professionals in these areas must similarly evolve. The implications of this new environment on how aspiring professionals should prepare for careers in this new space cannot be overstated. This forward-thinking panel will address some of the critical emerging and anticipated competencies and skills required by the sector over the next twenty years. In addition, the panel will assess the implications of these changes in the higher education sector that trains them.

Session C: *Future Targets and Challenges in Biopharmaceutical Research and Drug Development*
Abstract: It's been said that age of the blockbuster medicine is over; that all the low-hanging fruit has been picked. So where will the biopharmaceutical industry focus its future research and development efforts. This panel will examine the factors that will drive the direction of life sciences research and drug development - from the latest scientific advances in biologic research to policies that will encourage or inhibit investment and innovation.

Session D: *Partnership Opportunities to Improve Quality and Efficiency in Healthcare: Enlisting pharmaceutical, payer and governmental expertise*
Abstract: A panel of experts will engage in a wide-ranging discussion of innovative approaches to improving the effectiveness quality and efficiency of the healthcare system including current innovations in quality improvement, future applications of personalized medicine, real-world research and public/partnerships/consortia, recognizing incentives and rewards for innovation, and US healthcare reform.

Session E: *Pharma Careers in the Coming Decade*
A panel of Montclair State University alumni who now work in the pharmaceutical industry will share information about their careers and offer advice for those interested in pursuing careers in pharma. These accomplished Montclair State graduates will focus on the wide range of professional opportunities that the pharmaceutical industry has to offer—opportunities that extend well beyond the traditional perception of researchers in lab coats. Panelists will describe their experiences in an industry that provides opportunities not only in drug development and manufacturing, but also in management, production, sales, quality control, marketing, accounting, information technology, human resources, and more. This session, that will include the opportunity for questions and answers, will be a valuable experience for students who are considering a rewarding career in the ever changing and vibrant pharmaceutical industry.

Session D: *Career Fair*
The PharmFest Career Fair provides both students and alumni the opportunity to meet with professional recruiters at many top pharmaceutical organizations to secure career opportunities. Many different disciplines within the

Continued on page 6

An Interview with CSAM's New Academic Advisor

The College of Science and Mathematics, CSAM, recently appointed Ms. Ferguson-Murtha to the newly created position of Academic Advisor to provide a steady, full time advising presence to undergraduate and graduate students and to assist students interested in transferring into a CSAM major.

Below is a brief Academic Advisor interview discussing Ms. Ferguson-Murtha's background and responsibilities.

Q: What attracted you to MSU/CSAM?
A: I've always had an interest in Science, and the opportunity to work with students majoring in Science and Mathematics within a college as part of a large State university was very appealing. I see STEM majors as being vitally important to helping meet the challenges the world faces and I value importance of keeping our best and brightest Science and Math students in-state.

Q: What is your professional background?
A: I've been fortunate to have experience both in Student Development and Academics throughout my career in higher education, which I believe it is an interesting mix of two very diverse areas. I've held various counseling positions at the college level including working as an EOF counselor, doing consulting and serving as Director of a college counseling center. I hold NBCC (National Board Certified Counselor) certification and State Licensure as a Professional Counselor (LPC). I have a private practice; my area of specialty is in Trauma Response, particularly as it applies to traumatic loss of life.

My academic experience includes working as a first year advisor- trained as a generalist, coordinating First Year advising programs, developing and coordinating various types of advising programs for identified populations, teaching Psychology and Leadership courses and most recently working as the Director of Academic Student Counseling where my primary responsibilities centered around developing and coordinating retention programs for student populations considered "at risk" academically.

Q: How do you see advising as a key to retention?
A: I believe that no one states this purpose better than Charlie Nutt, the Executive Director of NACADA (National Academic Advising Association) 'Academic Advising is the only structured activity on the campus in which all students have the opportunity for one-to-one interaction with a concerned representative of the institution' (Habley, 1994). Tinto (1987) indicates that effective retention programs have to come to understand, therefore, that academic advising is the very core of successful institutional efforts to educate and retain students. For this reason, academic advising, as described by Wes Habley, should be viewed as the 'hub of the wheel' and not just one of the various isolated services provided for students. Academic advisors provide students with the needed connection to the various campus services and supply the essential academic connection between these services and the students. In addition, academic advisors offer students the personal connection to the institution that the research indicates is vital to student retention and student success.'

Nutt, Charlie L. (2003). Academic advising and student retention and persistence from the NACADA Clearinghouse of Academic Advising Resources Web site http://www.nacada.ksu.edu/tabid/3318/articleType/ArticleView/articleId/636/article.aspx

Q: What is your philosophy of Advising?
A: My basic philosophy is 1) To meet students where they are in their developmental process in order to assist them in acquiring and refining the skills needed to be active/ proactive participants in their educational experience. 2) To empower students to understand the importance of seeking out factual information in order to establish clearly defined educational objectives and make thoughtful, informed academic decisions regarding their educational goals. And 3) To work with students as a collaborator; I believe that that this approach to advising fosters a sense of belonging to the College/University.

Q: What will be your primary responsibilities in CSAM?
A: My responsibilities will include

- Collaborating with CSAM departments with regard to advising issues, initiatives.
- Serving as point of contact person for CSAM - liaison to departments.
- Responding to general advising/policy & procedure questions from CSAM majors, and assist students interested in transferring into CSAM.
- Collaborating with CAST, ASRP; serve as point of contact for freshman and transfers.
- Providing support/outreach for students referred from CSAM faculty advisors and for those students considered "academically at risk". Make referrals as appropriate.
- Providing outreach/support to first semester students, transfers, students on academic probation. Identifying groups of students who may need additional support, provide outreach. ♦

Advisory Council — Member Profile

The College of Science and Mathematics' Advisory Council was formed in 2004 to provide guidance, support and advocacy for the College's pedagogical, research and outreach programs. The Council assists the College in maintaining currency with changing educational, economic, national and international needs; helps to identify emerging directions for research and educational programs, as well as sources for student support, program and research collaboration, funding and other professional opportunities; and helps to promote the College with the external community. It is currently composed of 21 members, the newest is Dr. John J. Scheibelhoffer Membership list is available at http://www.montclair.edu/csam/about-us/advisory-council/.

Dr. John J. Scheibelhoffer is a lifelong resident of New Jersey and proud alumnus of Montclair State University having graduated Magna Cum Laude with a Major in Biology in 1984 and Master of Arts in Biology in 1986. He then attended UMDNJ-Rutgers Medical School where he earned his M.D. in 1989. He completed a five year post graduate residency in Otolaryngology-Head and Neck Surgery at the Albert Einstein College of Medicine/Montefiore Medical Center where he served as administrative chief resident. Next he completed a fellowship in Facial Plastic and Reconstructive Surgery in Birmingham Alabama. Dr. Scheibelhoffer is Board Certified by the American Academy of Otolaryngology Head and Neck Surgery and the American Academy of Facial Plastic and Reconstructive Surgery.

He has practiced in Wayne, N.J. since 1996 and is a partner in ENT & Allergy Associates, the largest ENT practice in the country.

He has recently become more involved with the pre- med students at MSU with the hope of strengthening the program and increasing the number of students who ultimately gain admission to post graduate health care programs.

Dr. Scheibelhoffer and his wife Maryann of 20 years reside with their three children in Franklin Lakes, N.J. ♦

Building Resilient Communities in NJ

By William Thomas, Co-Director

A single storm can change a country. After a 1953 storm that devastated the country, the Netherlands embarked on an infrastructure program to withstand North Sea storms. In 2013, in response to Superstorm Sandy, New Jersey and the surrounding regions have undertaken a similar transformation. Communities throughout the state are beginning to plan and build a more resilient New Jersey – one that can better withstand and recover quicker from the disruptions of future storms.

But what exactly is "Resiliency", and how should we apply it to New Jersey? Should resiliency take the form of increased coastal protection, or reducing risks by decreasing the number of people living in high-hazard areas? Or is resiliency an unaffordable dream? We will explore the programs that are being developed throughout the region and approaches taken in other parts of the US.

On June 10, 2014, MSU's PSEG Institute for Sustainability Studies will bring together leaders from government, academia and industry to explore what is being done to create a more resilient New Jersey, the real lessons learned from past storms, and the difficulties being encountered in protecting a business, empowering a community or fortifying a system.

Who should attend?
Representatives of regulatory agencies, professional associations, foundations supporting educational initiatives, and academic societies--as well as academic institutions.

More information is available at http://www.montclair.edu/csam/pseg-institute/ ♦

Continued from page 4—PharmFest 2014

industry are represented bringing an abundance of opportunities to one event. If you are planning your career, this fair is a great way to network and find out more information about specific companies and areas of interest.

PharmFest is offered through the collaborative work of the: College of Science and Mathematics (CSAM), School of Business (SBUS), Center for Career Services and Cooperative Education (CCSCE) at MSU and HealthCare Institute of New Jersey (HINJ). The program is open to any individual who is interested in the diverse disciplines that encompass the pharmaceutical, health and medical technology industries. Topics span the interest of high school and college students, science teachers, university professors, researchers and current members of the pharmaceutical industry. Detailed information and registration are available at http://www.montclair.edu/pharmfest. ♦

K-12 Visiting Scientist Program

Learning is an active process and there are two areas that we know make learning more real, more interesting and more grounded. Young minds learn by experience and young folks like to meet and interact with practicing professionals. The Visiting Scientist Program, developed and offered by the College of Science and Mathematics (CSAM) at Montclair State University, provides short-term visits to area schools to generate an atmosphere of inquiry, enthusiasm and challenge to students from elementary to high school levels. CSAM faculty members, with diverse expertise, are available to spend select classroom periods at area K-12 schools to share their research and expertise and most importantly the excitement of being a profession scientist, mathematician, information technologist, or STEM educator. Often these activities, talks or demonstrations align with or are done in conjunction with established curriculum in an effort to facilitate students' deeper understanding of the field of Science and Math.

This program also provides teachers with access to a valuable and unique resource that will enable them to enhance their curriculum and excite students about the possibility of going into a STEM discipline. Having an MSU faculty member in class with students will allow for the introduction of specific areas of study and research, and will also allow students to see real life examples of science professionals at work.

Fifteen of our faculty are available for class visits during this semester with expertise in three general areas:

-Issues of the Environment
-Computational, Mathematical and Statistical Sciences
-Chemical Sciences and Life Sciences.

Teachers, principals and superintendents are invited to review the list of outstanding presentations and hands-on activities and demonstrations offered by our CSAM faculty and arrange visits to your school and classrooms by visiting us on line at http://www.montclair.edu/csam/about-us/k-12-scientists/

For further information and assistance, you may contact Ms. Shari Ferguson-Murtha, CSAM Academic Advisor via email at fergusonmurs@mail.montclair.edu or by phone at 973 655-3329.♦

Visit CSAM at
http://csam.montclair.edu

CSAM-Celegene Collaboration Enters 6th Year

By John Siekiera,, Sokol Institute

In November of 2008, Dr. John Siekierka, Sokol Professor of Medicinal Chemistry and Director of the Sokol Institute of Pharmaceutical Life Sciences, along with the College of Science Mathematics entered into a formal sponsored research agreement with the Celgene Corporation (Summit, NJ) and Dr. Jerome Zeldis, M.D., Ph.D., Chief Executive Officer, Celgene Global Health. The agreement allowed Dr. Siekierka's laboratory to assess a collection of Celgene proprietary kinase inhibitors for activity against novel parasitic protein kinases identified through Dr. Siekierka's research. This program has now entered into its sixth year. The program evolved into an advanced drug lead optimization effort involving both Dr. Siekierka's laboratory and Dr. David Rotella's medicinal chemistry laboratory. The team has identified and characterized a set compounds with potent activity against the target kinase and against the human pathogen, *Brugia malayi* in cell culture. Plans are being made to evaluate one of these inhibitors in an animal model of the disease this year. *B. malayi* is one of the causative agents of lymphatic filariasis, a devastating disease affecting millions of individuals worldwide. The results of some of the recent advances in this program were recently presented jointly with Celegene Corporation's Division of Global Health at the annual 2013 American Society of Tropical Medicine and Hygenie held in Washington DC. ♦

Pictured from left to right, Dr. John Siekierka (MSU), Dr. Stacie Canan (Celgene), Tamara Kreiss (MSU), Agnieszka Chojnowski (MSU), Dr. Vikram Khetani (Celgene) and Dr. Dave Rotella (MSU)

A Different Path to a Doctoral Program

By Carter Smith *

At first glance, theater arts and scientific academia seem as disparate as two disciplines could possibly be, and undeniably they are different. However, they are both about exploring the world and how we understand it; they are about experimentation and investigation. In just a few years, I went from being a classically trained vocalist in a recording studio in New York, to an aspiring scientist, authoring a paper on a new invasive species of isopod.

The intense study required to improve and excel in the arts was the driving force of much of my adolescence. As a child, I was dedicated to vocal lessons, acting classes and auditions, and it was not until my junior year at Wesleyan University that I allowed myself the time to explore other interests. During this time, I took a semester abroad to trek through coastal Patagonia. Over the course of four months, I immersed myself in the marine environment, covering nearly 300 miles of the Chilean coast by kayak and on foot. This transformative adventure and the experiences it provided were a catalyst for a radical shift in my life's focus, and they sparked a fascination with the ocean that has only continued to grow.

After graduating from Wesleyan University with a B.A. in Theater, I joined the Catalina Island Marine Institute in 2009 as a marine science instructor for 4th through 12th graders. Despite the company's policy to hire only science majors, I convinced them of my enthusiasm for learning and devotion to self-study, and somehow I managed to persuade them to give me a chance. And thank goodness they did; over my two and a half years with the company, my attraction to the ocean turned into an unflagging passion for all aspects of the marine environment. Opportunities to kayak with risso dolphins, swim with leopard Sharks, dissect humbolt squid, or simply take care of the aquarium fish, provided the chance to conduct informal research and deepen my knowledge. I also broadened my hands-on skills in my free time with California Reef Check, a non-profit dedicated to the monitoring and preservation of California's near shore reefs. Through Reef Check I learned underwater surveying and sampling techniques and had the privilege of helping to scout and establish a new survey area at Long Point, Catalina Island. Working on a project that ultimately contributed to the conservation of one of my favorite scuba diving spots, incited a passion for field biology and an aspiration to conduct research of my own. I subsequently set my sights on a career in academia, and I returned to my hometown and post-baccalaureate studies at Montclair State University with renewed enthusiasm and purpose.

Collecting fouling samples from pier pilings at Barnegat Bay, NJ

In addition to taking a rigorous science curriculum at MSU, I have been fortunate to work in Dr. Robert Prezant's marine biology laboratory and to collaborate on several research projects. My first opportunity was volunteering for a doctoral student and assisting on field sampling and analysis for her dissertation on the effects of clam aquaculture on biodiversity. After this, I worked on another project quantifying the benthic biodiversity of the Hackensack River. I have also had primary control over experimental design, execution, and analysis for my independent project, "Settling and recruitment in intertidal fouling communities of Barnegat Bay, NJ". With the goal of assessing the diversity of bio-fouling communities at different tidal exposures, I placed settling plates on pier pilings and analyzed the plates over the summer and fall seasons. Over the course of my work, I identified tens of thousands of individuals across more than forty species. Most notably, I also uncovered an invasive species of asselid isopod, *Ianiropsis serricaudis*, new to the Atlantic Ocean. This discovery ultimately led to collaboration with some of the foremost authorities on invasive species.

My work in Dr. Prezant's laboratory has affirmed my passion and helped to clarify that my interests do indeed lie in invertebrate ecology. Furthermore, I feel that the hands on experience I gained at MSU not only strengthened my application for graduate school, but also prepared and excited me for the rigors of a PhD. My background in theater instilled the discipline to use persistent experimentation, the creativity to seek out unconventional solutions, and the curiosity to question the world and how we view it. Moreover, my unconventional journey to a PhD allowed me the time to test my passion and the maturity to commit to it with all of my heart. Though I cannot predict exactly where my graduate studies will take me, I hope to build upon the skills that I have learned at MSU, and continue working with invertebrates with a particular interest in commercially important invertebrate fisheries. ♦

* Carter will be enrolled in the PhD program in marine science at the University of North Carolina Chapel Hill in 2014. She also has been awarded a very prestigious five-year Royster Society fellowship...an award given to only 20 students across over 60 different graduate programs at UNC.

Ripple Effects:

Dean's note: Ripples emanate from a center showing concentric rings, new delineations that take on lives of their own. Such is the impact of our faculty, our teachers, and our scientists who in turn touch the lives of countless individuals. This is the first in a series of short notes that demonstrate the ripple effects of experiential opportunities made available through the talent, imagination and skills of member of the College of Science and Mathematics.

Montclair State University has a proud tradition of training many outstanding teachers for New Jersey's secondary education system. Mrs. **Patti Olsen**, an MSU Chemistry graduate and present MSU Chemistry graduate student, who teaches at Pope John XXIII, in Sparta, New Jersey, had a special day at the first NJ Science League Competition of the season on January 9, 2014. Her Chemistry I team, as well as the Pope John XXIII Biology I, Biology II, and Physics II teams all took first place. Mrs. Olsen serves as the moderator for the Chemistry I team.

The New Jersey Science League is a competitive science organization that has operated in the State of New Jersey since 1962. Begun as a chemistry league, competitions now take place for introductory level biology, chemistry, physics, earth science, and environmental science, as well as competitions for AP levels in chemistry, biology, and physics. Both public and private high schools participate in the league.

Individual students as well as teams are recognized at the end of the competition season, which runs from January through April. The program aims to encourage achievement in the sciences and a sense of teamwork and cooperation among the students. The leadership and mentorship of Patti Olsen, enabled by her training in Chemistry at MSU, grows through her high school chemistry students, producing ripple effects in New Jersey. ♦

Student News

Dr. Emily Hill presented a paper co-authored by undergraduate **Manuel Roldan-Vega**, and graduate **Greg Mallet**, along with Jerry Alan Fails, titled "NL-based query refinement and contextualized code search results: A user study" at the IEEE 2014 Software Evolution Week: Joint Meeting of the European Conference on Software Maintenance and Reengineering and the Working Conference on Reverse Engineering (CSMR -WCRE).

Melissa A. Harclerode (PhD student under the supervision of Dr. Pankaj Lal) presented her work on estimating societal impacts from characterization and remedial activities of a hazardous waste site using sustainability metrics from environmental footprint evaluation tools at both the Sustainable Remediation Forum (SURF) 23 Meeting and at the Battelle Bioremediation & Sustainable Environmental Technologies.

Students in the Middle Grades Mathematics Certification Program **Elizabeth Kalajian**, Mathematics Teacher, Saddle River Day School, and **Lindsy Michaels**, Sussex Middle School, Special Education Teacher presented a session titled, Hands-on CCSS Measurement and Geometry using Differentiation and Math Practices: Using a toolbox of free resources, engage in problem solving using multiple representations for all students" at the Association of Mathematics Teachers of New Jersey recently held the 6th Annual "Special Education and Mathematics Preparing for Common Core State Standards & Assessments: Update 2014 - A Conference for ALL Grades K-12.

Doctoral student **Hanieh Soleimanifar**, under the supervision of Dr. Yang Deng, recently won a $5,000 Graduate Student Grant of New Jersey Water Resources Research Institute (NJWRRI). Her proposal is entitled "Development of a new, effective and low-cost adsorption material to enhance Low Impact Development (LID) techniques for prevention of urban stormwater pollution in New Jersey".

PhD student, **Yu Qian,** under the supervision of Dr. H. Feng, attended two international conferences. She made a poster presentations on "Synchrotron Technique Application in Investigation of Wetland Plant Metal Uptake on an Urban Brownfield Site" at 2013 NSLS/CFN Joint Users' Meeting and an oral presentation on "Metal Concentrations and Distributions in Wetland Plant Roots from an Urban Brownfield" at 12th International Conference on the Biogeochemistry of Trace Elements - ICOBTE 2013. Yu also spent two weeks in the State Key Laboratory for Estuarine and Coastal Research at East China Normal University and participated in an international collaborative project on the Yangtze River estuary intertidal zone environmental research.

Students from the Prezant Laboratory recently presented papers at the 43rd Annual Benthic Ecology Meeting. **Matt Khan**, with co-authors R. Prezant and R. Shell offered a poster on Benthic Invertebrate Biodiversity Implications Resulting from Hydroraking of Lake Wapalanne, NJ. **Carter Smith**, also with co-authors R. Prezant and R. Shell presented "The first report of *Ianiropsis serricaudis* on the East coast of North America" grow-out operations on benthic communities in Barnegat Bay, NJ – Year 1 (2012)". And doctoral student Rebecca Shell gave an update on her dissertation reporting on the "Effects of hard clam (*Mercenaria mercenaria*) grow-out operations on benthic communities in Barnegat Bay, NJ – Year 1 (2012)".

Faculty Activity

Dr. **Lora Billings** (Mathematical Sciences) was elected as the Program Director for the SIAM Activity Group on Dynamical Systems for the 2014-2015 term.

Environmental Research and Education Foundation (EREF) recently invited **Dr. Yang Deng** (Earth and Environmental Studies) as a specialist on landfill leachate treatment to deliver a talk in EREF's Summit on Leachate Treatment in Philadelphia, Pennsylvania. Dr. Deng's talk was entitled "New Sulfate Radical-based Advanced Oxidation Process (SR-AOP) for Treatment of Landfill Leachate," EREF is the only private grant-making institution with a national and international scope whose sole mission is to support solid waste research and education initiatives.

Dr. **Charles Du** (Biology and Molecular Biology) presented "Helitron-Scanner: A two-layered local combinational variable approach to generalized Helitron Identification" (co-authers: Xiong, W., L. He, Y. Li, H.K. Dooner) and "A sequence-indexed reverse genetics resource for maize" (co-authors: Y. Li, J. Huang, L. He, Q. Wang, W. Xiong, G. Segal, H.K. Dooner) at the 55th Annual Maize Genetics Conference.. Also at the same conference, he presented "DsgMap-per: A pipeline tool for the identification of Ds-targeted sequences from multidimensional high throughput sequencing data" along with W. Xiong, L. He, Y. Li, H.K. Dooner.

Marc Favata (Mathematical Sciences) was recently selected as a KITP Scholar. KITP is the Kavli Institute for Theoretical Physics. Located on the UCSB campus, it organizes long-term workshops and conferences on various topics in theoretical physics. Around 8 KITP Scholars are chosen nationally from faculty at universities that are not major research institutes. Scholars are funded for three two-week visits over a period of three years to attend programs at the KITP.

Dr. **Huan Feng** (Earth and Environmental Studies) delivered a talk on "Investigation of metal uptake and translocation in wetland plants from urban coastal areas" at American Geophysical Union 2013 Fall Meeting.

At the Association of Mathematics Teachers of New Jersey 6th Annual Special Education and Mathematics Preparing for Common Core State Standards & Assessment: Update 2014 - A Conference for ALL Grades K-12, Dr. **Deborah Ives** (Mathematical Sciences) and undergraduate student, Jessica Munoz presented, "Understanding fractions through pictures, numbers, words, and symbols: A CCSS approach for all learners," which encouraged attendees to participate in a hands-on session using visual diagrams and models aligned with CCSS expectations for all students to demonstrate understanding using concrete, pictorial, and abstract representations in order to show their thinking about fractions.

Dr. **Pankaj Lal** (Earth and Environmental Studies) presented "Assessing socioeconomic impacts of biofuel development on rural communities in the Southern United States" at the Association for the Advancement of Industrial Crops 25th Anniversary Meeting.. He was also invited to give a training session at Forest Forecasting and Modeling Conference held at Blacksburg, Virginia. This Conference was supported by US Agency for International Development and US Forest Service as part of their efforts towards developing a forest forecasting model for India.

Kevin Olsen participated in the American Chemical Society Project SEED. His student was Gisela Vega from the Union City High School. Her project was to review sediment chemistry data from the 2011 and 2012 Weston Science Scholars field seasons on Barnegat Bay, New Jersey. Gisela presented a poster describing her work at the 27th ACS North Jersey Research Poster Competition at Seton Hall University. The poster titled "Polycyclic aromatic hydrocarbon levels in various locations in southern New Jersey, won first place. She presented the same at the ACS NY Section Research Poster Competition and at the Regional Intel Science Fair at Liberty Science Center.

Rebecca Shell gave an update on her dissertation reporting on the "Effects of hard clam (*Mercenaria mercenaria*) grow-out operations on benthic communities in Barnegat Bay, NJ – Year 1 (2012)" at the 43rd Annual Benthic Ecology Meeting. ♦

Tenure Decisions

The College of Science and Mathematics extends its congratulations to the following faculty on receiving tenure:

Jerry Alan Fails - Department of Computer Science
Vladislav Snitsarev - Department of Biology and Molecular Biology
Haiyan Su - Department of Mathematical Sciences
Ashwin Vaidya - Department of Mathematical Sciences

Publications

Billings, L., 2013. "Succeeding in undergraduate student research: A few helpful hints for advisors." *PRIMUS,* 23:9, 798-804.

Billings, L., L. Mier-y-Teran-Romero, B. Lindley, I.B. Schwartz, 2013. "Intervention-based stochastic disease eradication." *PLOS ONE* 8, e70211.

Cutler, J. and A.J. Radcliffe, 2014. "The maximum number of complete subgraphs in a graph with given maximum degree." *Journal of. Combinatory Theory,* Series. B 104, 60-71.

Deng, J.,Y. Shao, N. Gao, **Y. Deng**, S. Zhou, X. Hua, 2013. "Thermally activated persulfate (TAP) oxidation of antiepileptic drug carbamazepine in water." *Chemical Engineering Journal*, 228:15, 765-771.

Harcelode, M. A., P. Lal, M. E. Miller, 2013. "Estimating social impacts of a remediation project life cycle with environmental footprint evaluation tools." *Remediation Journal,* 24:1, 5-20.

Li, Y., J. Huang, L. He, Q. Wang, W. Xiong, G. Segal, **C. Du**, H.K. Dooner, 2013. "A sequence-indexed single gene knockout resource for maize." *Maize Genetics Cooperation Newsletter*. Vol. 87

Ming, Ray ....., **C. Du**, et al., 2013. "Genome of the long-living sacred lotus (*Nelumbo nucifera Gaertn*.)." *Genome Biology,* 14:R41

Ma, X., A. Gurung, and **Y. Deng,** 2013. "Phytotoxicity and uptake of nanoscale zero-valent iron (nZVI) by two plant species." *Science of The Total Environment*, 443(15), 844–849.

Munakata, M. and **A. Vaidya**, 2013. "Fostering creativity through personalized education." *PRIMUS,* 23:9, 764 -775.

Sagarika, R., **D. Ophori**, S,. Kefauver, 2013. "Estimation of actual evaporation using surface energy balance algorithims for land model: A case study in San Joaquin Valley, California." *Journal of Environmental Hydrology*, 21, 14.

Shi L., X. Zhu, Y. Su, W.-Z. Weng , **H. Feng**, X. Yi, Z. Liu., H. Wan, 2013. "Synergetic effect of VOx and TeOx species in mesoporous SiO2 for selective oxidation of propane to acrolein." *Journal of Catalysis,* 307, 316–326.

Snitsarev V, M. Young, R.M.S. Miller, **D.P. Rotella**, 2013. "The spectral properties of (-)-Epigallocatechin 3-O -Gallate (EGCG) Fluorescence in different solvents: Dependence on solvent polarity.." *PLOS One 8*, e79834.

Xiong, W., L. He, Y. Li, H.K. Dooner, **C. Du,** 2013. "InsertionMapper: A pipeline tool for the identification of targeted sequences from multidimensional high throughput sequencing data." *BMC Genomics,* 14, 679 .

Yang, Y., N. Gao, **Y. Deng**, and G. Yu, 2013. "Removal of perchlorate in water by calcined MgAl-CO3 layered double hydroxides." *Water Environment Research*, 85:4, 331-339.

Zhou, S., Y. Shao, N. Gao, **Y. Deng**, J. Qiao, H. Ou, J. Deng, 2013. "Effects of different algaecides on the photosynthetic capacity, cell integrity and Microcystin-LR release of Microcystis aeruginosa." *Science of The Total Environment*, 463-464, 111-119. ♦

Continued from page 1 - Drug Discovery in CSAM

for their toxicity against normal cells. This is a key piece of information needed by the consortium because previous experience showed that compounds that effectively inhibit BoNTX can also be toxic to normal cells. It is essential to learn this early in the compound testing process before a great deal of time and effort is spent to study it in more expensive and complicated animal tests. The data is used by the chemists to make new compounds to create "structure-activity relationships". Some molecules will progress to more detailed tests including use in animals exposed to BoNTX. Those that show acceptable effects in this model will be evaluated further for toxicity, stability and other properties. A compound that meets all criteria for safety, and efficacy can be submitted to the Food and Drug Administration for consideration as a clinical candidate. This molecule then proceeds through three phases of trials in humans for safety and efficacy as a BoNTX inhibitor and if successful can become an approved drug. The success rate for this entire process, from initial synthesis of a molecule to drug approval is very low (much less than 1%) and requires many years of study to lead to a new drug.

Dr. Rotella's team has starting points available and ideas in mind for their initial structure activity work. He is working closely with other members of the consortium to work out the procedures the team will follow to monitor progress and work effectively together. In a multisite, multidisciplinary project team, these aspects of the project are critical to define and adjust as needed so that data can be shared effectively and each group is kept completely up to date on progress. This project has been identified by the US Department of Defense as a high priority effort because of the significant need not only in the military but also for potential use in a bioterror attack scenario. As a result there is a great deal of excitement in the consortium to begin and the team is looking forward to achieving something that has not yet been accomplished. ♦

Kudos

Dr. **Tanya Blacic** was awarded $31,435 to study "New US-South Korean Collaboration: 2-D Ocean Temperature from Seismic Ocean ography Data" by the National Science Foundation.

Dr. **H. Feng** received $9,825 SKLEC Open Fund award from China State Key Laboratory for Estuarine and Coastal Research for a two-year international collaborative research project on "Sediment Metal Contamination and Bioremediation Study in Yangtze River Intertidal Zone for Coastal Sustainable Development."

Dr. **Eric Forgoston**, with Dr. **Lora Billings** as co-PI, received a $10,000 National Science Foundation REU Supplement CMMI-1233397: Understanding the Dynamics of Stochastic Disease Spread in Metapopulations.

Dr. **Aihua Li** received $5,804 to fund the "Garden State Undergraduate Mathematics Conferences 2013-2014-Year 2" from the National Security Agency.

Dr. **Kirsten Monsen**, with graduate student Paola Dolcemascolo, are studying "Colonization Genetics of the American Green Tree frog (*Hyla cinerea*): Evidence for a Recent Range Expansion in New Jersey" with a $3,410 from the NJ Department of Environmental Protection

Drs. **Robert Prezant** and **Carlos Molina** received a subgrant from the National Science Foundation, through Rutgers University, to continue the LSAMP The Garden State Alliance for Minority Participation.

Dr. David Rotella has been awarded $2.5 million, five year grant from the Defense Threat Reduction Agency to synthesize inhibitors of botulinum protease (BoNTX).

Passaic River Institute faculty Drs. **Meiyin Wu**, **Robert Prezant**, **Joshua Galster** and **Clement Alo** were awarded $67,672 by the NJ Department of Environmental Protection (NJDEP) to study "Strategies for Flood Risk Reduction for Vulnerable Coastal Populations along Hackensack River at Moonachie and Little Ferry." The NJDEP also funded Dr. Wu and graduate students Kelly Triece and Natalie Sherwood $3,500 work on "Environmental Education: Wildlife Habitat Permeability on an Urban Landscape." and $3,500 to study "Improving Permeability of Wildlife Habitats in New Jersey through Culvertand Landscape Assessment."

Upcoming Events

March 13, 6:30 p.m.—Seminar:
Weight and Exercise: Separating Reality from Beliefs

March 18, 4:00 p.m., Mallory 155
Sustainability Seminar: How long do sediments stay contaminated - Persistent chlordane concentrations in Long Island Sound sediment: Implications from chlordane, 210Pb, and 137Cs depth profiles

March 25, 4:00 p.m., Mallory 155
Sustainability Seminar: Restoration, Recovery, and Mitigation of Submerged Aquatic Vegetation

April 1, 4:00 p.m., Mallory 155
Sustainability Seminar: Technology Sources and Impacts of Atmospheric Nanoparticles

April 3, 8:00 a.m. University Conference Center
PharmFest (see article on page 4)

April 8, 4:00 p.m., Mallory 155
Sustainability Seminar: In Situ Biosequestration of Arsenic in Groundwater

April 12, 8:30 a.m., University Conference Center
8th Annual Student Research Symposium

April 15, 4:00 p.m., Mallory 155
Sustainability Seminar: Sustainable Remediation: Definitions, Methods, and Case Studies

April 22, 4:00 p.m., Mallory 155
Sustainability Seminar: Biosynthesis and Metabolic Regulation of Plant Phenolics

April 29, 4:00 p.m., Mallory 155
Sustainability Seminar: The Economics of Radon Mitigation for Public Wells in New Jersey

May 1, 8:00 p.m., University Conference Center
Margaret and Herman Sokol Science Lecture
Human Genomics a Decade after the Human Genome Project: Opportunities and Challenges

May 19, 7:00 p.m., Sprague Field
CSAM Convocation

May 23, 10:00 a.m, Izod Center
University Commencement ceremony

June 10, 8:00 a.m., University Conference Center
PSEG Institute for Sustainability Studies Conference: Building Resilient Communities in NJ