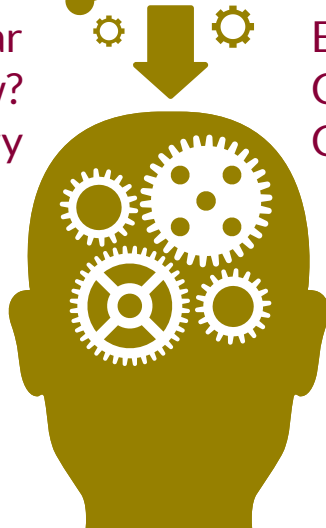


RISING TIDE



The Civil War
Where Are They Now?
New Drug Discovery

Exciting pH!
Childhood Obesity
Chemical Warfare



RISING TIDE

A publication of The Office of
Research and Scholarship at the
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REFLECTIONS



Research, scholarship and creative activities are intimately linked with and integral to teaching and learning, as well as the broader mission of a university. Wilhelm von Humboldt, considered the founder of the modern university, held the philosophy of “achieving a unity of teaching and research while providing students with an all-round humanist education.” A fair question is whether or not this ideal is still relevant to higher education. Colleges and universities are under immense pressure to adapt to changing economics, out-of-control tuition costs and the expectations that employers have of recent college graduates.

Conducting high-quality research and scholarship is expensive with the necessary upfront infrastructure costs, maintenance of specialized buildings and laboratories, and the need for dedicated faculty and student time to pursue these endeavors. Many institutions are unwilling or unable to make these long-term commitments, while other “research” universities have focused too narrowly on the research aspects and drifted away from the education mission.

As eloquently stated by Colin Macilwain in a 2011 *Nature* commentary, “research in universities requires solid

undergraduate and graduate learning and teaching. It is foolhardy to weaken this foundation, because the modern research university is built on the energy and ideas of students. Students are not customers of a university; they are its very soul. The idea that research will prosper while teaching and learning decay is a dangerous fallacy.”

In my opinion, the ideals Humboldt expressed are even more relevant today than when he first articulated them over two centuries ago. Engagement of students in scholarly activities is an important part of the education process. It requires significant time and effort to do well, and from that perspective it is not as efficient compared to traditional methods of classroom delivery. But in terms of achieving many of the most desired learning outcomes, it is among the best. The Council for Undergraduate Research has devoted numerous articles and publications on the value of creative inquiry in the arts and humanities. Likewise, the science education literature highlights the importance of authentic research experiences in stimulating an interest in science and increasing the likelihood that a student will pursue a career in STEM disciplines. Prior success in undergraduate research and scholarship is one of the best predictors

of success in graduate school. Many professional schools are adding, or increasing requirements for, scholarship in their curriculum to better train future healthcare professionals.

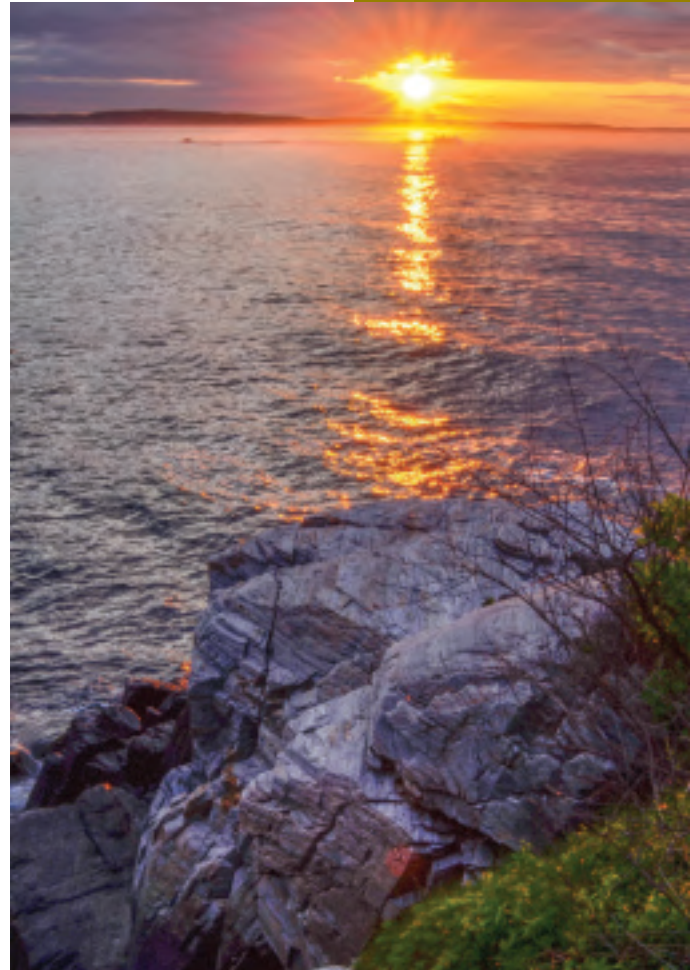
Tuition and tax dollars contribute significantly to the resources needed to start and maintain quality research programs. Students and their families take on debt and work extra jobs to be able to afford the premium tuition of a private university. I was reminded of this while traveling to my parent's house over winter break. The familiar creaks and groans of an older house brought back memories of high school and allowed time for reflection. My Dad's footsteps overhead in the early morning hours (now shorter in stride and for a different purpose) reminded me how hard both my parents worked to be able to afford a private university education for their son, and called to mind the professor who took a chance on an underperforming sophomore and became a trusted mentor and lifelong friend, and the graduate program that allowed me to pursue teaching opportunities and mentor undergraduates in the laboratory. These investments, opportunities and experiences have been invaluable in preparing me for the "real" world and a fulfilling and meaningful career.

It is fitting that the theme of this year's *Rising Tide* magazine is student-centered research and scholarship. As you browse through the various sections and read individual articles and spotlights, you will see example after example of UNE faculty and staff mentors working closely with their students on projects that have both meaning and value. The students gain competency in critical thinking and oral and written communication, while building valuable professional networks. While we love to highlight the successful experiments, grant applications and national awards and accolades, the behind-the-scenes failures and false starts are just as valuable to the students' education. They are learning to adapt on the fly, face and overcome unexpected challenges and failed hypotheses, and persevere to see a project through.

The investment in education being made by students and their families is enormous. The University of New England is making investments back into the infrastructure and faculty so that we can expand in scope, breadth and quality. And at the heart and soul of this initiative is the student-centered approach to providing the best education and career preparation possible.



ED BILSKY
VICE PRESIDENT FOR
RESEARCH AND SCHOLARSHIP



"You have the sky overhead giving one light; then the reflected light from whatever reflects; then the direct light of the sun; so that, in the blending and suffusing of these several luminations, there is no such thing as a line to be seen anywhere."

—Winslow Homer

Sunrise on Prout's Neck,
Scarborough, Maine
June 2013
Photo by Ed Bilsky

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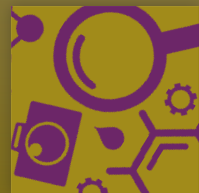


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RESEARCH & SCHOLARSHIP

UNIVERSITY MISSION The University of New England provides students with a highly integrated learning experience that promotes excellence through interdisciplinary collaboration and innovation in education, research and service.

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CAS



COLLEGE OF
arts and sciences



Civil War artifacts at the Saco Museum exhibit

The

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IN FIFTEEN WEEKS

Elizabeth De Wolfe, Ph.D., Professor of History and Chair,
Department of History and Philosophy

When twenty-two year old John Haley heard Abraham Lincoln's 1862 call for volunteers, he did not expect to serve. But when one friend enlisted "the rest thoughtlessly followed, like sheep over a fence," and Haley, despite "no inclination for the business" found himself a soldier. Over the next thirty-three months, Haley fought with the Maine 17th Regiment and kept a daily memorandum book recording his experiences, alternating between the sheer boredom of camp and the unfathomable terror of the battlefield. Haley survived the war, as did his diary, which he later refashioned into a narrative account of what Haley called a "hideous dream."

One hundred and fifty years later, in Spring 2013, fourteen undergraduate students in the College of Arts and Sciences (CAS) took on a unique challenge: tell Haley's story in the form of a professional-level museum exhibit that would be installed at the Saco (Maine) Museum. The challenges were many: Haley's diary covered nearly three years of a complex and lengthy war; students had little familiarity with the details of mid-nineteenth century life; and they had just fifteen weeks to research, design, and install the exhibit. The exhibit would open May 4 at 5:30 p.m., whether or not the paint was dry.

John Haley's Civil War is the third exhibit collaboration between UNE's Department of History and Philosophy and the Saco Museum. Generously funded by the Maine Humanities Council, these student-designed exhibits give undergraduate students the opportunity to experience history hands-on. Students grapple with historical documents and wrestle with the questions of how to tell a historical story through words, images, and artifacts.

The first collaboration, in 2008, produced *Mary Bean, The Factory Girl* and explored the lives of nineteenth-century Saco-Biddeford textile mill girls. In 2010, the UNE student exhibit design team used letters between Saco sea captain Tristram Jordan and his wife Catherine to create *Voyages and the Great Age of Sail*.


The collaborative exhibit begins in the history course Museums and Public History, co-taught by Elizabeth De Wolfe, Ph.D., professor of history, and Camille Smalley, research and collections manager at the Saco Museum (UNE '08). The 2013 exhibit team members represented fields of study from across the College of Arts and Sciences: psychology, medical biology, aquaculture, exercise science, political science, biochemistry, history, English, women's and gender

studies, liberal studies, business, and marine biology. Each student brought a unique strength to the team. Some students found they had a way with words and learned to write engaging, concise text panels; others found their niche in designing the space and offered creative ideas for representing Haley's story visually.

The foundation of exhibit preparation is research. Team members read Haley's diary published in 1985 and identified exhibit themes before diving into research. One team of students worked on life in antebellum America—the decades just prior to the Civil War. History major Max Metayer ('15) explored the economy, communication systems, and transportation networks in both the North and the South; Stephen Snyder (liberal studies '13) studied life in Saco; while Codi Riley (business/history '13) took on the challenging task of explaining the intricate causes of the Civil War.

A second group explored the battlefield. Richard Bruce (history '13) described how citizens answered the call to duty—and what happened to the "skeedaddlers" who did not. History major Dean Smalley ('14) researched weapons and, during exhibit installation, found a creative way to display Civil War rifles. Ashley Green (biochemistry '15) noted how often food was mentioned in the diary and used that as a springboard to explore what and how soldiers ate. And in the most gruesome section exhibit, Katherine Misaiko ('13) put her medical biology major to good use in her exploration of the diseases and injuries prevalent among soldiers.

War





John Haley's Civil War Museum exhibit team. The full team consisted of: Richard Bruce '13, Lydia Colbert '13, Madeleine Cox '15, Heather Duquette '13, Constance Glynn '13, Ashley Green '15, Sarah Hoover '16, Katie Labbe '14, Kristel Lee '15, Max Metayer '15, Katherine Misaiko '13, Codi Riley '13, Dean Smalley '14 and Stephen Snyder '13.

The home front provided a third theme. Sarah Hoover (undeclared '17), Madeleine Cox and Kristel Lee (both aquaculture and aquarium science '15) used period magazines, newspapers and books to discover how women supported the war effort and how the absence of men presented daily challenges and forced women into new roles. The final section of the exhibit explored how the Civil War was remembered in song and poems (Heather Duquette, medical biology/history '13) and in the rise of veterans' groups and services (Lydia Colbert, animal behavior '13). Constance Glynn (history/English '13) revealed Haley's post-war life, and in a moving and evocative exhibit conclusion, a memorial wall listed every soldier of the 17th Maine and their ultimate fate. This detailed, time-consuming,

and extraordinary original research was conducted by Katie Labbe ('14), a political science major/ women's and gender studies minor.

From their research papers, students drew concise explanatory text panels. Students designed the exhibit space, positioning moveable walls and display cases. They crafted interactive activities and selected artifacts. In the last days of the semester, the team worked feverishly at the museum putting into place their on-paper design. They painted display risers, mounted labels and text panels, and transferred large-font quotes from vinyl decals to the museum gallery wall. When all the prep work was done, UNE students touched history, carefully installing Civil War rifles and uniforms, medals, medicine, photographs, Haley's diary and more.

On May 4, the exhibit opened—the paint was dry.

John Haley's Civil War brought 3,000 visitors to the Saco Museum. Summer tourists and local residents, area school children and Civil War buffs viewed the hard work of the exhibit team and unanimously praised the result. Local and regional media carried news of the exhibit across New England. In May, the exhibition's student curators gave a well-received public gallery talk, leading visitors through the exhibit. One student was offered a paid summer job at the museum, another continued his interest in museums work with an internship in a local history archive. And students who prior to this course had rarely set foot in a museum, could point with pride to a museum exhibit they themselves had built.



Dean Smalley '14 and Katherine Misaiko '14 hang prints from *Harper's Weekly*.



Codi Riley '13 stands near the Abraham Lincoln portrait.

STUDENTS SHINE AT UNE RESEARCH SYMPOSIA

Charles Tilburg, Ph.D., Associate Dean, College of Arts and Sciences, Associate Professor, Department of Marine Sciences

Markus Frederich, Ph.D., Assistant Department Chair, Associate Professor, Department of Marine Sciences

One of the most crucial skills for any researcher is the ability to convey his or her thoughts, ideas and conclusions to others. Unfortunately, students frequently leave college without the basic presentation skills that they need to be successful in their chosen fields. The College of Arts and Sciences (CAS) provides multiple opportunities for students to practice and hone their ability to communicate with others. Over the last few years, CAS has developed a robust student research experience throughout the academic year and during the summer that has resulted in dividends for both the students engaged in the various research activities and the faculty who mentor them. Partnering with several private foundations (such as the Green Family Foundation and the Pond Family Foundation), public funding agencies (such as the National Science Foundation and the National Institutes of Health), and internal offices (such as the Marine Science Center, the Office of Research and Scholarship, and the Office of the Provost), the College has created multiple undergraduate and graduate research opportunities that have allowed students to work directly with faculty during our Summer Undergraduate Research Experience, pursue cutting-edge research of their own, and share the results of their studies with others. To meet the increasing need for communication skills, CAS provides students with the opportunity to present their work in formal conference settings.

One such opportunity includes the 5th Annual Northeastern Undergraduate Research and Development Symposium (NURDS), March 2–3, 2013, which brought together 160 students from 42 colleges throughout the Northeast U.S. and Canada. This conference, hosted and run by a team of UNE students, featured 83 posters and 56 presentations on topics ranging from history and education to biology and marine sciences. NURDS provides the opportunity for students from UNE and students from as far away as Nova Scotia, Canada, and Providence, RI to showcase their work, interact with other students, and participate in a novel conference specifically designed for undergraduate students.

Additionally, on May 5, 2013, the College of Arts and Sciences teamed up with the Westbrook College of Health Professions to host a Student Research Symposium that fielded 184 students working with 48 separate CAS faculty members. Representing all different disciplines and all different levels, the Student Research Symposium participants ranged from sophomore psychology students to graduate students in marine science. Students' presentations described course-based research projects designed to introduce students to research, results from capstone projects that allowed students to showcase their skills gathered throughout their academic career, and independent research projects that resulted in peer-reviewed publications.

Colin Longhurst (political science and mathematics, '13) describes his research to Charles Tilburg, Ph.D., associate dean of the College of Arts and Sciences, at the Spring 2013 Student Research Symposium.

INTERNATIONAL AQUACULTURE WITH UNDERGRADUATES

Jeri Fox, Ph.D., Associate Professor, Aquaculture and Aquarium Sciences Program ,
Coordinator, Department of Biology

Aquariums seen in places such as doctor and dentist offices are typically put in place for their aesthetic appeal but are not given much more thought than that. However, if one were to think about the lives of the fish and other sea creatures in those tanks, it might come as a surprise that not too long ago those fish probably lived on a beautiful coral reef or in a crystal clear lake halfway around the world (and more than likely in a developing country). Probably even farther from thought would be the reality that the processes that brought those fish to the tank crossed many disciplines—biology, ecology, business, sociology, and political science, to name a few. Aquarium fish hold a solid position in the global economy; the fish portion of the pet industry is valued at \$15 billion annually with 75% (for marine) of the livestock still coming from wild capture fisheries, and it is still growing (fish keeping is second only to photography as the most popular hobby).

Often the people who catch the fish seen in office or home aquaria are men from poor, isolated villages in underdeveloped countries who, due to decreasing food fish landings, are turning to the more lucrative ornamental species (animals that are sought after by hobbyists for use in their home aquaria). These men inevitably turn to destructive fishing practices such as bleaching, using cyanide or dynamite to increase their success. Although some fish survive this

practice, many do not, thus leaving the fragile ecosystem, which once was their home, in utter devastation. Ultimately, the survivors succumb to the after-effects of the capture process but usually not until they've been bought and placed in an aquarium.

Jeri Fox, Ph.D., and her students would like to change this devastating custom. Working with local people in various countries, they apply the practice of aquaculture to the ornamental species. Aquaculture involves the farming of aquatic species under controlled conditions; in this case it is applied to organisms for exhibit. Using aquaculture in the location where fish are currently captured means that a village's livelihood is not removed but is brought either to land or to shallow water where men, who are traditionally the fishers, can share the work with the other members of their family.

In one situation, the people of the island of Tobago were interested in bringing aquaculture to their island and were specifically interested in the culture of ornamental species. Along with the Buccoo Reef Trust, Fox and her team worked on selecting a suitable site based on the possibility of digging a seawater well. Students identified appropriate species for culture based on their abundance, appeal and ease of keeping in captivity. The Fox Lab continues to work with some of these species on the UNE campus.

Photo of the two banded coral shrimp, *Stenopus hispidus*, taken by a student on a class trip to Tobago.



UNE STUDENTS ON THE HILL

Undergraduate Research Presented to Members of Congress at CUR Posters on The Hill Program

Linda Morrison, Ph.D., Associate Professor and Chair of the Psychology Department

On April 24, 2013, two University of New England undergraduate students and their faculty mentors travelled to Washington, D.C., to present their research to members of the U.S. Congress. The Council on Undergraduate Research (CUR) is an organization representing over 900 colleges and universities, and the Posters on the Hill Program is designed to educate Congress on the positive impact of undergraduate research and the importance of continued national funding. Only 60 students from across the nation are selected each year for this honor, from among well over 500 applicants. Olivia Hebert (medical biology '13) and Andrea Taatjes (psychology '13) proudly represented UNE at the Spring 2013 CUR Posters on The Hill program.

Olivia Hebert, from Westbrook, Maine, worked for three years in the research lab of Associate Professor of Psychology and Coordinator of the Animal Behavior Program, Teresa Dzieweczynski, Ph.D. Hebert's time in Dzieweczynski's lab included two summers of research made possible by College of Arts and Sciences Summer Undergraduate Research Experience (SURE) fellowships.

Under the direction of Professor Dzieweczynski, Hebert was involved with a number of projects designed to examine the effects of inadvertent pharmaceutical exposure on behavioral consistency in male Siamese fighting fish. She is the co-author (with Dzieweczynski) of three peer-reviewed publications and the first author on a fourth. She received a Sigma Xi Grants-in-Aid Research grant to fund the specific project that she presented to congress. The project involved the effects of acute exposure to ethinylestradiol (EE2—the active ingredient in birth control pills) on the relationship between boldness and decision-making behavior in male Siamese fighting fish. Olivia's research data indicate that even nominal, short-term exposure to EE2 can have dramatic effects on multiple levels of behavior and can potentially generate severe fitness consequences on exposed aquatic species. Her study provided the first evidence of a boldness-aggression syndrome in this

species of fish and, perhaps more importantly, demonstrated that pollution may negatively influence consistent individual differences in behavior.

Andrea Taatjes, from Westford, Vermont, worked closely for two years with Professor Emeritus of Psychology, Maryann Corsello, Ph.D., in the evaluation of a Maine juvenile diversion program called Diversion to Assets (D2A). D2A is a strengths-based program that uses evidenced-based practice to reduce recidivism in juvenile offenders. Taatjes evaluated the effectiveness of the program in reducing recidivism for juvenile offenders in a particular community in northern Maine, and her project also helped to identify which juveniles and types of crime the D2A program is most effective in helping. In addition to being the subject of her Posters on the Hill project, this research was the basis for her senior thesis.

The research that both Hebert and Taatjes engaged in as undergraduates under the direction of faculty mentors was an integral part of their education at UNE. Hebert remarked, "Getting involved in research was one of the most beneficial things I did for myself during my time at UNE." Both women have transitioned to graduate programs: Hebert has started a doctoral program in physical therapy at Duke University, and Taatjes is pursuing a masters program in clinical psychology at the Massachusetts School of Professional Psychology.



From left to right, Olivia Hebert and Andrea Taatjes stand in front of the United States Capitol Building.



Nicole Hunter

Nicole Hunter's, (marine science '14)

research with Kathryn Ono,

Ph.D., is focused on the behavior of harbor seal (*Phoca vitulina*) pups. Her study goal is to determine if individuals exhibit significantly different behaviors when compared to one another and if their behavior is consistent over time and among different situations. Nicole observed seals several times during feeding and swimming over the course of their rehabilitation and noted all behaviors exhibited by individuals using focal sampling. Preliminary analysis indicates that the pups displayed significantly different types of behaviors.

Stay tuned for more of her findings. To find out more or donate to MARC, visit www.une.edu/research/msc/marc.

UNDERGRADUATE OPPORTUNITIES

In Marine Animal Rehabilitation And Conservation (MARC)

Anna Bass, Ph.D., Research Assistant Professor; Kristen Patchett, C.V.T., L.V.T., Interim Marine Animal Rehabilitation Coordinator; Shannon Prendiville, B.S., MARC Animal Care and Laboratory Technician; Asheley Simpson, MARC Animal Care and Laboratory Technician, all Department of Marine Sciences

“While at MARC, not only did I acquire skills necessary for working with rehabilitating seals and sea turtles, the staff instilled in me the importance of hard work, flexibility, and the desire to learn more.”

—Kristy (Volker) Phillips, Stranding Technician, Necropsy Coordinator, Virginia Aquarium, (UNE '08)

Marine Animal Rehabilitation and Conservation (MARC) at UNE has served marine animals in the Gulf of Maine, UNE students, and the coastal community since 2001. As a member of the Northwest Atlantic Seal Research Consortium, MARC also collaborates with multiple universities and non-profits to advance meaningful research and community-based outreach on wild seal populations. Several species of marine animals, including harbor, grey and harp seals, are given a second chance at a healthy life through the hard work of MARC staff, student workers and community volunteers.

The experienced staff of veterinary technicians rehabilitate seals and marine turtles while also training undergraduates in the skills needed to maintain a successful rehabilitation facility. Specifically, techniques in animal husbandry, water quality analysis, diagnostics techniques, quarantine procedures, marine animal anatomy, environmental education, and fundraising can be learned.

Opportunities for research are also available, involving, but not limited to, areas that focus on increasing the successful rehabilitation of sick or injured animals

(see sidebar for one example). Some research questions are related to identifying the best dairy-formula for rehabilitating dependent seal pups, “protecting” young pups from diseases when their immune systems are still developing, effectively treating ear infections in animals that must dive to hunt, and how best to simulate an environment that will enable a successful transition back to the wild. The archived information collected from marine animals for over a decade includes data on antimicrobial resistance, blood chemistries and complete blood counts, and growth rates of animals over time. For example, a review of the archived data on types of bacteria, their associated antimicrobial resistance levels and how these levels have changed over time has already been conducted and published.

MARC includes the only rehabilitation facility located on a U.S. university campus and provides numerous opportunities for learning and collaboration. MARC welcomes students (and researchers) who strive to increase understanding of these wild animals, and encourages active student participation in daily operations and research initiatives.



Top: (L to R): Erin Klem ('12) and Brianna Scimone ('12) begin a necropsy to determine the cause of death of a young harbor seal (*Phoca vitulina*).



Bottom: Fabian Smith ('13) and Kylie Galliani ('13) take carapace measurements of a young Kemp's ridley marine turtle (*Lepidochelys kempii*) that was cold-stunned and successfully rehabilitated.

Photos: MARC Staff

NO TOPIC OFF LIMIT

Brian Duff, Ph.D., Associate Professor, Department of Political Science

Which of last summer's political protests (in Turkey, Egypt and Brazil) is most likely to produce lasting political change? How has online news changed the way citizens form their political opinions? Will advocates of marriage equality be best served to pursue their goals through legislation, referendums, or the courts?

These are all excellent questions to which UNE's political science department can offer answers. Each of these questions has recently been the subject of independent research conducted by UNE political science majors for their senior theses.

In some fields it is common for students to engage in research by working on a professor's project, but political science at UNE approaches student research differently. Every student during senior year carries out his or her own research project from start to finish: developing an interesting political question, conceiving a strategy to shed new light on that question, carrying out the research and writing it up into a paper the length of the typical journal article in the field. Along the way, they work closely with a faculty mentor, and also learn from each other in the senior seminar.

Some students' research addresses central questions of the moment—for example the aforementioned thesis on public opinion and the internet carried out by Colin Longhurst. He showed just how several established political science theories failed to account for the effects of new media environment.

Some seniors conduct research that sheds new insight on the politics of the past. Brianni Frazier's thesis developed a novel explanation of the rise of lynching in the post-Civil-War South and, along the way, offered a revision of postmodern ideas about discipline. She presented the results of her work at a major political science conference in Chicago.

Often research does both—it offers an analysis of a political question that uses evidence from the past to offer new insights into the present. Erika Streim's work on the 1970's environmental movement in Kenya inspired her to write an op-ed article regarding a similar movement in Turkey this summer. Her research suggests that the comparisons between Kenya and Turkey are misguided, and that it is actually current Brazilian protests that best recreate the important aspects of Kenya's Green Belt Movement.

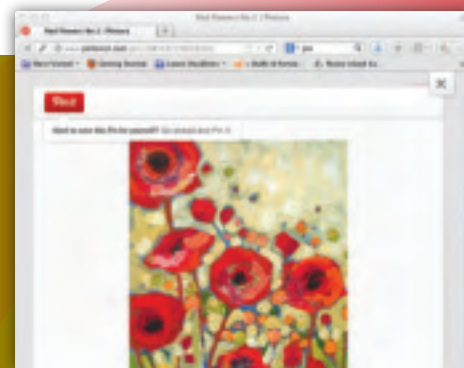
While the topics vary widely, what each senior thesis does is allow a UNE political science student to pull together the various skills and interests he or she has developed over four years at UNE. It allows students to work with a faculty advisor with a level of individual attention more typical of graduate school. And completing a senior thesis allows students to demonstrate to employers and graduate schools that they have developed the most valuable set of skills in most careers: the ability to cut to the heart of a problem and develop a creative and compelling new solution to it.

The Power of Pinterest

Bistra Nikiforova, Ph.D., Assistant Professor, Department of Arts and Communications

It was during a discussion in the Communication and Global Organizations class in the spring of 2012 that Sabrina Congram (communications '13) mentioned the newest social media site Pinterest and the obsession of female college students with it. A brief conversation with Congram after the class led to an independent study in the fall of 2013. Over the course of the semester, Congram and Bistra Nikiforova, Ph.D., developed a survey to collect more specific data about students' uses of Pinterest. Congram asked her roommates to test the survey in order to refine the questions. Meanwhile, an overview of the project titled "Mind of Pinners: College Students' Uses of Pinterest" was prepared for review by the Institutional Review Board at UNE. Congram took all the required training for working with human subjects and focused on collecting data from the UNE undergrads. In the spring of 2013, after

an unsuccessful attempt to share the survey through the official communication channels for UNE students, Congram and Nikiforova directly appealed to the students in the classes Nikiforova was teaching at that time, and using the power of networking through Facebook, more than 400 responses were collected. Even though Congram graduated in the spring, she has continued to work with Nikiforova long-distance to organize the data and the reasons for Pinterest's popularity among undergraduates. Findings were presented in the paper "What Do College Students Pin?" in October 2013 during the annual meeting of the Northeastern division of the Popular Culture Association.



Tackling Reading Deficiencies and Improving Learning Outcomes

Jennifer Stiegler-Balfour, Ph.D., Assistant Professor, Department of Psychology

While many factors combine to determine success in the classroom, a case can be made for reading comprehension to be near the top of the list. Since arriving at UNE in 2010, Jennifer Stiegler-Balfour's Reading Comprehension and Cognition (RCC) lab has sought to explore the cognitive processes involved in reading comprehension and identify strategies for decreasing deficiencies among less-skilled readers.

At present, the RCC lab has a number of studies in progress—all featuring student researchers who are involved in data collection and analysis. Students supporting the lab's research efforts for 2013/14 are Emily Boulton (psychology '16), Lauren Hayden (psychology '16), Jessica Hering (occupational therapy '15), Benjamin Katz (psychology '17) and Dana Wohl (doctoral candidate).

The RCC lab's efforts range from early-stage projects to studies nearing completion after multiple years of data collection. A recently concluded project devised by Stiegler-Balfour assessed the benefits of adjunct questions in raising less-skilled readers' comprehension levels. Featuring two student co-authors, Heather Tatsak (psychology '13) and Andrea Taatjes (psychology '13), the findings are due to be published as part of a book titled "Applying the Science of Learning in Education: Infusing psychological science into the curriculum," by the Society for the Teaching of Psychology.

Research assistants will also play an important role in support of a study developed by Stiegler-Balfour and Regi Robnett, Ph.D. (Occupational Therapy Department) exploring how Alzheimer's Disease affects reading comprehension. As part of this study, they hope to identify strategies for prolonging the ability of people diagnosed with the disease to comprehend written material.

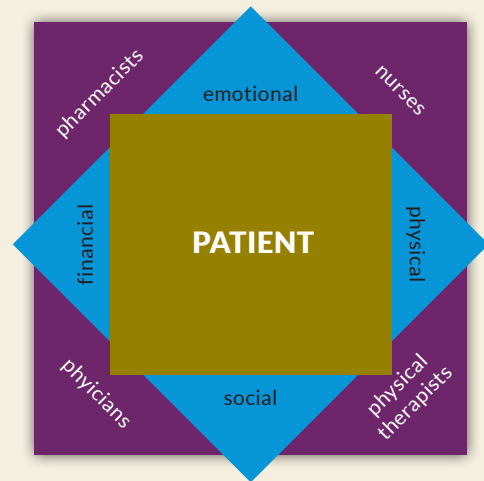
From left to right, Julia Rich (psychology '12), Hadleigh Smith (education '13, psychology minor), and Dr. Stiegler-Balfour at the New England Psychological Association conference.

Below, left to right, Jessica Hering (occupational therapy '15), Emily Boulton (psychology '16), Dr. Stiegler-Balfour, Lauren Hayden (psychology '16), and Benjamin Katz (psychology '17).



Patient and Healer Narratives to Enhance Medical Education on Chronic Pain

Jennifer Tuttle, Ph.D., Dorothy M. Healy Chair in Literature and Health, Department of English



As the Dorothy M. Healy Chair in Literature and Health and Professor of English, Jennifer Tuttle, Ph.D., is centrally concerned with bringing the fields of health and humanities into conversation. She is fortunate, indeed, to have worked this past summer as mentor to English and neuroscience double-major Tyler R. Vunk '15 on a project titled "The Intimate Angles of Chronic Pain: a Reflective Reading Experience for Aspiring Health Care Professionals." Chronic pain treatment is often impeded by fractured dialogue, misunderstanding and structural problems that cloud the interchange between patients and those helping to heal them. Vunk's project builds upon new work in narrative medicine, proposing to bridge the patient-practitioner divide through a pilot textbook featuring anonymous interviews of medical professionals and chronic pain patients alongside discussion questions that encourage conversation in the classroom setting.

Designed for aspiring health care professionals, the proposed textbook takes a qualitative approach meant to develop students' reflective thinking. Scholarship on patient narratives suggests that exposure to such stories humanizes patients in ways that raw data and dry textbook explanations cannot. As Tuttle has found in her own medical humanities teaching at UNE, reading these narratives will help aspiring healers to empathize with their patients and to understand them and their chronic pain holistically and in context; likewise, encountering the narratives of other health care practitioners will help students in the healing arts to become more self-reflective about their own assumptions and practices as well as about the stories they construct to understand their experiences providing health care.



Ecology and Movements of Spotted Turtles, *Clemmys guttata*, in UNE's Forested Wetlands

Bethany Woodworth, Ph.D. Assistant Lecturer,
Department of Environmental Studies

Three students stood quietly, overlooking the still waters of a vernal pool surrounded by lush, green oak-pine forest. Brendan Bennett (environmental science '13) was holding an antenna and a radio-receiver; as he adjusted the dial, a steady, high-pitched "ping...ping" suddenly sprang to life from the receiver.

"She's here!" he announced. Somewhere hidden among the lily pads and murky water was a small, approximately five-inch-long spotted turtle (*Clemmys guttata*), gorging herself on amphibian eggs and insect larvae in anticipation of the coming breeding season. This particular turtle had disappeared from her usual pond as it dried up over the course of the previous weeks. Were it not for the quarter-sized radiotransmitter glued to her back, it would have been impossible to guess the turtle's fate or understand the movements, habitat requirements and ecology of this state-listed threatened species.

Severely threatened by loss of wetlands, habitat fragmentation, and collection for the pet trade, spotted turtles have been all but eliminated throughout much of their range. The University of New England's 363-acre woodland along Rt 9, a mosaic of upland forest interspersed with vernal pools and other wetlands, is an ideal habitat for this threatened species.

For three years Bennett has pursued his passion for herpetology (the study of amphibians and reptiles) by studying spotted turtles, aided by student assistants Lauren Eno (environmental science '13) and Elizabeth (Beth) Smith (marine science '13). Under the guidance of Bethany Woodworth, Ph.D. and colleagues at the Maine Department of Inland Fisheries and Wildlife, the students have captured 36 examples of this rare species, individually marked each one, and radiotracked 18 of them. Among their subjects were three juveniles, including a three-year-old juvenile, the youngest spotted turtle radiotracked in Maine. Because spotted turtle survival depends on access to vernal pools, red maple swamps, and associated uplands to support them during the various stages of their annual cycle, information on movements and ecology is crucial to the conservation of this threatened species.

UNE Researchers Work to Conserve Local Sturgeon

James Sulikowski, Ph.D., Professor, Marine Science Center

James Sulikowski, Ph.D., professor, and undergraduate researcher Carolyn Wheeler (marine sciences '15) are conducting research to better understand the federally protected Atlantic sturgeon population in the Saco River. The Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*) is a long-living, anadromous (migrating up rivers from the sea to spawn) fish species with a range from Labrador, Calif. to Georgia, USA. Because of overfishing and habitat destruction, the population has steadily declined throughout its native range over the last century, along with local extinction in the Saco River. Mysteriously in 2008, Atlantic sturgeon reappeared in the river after a fifty-year absence, yet the reason is unknown due to a lack of information about the species.

Reproductive data, such as sex ratios and sexual maturity, is among some of the information that has yet to be determined for the Saco River watershed. Stress-inflicting or fatal techniques like boroscopes and gross dissections are typically used to evaluate these parameters, but such procedures are not advised for threatened species. Instead, Sulikowski and Wheeler are currently developing three nonlethal techniques that have never been coupled on Atlantic sturgeon previously. Over the next two years, Wheeler will determine blood hormone concentrations and use ultrasonography and external features to define a sex ratio and sexual maturities of the individuals in the population. This research will not only provide a better understanding of why the Saco River Atlantic sturgeon population has returned but also aid in their future conservation.



Carolyn Wheeler holds a juvenile Atlantic sturgeon.

Internships Offer Transformational Experiences for a Student's College Career

Cynthia Simon, M.S., CAS Internship Director

The College of Arts and Sciences Internship Director Cynthia Simon establishes relationships with organizations, consults students and instructs internship courses. Students pursue local, national and overseas internship opportunities. In some programs, Simon offers both 200- and 400-level internships to encourage early career exploration and 12 credit internships so students may maintain their enrollment and scholarship while interning away. The breadth and caliber of CAS internships is astonishing.

CAS interns are traveling the globe. Aquaculture and aquarium science major Sky Williams '13 enrolled in the Biology 495 internship course, and accompanied Jeri Fox, Ph.D., to Tobago, West Indies, as a research assistant. Anna Clabaugh (marine biology '13) was only a freshman when she pursued her dream of going to Fiji. She spent her Marine 295 internship as a coral reef research assistant at Waituba Marine Park.

CAS Interns are serving their community. Matthew Lavassieur (medical biology '11) completed his Biology 495 internship with Maine AIDS Alliance, where he assisted with research on medical policy that contributed to a change in Maine state law governing AIDS prevention. Matt is currently pursuing a Doctor of Osteopathic Medicine degree at UNE COM.

Internships bridge the disciplines. Amy Farinelli (environmental studies and sociology '13) completed her Environmental Studies 495 internship with the Danville Regional Foundation, VA, where she and a team researched and devised a strategic project to build community around the town's main river. Farinelli's internship landed her a job offer.

CAS interns are experiencing their studies from a professional perspective, gaining transferable knowledge and skills, building networks and serving community through critical and cutting-edge research.

A Collaborative Approach to Establishing Biological Control of Mosquitoes at UNE

Noah Perlut, Ph.D., Assistant Professor, Department of Environmental Sciences

The beauty of UNE's Biddeford campus is defined by water—the Saco River, Atlantic Ocean, Biddeford Pool, brooks and streams, forested wetlands, vernal pools, and salt marshes. Inherently, these waters are a host habitat for some of the 40 species of mosquitoes found in Maine.

Recently, concern for mosquito populations around both campuses has increased due to the local identification of West Nile Virus and Eastern Equine Encephalitis, two diseases of serious concern to human health. Recognizing the potential for mosquitoes to infect members of our campus community, during the fall 2013, Bill Bola, vice president for Campus Services, and Ronnie Souza, director, Environmental Health and Safety, engaged Noah Perlut, Ph.D., in a collaborative project aiming to increase biological control of mosquitoes on campus, as increased chemical spraying would pose further threats to the health of the campus and ecological communities.

Perlut recruited three environmental science majors—Samantha Fields '14, Brendan Emanuel '14 and Caitlyn Spaith '13—on the project. The students spent the year writing a biological control program, engaging birds, bats, and plants in mosquito control. Fields and Emanuel interned through the 2013 summer, establishing and monitoring the campus infrastructure for biological control.

Working with Facilities Maintenance, they sited 23 bird houses designed to attract mosquito-eating tree swallows and bluebirds and 24 bat boxes. The grounds crew planted mosquito-repellent plants in high human-traffic locations around campus, and the students tested if mosquitoes were repelled. The students trapped mosquitoes to assess which species were on campus. This project established the infrastructure to both increase the biodiversity on campus and make our time walking the grounds a bit more pleasant.



NSF GK-12 SPARTACUS

Program provides graduate students with the freedom to pursue science and become better communicators

Charles Tilburg, Ph.D., Associate Dean, College of Arts and Sciences, Associate Professor, Department of Marine Sciences; Stephan Zeeman, Ph.D., Professor, Department of Marine Sciences; Susan Hillman, Ph.D., Professor, College of Arts and Sciences, Teacher Education; Henrietta List, SPARTACUS Program Manager

The National Science Foundation GK-12 SPARTACUS Program is a multi-year project designed to improve graduate students' communication skills by placing them in K-12 schools. The program features cooperation between the Education and Marine Science departments and has supported the education of 22 graduate students and reached more than 2,000 K-12 students.

While it has been invaluable in helping future scientists become better communicators, it has also provided UNE graduate students with unprecedented freedom to tackle scientific problems within the Saco River Watershed and share that information with K-12 students in classrooms throughout southern Maine. This freedom has resulted in both training that will further the careers of graduate students and research that fuels their passions. The fellows perform high-level research in pursuit of their graduate degrees and are then challenged by the SPARTACUS Program to communicate their findings to a K-12 audience.

Margaret Meserve

Advisors: Kathryn Ono, Ph.D., associate professor of marine sciences, Noah Perlut, Ph.D., assistant professor of environmental studies

Project: Examination of parental care and nestling behavior at two (inland and coastal island) Great Blue Heron colony sites in Maine.

School: Lincoln Middle School, Portland, ME, grade 7

Amber Thomas

Advisor: Kathryn Ono, Ph.D., associate professor of marine sciences

Project: Investigation of early-life diving development of seal pups undergoing rehabilitation.

School: Biddeford High School, Biddeford, ME, grades 10-12

Christopher Goodchild

Advisor: Stephan Zeeman, Ph.D., professor of marine sciences

Project: Assessment of the prevalence of triclosan in the Gulf of Maine watershed and the sub-lethal effects in a freshwater mussel.

School: Massabesic Middle School, East Waterboro, ME, grade 8

Michelle Slater

Advisor: Pam Morgan, Ph.D., associate professor of environmental studies

Project: Examination of the transport regimes of the Common Reed, *Phragmites australis*, in the Saco River Estuary, ME using physical oceanography techniques and genetic analysis.

School: Saco Middle School, Saco, ME, grade 7

Laura-Whitefleet Smith

Advisor: Anna Bass, Ph.D., research assistant professor of marine sciences

Project: Molecular techniques to identify and differentiate between three different species of hake (genera *Urophycis*, *Phycis* and *Merluccius*).

School: Bonny Eagle High School, Standish, ME, grades 9-12

Kenneth Reese

Advisor: Stine Brown, Ph.D., professor of biology

Project: Investigation of American Lobsters, *Homarus americanus*, social (agonistic) interactions when presented with a limiting resource in their environment.

School: Loranger Middle School, Old Orchard Beach, ME, grade 7

Timothy Harder

Advisor: Charles Tilburg, Ph.D., associate dean of college of arts and sciences and associate professor of marine sciences

Project: Investigation of the effects of river dredging on the river morphology of the Saco River estuary

School: Loranger Middle School, Old Orchard Beach, ME, and Massabesic Middle School, East Waterboro, ME, grades 6 and 7



Student Research on the Saco Estuary Continues to Strengthen Connections Between Science and Community

Pamela Morgan, Ph.D., Associate Professor and Chair, Department of Environmental Studies

Four years into the Saco Estuary Project, students in several different departments are still discovering new things about the ecology of the estuary, and they are linking those discoveries to issues that people in the local communities care about. During the summer 2013 field season, the team researched water quality, invasive plant species and endangered and threatened fish species, while continuing to document the amazing biodiversity that the estuary holds. Students with majors in environmental science, sociology and marine science have spent the summer working with faculty and gaining experience in their chosen fields.

During the fall semester 2013, students in several UNE classes had the opportunity to get involved as well. In the Environmental Studies department, Chris Feurt, Ph.D. assigns students in the "Sustaining Water" class a project that creates outreach materials to help translate the science discoveries to local communities. In the "GIS: Spatial Analysis" class, students will create maps to show what effect future sea level rise will have on the marshes that line the river. And in the Humanities department, the new "Doing Humanities

Digitally" class taught by Michael Cripps, Ph.D., will create a digital exhibit to document the project. "By bringing historical artifacts showing the varied uses of the Saco River estuary, interviews with contemporary commercial interests on the Saco River, and current research on the health of the ecosystem, the digital exhibit project will make publicly accessible a set of disparate artifacts that document the centrality of the estuary to plant, animal and human habitation," says Cripps.

Students use GPS/GIS technology to map the location and extent of invasive Phragmites in the Saco estuary.



Graduate student Michelle Steen-Adams and undergraduate Sarah Cowles ('15) in the marsh.



Gene Expression and Neuropathic Pain

Lei Lei, Ph.D., Assistant Professor,
Department of Biology

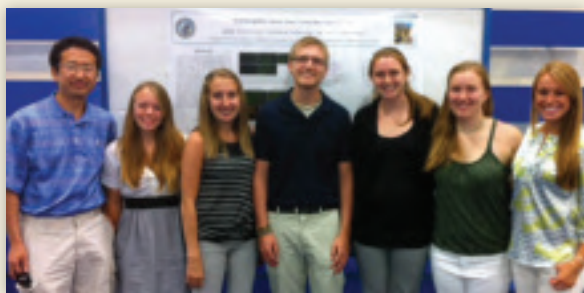
Neuropathic pain is a severe and debilitating form of chronic pain that can occur after injury to the nervous system. Current therapeutic options for neuropathic pain are very limited due to lack of efficacy and undesirable side effects.

Lei Lei, Ph.D., is an assistant professor in the Department of Biology and a member of the Center for Excellence in the Neurosciences. His undergraduate students are examining the role of the transcription factor Sox11 in nociceptive neurons, a specific type of sensory neurons that sense temperature and pain. Lei's laboratory previously demonstrated that Sox11 is a key molecule in regulating the development of nociceptive neurons.

Because the expression of Sox11 is significantly enhanced after peripheral nerve injury, Lei hypothesized that Sox11 protects the subject from the development of neuropathic pain.

Using molecular biology and stem cell techniques, the Lei Laboratory engineered a mouse strain in which the Sox11 gene is specifically deleted in nociceptive neurons. The laboratory uses a combination of molecular, histological and behavioral approaches to examine the function of Sox11 in mouse models of neuropathic pain. This research will contribute to the understanding of neuropathic pain and may identify novel targets for developing effective analgesics.

Undergraduate students continue to have a strong presence within the Lei laboratory. Current students include Maria Leasure (medical biology '14), Kristina Michaud (medical biology '14), Abby Small (medical biology '14), Kelsie Galusha (medical biology '15), Samantha Frederickson (medical biology '15), and Rebecca Green (medical biology '16).



From left to right: Lei Lei, Kelsie Galusha, Samantha Frederickson, Michael Anderson (biological sciences '13), Brittany Roy, Rebecca Green, and Kristina Michaud present at the 2013 COBRE Summer Symposium.

Winning at the Frontline: Bacterial Strategies for Evading the Immune System

Kristin Burkholder, Ph.D., Assistant Professor,
Department of Biology

How do bacterial pathogens cause infections in people with healthy, functioning immune systems? What enables pathogens to resist destruction by the host's immune cells? Assistant Professor of Biology, Kristin Burkholder, Ph.D., and her students Jessfor Baugh (College of Dental Medicine), Kayla Harris (biochemistry/pre-pharmacy '16), Natasha Boada (biology '14) and Zachary Tranchemontagne (master's student, Department of Biology) seek the answers to these questions. The Burkholder Lab studies how the common and troublesome human pathogen *Staphylococcus aureus* tricks immune cells in order to establish persistent infections. *S. aureus* causes serious and often drug-resistant infections of the skin, heart, bloodstream and bones.

One way that *S. aureus* persists and spreads within the body is by entering and surviving inside of macrophages; cells used by the immune system to engulf and kill microbes. Although it is unclear exactly how *S. aureus* survives inside the very cells designed to destroy bacteria, recent work conducted by Baugh and Harris indicates that when *S. aureus* is engulfed by macrophages, the bacteria actually responds to the environment inside the macrophage by becoming more infective, rather than being killed.

These findings suggest that *S. aureus* has adapted so well to the immune system that the bacterium "gears up" its infective properties when faced with the immune response. Ongoing work in the Burkholder Lab aims to identify how *S. aureus* infectivity is influenced by the macrophage environment. Information gained from these studies may provide targets for future development of anti-bacterial drugs.

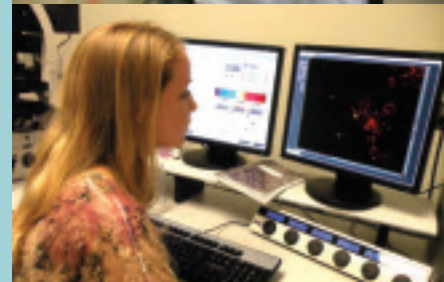
Jessfor Baugh, performing an experiment that examines *S. aureus* survival inside of macrophages.



Natasha Boada (left) and Kristin Burkholder (right) examine macrophage cell cultures. Students in the Burkholder Lab use techniques of eukaryotic cell culture and microbiology in the study of host-pathogen interactions.



Kayla Harris examines confocal micrograph images of *S. aureus* inside infected macrophages. These images were taken with the Leica confocal microscope, which is part of UNE's Imaging Core Facility.



Chemical Warfare in the Intertidal Zone

Ursula Roese, Ph.D., Assistant Professor,
Department of Biology

Just a few steps away from campus is the field site in the intertidal zone of Biddeford Pool where undergraduate students and their advisor Ursula Roese, Ph.D., assistant professor in the Department of Biology, are working on answers to questions on the chemical warfare of algae. “Algae are under constant attack by microbes or animals like snails and little Crustaceans in the intertidal zone. It is amazing how well they are defended, and it is often the chemicals that these algae produce that ward off their enemies” says Roese.

In her Chemical Ecology laboratory, Roese and her students investigate what type of chemicals algae synthesize and which pathways are involved in their synthesis. While this is basic research, it has important applications to understand the physiology and chemical composition of algae for human health benefits and pharmaceutical applications. “We are able to use our knowledge to, for example, increase the content of antioxidants in algae or other antimicrobial compounds” states Roese.

A recently funded NSF-MRI grant (PI Roese, Ph.D.; Co-PIs Amy Keirstead, Ph.D., assistant professor and Amy Deveau, Ph.D., associate professor, Department of Chemistry and Physics; Teresa Dzieweczynski, Ph.D., associate professor Department of Psychology; Stephan Zeeman, Ph.D., professor Department of Marine Sciences) now allows students to use state-of-the-art chemical analysis to identify chemicals on the newly acquired Gas Chromatography-Mass Spectrometer located in Roese’s laboratory.

Roese and her students presented their research at the International Society of Chemical Ecology annual meeting in Vancouver and twice at the Northeast Algal Symposium. Kyle Martin, a former biology student in Roese’s laboratory, presented at the Symposium and summarized his experience by saying: “It was a great experience to conduct research and to present our results at a regional conference with other scientists as an undergraduate student. Because I had given a poster presentation at the Undergraduate Research Symposium at UNE last summer, I felt very well prepared to present and answer questions.” Kyle has since completed his honors thesis in Roese’s Chemical Ecology laboratory and began a prestigious Plant Science Ph.D. program at Cornell University in the fall of 2013.

Undergraduate student Kyle Martin (biology '13) and Dr. Ursula Roese at the field site in Biddeford Pool.



Additional Research

Teresa Dzieweczynski, PhD, Associate Professor in the Department of Psychology, is the newly appointed College of Arts and Sciences Undergraduate Research Coordinator. Dzieweczynski has been a strong advocate for the benefits of undergraduate research experiences since her arrival at UNE in 2005. She has mentored over 30 undergraduates in her research lab where they work with her to examine how man-made chemicals in the environment, such as pharmaceuticals, affect fish behavior. Many of these students are co-authors on scientific publications and have presented at national and international conferences. Dzieweczynski believes that all undergraduates benefit from research experience in their major, not just those that plan on attending graduate school. Conducting research is an ideal way of training students to becoming critically thinking, informed citizens that know how to question rather than merely accept what they see or read. In addition, doing research generates a strong relationship with a faculty mentor and instills a sense of confidence within students as they realize they are capable of more than they imagined possible. Dzieweczynski looks forward to working with CAS faculty and other partners across the University to take the already successful program of undergraduate research at UNE to an even greater level of success.

Students conducting research with Deena Small, Ph.D. are participating in a unique study that is shedding light on the potentially harmful effects that Polybrominated Diphenyl Ether (PBDE) flame retardants may have on human health. PBDEs are chemicals used to meet flammability requirements for household furnishings and electronics. Unfortunately, PBDEs are released from these products into the environment and then find their way into humans through the inhalation and ingestion of PBDE-contaminated dust. PBDEs are classified as endocrine-disrupting molecules due to their chemical similarities to thyroid hormone.

Through the use of biochemical techniques, Small and her students have catalogued several cellular and physiological abnormalities in organisms exposed to PBDE. More than five UNE undergraduates have participated in this NIH-funded project and most have presented their results at regional, national and international scientific meetings. Recently, Patrick Randall (medical biology '13) was awarded “Best New (undergraduate) Student Poster Presentation” for his research describing the effects that PBDE exposure has on bone development in mice at the 2013 annual meeting of the North Atlantic Chapter of the Society of Environmental Toxicology and Chemistry.

These data and that generated by former UNE students Olivia Paquette (medical biology '12), Megan Bagdon (medical biology '12) and Jason Viggiano (marine science '13) will be published in peer-reviewed, scientific journals.

Small proudly states that the generation and publication of data from this important and groundbreaking study is likely to impact policy decisions regulating the manufacture, use and disposal of PBDEs and would not have been possible without the dedication and talent of UNE student researchers.



Synthesis: Arts and Sciences

Stephen Burt, M.F.A., Associate Professor and Chair, Department of Arts and Communications

The Concentration Seminar is an advanced studies course in art offered by the Arts and Communications Department at the University of New England.

The seminar began with experimentation in style and content with new artwork being created each week. This work, critiqued by the group, was then revised, reworked or “deleted” to begin anew. By mid-semester a firm commitment to an artistic identity, theme and technique was established and the hard work of putting together a group exhibition, body of coherent work and individualized artist statement was well under way.

There is a great deal of freedom inherent in this kind of seminar, so each student had many difficult choices to make along the way: What do I make? How do I make it? Is this the result I was looking for? Is the work garnering the response I wanted? Why not?

Stephen Burt, associate professor and chair of the Arts and Communications department, helped guide conversations and made sure deadlines were met, but it was the students themselves who largely constructed the course. They led the discussion and made the final decisions on what kind of work they exhibited, the design of the exhibition invitation and when and how the opening reception occurred.

Art is a personal statement that evolves with the individual through choices based on experience. Solutions require a comfort level with ambiguity, as creativity—the unique combination of traditional elements in the attempt to transcend tradition—is almost never clear. The process of creating work can be frustrating, yet the reward that comes from making “it” work is deeply personal. Students come away from the experience with a deeper understanding of their world.

The 2013 group exhibition, *Synthesis*, was created by:

Jessfor Baugh (medical biology/ medical sciences '13)

Angela Cuddy (art education '13-14)

Kim Hentz (animal behavior '13)

Matt Lawrence (biological sciences '13)

Anthony Leavenworth (medical biology/ pre physician assistant '13)

Ariana Rossi (health sciences occupational studies '13-14)

Gabrielle Phaneuf (medical biology, medical sciences '13)

Shawna Kelley (art education '13)



WHERE ARE THEY NOW?

Barbara Winterson, Ph.D., Chair, Department of Biomedical Sciences,
Professor of Physiology

A goal of promoting osteopathic medical student research is to set the stage for a career that includes research and continuing contributions to medical science. Many of the research fellows have gone on to careers in research, academic medicine and administration. Two outstanding former medical student fellows include Robert Moore, D.O. and Tom Miller, D.O.

Moore is now practicing as a laparoscopic and vaginal reconstructive surgeon in Atlanta, Ga. Moore graduated at the top of his class from UNECOM in 1994. While at the University, he received a research fellowship from the American Osteopathic Association and from Burrough's Welcome to study the involvement of amino acid regulation of spinal circuits underlying persistent muscle contraction in a rat model. This resulted in several publications representing groundbreaking work on the phenomenon of spinal memory systems and central sensitization. Moore went on to a residency in obstetrics and gynecology at the Maine Medical Center followed by a two-year fellowship in pelvic surgery at Northside Hospital in Atlanta, Ga. He is now the Director of Advanced Pelvic Surgery and the Co-Director of Urogynecology at the Atlanta Center for Laparoscopic Urogynecology, the Vaginal Rejuvenation Center of Atlanta and Atlanta Medical Research, Inc.

Moore has continued to publish and has over 100 publications to date,

including journal articles and co-authorships of the first comprehensive book on vaginal rejuvenation and cosmetic surgery for women as well as the first chapter ever published in a major medical textbook on vaginal cosmetic and reconstructive surgery. He is internationally recognized for multiple innovations in the field of vaginal surgery.

Moore is board certified and a Fellow of the American College of Obstetrics and Gynecology (FACOG) as well as the American College of Surgeons (FACS) and International College of Surgeons (FICS). He is member of the American Association of Gyn Laparoscopists, American Urogynecology Society, International Urogynecology Association, and the American Urologic Association and a Fellow of the The Royal Society of Medicine, London, England. He is also the Executive Editor-in-Chief of the Online Journal of Urology.

Miller is now a fourth year fellow in imaging with a focus on fetal cardiology at the University of Utah and is board certified by the American Academy of Pediatrics. Miller graduated from UNECOM in 2007, after which he did his residency at Maine Medical Center in pediatrics from 2007-2010, followed by his pediatric cardiology fellowship at the University of Utah.

Prior to matriculating at UNECOM in 2003, Miller conducted research at the Myocardial Biology Unit at Boston Medical Center, where he co-authored

seven peer reviewed publications focused on myocardial apoptotic signaling. He has since published several more with a total of four first authored publications (and 10 presentations at national conferences).

While at UNECOM, Miller continued his interest in research and was awarded a Dean's Research Fellowship in the Department of Pharmacology and undertook a leadership role as the President of the New England Research Club (UNECOM student-run organization). He graduated with honors and was a recipient of Psi Sigma Alpha award.

Miller was elected Chief Senior Fellow in the Division of Pediatric Cardiology Fellowship program at the University of Utah. He has continued to build on his training in biomedical and translational research and for his subspecialty year, he was awarded an NIH-T32 training scholarship.

His research, interests are focused on the effect of in utero insults on post-natal myocardial and vascular development. He was awarded an American Society of Echocardiography grant in 2013 to investigate prenatal predictors of post-natal outcomes in congenital heart disease. His career has enabled him to develop expertise in anatomy, embryology, molecular biology, pediatric clinical skills, as well as cardiovascular and fetal physiology, and he looks forward to establishing his career as a clinician-scientist.

UNECOM DEPARTMENT OF GERIATRIC MEDICINE

Students Lead the Way with Research and Practice Fellowships

Marilyn Gugliucci, Ph.D., Professor and Director for Geriatrics Education and Research

The UNECOM Department of Geriatric Medicine “Adding Life to Years”—formed in 2007, has proven to be a powerhouse in attaining internal and external research fellowship funding for UNECOM students. The department is proud to announce that 17 UNECOM students with an interest in geriatrics were awarded 2013 research and practice fellowships. These fellowships include: American Federation for Aging Research (AFAR) Medical Student Training in Aging Research (MSTAR); Betty Ford Summer Institute for Medical Students (SIMS); Medical students’ Sustained Training and Research Experience in Aging and Mental health (MSTREAM); Institute for Research, Education and Training in Addictions (IRETA); Gold Foundation Global Health; Nth Dimension Orthopedic Fellowship for Women and Minorities, Paul Ambrose Scholars in Public Health, as well as UNECOM’s Carman Pettapiece and Peter Morgane Research funding. Three students participated in the UNECOM Learning By Living Research Program.

UNECOM has a strong track record in attaining the highly prestigious and competitive AFAR (American Federation for Aging Research) MSTAR Fellowships. To date, UNECOM has the highest funding rate for AFAR applications for non Reynold’s Foundation funded osteopathic medical schools (20 funded fellowships since 2003). Juliana Hoffelder, MS II, conducted research at University of Pittsburgh Geriatrics Center in summer 2013 and focused her research on factors associated with including older adults (ages 85+) in medical decision-making during clinical encounters; and Bridget Foley, MS II, conducted research at the University of North Carolina on older adults and rheumatology. While there, her research mentor assisted her with attaining the Rheumatology Research Foundation Medical Student Research Preceptorship. This foundation

advances research and training to improve the health of people with rheumatic diseases.

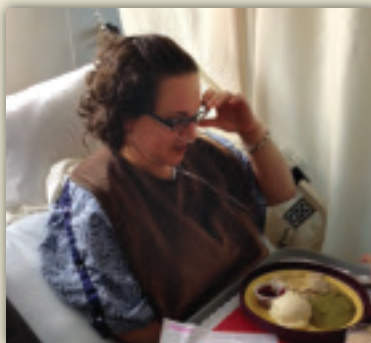
Jaclyn Jankowski, MS II is the second UNECOM student to be awarded the highly competitive and primarily allopathic fellowship for women and minorities: Nth Dimension Orthopedic Four Year Fellowship. After undergoing a stringent and competitive application process, 20 first-year medical students are selected to participate in this eight-week clinical and research internship with orthopedic surgeons nationwide. The orthopedic surgeon preceptors are members of varying ethnic and gender minority groups who have been specifically selected because of their teaching and mentoring achievements in the field of orthopedics.

This four-year developmental program is designed to expose medical students to the field throughout their medical school matriculation. During Jankowski’s second to fourth years of matriculation, she will receive core support from her internship preceptor and will be encouraged to develop relationships with other orthopedic surgeons through interactions and mentoring activities during annual programs at the annual meeting of the AAOS, J. Robert Gladden Society and Ruth Jackson Orthopedic Society meetings.

Elizabeth Ryer, MS III, was the second UNECOM student to be awarded the National Institute of Mental Health MSTREAM Fellowship. Ryer conducted research at University of California San Diego for eight weeks on the use of iPads in patients with dementia to determine if the use of these devices can increase a sense of calm, thereby reducing the need for medications prescribed for agitation.

Carman Pettapiece funding was awarded to Lindsay Katona, MS II, Will Douglas, MS II, and Sean Lean, MS II. These students were also awarded the Peter Morgane

Left to right: Jordan Falloon (MS II), Jillian Dodge (MS II) and Anthony Pastore (MS I) with a nursing home resident participate in the Learning By Living research program.



Fellowship and Gold Foundation funding to travel to South Sudan to conduct Global Health research under the mentorship of Chuck Radis, D.O. Student doctors Katona, Douglas, and Lean were awarded over \$15,000 in research fellowship funding to conduct their global health research on the efficacy of first aid training with residents in the village of Kit, South Sudan.

Holly Laird, MS II was the first UNECOM student to be accepted as a first-year student (normally MS IIIs and IVs are accepted) to attend the Boston University/American Geriatrics Society Summer Institute for Geriatrics. The National Institute on Aging Funded initiative is a week-long intensive training program in geriatrics research associated with the care and treatment of older adults.

Two UNECOM students were awarded the Betty Ford Summer Institute for Medical Students (SIMS) Fellowship in California: Julie Levassuer, MS II, and Rose Shack, MS II. These student doctors participated in an extremely intense one-week immersion with either the patients or families who have been affected by substance abuse.

In addition, three students were lead researchers in the UNECOM Learning by Living Project, a program that provides a unique ethnographic perspective enabling UNE students to live the life of an elder nursing home resident for two weeks. Jillian Dodge, MS II, resided at the Life Care Center of Nashoba Valley, in Littleton, Mass., Jordan Fallon, MS II, who also attained Carmen Pettapiece Funding, resided at Saint Andre's Health Care Facility in Biddeford, Maine, Anthony Pastore, MS I, resided at the Maine Veterans Home in Scarborough, Maine. An exceptional segment was aired on MPBN "Maine Things Considered" on Anthony Pastore's experiences.

Marilyn R. Gugliucci, Ph.D., director of Geriatrics Education and Research, is the home site research sponsor and/or mentor for these students.

In addition to the 17 fellowships sought through the Department of Geriatric Medicine, four UNECOM students were awarded the American Medical Student Association Sexual Health Scholars Fellowship. This year-long fellowship was attained by only 40 medical students nationally. UNECOM's four scholars were Eugenia Edmonds, MS III, Matt Levasseur, MS III, Jillian Dodge, MS II, and Stephanye Doucette, MS II. These students participated in online learning sessions with their national colleagues and in-person facilitated sessions by Lauren Groud from Planned Parenthood of Northern New England and Marilyn R. Gugliucci, Ph.D., Department of Geriatric Medicine.

Undergraduates and Medical Students Advance the Fight Against Osteoarthritis

Tamara King, Ph.D., Assistant Professor,
COM Biomedical Sciences

Undergraduates and osteopathic medical students are working hard in the laboratory of Tamara King, Ph.D. Their work focuses on factors driving persistent pain, "pain that is just there," using animal models of osteoarthritis and cancer pain. Many undergraduate medical biology students have participated in these laboratory efforts, including students who received summer fellowships. Jennifer Cormier (biomedical sciences '15) received a Student Undergraduate Research Fellowship (SURE), and Joshua Allen (medical biology '15) was awarded a fellowship from the NASA Maine Space Grant Consortium. In addition, Erin Tuffy, MS II, received a Peter Morgane Fellowship to perform research within King's laboratory.

Efforts this past summer focused on gaining a better understanding of mechanisms underlying advanced osteoarthritis (OA) pain. In patients, advanced OA pain is characterized as moderate to severe and has a persistent, background pain that is not responsive to Non-steroidal anti-inflammatory drugs (NSAIDs). Cormier's research demonstrated that this pain is treated with drugs effective in patients with neuropathic pain and is associated with development of central sensitization, characterized by changes in the spinal cord and brain resulting in amplification of the pain signal.

Allen's project focused on the effects of exercise on advanced OA pain. He demonstrated that exercise across four weeks ameliorates persistent, background pain, an effect mediated through increased endogenous opioid signaling. These findings point to exercise induced changes in molecular signaling pathways within the brain that diminish the pathological pain.

Tuffy's project demonstrated that blocking persistent joint pain in this model of OA pain activates reward pathways within the brain.

These exciting projects are leading to better understanding of a prevalent pain problem that is growing in the U.S. and around the world due to the aging population and increasing incidence of obesity. Such advances will allow for development of better and safer treatment options for these patients.

Creating a Culture of Scholarship in Pharmacy

Gayle A. Brazeau, Ph.D., Dean, College of Pharmacy

Why are certain medications to be taken with food? What makes certain infections resistant to standard antibiotic treatments? Is the use of prescription drugs by high school students effective in enhancing their academic success? How do regulators like the Maine Office of Substance Abuse know what drugs are being misused, abused or wasted?

Benjamin Franklin is quoted as stating, "Tell me and I forget, teach me and I may remember, involve me and I learn." The answers to the questions above could be answered by faculty during lectures but might then be quickly forgotten. The answers may be read in scholarly publications or textbooks but

may only be remembered as facts and not applied to anything greater. College of Pharmacy students have unique opportunities to learn the application of the answers by being involved in the very research that addresses the questions.

The College of Pharmacy offers an environment that promotes intellectual curiosity and affords opportunities for students to engage in research as well as scholarly activities with faculty.

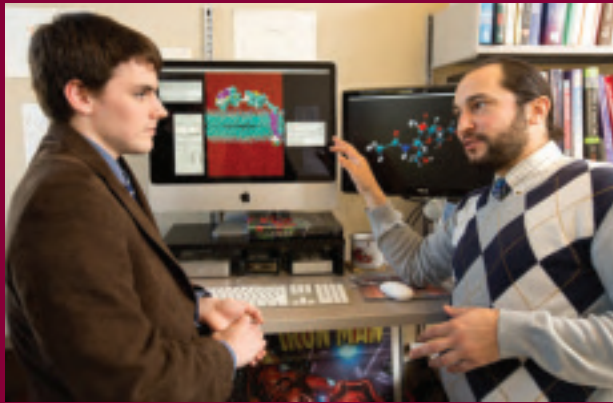
Our goal of "educating pharmacists for your team" means we want to excite students to research possibilities in our laboratories as well as in our clinics, classrooms and communities. Student opportunities to engage in scholarly activities exist in the areas



Dean Gayle Brazeau joins students in the Hannaford Pharmacy Practice Lab.



Kyle Reilly, Class of 2014 with Olgun Guvench, M.D., Ph.D., Assistant Professor; Vice-Chair of the Pharmaceutical Sciences Department. Kyle completed a research advanced pharmacy practice elective with Dr. Guvench this academic year.



“Tell me and I forget,
teach me and I may
remember, involve
me and I learn.”

—Benjamin Franklin

of pharmaceutical sciences, biomedical sciences, clinical sciences, social-administrative sciences and the scholarship of teaching and learning. In many cases academic credit is attained through the completion of faculty-guided elective Independent Study or Advanced Pharmacy Practice Experiences. One example of these courses is an innovative elective laboratory course as the basis for research in pharmacogenomics. Molecular Genetic Methodologies is a two credit week-long course that provides students with hands on experiences. More than 100 students have engaged in this innovative elective course that teaches polymerase chain reaction, cloning, silencing RNA and basic laboratory principles in this rapidly growing arena.

Each of the questions posed in the beginning of this article has been addressed by student research. Faculty and students work together to produce cutting-edge research in a variety of disciplines. Doctor of Pharmacy student involvement in the search of answers resulted in numerous presentations and publications of research projects at local, regional and national meetings in the academic year 2012-2013.

These student-faculty research projects ranged from the study of anticancer therapies for patients with metastatic renal cell carcinoma to predictors of prescription drug overdose death. Funds for faculty and student research have been acquired from a variety of sources, including the National Institutes of Health and the United States Public Health Service. In 2012, the Emily Jane Etherton Charitable Lead Trust Student Research Fellowship was used to support faculty-mentored student research.

The high quality and topical significance of student-centered research projects at the College of Pharmacy speak volumes about the mentors students have and the kind of healthcare providers that they will become. Student research opportunities not only contribute to scientific and clinical discovery, along with serving as valuable learning experiences, but sometimes reveal a path to a life-long calling. Twenty percent of pharmacy students engage in scholarly and research activities with faculty. Nineteen graduates in the inaugural class of 2013 are now pursuing residency and fellowship programs; most of these students collaborated in research projects while they were students at the College of Pharmacy. The College of Pharmacy culture of scholarship creates a learning experience centered on critical thinking and a commitment to continued learning.

NEW DRUG DISCOVERY

Exploring the Analgesic Potential of the Natural Product Kaurenoic Acid and its Analogs

Cassia Mizuno, Ph.D., Assistant Professor, College of Pharmacy

Pain relief is a major unmet medical need. The opioid analgesics (pain relieving medications) are very efficacious, but serious side effects such as respiratory depression, dependence and tolerance limit their clinical use. The need for new analgesics that can successfully and safely treat pain is clear and urgent. Nature provides a vast source of compounds with potential therapeutic use that may be helpful in developing novel analgesics. New, effective and safe analgesics could potentially be discovered by synthesizing analogs of natural products with reported analgesic activity such as kaurenoic acid (KA).

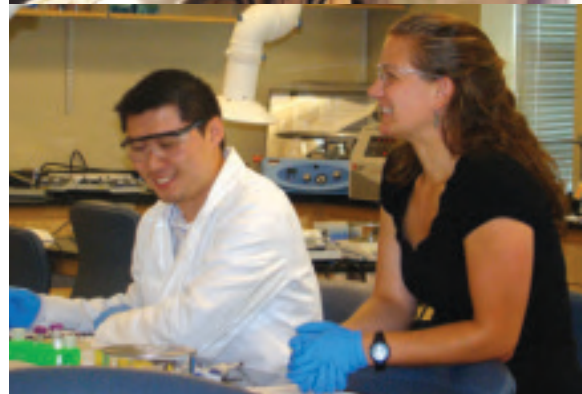
KA is a naturally occurring diterpene found in *Sphagneticola trilobata* (L.) and in the *Copaifera* L trees popularly known in Brazil as “copaiba.” The copaiba oil, rich in KA, is one of the most used natural medicines in the Amazon. The oil has been traditionally used by the indigenous and Amazonian people who discovered the healing properties of the copaiba oil based on the observation that animals rubbed on the copaiba trees when they were wounded.

In the search for natural products-based compounds with pharmacological activities, a series of KA analogs were synthesized in College of Pharmacy Assistant Professor Cassia Mizuno’s lab by Marilia Simao, a Ph.D. student from Brazil, and Winnifred Ampomaah, a third-year pharmacy student.

As part of the collaboration between the University of Franca (Unifran) in Brazil and UNE, Simao spent five months at UNE working under the supervision of Mizuno to gain synthetic chemistry skills. The pure and isolated kaurenoic acid brought from Brazil was structurally changed to generate the analogs. Simao returned to Brazil in September, 2013. She is currently testing the KA analogs using difference cancer cell lines.

The pain assays were performed at the College of Osteopathic Medicine by John Streicher, Ph.D., assistant professor in biomedical sciences and Ed Bilsky, Ph.D., vice president for Research and Scholarship, director of the Center for Excellence in the Neurosciences, and professor of pharmacology.

Pharmacy student Winnifred Ampomaah is doing her independent studies in Mizuno’s lab and has also been working on other projects, such as the synthesis of stilbenes for the potential treatment of cancer. The independent study is providing Ampomaah a chance to experience the other side of the Pharmacy profession. Hands-on activities such as the design, synthesis and purification of the organic compounds provide a glance at the drug discovery process. This experience will contribute to Ampomaah’s success as a pharmacist and enable her to explore different areas of the pharmacy profession.



Marilia Simao, a Ph.D. student from the University of Franca in Brazil, and Winnifred Ampomaah, UNE College of Pharmacy Class of 2014, work in Dr. Cassia Mizuno’s lab.

Edward Li, PharmD, and Christina Faller, Research Technician, were two of the first students in the Molecular Genetic Methodologies course at the College of Pharmacy.

Pharmacodynamic Modeling

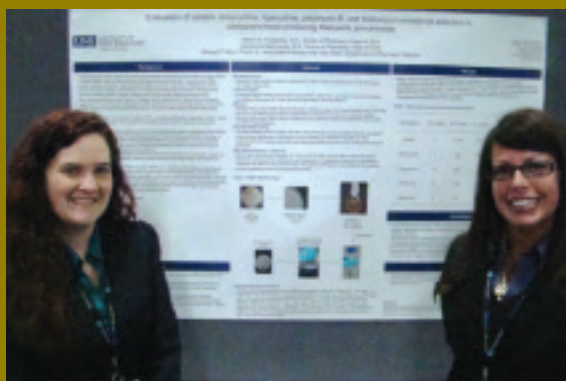
George Allen, PharmD, Associate Professor,
College of Pharmacy

George Allen, PharmD, associate professor of pharmacy practice, has developed a program of research that is devoted to laboratory-based studies of antimicrobial resistance. The ongoing emergence of antimicrobial-resistant pathogens and their associated infections, combined with the lack of innovation in the development of new antimicrobial molecules, is considered to represent a global medical crisis. Novel antimicrobials that may be used to combat the threat of resistance are scarce, and grave concerns exist regarding the ability to treat infectious diseases in the future.

Allen's research examines antimicrobial therapies, including innovative combinations of agents, against key antimicrobial-resistant bacteria. His recent work includes studies of *Neisseria gonorrhoeae*, the cause of gonorrhea, the second most common bacterial sexually transmitted infection, and *Salmonella enterica* serovar Typhi, the cause of over 10 million cases of typhoid fever each year. Allen's most recent work has focused on *Klebsiella pneumoniae* species that express antimicrobial resistance through the production of the enzyme NDM-1; such bacteria are resistant to all known antimicrobials.

All of Allen's scholarly work at the University of New England College of Pharmacy has involved the efforts of students in the Doctor of Pharmacy program. Two members of the Class of 2014, Alexandra Malinowski and Alison Paplaskas, have been particularly active in his laboratory. They served as co-authors on abstracts presented at a number of conferences, including the Interscience Conference on Antimicrobial Agents and Chemotherapy, in Chicago, Illinois, and the 1st International Conference on Polymyxins, in Prato, Italy. Their work has identified several promising antimicrobial therapies that display activity against multidrug-resistant *Neisseria gonorrhoeae* and *Klebsiella pneumoniae*.

Alexandra Malinowski and Alison Paplaskas, Doctor of Pharmacy Class of 2014, presenting research at the American Society of Health System Pharmacists Midyear Clinical Meeting, Las Vegas, NV, December 2012.

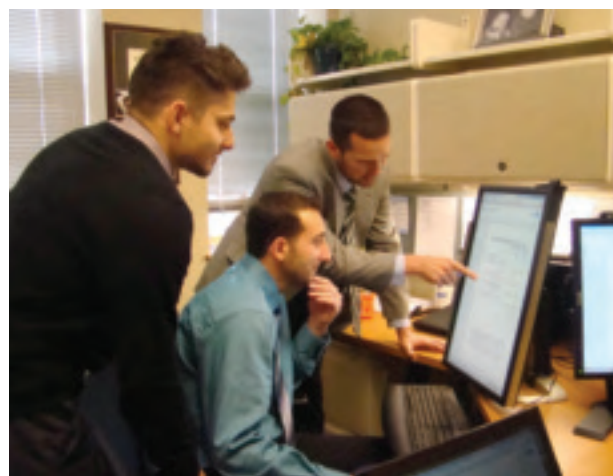


Pharmaco-Epidemiology

Kenneth McCall, PharmD, Associate Professor and Chair,
Department of Pharmacy Practice

Christian Teter, PharmD, assistant professor of psychopharmacology, conducts a research program that focuses on medication taking behaviors and attitudes among individuals with psychiatric and substance use disorders as well as population-based studies to examine the misuse and abuse of prescription medications. Motives associated with the nonmedical use of prescription stimulants (NMUPS) have garnered a great deal of attention in recent years among United States high school and college students. A common theme found throughout these studies is that students self-report NMUPS for the purposes of increasing concentration, helping them to study, and increasing alertness. Although students report NMUPS for pharmacologic cognitive enhancement (PCE), there appears to be mixed findings as to the efficacy of this behavior.

Christopher DiRaimo, PharmD '13, worked with Teter on a study that seeks to answer the question: Are U.S. high school seniors using prescription stimulants non-medically for study enhancement while demonstrating characteristics consistent with academic success? This project provides an analysis of the first nationally representative, probability-based sample of U.S. high school students that assessed NMUPS specifically for academic PCE. DiRaimo presented his research, "Nonmedical Use of Prescription Stimulants: Cognitive Enhancement or Dissonance?" at the College of Psychiatric and Neurologic Pharmacists (CPNP) Annual Meeting in Colorado Springs, Colo., April 2013. DiRaimo collaborated with Teter and colleagues from the University of Michigan on this project.



From left to right, Jonathan Grayson, PharmD '13, Christopher DiRaimo, PharmD '13, and Assistant Professor Christian Teter, PharmD, analyze data.

Abuse of Prescription Medications

Kenneth McCall, PharmD, Associate Professor and Chair, Department of Pharmacy Practice

Assistant Professors Meghan Sullivan, PharmD, and Leslie Ochs, PharmD, led a project to analyze pharmaceutical waste collection data at medication drop-off events coordinated with local law enforcement and the Maine Drug Enforcement Agency. The diversion, misuse, and abuse of prescription medications are a growing problem, and Maine is suffering disproportionately from this national epidemic. For example, Maine has had the highest recorded national rate of admissions (386 admissions per 100,000 population in 2008) for prescription opioid analgesic abuse per capita according to the Substance Abuse and Mental Health Services Administration (SAMHSA) Treatment Episode Data Set. While prescription substance abuse is a multifaceted community health issue, one specific problem is the shortage of medication return programs. The lack of such programs leaves households with unused medications which are easily accessible to diversion, may be accidentally ingested by children, or mistakenly taken by adults.

In an attempt to obtain medication return data, Maine hosted over 154 collection sites for the U.S. Drug Enforcement Administration national medication drop-off events in 2011. Data was collected from 11 of those sites. The intent of this project was to collect data regarding unused medications in order to inform public health policy, increase patient safety, improve pharmacy practice, decrease poisonings, abuse, misuse, and diversion of medications and to document medication disposal programs.

Heather Stewart, UNE College of Pharmacy Class of 2014, has led efforts to coordinate student involvement in these community events and systematically document medication waste. She regularly presents updated collection data to the Maine Office of Substance Abuse and has presented her findings at national and international scientific meetings.

Heather Stewart, '14, and Governor Paul LePage discuss the potential impact of pharmaceutical waste on drug diversion and drug misuse in Maine.



Sahn Duong, '15 using the auto-micro-titrator.



Exciting pH!

Steven Sutton, Ph.D., Associate Professor and Chair, Department of Pharmaceutical Sciences, College of Pharmacy

It all starts with a simple instruction: "take with food." Take with food? Why? Well, in many cases, a prescription must be taken with food because the active pharmaceutical ingredient (API) in the oral solid dosage form does not dissolve well in water. However, everything must dissolve before it can be absorbed from the intestines and make its way to the receptors in the body where the API has an effect. When food is consumed, it stimulates the intestines, gall bladder and the pancreas to secrete water and chemicals that often improve the solubility of compounds.

Some API are weak bases, meaning that they dissolve in the acidic environment of the stomach but not as well in the neutral environment of the intestine. Due to this acidity change, some bases can precipitate out of solution when emptied from the stomach to the small intestine. If this happens the API may neither dissolve nor be absorbed and thus no benefit will be gained from the medicine.

To determine whether a weakly basic API will precipitate, one must examine both the pH of the gastro-intestinal tract and how readily the API becomes ionized. The pH of a solution is simply a measure of how acidic or basic the environment is. How readily the weakly basic API ionizes means how easily it will accept a proton in the stomach (where the proton concentration is high), and how easily it will give up the proton in the small intestine (where the proton concentration is low). This behavior is studied in the lab with an instrument that automatically adds very small volumes of acid and base to a solution of the compound: the auto-micro-titrator.

Doctor of Pharmacy class of 2015 student Sahn Duong has been collecting data with the auto-micro-titrator under the supervision of Steven Sutton, Ph.D. Duong and Sutton submitted an abstract for presentation at the annual meeting of the American Association of Pharmaceutical Scientists in San Antonio last fall. They have observed that some compounds precipitate very rapidly while others precipitate somewhat slowly. This behavior is seen in both water and a solution similar to the small intestine in the fasting state. Their research will continue with an examination of these behaviors in a solution similar to the small intestine after a meal. The goal of this research is to predict rapid precipitation which will indicate that a drug must be taken with food.



Obesity Prevention Work

Dora Anne Mills, M.D., M.P.H., F.A.A.P., Vice President for Clinical Affairs,
Director of Public Health Programs

With contributions from: Karen O'Rourke, M.P.H.; Michele Polacsek, Ph.D., M.H.S.;
Leslie Ouellette, M.S., R.D., L.D.; Allison Morrill, Ph.D.

Long before someone coined the term “you are what you eat,” societies have recognized the importance of nutrition. However, now with obesity rapidly overtaking tobacco as the leading underlying cause of death and disability, the importance of research on nutrition and other obesity-related issues is critical.

UNE's School of Community and Population Health (SCPH), formed in the spring of 2013, is quickly becoming a leader in obesity-related research and practice, especially in the area of prevention. “We are fortunate that several of our faculty and staff have a long track record in the field and are now able to bring that knowledge to benefit our students,” said Dora Anne Mills, M.D., M.P.H., F.A.A.P., founding director of the SCPH. “The SCPH offers students unique courses, research, training, service, and policy experiences that are focused on addressing the obesity epidemic.”

MAINE SNAP-ED

One such program is the Maine Supplemental Nutrition Assessment Program Education (Maine SNAP-Ed), awarded to UNE in 2012. Administered by the Maine Department of Health and Human Services (DHHS), Maine SNAP-Ed is part of a \$4.4 million federal grant from the United States Department of Agriculture (USDA) to provide nutrition education and obesity prevention interventions to low-income families, especially those receiving SNAP, formerly known as food stamps. A major focus is to improve the likelihood that low-income persons receiving SNAP will make healthy food choices within a limited budget and choose physically active lifestyles.

UNE works with the Healthy Maine Partnerships (HMPs), the local public health infrastructure for Maine, to provide obesity prevention education to Maine's low-income residents. HMP nutrition educators implement evidence-based nutrition education programs in a variety of settings including childcare centers, schools, public housing, food security organizations, community and tribal health centers, senior centers, social service agencies, community centers and shelters.

Maine SNAP-Ed is currently teaching over 500 classes serving over 2,000 low income Mainers each month. “As a new program to UNE, we have been focused on working across Maine to get the program started. However, this next year we are also excited about providing student internships. SNAP-Ed is a wonderful opportunity for UNE undergraduate or graduate students to work on the front lines of the obesity epidemic and to build a better understanding of the barriers that especially those living in poverty face to get to and maintain a healthy weight,” commented Mills.

With the Maine Prevention Research Center now located in UNE's School of Community and Population Health, students across UNE will have more access to working alongside obesity prevention researchers to learn about the policies and environmental changes and their impact on this epidemic.

—Dora Anne Mills, M.D., M.P.H., F.A.A.P.



MAINE PREVENTION RESEARCH CENTER

While educating individuals to improve their nutrition and increase physical activity is an important strategy for obesity prevention, research has shown that changing the environment in which people work, live, play, and learn, and focusing on making the healthy choice the easy choice, will have a much greater impact on health.

The Maine Prevention Research Center at UNE's School of Community and Population Health plays a leadership role in policy, program research and development, and in research translation and capacity building. With its mission to reduce weight-related morbidity and mortality by promoting evidence-based practice, the Center has worked with public health advocates to help change the environment so it better supports good nutrition and increased opportunities for physical activity. UNE's role has been to identify policies and practices that are more likely to result in positive change and ensure the research supports the policy initiatives.

Funded primarily by the U.S. Center for Disease Control and Prevention (CDC) and working in partnership with the Harvard School of Public Health and Maine CDC, UNE's Maine Prevention Research Center is able to bring researchers to Maine in yearly conferences on specific obesity topics to launch policy initiatives.



Bryony Kean, R.D., M.S., Nutrition Educator at Coastal Healthy Communities Coalition, teaches a Simply Good Eating class to 11 ladies at a low-income senior housing complex in southern Maine.



Examples of obesity prevention policies UNE's Maine Prevention Research Center has worked on include:



- UNE's Maine Prevention Research Center supported organizations interested in improving the foods and beverages offered in schools. As a result, Maine was one of the first school systems in the country to eliminate soda sales in schools at all hours. The Center also provided research to public health advocates that informed the passage of a law that restricts junk food advertising in Maine schools.
- UNE obesity prevention researchers have evaluated the implementation of Maine's laws banning junk foods and marketing and have provided recommendations for improvement. For instance, research led by Michele Polacsek, Ph.D., M.H.S., and funded by the Robert Wood Johnson Foundation, showed unhealthy food and beverage marketing in all schools, even after the state law was passed. This research has resulted in further work with the Healthy Maine Partnerships and local schools to improve the law's implementation.
 - Polacsek is using a Health Impact Assessment (HIA) that brings together scientific data, health expertise and public input to examine the potential health and other impacts of a Sweetened Excise Tax to help address the obesity epidemic.
- UNE researchers worked with the Maine CDC and the Maine Nutrition Network to implement an evidence-based program in child care centers to improve their nutrition and physical activity policies and practices.
- The Center has developed materials and training for primary care providers to address obesity with their patients, especially pediatric patients and their families.
- An exciting new initiative is a partnership with the Harvard School of Public Health Department of Nutrition to examine the purchasing habits of SNAP users and work with a grocery retail chain to affect store choice architecture to motivate SNAP users to make healthier purchases. This work is in the planning stages now.



Michele Polacsek, Ph.D., M.H.S., associate professor, received her Master's degree in International Health and her Doctoral degree in Public Health Social and Behavioral Science from the Johns Hopkins Bloomberg School of Public Health. Having taught at UNE's Master of Public Health Program since 2006, her research has focused on childhood obesity prevention. Her work on community and medical setting-based interventions to prevent obesity has been published in journals such as *Pediatrics*.

Although the old adage “you are what you eat” is still true today, we also know that we are products of the environment in which we live, work and play. Today at UNE, the complexities of the obesity epidemic, how it is integrated into the fabric of our society, and how to stem its growth are not only being unraveled, but also becoming available for our students to discover.

Healthy Maine Partnership Evaluation Faculty and staff at UNE's School of Community and Population Health have a long history of working in a variety of ways with Maine's community-based public health infrastructure, the Healthy Maine Partnerships (HMPs). Since 2000, local HMP coalitions—now 27 in all—have been working with schools, municipalities and businesses, helping them to make policies and changes to the local environment that will promote healthier living. HMPs especially target tobacco use, obesity, heart disease, diabetes, and

substance abuse. For example, they encourage safe bicycle routes for commuting to work and school, healthier foods in vending machines, and prohibiting tobacco at public recreation sites and events.

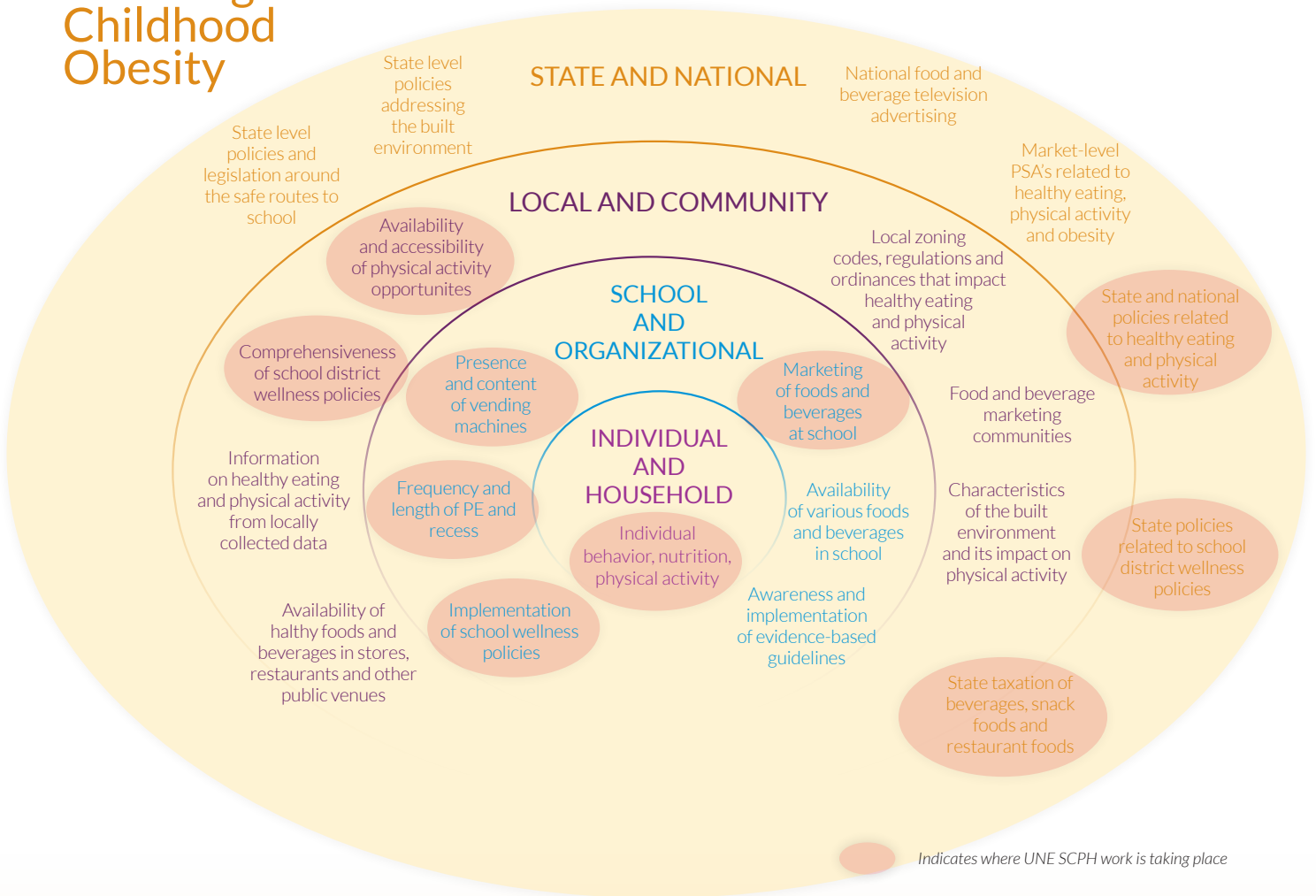
For several years UNE research faculty and staff at the SCPH have been studying what HMPs do and what their impact has been, on the obesity epidemic as well as on tackling other health problems. The team has just completed focus groups of staff from all local HMPs to better understand how they operate. Team members are now interviewing key informants about HMP efforts to reduce health disparities. This year the team is surveying superintendents of all school administration units in Maine to learn about their policies and actions to reduce tobacco use and to encourage physical activity and healthy eating.

In assessing results from HMP obesity prevention efforts in years 2007-2011, evaluators found the following outcomes as a result of HMP work:

- Most small businesses and municipalities are aware of the “Right to Breastfeed” law in Maine.
- Fewer schools offer unhealthy snack foods or beverages, and more offer healthy food options.
- More schools with school health coordinators offer physical activity clubs, and their students watch less television.
- Municipalities are circulating information that promotes cardiovascular health.

As part of their work, the evaluation team also tracks health data throughout the state—especially adult and youth smoking rates, overweight and obesity rates, prevalence of high blood pressure and high cholesterol. The next goal is to discover connections between the work of the local HMP coalitions and the health of the population.

Reducing Childhood Obesity



WCHP



WESTBOOK COLLEGE OF
health professions



PLAYROOM



Interprofessional Student-led Transdisciplinary Playgroup

Education, Service, Practice and Joy

Eileen Ricci, P.T., D.P.T., M.S., P.C.S. and Kathryn M. Loukas, O.T.D., M.S., O.T.R/L, F.A.O.T.A.

When spring rolls around and the air is cold and families are huddled inside their homes, parents may be wondering how their children can be involved in meaningful occupations to enhance their development. On the Portland UNE campus, students sit crouched over their textbooks, dazedly sipping their Starbucks lattes while dreaming of their future as a health professional and wondering what all of this studying has to do with their future. Suddenly, an epiphany occurs; students realize they want to help people in need!

From down the hallway comes a surprising sound: the pitter patter of little feet, the anxious calls of parents “Slow down, Tucker, they won’t start without us!” Soon the hallway is filled with much smaller people than students are accustomed to seeing on campus. Little people appear dressed in colorful play clothes, tugging on their parents’ hands, some carried on shoulders, other pushed in wheelchairs or strollers, but all with smiles that go from adventurous to shy, as they hide behind parents’ legs.

Students, shoeless, but with even bigger smiles on their faces, come out to greet the little ones and welcome them into Blewett 12, a space recently transformed from a serious therapy lab to a bright, inviting, “Let me get my hands on it” play space. Clusters of toy trucks, cars and motorcycles, along with ramps, dress-up clothes and mirror, sand table, riding toys, play house with doors that open and close (and its own mail slot for delivering letters to grandma!), water table, ball pit, ladder and slide, tunnels.... All of this and more await the toddlers and their parents. In this joyful cacophony, the entire scene cries out: “IT’S TIME FOR PLAYGROUP!”

What is the Transdisciplinary Integrated Playgroup?

The highly successful Transdisciplinary Integrated Playgroup for Toddlers (Playgroup) has provided dozens of physical therapy (PT), occupational therapy (OT), social work (SW) and nursing



Eyes and hands work at Playgroup

students with a unique, practical clinical experience on the Portland campus for the past four years. Recent national initiatives have targeted the creation of early intervention programs that are community based and inclusive of children with disabilities. The educational importance of hands-on experiences for future professionals in early intervention settings for young children is paramount.

Why do students play?

Play is the primary occupation of childhood and play with a purpose is the process most therapists utilize in therapeutic practice with infants and young children in family-centered practice. Toddlers and preschool children are in formative stages of their development and in critical periods for the formation of lifelong habits of activity and exercise. These young children are especially dependent on their families for the establishment of activity levels that support development, health, fitness, communication, and occupational performance.

Supporting families in the attainment of this goal and respecting the ability of each family to make informed decisions about their child, within the





2013 Playgroup leaders left to right: Amy Muntifering (PT coordinator); Laurie Mack (Speech and Language Pathologist); Eileen Ricci (PT Faculty); Kate Loukas (OT Faculty), and Jessica Nadeau (OT coordinator).

context of their family structure, is a critical component of early intervention service delivery. Interprofessional preparation of UNE students in early intervention services in a natural environment within a family-centered model may be best accomplished through the modeling of this form of “best practice” in the academic environment.

Fun Facts about Playgroup

From February to April each year, the Playgroup is a service to the UNE community and surrounding Portland neighborhoods as well as a valuable education tool. It provides a weekly two-hour long period of playful fun, crafts, snacks, movement and music experiences for children aged 18 months to three years. Parents play alongside their children or sit and chat with other parents as students from various health professions facilitate this process. There is a structured parent group that meets during the more structured activity times for the toddlers. The atmosphere is

upbeat, friendly and, most of all, playful. The benefits of play in this age group cannot be overestimated, as play is both a process and product of many early intervention program goals.

Graduate students in PT and OT serve as the Playgroup coordinators each year. These student leaders are responsible for advertising, distributing invitations, signing up children and families, ensuring compliance with health and safety standards, coordinating student participation within the group sessions, planning the activities and leading them.

The Playgroup is supervised by faculty members Eileen Ricci, P.T., D.P.T., M.S., P.C.S., Kathryn M. Loukas, O.T.D., M.S., O.T.R./L, F.A.O.T.A., Caryn Husman, M.S., O.T.R./L, and Shelly Cohen Konrad, Ph.D., L.C.S.W. In addition, Speech Language Pathologist, Laurie Mack, M.A., C.C.C.-S.L.P., from Northeast Hearing and Speech has provided consultation related to the communication needs of toddlers, which is vitally important to a child’s development and a critical component in helping students understand and implement transdisciplinary teamwork.

Student feedback regarding the learning experience has been very positive. One student summed it up by stating, “I was surprised how easily the students of different programs were able to come together and work towards one common goal—for the kids to have fun and to be safe.”

Is Research Part of the Playgroup Experience?

Professors Ricci, P.T., and Loukas, O.T., have implemented a study using Interprofessional Education questionnaires, focus groups and postgraduate surveys to measure changes in student attitudes related to interprofessional interaction and teamwork as a result of Playgroup participation. The results are clearly articulated in the postgraduate surveys following Playgroup, as one new OT graduate said, “This

\$50,000 Grant Awarded for Dental Hygiene Program

Ellen Ridley, Institutional Advancement

The Dental Hygiene Program at the University of New England is pleased to announce a \$50,000 grant award from the Ludcke Foundation to expand its portable dental hygiene program. Initiated in 2009 with the Ludcke Foundation’s generous support, this special project provides portable dental hygiene services to pediatric patients at rural health clinics, delivered with a suitcase-style unit that can be utilized in any clinical space. It offers UNE’s dental hygiene students a wonderful opportunity to broaden their experience with rural pediatric patients, many of whom

have never had access to dental hygiene information or services.

As a result of this expansion grant, a 13-week public health dental hygiene course will be created to provide an on-going academic and clinical platform for UNE’s dental hygiene students. Through this course they will learn about and participate in public health dental hygiene. In addition, funding will support an expansion of the number of service delivery days students can spend out in the community, increasing the number of patients impacted by this important service.

UNE is grateful for the Ludcke Foundation’s investment and recognizes the impact this will have on students as they enter their professional careers. One student noted of her experience: “This has made me more interested in getting the education out there for parents who don’t understand oral hygiene for themselves and their children. It opened more doors to see what’s going on in the rural areas and how I and other students can have an impact. We will forever be changed emotionally, socially, and mentally in our careers as dental hygienists.”

interprofessional playgroup experience has already influenced my practice. My inpatient fieldwork rotation is at a facility that stresses the importance of interprofessional care. One of my goals each week is team communication. I work very closely with nursing staff, physical therapists, speech therapists, and physician assistants. My experience at UNE has helped me appreciate this team approach to client care.”

In addition, DPT students Megan Hyde, Brian Cummings and Ashley Fann are conducting a study to measure changes in the amount and type of toddler activity during the Playgroup experience.

How is the Playgroup Supported and Recognized?

The Playgroup was initially funded through the Westbrook College of Health Professions Division Grant Funds, which allowed for the acquisition of necessary initial start-up equipment (pediatric furniture, play items, etc.). Since that time, the Playgroup has evolved and has been gradually woven into the coursework of the curricula in various departments in different ways.

The innovative pedagogical format of the Playgroup experience has been recognized nationally and internationally by professional and educational organizations. It has been the subject of many successful faculty/student scholarship endeavors: a national American Physical Therapy Association Education Section Conference platform presentation, two national conference poster presentations at the American Occupational Therapy Association, a poster presentation at Collaborating Across Borders Interprofessional Health Care Conference, one international interprofessional conference poster presentation in Canada, professional publication in *OT Practice Magazine* (February 20, 2012) and three Westbrook College of Health Professions symposia presentations.

The Transdisciplinary Integrated Playgroup has provided a venue for important interprofessional collaboration and mentoring for students in the health professions. The Playgroup contributes meaningful promise as a platform for best practice, education, research, and service to the UNE community and beyond.



Matt Pascarella gets instruction from professional drummer Chris Rogers, to facilitate movement of Matt's left arm.



Patricia Shields (MS OT 2013), Kathryn Loukas (Clinical Professor of OT), Matt Pascarella (of Opportunity Alliance) and Erin Lyons (MS OT 2013) pose after a Saturday drumming session.

Neuro-Occupation: Drumming as a Therapeutic Activity

Kathryn Loukas, O.T.D., M.S., O.T.R./L., F.A.O.T.A.,
Associate Clinical Professor

How might occupational therapy students facilitate a young man to use his left side following a brain injury? Well, this year's class drummed up a few ideas! Working with Clinical Professor Kathryn Loukas and professional drummer Chris Rogers, Erin Lyons (MS OT '13) and Patricia Shields (MS OT '13) set up a six-week program and research project to find out if participation in a drumming project improved occupational performance. The subject of this project is a young man named Matt who experienced a brain injury in 1993. Following initial school-based occupational therapy and other defining events, Matt has experienced exceptional recovery of his life occupations.

Using the concepts of Neuro-Occupation, the drumming team created a project that involved Matt with meaningful rhythms and music-making to both influence neuroplasticity and life participation. Neuro-occupation is part of required coursework in the UNE occupational therapy program. This approach uses non-linear dynamics of the brain, which incorporates the complexity and dynamic nature of human occupation—an interplay between the mind, body and environment.

Results of the six-week drumming program included improvements in range of motion as well as appraisal of ability, roles, responsibility, non-verbal skills, conversation, vocal expression, social groups, relationships, knowledge, timing, problem-solving, coordination, strength and effort, and occupational demands as measured by a commonly used assessment tools. Videotapes will be analyzed by outside therapists to assess changes in motor control in the next phase of data analysis.

The drumming study was presented to the Maine Occupational Therapy Association in June 2013 and has been submitted for publication and presentation with the American Occupational Therapy Association. Matt has chronicled his journey following brain injury and the influence of occupational therapy in his recovery in his own article that was published last year.

THE MEDICALLY ORIENTED GYM

Community Research Partner for Doctor of Physical Therapy Students

Jim Cavanaugh, P.T., Ph.D., NCS, Associate Professor

Exercise can prevent and treat many health problems, but what if you think you're not healthy enough to exercise? The Medically Oriented Gym (M.O.G) in South Portland is a unique wellness facility that was founded on the idea that exercise is the best medicine for all members of the community, including those with special health needs. In addition to prescribing personalized exercise programs and assisting with exercise, M.O.G. exercise physiologists, athletic trainers and physical therapists can measure a client's key health indicators and communicate health status and fitness progression to a designated personal physician. The M.O.G. has become an important community research partner for Doctor of Physical Therapy (DPT) students and faculty, and the student research projects reflect the wide range of health conditions routinely seen at the M.O.G.

Exercise for Individuals with Parkinson's Disease

Associate Professor Jim Cavanaugh, P.T., Ph.D., worked with M.O.G. staff to identify evidence-based health indicators that assess problems experienced by people with Parkinson's disease (PD). In 2012, student researchers Hannah Ehrenhardt, Christina Murphy and Jay Mizuta examined balance, mobility, and quality of life outcomes of the first PD exercise program held at the M.O.G. The results illustrated the effectiveness of the program and provided clear rationale for offering the program on an ongoing basis.

In the fall of 2013, student researchers Alati Gagne, Sarabeth Makins and James Walrath worked with Dr. Cavanaugh to examine the feasibility of a novel "forced exercise" protocol. There is emerging evidence that when people with PD attempt to keep pace with a "captain" who is pedaling at 80 rpm on a stationary tandem bicycle, they experience improved movement and reduced symptoms. Once feasibility is established, research on the forced exercise modality in a community-based environment can begin.

Cardiovascular Fitness Testing

In 2012, DPT student researchers Bethany Boutin, Katelyn Provencher and Jenna Weitzman examined the test-retest reliability of the "self-paced step test," which provides a safer, less expensive, and submaximal alternative to maximal forms of exercise testing. Associate Professor Michael Fillyaw, P.T., M.S., advised the students, while M.O.G. members volunteered as participants. Study findings revealed the high reliability of the test and provided important minimal detectable change values for the clinical and research communities.

Diabetes Management

In the fall of 2013, DPT students Karen Bartling, Kristen Brooking, Gia Calabrese, Edmond Gordon, Ryan Hill, Ashley McOsker, Patrick Robichaud and Kristi Stalsbrotten brought what began as a service learning opportunity to fruition at the M.O.G. The program is a 10-week exercise and educational program for individuals at risk for, or who have, Type II Diabetes Mellitus (DM).

The program aims to promote a healthy lifestyle as a means of mitigating complications associated with DM. With funding from a mini-grant from the UNE Interprofessional Education Collaborative, DPT and Nursing students will implement the program that will lay the foundation for future research and service learning. Assistant Professors Jeanne Charles P.T., M.S.W., Ph.D., and Adrienne McCauley, P.T., D.P.T., M.Ed., and Program Director Mike Sheldon, P.T., Ph.D., are advising on the project.



Left to right: DPT faculty advisor Jim Cavanaugh, Ph.D., P.T. D.P.T., class of 2013 students Hannah Ehrenhardt, Jay Mizuta and Christina Murphy present research to the UNE Community.

APPLIED ARTS IN SOCIAL WORK

Theatre for Health Promotion

Cathy Plourde, M.A., Program Director, Add Verb Productions

The School of Social Work (SSW) focuses on challenging structures and relationships that foster the inequities that undermine the promotion of health. Several on-campus SSW students have been taking advantage of their opportunity to work with Add Verb—UNE’s unique and dynamic program that uses the arts for health and wellness promotion and in the curriculum—including Carin Stromgren (SSW '13), Elisa Orme (SSW '13), and Lilia Bottino (SSW '14). All of the students describe how being a part of the research process has supported their academics.

A team has conducted three years of a longitudinal study looking at Add Verb’s programs, *The Thin Line* (on coping with eating disorders) and *You the Man* (bystander engagement in dating violence/sexual assault prevention). Team members include Nancy Shore, Ph.D., associate professor, School of Social Work; Peter Herrick, MSED, adjunct research professor, College of Graduate Studies; Allison Morrill, J.D., Ph.D., research associate professor; Gary Cattabriga, director of Analytics, and Cathy Plourde, M.A., director of Add Verb.

Stromgren appreciated the chance to study an issue in depth and, in the process of a literature review and focus groups, discovered a better sense of the issues and their application within interventions. “If the problem of dating violence is already happening it is hard to stop. By reaching kids, the hope is that we are preventing the problem.”

Orme presented some of the preliminary findings to the Board of Trustees. She spoke with Robert McAfee, M.D., Trustee Emeritus, and learned about his efforts in domestic violence as the President of the American Medical Association over 30 years ago. “He was super excited about the research and that we are doing prevention on this level. It’s great to see how this has progressed.”

Reflecting on her involvement in Add Verb’s research during her first year of the MSW program, Bottino shared with Interim School of Social Work Director Clay Graybeal that “As a writer and a musician, I have seen firsthand the power of arts as a tool for education and advocacy. It has had a powerful impact on me, and I am so grateful. It has complemented my classroom experience and has had an impact on me as a future social worker.”

Plourde presented findings at the American Public Health Association in November 2012, reporting that the research subjects have an increased likelihood of taking action either for themselves or on behalf of another person; furthermore, these findings persist over time. This presentation led to a collaboration with Deakin University of Melbourne, Australia, and resulted in the development of a cultural adaptation of the play and the education program, as well as a new research study, now underway in the Australian state of Victoria.

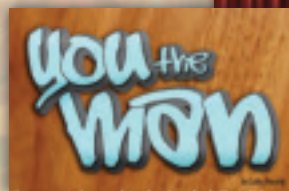
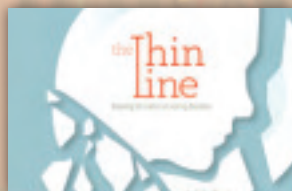


Brian Chamberlain, Portland-based actor, performing *You the Man* for an Interprofessional Education event at Ludcke Auditorium.



Elisa Orme (SSW '13) was a research assistant for the longitudinal studies about theatre’s impact on bystander behavior and attitudes.

Emily Dennis, Portland-based actor, at her debut in *The Thin Line* for UNE graduate students and the Portland Community.





Above: Students enjoy the Blue Lagoon geothermal spa in a lava field in Grindavík, Iceland.

Below: On April Fools' Day, Dr. Carlson's Environmental Physiology class, with support from a couple of staff members from the Global Education Program, plunged into the cold Atlantic—no foolin'! The chilly event was a fund-raiser for the class trip to Iceland.



Photo credit: Dina Mendros/Journal Tribune



Above left: Dr. Carlson at the summit of Valahnúkur. Middle: Iceland group heading to ice-climb Gígjökull; one of the two glacier outlets from the Eyjafjallajökull Ice cap. Right: Iceland group with UNE banner at Gígjökull.

COOL RESEARCH IN ICELAND

Jennie Aranovitch, B.A., Communications Assistant

One might think that the University of New England, like any college or university in Maine, would be a good place to study the effects of cold temperatures on athletic performance. But for Lara Carlson, Ph.D., C.S.C.S., F.A.C.S.M., assistant professor in UNE's Department of Exercise and Sport Performance, and UNE student Cara Fowler (applied exercise science '14), the Maine cold was apparently not cold enough.

Carlson and fellow chaperone Kash Dutta, associate lecturer in the Department of Biological Sciences, took a group of 11 applied exercise science and athletic training students, including Fowler, on a six-day trip to Iceland to conduct research on the impact of cold exposure on physiological performance.

During the spring academic term, Fowler and her classmates Ellie Arsenault, Brianna Bisesti, Lindsay Calcaterra, Lindsay Ellis, Nicholas Gross, Stacey Howard, Morgan Humphreys, Molly Laubach, Olivia Lufkin and Sarah McLintock were enrolled in an environmental physiology course developed and taught by Carlson. The class focused on the various forms of environmental stress and how humans respond to them physiologically. Students learned how physical performance is affected by environmental stressors such as heat and cold, as well as hypobaric (low pressure), hyperbaric (high pressure), and micro-gravitational conditions. The students learned both in lecture and in laboratory, and there was an optional travel laboratory component—in this case, a trip to Iceland.

Prior to the trip, Fowler submitted a research grant proposal to the New England chapter of the American College of Sports Medicine (NEACSM) with the hypothesis that an acute cold exposure will negatively impact athletic performance. She served as principal investigator of the study and led the research in Iceland. According to her, the effects of the extreme cold in Iceland were very apparent. "At first, the cold didn't feel terrible and was almost bearable," she shared. "It was around the halfway mark that the shivering and goose bumps really kicked in for me... My muscles were very stiff throughout the entire duration of testing in Iceland, and it was incredibly hard to even walk. It almost felt as though my legs were not attached to me because I had no control over where they went."

According to Carlson, despite vast amounts of research on the effects of a heat stress on performance variables, there has been significantly less inquiry focusing on the effects of a cold environment on athletic performance tests. While it is known that cold causes constriction of blood vessels to the skin, which in turn decreases blood flow to working muscles during exercise and consequently impairs muscle function, it has been reported that the cold may impair neuromuscular performance, as well. Carlson felt that these findings were somewhat limited, however.

She explained: "Research suggests that a cold exposure deteriorates short duration neuromuscular performance, such as jumping and sprinting; however, these previous findings are based on cold-water immersion or ice-pack application—not changes in the environmental setting. Therefore, we thought it was important to examine the consequences of acute environmental changes that athletes potentially experience during competition in cold climates."

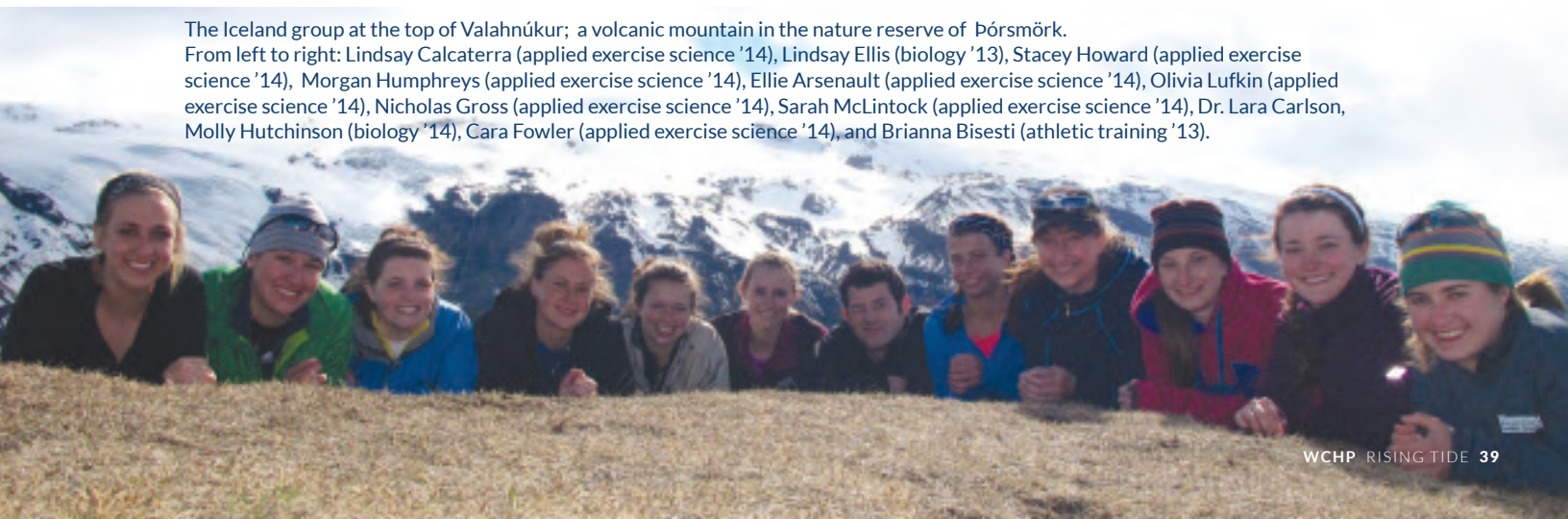
Fowler explained how the team measured various athletic performance variables and plasma lactate values in both a thermo-neutral environment and in the frigid conditions in Iceland: "To measure athletic performance variables, we completed three tests to quantify the variables of agility (pro-agility test), speed (36.6 meter sprint), and power (vertical jump). We had each individual complete two trials of both the sprint and the pro-agility test and three trials of the vertical jump test." In addition to testing the performance variables, Fowler also tested the study participants via finger-prick test for lactate measurements in the blood before and after each testing session, both in the thermo-neutral environment and in the cold.

The trip also involved plenty of exercise that was not part of the research. The group hiked to the top of Valahnúkur Mountain, ice-climbed at a sub-glacier of the Eyjafjallajökull Glacier, and performed a demanding hike along the Tindfjöll Mountains.

Since the Iceland trip, Fowler was awarded a grant from the NEACSM, was a finalist in the NEACSM Student-Investigator competition, and recently received news that her abstract will be published in *Medicine & Science in Sports & Exercise* in May. Fowler will present her research at the national American College of Sports Medicine (ACSM) conference in Orlando this June. Her manuscript is currently being finished to submit to a peer-reviewed journal.

The Iceland group at the top of Valahnúkur; a volcanic mountain in the nature reserve of Þórsmörk.

From left to right: Lindsay Calcaterra (applied exercise science '14), Lindsay Ellis (biology '13), Stacey Howard (applied exercise science '14), Morgan Humphreys (applied exercise science '14), Ellie Arsenault (applied exercise science '14), Olivia Lufkin (applied exercise science '14), Nicholas Gross (applied exercise science '14), Sarah McLintock (applied exercise science '14), Dr. Lara Carlson, Molly Hutchinson (biology '14), Cara Fowler (applied exercise science '14), and Brianna Bisesti (athletic training '13).





EDUCATION FOR TRANSFORMATION

An Exciting First Year for UNE's Center for Excellence in Interprofessional Education

Shelley Cohen Konrad, Ph.D., Associate Professor and Director of the CEIPE

Kris Hall, M.F.A., Associate Director of Add Verb Productions

In June 2012, UNE leadership designated the Interprofessional Education (IPE) Collaborative a Center for Excellence. Along with supporting existing IPE initiatives, the Center launched new projects during the 2012-2013 academic year including student-led mini-grants, an interprofessional student advisory team (IPSAT) and the UNE Interprofessional Case Competition, which culminated in UNE students placing second in the national CLARION Case Competition. The Center also forged partnerships with community healthcare practices to develop shared learning sites for health professions students. The Center's inaugural success is attributable to the contributions of many people across the university.

Transformative Change from the Classroom to Practice

University of New England scholars were well represented at the fourth bi-annual Collaborating Across Borders (CAB IV) conference in Vancouver, B.C. Presentations included:

- An interactive session demonstrating the integration of Interprofessional education and the arts marked the first public unveiling of COMptime: Competencies for Collaborative Healthcare, the first in a series of IPE online learning modules produced by a collaborative UNE team including Karen Pardue, Ph.D., R.N., C.N.E., A.N.E.F., associate dean of the Westbrook College of Health Professions, Cathy Plourde, M.A., director of UNE's Add Verb Productions, Kris Hall, M.F.A., program coordinator of the Center for Excellence in Interprofessional Education (CEIPE), Ryan Eling, operations manager and simulations



Left to right: Shelley Cohen Konrad, Ph.D., CEIPE Director, Associate Professor School of Social Work; Kolawole Bankole, M.D., M.S., Minority Health Program Coordinator/Access Project Director; Jennifer Morton, D.N.P., M.S., M.P.H., R.N., Interim Director of Nursing; and Toho Soma, M.P.H., Health Equity and Research Program Manager City of Portland, Public Health Division; together after their presentation at CAB IV.

specialist, and Shelley Cohen Konrad, Ph.D., associate professor in the School of Social Work and director of the CEIPE.

- Jennifer Morton, D.N.P., M.S., M.P.H., R.N., interim director of Nursing, Shelley Cohen Konrad, Ph.D., and Kolawole Bankole, M.D., M.S., and Toho Soma, M.P.H., from the City of Portland, co-presented an oral presentation highlighting the critical role of Community Health Outreach Workers on the collaborative health team.
- Plourde, M.D., M.P.P., M.P.H., F.A.C.P., joined Nananda Col, COM research professor and faculty of the Center for Excellence in Neuroscience, to present a workshop introducing tools and skills for engaging patients in shared decision-making.

Grant to Cultivate Caring Work Force

CEIPE was pleased to be the recipient of a two-year, \$200,000 grant by the Arthur Vining Davis Foundation (AVDF) to cultivate a caring interprofessional health work force. The award, co-authored by Pardue and Cohen Konrad, continues the development of flexible learning modules designed to be adaptable within curriculum across the health disciplines.

The AVDF grant concurrently funds academic and community faculty development, the goal of which is to establish a cadre of IPE-proficient train-the-trainers at UNE. According to Cohen Konrad, "caring and collaborative practice relies not just on the individual preferences of clinicians but on the collective capacities of

interprofessional health care teams.” Training faculty together with the community connects campus-based learning to clinical work force needs.

UNE awarded \$35,000 grant from the Josiah Macy Jr. Foundation

In June 2013 CEIPE learned that the Josiah Macy Jr. Foundation, a national leader and funder of interprofessional education, practice and research initiatives, awarded UNE a \$35,000 President’s Grant. The grant is an investment in bridging campus-based interprofessional education with practice environments in the community.

The grant will support a two-day Interprofessional Collaborative Practice Summit addressing current national initiatives to align the needs and interests of health education and the health care workplace. The participants’ task will be to develop collaborative learning opportunities in local health care settings for UNE students with community practitioners.

UNE’s collaborative summit team includes: Cohen Konrad, Pardue, Morton, Douglas Wood, D.O., Ph.D., F.A.C.O.I., dean of the College of Osteopathic Medicine, and Dora Anne Mills, M.D., M.P.H., F.A.A.P., vice president for Clinical Affairs and director of the School of Community and Population Health.

Education for Transformation: IPEC develops its new five year Strategic Plan

2013 marks completion of the Interprofessional Education

Collaborative (IPEC) three-year strategic plan. Formed in 2010, IPEC’s diverse membership envisions and facilitates shared learning opportunities for students, faculty and the greater UNE community. Benchmarks for IPEC’s inaugural strategic plan were met or exceeded, culminating in June 2012 with the designation of IPEC as a UNE Center for Excellence.

UNE stakeholders, students and community partners contributed valuable input that guides IPEC’s mission to “Transform healthcare education by fostering community-centered, collaborative learning and interprofessional practice.”

The new strategic plan includes, for the first time, core values that inform UNE’s IPE programming. These include:

- Safety and Quality
- Social Justice and Health as a Human Right
- Patient/Person Centeredness
- Cultural Humility
- Collaborative Leadership
- Student Empowerment

The final version of the 2013-2018 strategic plan is available on IPEC’s website www.une.edu/wchp/ipec.

COMptime: Competencies for Collaborative Health Care

COMptime is an evolving series of online learning modules that demonstrate IPE principles for collaborative health practice and inform learners about the application of IPE competency domains. Content was developed by an interprofessional faculty team and informed by the 2011 IPEC Expert Panel Report and Canadian Interprofessional Health Collaborative objectives.

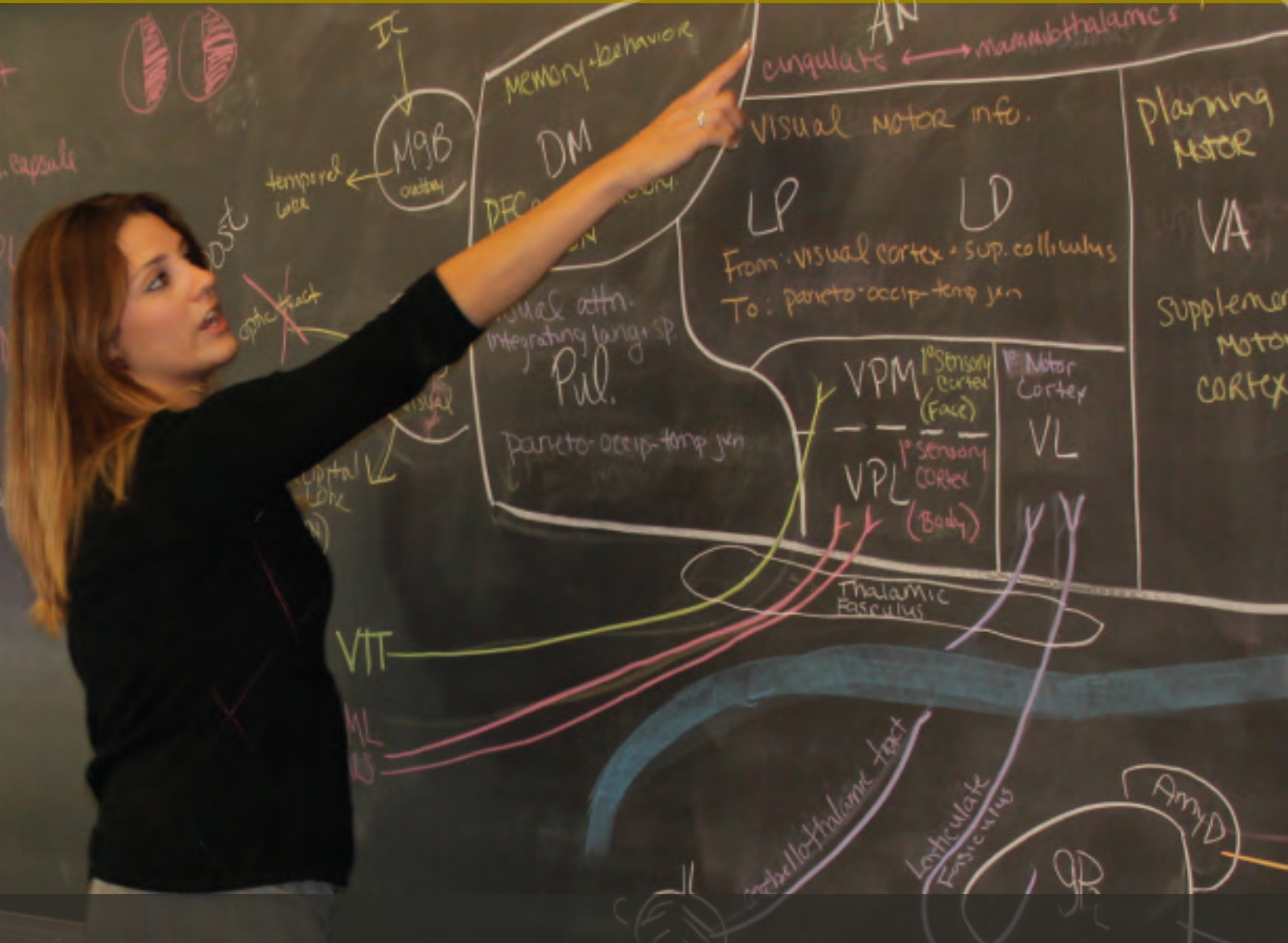
Add Verb Productions crafted COMptime’s script, and UNE’s media professionals (including the Clinical Simulation Program) and Academic Technology Services were instrumental in filming, editing and course design.

Through thoughtful vignettes the modules follow Pat, a 31-year-old woman, over a six-month period from one dental cleaning to another. Learners are introduced from both patient and health professions perspectives to the roles of healthcare team members as they demonstrate expertise, communication, teamwork, ethics, leadership and patient centeredness.

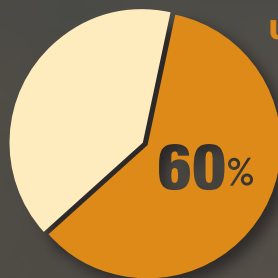




CENTER FOR EXCELLENCE IN THE NEUROSCIENCES



Brittany Bolduc presents compelling research she has done with David Seder and Richard Riker at Maine Medical Center. Last year she presented her work on the use of hypothermia to preserve brain function in cardiac arrest patients at a national conference on neuro-critical care. Bolduc credits her successes to the experiences she had as an undergraduate working with professor Michael Burman.



undergraduate research

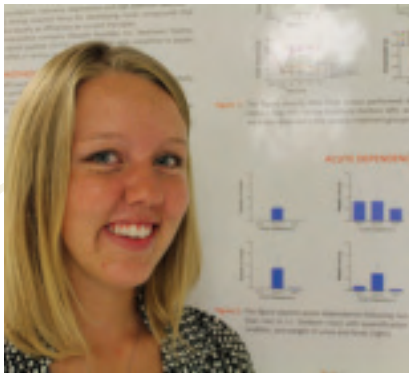
60% of UNE students participated in an in-class research program last year

Participation in research improves the quality of the education students receive at UNE and enables them to continue on to greater success when they graduate.

STUDENTS AT THE CENTER OF RESEARCH

Geoff Ganter, Ph.D., Associate Professor, College of Arts and Sciences

Grinning proudly, senior UNE medical biology major Brittany Reid waited in the Windward lounge at the start of the 2013 UNE Coastal Neighbors reception in August. She stood in her professional attire next to a large poster full of graphs and photos, ready to explain her pain research to visitors from UNE's local community.



Reid told visitors about her methods for administering experimental medications to mice and then assessing any resulting pain relief. This fall will be Reid's third semester of research, as one of four undergraduates working in the laboratory of College of Osteopathic Medicine (COM) Professor and Vice President for Research and Scholarship Edward Bilsky. When she graduates next year, she hopes to attend medical school.

Reid's was one of several well-rehearsed student presentations featured at this event, including ones from other Center for Excellence in the Neurosciences (CEN) laboratories like the Burman and the Ganter groups. When we want to show the world what is best about UNE, it makes good sense to showcase our successes in student research.

Not every college student gets an opportunity to perform and present

important scientific research like Reid has done, but at UNE research has become a large part of many students' lives. Student researchers can be found at benches and microscopes in CEN-affiliated laboratories late at night, on weekends and during vacations. They are studying fear, headache, chronic pain and many other neuroscience topics.

In the last five years, CEN research faculty have supervised over 163 student researchers and have shared poster or article authorship more than 238 times with those students. This is an excellent track record for a program of any size, but it is to be celebrated that a small university like UNE is succeeding so well in offering high-quality research experiences to its students.

Hands-on student research experiences are integrated with other parts of our educational approach. For example, thanks to the undergraduate Neuroscience program recently established by CEN-affiliated faculty from College of Arts and Sciences (CAS) Psychology, CAS Biology and COM Biomedical Sciences departments, 38 students are majoring and 12 students are minoring in Neuroscience (as of fall of 2013). The Neuroscience major is well-suited to students bound for medical schools or research careers, as it includes the usual pre-requisites for both and incorporates a strong focus on the research experience.

The ability to offer excellent research opportunities to our students does not come without a cost. Laboratory space must be dedicated to research; materials must be procured; and personnel must be compensated. For instance, during the summer of 2013, 27 UNE students were supported by the CAS Summer Undergraduate Research Experience (SURE) program. In this program,

students compete for stipends that allow them to immerse themselves in their research projects during the summer. The University is able to offer research support like the SURE program because of strategic internal allocations that are funded in part by indirect cost income from federal grants to UNE faculty researchers. The students supported by SURE, in turn, contribute to the research effort and the securing of future federal grants.

As an example drawn from the over \$19.9 million in current extramural CEN funding, a National Institutes of Health (NIH) Academic Research Enhancement Award (AREA) totalling over \$403K was made to Michael Burman, professor in CAS Psychology, to support his neuroscience research involving students. Burman, who studies the development of emotional learning, has mentored 13 undergraduate students since starting his laboratory, and the four who have graduated in this time have all gone on to science-related careers or further training.

As another example, COM Professor Ian Meng's \$10M Center of Biomedical Research Excellence (COBRE) grant, with a focus on mechanisms of chronic pain, has also greatly increased the number of students trained in various neuroscience research laboratories, allowing nine additional summer undergraduate research students and two graduate students to join those supported by SURE.

For a small university, UNE has a high level of intramural and extramural support for research, and students benefit by participating in projects that are demonstrably national priorities.

Another young scientist presenting at the 2013 Coastal Neighbors reception was UNE alumna (neuroscience '11)



CENTER FOR EXCELLENCE IN THE NEUROSCIENCES

Brittany Bolduc. As an undergraduate, Bolduc studied contextual fear development in rats with Professor Burman, and she is now a third-year medical student in UNECOM. Her involvement in research has continued into her busy post-baccalaureate life, and at the reception, she presented the compelling research she has conducted with David Seder, M.D., and Richard Riker, M.D., at Maine Medical Center. Last year she presented her work on the use of hypothermia to preserve brain function in cardiac arrest patients at a national conference on neuro-critical care. Bolduc credits her successes to the experiences she had as an undergraduate working with Professor Burman.

When students engage in research, they benefit from a closer connection with their professors. Research mentors become deeply invested in their students' successes and can do more to aid the development of their student' careers. Students can earn co-authorship on publications and powerful letters of recommendation to include in applications for jobs and graduate programs. In research settings, students can put classroom concepts into practice, adding richness to their education. They learn technological skills, time management, and responsibility. Lastly, as Reid and Bolduc demonstrated so well at the 2013 Coastal Neighbors reception, research students gain valuable

experience communicating complicated concepts.

UNE excels at incorporating research and scholarship into the educational experience, and the Center for Excellence in the Neurosciences has been a major contributor to this success. Students at UNE enjoy the intimacy of a small liberal arts college but also have access to high-quality research experiences more often found at large universities. Participation in research improves the quality of the education students receive at UNE and enables them to continue on to greater success when they graduate.



MARINE SCIENCE CENTER

GROWING A NEW GENERATION OF COASTAL MARINE LEADERS

Barry A. Costa-Pierce, Ph.D., F.A.A.S., Henry L. and Grace Doherty Chair of Marine Sciences; Director, Marine Science Center; Professor and Chair, Department of Marine Sciences

Given the accelerating pace and complexity of modern science, students who are steeped in specific content without understanding how that knowledge is generated and how (or even whether) it should be used and applied will be at a considerable disadvantage in dealing with the scientific issues that arise in their lives, compared with students who understand and have had authentic experiences with the processes, nature, and limits of science. ¹

UNE marine programs, including the Marine Science Center (MSC), over the past year have developed a new strategic plan to examine where we have a significant niche and can invest to train the next generation of leaders to carry forward UNE's unique Maine place-based excellence and strength of ideas. UNE is advancing its marine programs to become models of innovative, transdisciplinary, experiential education and undergraduate

research. The MSC proposes to build on the existing education foundations held within the strong marine science program. UNE has added a new Ocean Studies and Marine Affairs major that will deliver educational programs for this new era of planetary history being called the "Anthropocene" (Biermann et al., 2012).

Top Four Programmatic Goals

1. Build on the existing strengths and expand Marine Science academic programs to provide students with a more comprehensive, 21st century understanding of the rapidly changing coastal/ocean environment and its processes.
2. Build an Ocean Studies and Marine Affairs Program that will examine the human dimensions of the

coast, focusing on explorations of transdisciplinary, social-ecological systems and the law and policy dimensions of interconnected human/ocean/coastal systems.

3. Strengthen academic and research connections to enhance the Marine Animal Rehabilitation and Conservation (MARC) program in order to emphasize the dynamic connections of marine animal health to marine ecosystem health and to human health and wellness.
4. Build a Sustainable Fisheries and Ecological Aquaculture Program that will examine, in an integrated manner, the seafood value chain—connections between innovative seafood production systems (sustainable fisheries, ecological aquaculture) to consumption (sustainable seafoods)—and the transdisciplinary connections to marine ecosystems, economies, and human health and wellness.

UNE Marine Sciences will expose students to novel research and approaches and to activities, ideas, different perspectives and methods that will lead to transformational solutions. Students will be challenged with complex, real-world problems that have significant impacts on society and the marine environment and economy in order to inspire them to seek innovative solutions.

Developing these four programs will allow UNE to attract outstanding students, faculty, staff and distinguished scholars regionally, nationally, and internationally and advance UNE's marine education and research programs. Implementation of these priorities will also allow UNE to recruit and train the next generation of marine/coastal leaders to help expand Maine's marine economy.

The top goal is to build on the

existing disciplinary strengths in UNE Marine Sciences programs by revising academic offerings and incorporating transdisciplinary teaching methods, experiential approaches, and “team marine science” approaches strongly connected to research.

As part of this, UNE has been working to form a new partnership with the University of Maine to develop a multi-institutional statewide public-private partnership and a new proposal submitted to the National Science Foundation. If funded, it will engage 65 Maine scientists from six universities and 20 disciplines, including 12 UNE education/research faculty from four departments. It will also fund new faculty hires, 76 undergraduate students per year, 100 K-12 teachers, 10 teacher internships per year, and 20 high school student internships per year.

UNE Marine Sciences has been working over the past year to build the existing MSC into a warm, welcoming, convening environment for students, visiting scientists, the public, partnership and donor organizations, marine/coastal science-based businesses and organizations on the cutting edge of the “living marine economy” so that it becomes a destination for outstanding students, thought leaders, scholars, alumni, and their families.

UNE has designated the MSC as a Center of Excellence in Marine Sciences, replacing the Center for Land-Sea Interactions to give a better alignment of all marine administrative, academic, and research/outreach activities at UNE. The MSC physical plant has been expanded to accommodate five new research scientists (Carrie Byron, Ph.D., Carter Newell, Ph.D., Joseph Kunkel, Ph.D., John Kraeuter, Ph.D., and Dennis Esposito). The Marine program is in the process of building connections to local and regional partners in the marine business, academic, oceanographic,

coastal management, and fishing and aquaculture communities and is connecting these partners to UNE's educational, experiential learning, internship and research programs.

Some accomplishments and on-going activities include:

- Professor Stephan Zeeman, Ph.D., led the establishment of a new major, Ocean Studies and Marine Affairs, which took on its first students in the 2013-14 academic year to broaden the scope of UNE's marine education and career opportunities and allow development of new, entrepreneurial directions with other departments at UNE.
- Assistant Department Chair and Associate Professor Markus Frederich, Ph.D., is leading the strengthening of the curriculum to create a nationally innovative undergraduate research education program across all four years of an undergraduate career that will involve all marine science students in long-term interdisciplinary research projects focused on the Saco River/Saco Bay/NW Atlantic Marine Ecosystem.
- Associate Professor Kathryn Ono, Ph.D., has led the development of an innovative, 4+1 undergraduate/graduate marine education leadership program that builds upon our unique undergraduate education/research methodology while creating a viable financial model for expanding graduate programs in marine programs at UNE.
- Stephan Zeeman, Ph.D., has visited UNE Morocco and is exploring the feasibility of initiating marine science programs there to provide our students an outstanding study abroad opportunity.

¹ Biermann, F. et al. 2012. Navigating the Anthropocene: Improving Earth system governance. *Science* 335: 1306-1307.

Brewer, C. and D. Smith. 2011. *Vision and Change in Undergraduate Biology Education. A Call to Action*. AAAS and the Directorate for Education and Human Resources, Division of Undergraduate Education and the Directorate for Biological Sciences, National Science Foundation, Washington, DC www.visionandchange.org

Innovation is in the DNA of UNE.

—President Danielle Ripich

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