

F L O R I D A A T L A N T I C U N I V E R S I T Y



D I V I S I O N O F R E S E A R C H A N N U A L R E P O R T

FAU



Shaping Tomorrow Through Research

A university's greatness can be measured by its performance in three areas – the quality of education that it delivers to its students, the relevance of its research activities to “the real world” and the effectiveness of its outreach to the community. At 50 years of age, Florida Atlantic University is one of the youngest universities in America to achieve distinction in all of these

arenas. The quality of classroom instruction has been rated as excellent by generations of students and employers, the scope of research has undergone rapid expansion and sophistication, and the sustained volume of meaningful community service efforts by students, faculty and staff has won national recognition. At this half-century mark, we have the opportunity to look back down the road that's been traveled and – more importantly – to look ahead to the dawn of a whole new day.

Our world is changing very rapidly, at a rate never before experienced in human history. Technological advances are being introduced at an unprecedented pace in every industry, from medicine and manufacturing to communications and entertainment. As in years past, the United States is the primary engine of innovation worldwide, generating changes that are revolutionizing our lives. Universities are playing a bigger role than ever in this process, and, as you will read in these pages, FAU is a fully engaged participant.

An especially exciting development is the recent establishment of the Office for Undergraduate Research and Inquiry, providing a formal structure for implementation of FAU's acclaimed Distinction through Discovery Initiative, which integrates research and scholarly activities into the undergraduate experience. This opens up a whole new world of opportunity to students in all majors.

This report presents an overview of the wide variety of research activities that are taking place at FAU, and it illustrates the strong sense of commitment that our researchers in all disciplines bring to their work. Their efforts are making our University a powerful agent of change in the 21st century.

John Kelly, Ph.D.
President
Florida Atlantic University



Innovation for All

Innovation is key to the success of research universities all across our nation. At Florida Atlantic University, our investigators are forging a path toward discoveries in a host of areas. While faculty researchers lead the way, our student researchers are the next wave of innovators. With the launch of the Distinction through Discovery Initiative, FAU made research part of the entire undergraduate curriculum. Now, in addition

to mentoring graduate students, our veteran faculty researchers are giving undergraduates the opportunity to get experiential learning in the research process and a chance to participate in the development of innovations aimed at improving life for everyone.

FAU is taking its place among the world's research centers and has been given the designation of “High Research Activity” university by the Carnegie Foundation for the Advancement of Teaching. Last year, our researchers were awarded more than \$33 million in funding from state, federal and private sources, including the National Science Foundation, the Office of Naval Research, the U.S. Department of Education, the U.S. Department of Energy and the U.S. Department of Health and Human Services.

The University is working on cooperative research and education projects with four of the world's premier scientific research organizations: The Scripps Research Institute Florida, the Max Planck Florida Institute for Neuroscience, the Torrey Pines Institute for Molecular Studies and the Vaccine & Gene Therapy Institute of Florida.

The award-winning Research Park at Florida Atlantic University is located on 94 acres on the Boca Raton campus and 14 acres in neighboring Deerfield Beach. In addition to its 20 regular tenant companies, the Research Park in Boca Raton is home to the Technology Business Incubator (TBI), which currently houses 15 early-stage technology companies in various industries such as pharmaceutical development, software development and logistics management for transportation and medical devices.

In this annual report, we are pleased to present our talented researchers – both faculty and students. The report is divided into sections highlighting our sponsored programs, technology development and scholarship and creative accomplishments. You will see in these pages that FAU is truly at the forefront of innovation.

John W. Newcomer, M.D.
Interim Vice President for Research, Florida Atlantic University
Executive Vice Dean and Professor of Clinical Biomedical Science
Charles E. Schmidt College of Medicine, Florida Atlantic University

Table of Contents

SPONSORED RESEARCH

SPONSORED PROGRAMS	2
Cure for Blindness Within Reach	3
The Rodent Hippocampus – It's Not Just for Space Anymore	4
Hands-on Experience with Spectroscopy to Give Students an Advantage	5
Lagoon Crises Put HBDI in Public Eye	6
Focus on Undersea Habitat Deepens Conservation Knowledge	7
Marine Mammal Research Goes Far Afield	8
FAU's Southeast National Marine Renewable Energy Center Moves Ahead With Historic Effort to Capture Energy From Ocean Currents	9
FAU and Partners Go Solar	10
Emergency Alert Technology for the Profoundly Deaf	11
'Sit N Fit' Chair Yoga to Help Osteoarthritis Patients	12
Addressing a Nursing-Pipeline Challenge	13
FAU Welcomes One of Nation's Top Malaria Scientists	14

TECHNOLOGY DEVELOPMENT

TECHNOLOGY DEVELOPMENT	15
Research Park at FAU Receives Top Marks	16
INTERACT Helping to Reduce Unnecessary Hospitalizations of Nursing Home Residents	17
Collection an Arsenal of Hope Against Disease	18
Patent for 5D Visualization Method to Understand Big Data	20
FAU Neuroscientist Searching for Treatment for Epilepsy, Migraines and Stroke	21
FAU Partners with Global Pharmaceutical Company Eli Lilly in Open Innovation Drug Discovery Program	22
FAU Students Turn Smartphones Into Lifesaving Devices	23
EDITORS: Paige Garrido and Lynn Laurenti CONTRIBUTING EDITOR: Beth C. Barak WRITER: Paige Garrido CONTRIBUTING WRITERS: Polly Burkes, Megan Geiger, Sandy Leander, Larry Macke, Carol West DESIGNER: Manny Cannatella	

SCHOLARSHIP AND CREATIVE ACCOMPLISHMENTS

SCHOLARSHIP AND CREATIVE ACCOMPLISHMENTS	24
Monkey Discovered by FAU Researcher Makes Top 10 New Species List for 2013	25
Creative Writing Associate Professor Receives Prestigious Literary Awards	26
The Science, Technology, Engineering and Math (STEM) Adventure: Teaching the Teachers	27
STEM: A Top Priority	28
Student Ambassadors Leading Undergraduate Research and Inquiry	29
FAU High School Students Building Electric Supercar	30
Wilkes Honors College Student Conducts Research at Harvard University	32
Debunking "'Give Mom a Break' Theory When Experiencing the Baby Blues"	33
Getting a Grasp on Political Campaign Advertising	34
On the Record: A Project to Save a Rare Collection	35
Researchers and Scholars of the Year	36

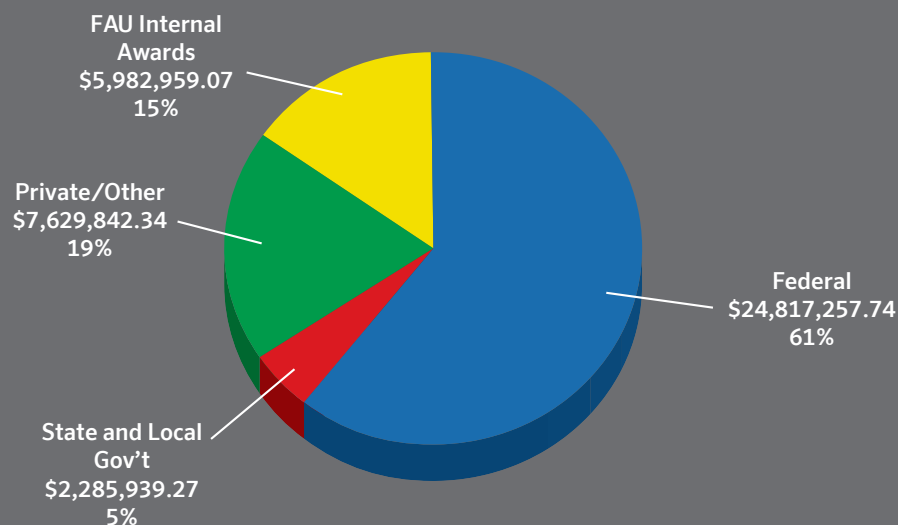
Sponsored Programs

Sponsored Programs (SP) supports the mission of FAU and the Division of Research as the central business office for the submission of research, education and community service proposals and awards received. SP is dedicated to providing services that give FAU faculty and staff a competitive edge in obtaining external funding.

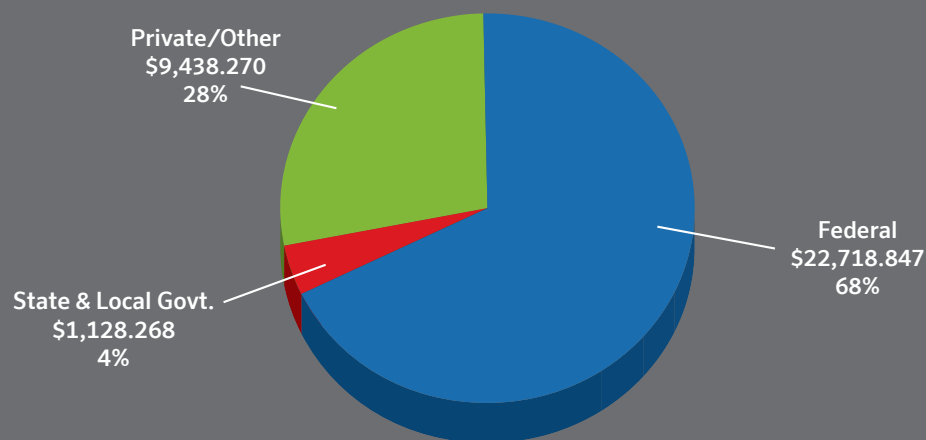
With more than \$33 million in programs sponsored by state, federal and private sources, SP works to identify and match funding opportunities with principal investigators' research interests; to review, edit and approve research proposal submissions; to review and negotiate award terms and conditions; and to provide training and workshops for faculty and staff. SP is also responsible for facilitating, reviewing and approving post-award actions and coordinating with sponsors.

In these pages, you will read about research funded by agencies such as the National Institutes of Health, the National Science Foundation, the Florida Fish and Wildlife Conservation Commission, Florida Sea Grant and the U.S. Department of Energy, to name just a few. Our investigators are conducting research across a broad spectrum that includes the search for new cancer treatments and an initiative to harness the power of the ocean's currents to produce renewable energy. We are proud of all that they're doing to craft a better future for everyone.

Sponsored Program Expenditures by Type FY 2012-2013



Funding Sources by Type FY 2012-2013



Cure for Blindness Within Reach

It seems like an idea out of a science fiction movie: growing transplantable human ocular tissue to cure blindness – but it's not even remotely far-fetched anymore. In fact, Marc Kantorow, Ph.D., Director of Graduate Programs and Professor of Biomedical Science in the Charles E. Schmidt College of Medicine, believes it will happen in his lifetime – and perhaps sooner rather than later.

For 20 years, Kantorow has been studying the genetic and biochemical mechanisms required to prevent cataract formation and defend against age-related macular degeneration. His work is funded by the National Institutes of Health and the Rand Eye Institute. He has also received funding from the Age-related Macular Degeneration Program of the BrightFocus Foundation.

In collaboration with Javad Hashemi, Ph.D., and Oren Masory, Ph.D., both of the Department of Ocean and Mechanical Engineering in the College of Engineering and Computer Science, and John W. Newcomer, M.D., Executive Vice Dean for the Charles E. Schmidt College of Medicine and Interim Vice President of Research, Kantorow has begun studies to transform and engineer transplantable human ocular tissues – essentially,

they're aiming to bio-engineer the human eye. These studies involve combining stem cell transformations into specialized ocular tissues and reconstructing them as three dimensional transplantable tissues.

One of the students working in Kantorow's lab is Bettina Teng, an undergraduate in the Wilkes Medical Scholars Program, a joint initiative of the College of Medicine and the Harriet L. Wilkes Honors College. The program is highly selective, offering early admission to the College of Medicine for students who have a strong desire to pursue careers in medicine. Students receive the B.A. degree from the Wilkes Honors College in Jupiter and the M.D. degree from the College of Medicine in Boca Raton in seven to eight years.

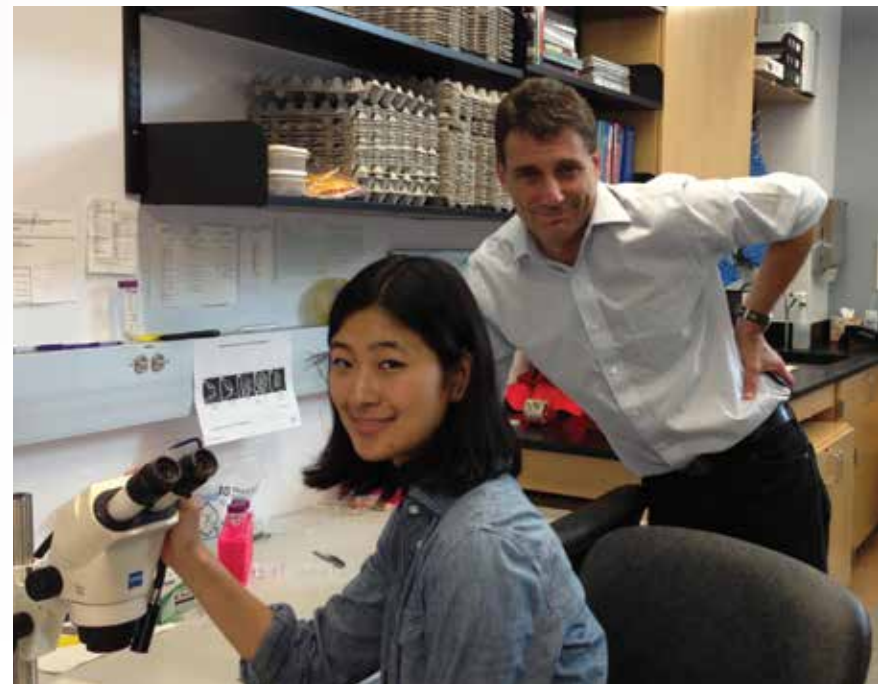
"I am interested in the eye and how it functions," said Teng. "I have always been interested in physics and studying the diffraction and refraction of light, and I became interested in the lens."

Working in Kantorow's lab as an undergraduate researcher is giving her an invaluable opportunity to expand her knowledge base and gain hands-on experience.

Other researchers in Kantorow's lab include Research Associate Professor Lisa Brennan,

Ph.D., and doctoral student Daniel Chauss, who completed his M.S. in Biomedical Science with Kantorow in 2012 and is now in the Integrative Biology Ph.D. program.

"Dr. Kantorow's research program interested me because of the lab's unique track record of being a jack-of-all-trades in designing experimental approaches to understanding human disease," said Chauss. "I believe that Dr. Kantorow's



Dr. Kantorow and Bettina Teng study the mechanisms to prevent cataract formation.

guidance and the experience of being part of the Kantorow Laboratory will allow me to be a competitive scientist, ready and eager to face the demand of delaying age-related disease in our aging population."

The Rodent Hippocampus - It's Not Just for Space Anymore

We've all seen images of mice running through mazes trying to find cheese. Scientists have known for years that rodents have spatial memory – the ability to remember the physical properties of the surrounding environment and how to navigate it. There is also long-standing agreement about which brain regions control spatial memory. What researchers didn't know was whether rodents could remember specific objects encountered during their runs through mazes, and whether brain circuits for spatial memory also control object memory. Until now.

Robert Stackman Jr., Ph.D., Associate Professor of Psychology and Neuroscience in the Charles E. Schmidt College of Science, published a paper about the neuroscience of long-term memory in rodents in the journal *Current Biology*.

Stackman studies the rodent hippocampus, the region within the medial temporal lobe of the brain that is well known for its role in spatial memory. Its role in non-spatial memory has been intensely debated. Stackman's research, funded through a five-year, \$1.4 million grant from the National Institute of Mental Health, presents, for the first time, behavioral, neurochemical and neurophysiological evidence demonstrating that the mouse hippocampus plays a critical role in the ability to remember objects. The team – Stackman, graduate



Members of Dr. Stackman's lab from the left front: Sarah Cohen, Rebecca Avila, Alcira Helen Munchow, Nanna Ásgeirsdóttir and Robert Stackman. Back row: Joan Lora, Lisa Rios and Shannon Sanguinetti.

students Sarah Cohen, Lisa Rios and H. Nanna Ásgeirsdóttir, postdoctoral fellow Gongliang Zhang and then Lab Manager Alcira Helen Munchow — also found that when a rodent explores a novel object in its surroundings, a memory of the object is formed within the hippocampus (much as in the human brain).

This finding is significant because it means that the rodent hippocampus more closely mirrors the human hippocampus

than previously believed. Given the similarity of the rodent and human hippocampi, scientists now can use rodents to test drugs developed to treat human disorders such as memory loss and dementia.

“The next step will be to identify the neural circuits and molecular mechanisms that control the ability of the mouse to discriminate the object it has seen before from a new object – behavioral processes that are compromised with aging in humans,” said Stackman. “Such efforts will aid the development of effective treatments for age-related memory loss.”

Hands-on Experience with Spectroscopy Gives Students an Advantage

While a college education is vital, practical, hands-on experience adds real value in the eyes of employers.

FAU's chemistry students are now getting that kind of experience in the classroom.

Thanks to a \$200,000 grant from the



Chemistry students Livingston Graham and Satu Hyvarinen work on the spectroscope.

National Science Foundation, the Chemistry Department has purchased a sophisticated Raman spectrometer, making FAU one of just a handful of universities in the country that is able to make this technology available to undergraduates.

Evonne Rezler, Ph.D., Associate Scientist, and Andrew Terentis, Ph.D., and Jerome Haky, Ph.D., – both Associate Professors in

the Chemistry Department – obtained the grant, which enables chemistry faculty to integrate Raman spectroscopy experiments and experiences into the undergraduate chemistry curriculum. They are using the spectrometer to introduce and reinforce increasingly more complex chemistry concepts as part of a restructured chemistry curriculum. The Raman spectrometer is a practical tool to teach concepts such as molecular structure, quantitative analysis and elucidation of reaction mechanisms.

“We are integrating into the curriculum cutting-edge technology that students will experience both in academia and in industry,” said Rezler. “But we’re not just putting the instrument in front of them and teaching them how to use it. We are teaching concepts through the use of the instrument.”

Even students in General Chemistry – a class attended by thousands of students each year (many of whom are not science majors) – have the opportunity to use the spectrometer in small groups of four or five. Junior and senior chemistry majors get repeated individual

sessions with the instrument for more in-depth understanding and to conduct research.

A Raman spectrometer is a type of microscope that uses a laser to interact with molecular vibrations to obtain information about the molecule. Under this microscope, molecules have their own “fingerprint,” allowing chemists to understand what they’re looking at. An advantage of Raman spectroscopy over traditional microscopic analysis is that specimens do not need to be fixed, sectioned or destroyed. Data can be collected from a very small volume or from an entire piece of material

that has not been broken down.

Raman spectroscopy is common in laboratories doing research and development in fields such as biotechnology, agriculture, pharmaceuticals, consumer products and many others. It is even used in hospitals during surgery to monitor anesthetic and respiratory gas mixtures.

“Industry is really catching on to the uses of Raman and it is now used for many kinds of things, including in production lines and for quality control purposes,” said Terentis. “There will be many chemistry students who will end up using Raman in their jobs, and FAU is giving them that advantage over other job applicants.”

Lagoon Crises Put HBOI in Public Eye

People outside of Florida are used to seeing news items about the state's famous beaches and waterways, but in 2013 national media attention turned to the Indian River Lagoon (IRL), and the stories were, unfortunately, not the type that encourage tourism.

The IRL runs along more than 150 miles of Florida's east coast and is designated by the U.S. Environmental Protection Agency as an "estuary of national significance." Freshwater from the land meets ocean water in estuaries; the natural balance in these systems and the life they produce are vulnerable to changes in land use. In the case of the IRL, excess freshwater releases have led to oyster, seagrass and fish deaths, poor water quality, high concentrations of mercury in dolphins and fish, bacterial contamination and harmful algal blooms. All of these problems have been extensively reported in the news media.

A number of FAU's Harbor Branch Oceanographic Institute (HBOI) scientists have been working to understand and communicate the science behind the headlines. Research Professor Brian Lapointe, Ph.D., published research – funded by the City of Stuart and Martin County – characterizing the combination of freshwater releases from Lake Okeechobee and land runoff that harm water quality in the southern IRL. He testified at national and state legislative hearings on IRL issues, pinpointing sewage as the major source of nutrients in the Lagoon.

As media and public interest in the IRL increased, HBOI Epidemiologist Adam Schaefer, M.P.H., became a sought-after speaker. In addition to researching mercury levels in dolphins and people who eat IRL fish, he is studying bacterial contamination in the IRL with Research Professor Peter McCarthy, Ph.D., who reported a spike in levels of antibiotic-resistant bacteria in 2013 compared to sediment samples taken in 2011 and 2012.

Water outflows through ocean inlets create the potential for effects beyond the Lagoon, which is why Assistant Research Professor Joshua Voss, Ph.D., is studying the coral reef ecosystem that lies just beyond the IRL in St. Lucie Inlet Preserve State Park. St. Lucie Reef represents the northernmost occurrence of many tropical corals in Florida and supports more than 250 fish species. Funded by the Florida Fish and Wildlife Conservation Commission, Florida Sea Grant and several local agencies, Voss and his team are investigating the effects of freshwater discharge and lagoon outflows on coral reef health and providing new data to help in the development of effective management strategies.

"With threats to the Lagoon on the rise, media interest is at an all-time high," said Research Professor and Indian River Lagoon Observatory Director Dennis Hanisak, Ph.D. "We've been looking at these issues for decades, and it's good to have others share our interest and concern."



NBC interviews Adam Schaefer about the status of the lagoon.

Focus on Undersea Habitats Deepens Conservation Knowledge

It's been said that people will only conserve what they love, love what they understand and understand what they're taught.

The National Oceanic and Atmospheric Administration (NOAA) Cooperative Institute for Ocean Exploration, Research and Technology (CIOERT) at FAU's Harbor Branch Oceanographic Institute is teaching people why the ocean and its coral reefs are worth conserving.

Research Professor Shirley Pomponi, Ph.D., is the Executive Director of CIOERT, which received \$1 million in funding from NOAA in 2013, marking the fifth straight year of funding support for CIOERT, which has received an "outstanding" rating by an NOAA-appointed external review panel. CIOERT has been awarded more than \$6.6 million from NOAA since its inception in 2009 and was expected to be renewed for another five years beginning in July 2014. The University of North Carolina Wilmington is the co-managing partner of CIOERT, with SRI International in St. Petersburg, Florida, and the University of Miami in the role of limited partners.

"We are thrilled that NOAA recognizes and supports the work that we and our partners are doing," said Pomponi. "The grant supports ocean exploration, research, technology development, and education, with a focus on the Gulf of Mexico."

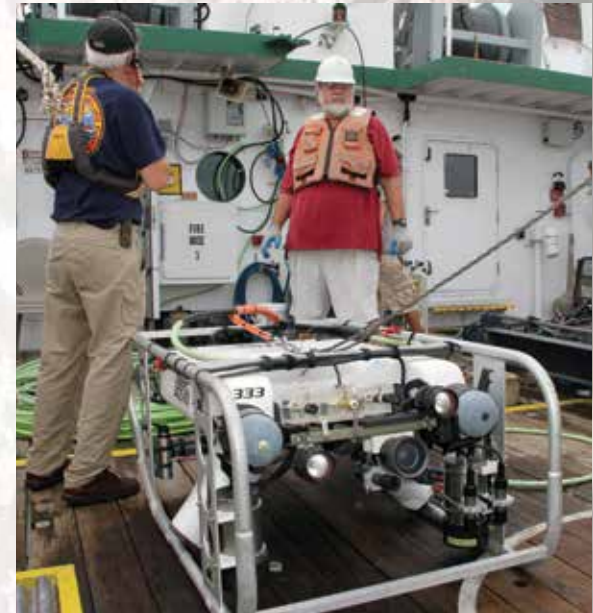
Assistant Research Professor Joshua Voss, Ph.D., was Co-Principal Investigator on two expeditions in the Flower Garden Banks National Marine Sanctuary in the western Gulf, completing a three-year project to map and characterize the sea life and habitats there. The project established baseline coral and fish community data that are being used to help develop more effective resource-management strategies for the Sanctuary.

A CONSERVATION VICTORY

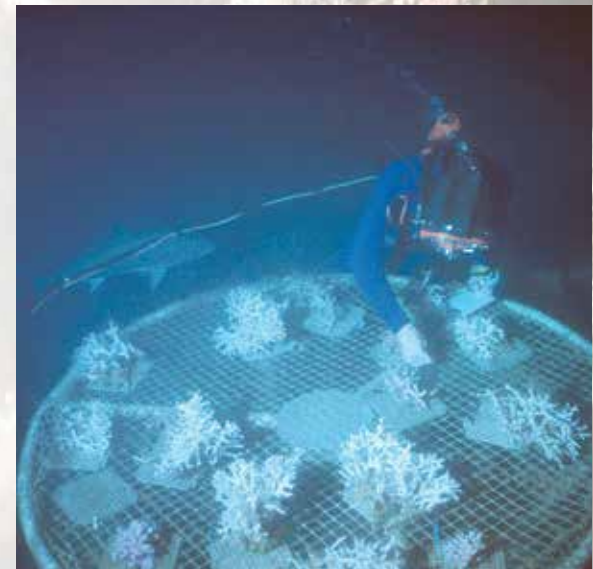
Research Professors John Reed, M.Sc., and Dennis Hanisak, Ph.D., both CIOERT investigators, were part of a multi-institution research expedition called "Coral Ecosystem Connectivity 2013: From Pulley Ridge to the Florida Keys," which aimed to shed light on interactions between the two ecosystems. The Pulley Ridge Habitat Area of Particular Concern lies to the west and north of the Florida Keys National Marine Sanctuary, and because of the Loop Current, is upstream from the Florida Keys. Understanding how marine life survives and potentially travels between these two regions is important to preserving the fisheries in both areas.

Reed celebrated a conservation victory in August 2013 when the South Atlantic Fishery Management Council approved Coral Amendment 8, which extended the area of protection for the deep-water *Oculina* coral reefs by more than 300 square miles – a near-doubling of the previously protected area along Florida's east coast. This was the latest in a series of conservation triumphs for Reed dating back to the 1970s, when he and other Harbor Branch researchers discovered the reefs and worked to have them designated the world's first deep-water coral marine protected area in 1984. A June 2011 CIOERT-supported survey revealed additional reef areas, which eventually led to expanded protection against destructive fishing practices.

"These stewardship examples are just a few of the ways in which FAU is fulfilling its role as a public institution that contributes to the greater good," said Reed.



Dr. Hanisak and team prepare for a dive.



*Deep water *Oculina* coral reefs.*

Marine Mammal Research Goes Far Afield

FAU marine mammal scientists have been on the move.

Greg O’Corry-Crowe, Ph.D., Associate Research Professor and head of the Population Biology and Behavioral Ecology program at FAU’s Harbor Branch Oceanographic Institute (HBOI), followed his research interest – the beluga whale – to the arctic waters off Alaska, Norway and Russia. He was part of a multi-national collaborative team sponsored by the National Oceanic and Atmospheric Administration (NOAA) that demonstrated the viability of echolocation loggers, which detect and record marine mammal navigation vocalizations, for remote monitoring of belugas. The team published its findings in *Polar Biology*.

During the 2012-13 calving season off the coast of northern Florida, Associate Research Professor Edmund Gerstein, Ph.D., Director of Marine Mammal Research in the Charles E. Schmidt College of Science, and Harbor Branch postdoctoral researcher Vasileios Trygonis, Ph.D., conducted photo-identification, surface video surveillance and synchronized underwater acoustic recordings of more than 28 North Atlantic right whales, including 13 mother and calf pairs. The North Atlantic right whale is one of the most endangered whales in the world;

according to NOAA, only 450 to 500 remain. The multi-year study, supported in large part by sales of Protect Florida Whales specialty license plates, represents the most robust investigation of right whale social behavior and vocal repertoire in this critical calving habitat. Results were published in the *Journal of the Acoustical Society of America*.

“Right whales face extraordinary challenges, primarily from ship strikes and entanglement in commercial fishing gear,” said Gerstein. “Our goal is to aid management strategies by developing passive acoustic monitoring devices capable of detecting right whale vocalizations in order to alert mariners and divert approaching ships.”

In the waters of South Carolina’s Charleston Harbor, HBOI Affiliate Professor Greg Bossart, Ph.D., and other staff members directed dozens of collaborators in a multi-disciplinary bottlenose dolphin Health and Environmental Risk Assessment (HERA) research project. Initiated in

2003, HERA is designed to assess the health of individual dolphins and whole dolphin populations in two southeast estuarine regions – the other is Florida’s Indian River Lagoon – and compare the environmental and anthropogenic stressors that may affect the health and long-term viability of wild dolphin stocks. The assessment also yields valuable information about environmental conditions. Dolphin can be considered a sentinel species for ocean and human health.



Dr. O’Corry-Crowe visits Arctic waters to test echolocation loggers.

FAU's Southeast National Marine Renewable Energy Center Moves Ahead with Historic Effort to Capture Energy from Ocean Currents

With the search for alternate sources of energy receiving frequent media coverage, FAU soon may make some paradigm-shifting headlines.

Researchers at FAU's Southeast National Marine Renewable Energy Center (SNMREC) will be the first in the world to launch an ocean current turbine testing infrastructure. The testing facility is designed to determine the efficacy of various turbines to generate energy in a pollution-free, highly sustainable manner by using the ocean's currents.

With close to \$20 million in funding from the U.S. Department of Energy, the state of Florida and private companies, FAU scientists worked for the last six years to bring this technology to fruition. Given that nothing of this nature has ever been done before, the researchers had to forge their own path through state and federal regulatory agencies and partner with them to establish policies and protocols.

"Environmental, socio-economic and technical factors have all been addressed during the planning process," said Susan Skemp, SNMREC Director. "It has been a fulfilling experience to engage a diverse group of disciplines and agencies to help prepare the first environmental assessment of ocean current energy generation."

Last year, FAU was granted a final Environmental Assessment with a finding of "no significant impact" by the U.S. Department of Interior's Bureau of Ocean Energy Management. This finding – meaning that the proposed turbine testing facility is expected to have little environmental impact on the surrounding area – gave FAU the green light to begin negotiations for a five-year lease to conduct testing activities on the U.S. outer continental shelf.

The project involves the installation of multiple anchored floating "test berths" to evaluate ocean current turbine designs. Each test berth will consist of a buoy anchored to the sea floor

13 miles (22 km) off Fort Lauderdale to measure ocean conditions and allow ocean current turbine prototypes to be deployed from vessels moored in the Gulf Stream. The first technology to be tested will be a research turbine designed and built at FAU that will collect unprecedented drive-train performance and reliability data valuable to commercial developers and regulatory agencies alike.

SNMREC will perform additional surveys on sea life and the sea floor as well as a final sea trial of the buoy before installing the first test berth. FAU's research turbine will be deployed in the Gulf Stream after a series of towed tests.

"This research is of great importance from both the economic and environmental perspectives," said FAU President John Kelly. "It has the potential to allow us to tap into the power of Florida's strong offshore currents as a limitless source of clean, renewable energy. We're very proud that FAU is playing a leadership role in this initiative."



FAU and Partners Go SOLAR



Even for the most environmentally friendly among us, installing solar panels on our homes or businesses simply seems too complicated and costly. Until now, the permitting process alone could take weeks to accomplish and the process varied by city and county.

But now, as part of a two-and-a-half year SunShot Initiative Rooftop Solar Challenge II project from the U.S. Department of Energy, Florida Atlantic University and its partners in the “Go SOLAR-Florida” initiative intend to streamline the process, reduce the cost of permitting and non-hardware installation and increase the number of homes and businesses using solar panels.

The Go SOLAR-Florida team is a partnership of Florida counties, cities, the Florida Solar Energy Center and FAU. Six Florida counties are participating (Alachua, Broward, Miami-Dade, Monroe, Orange and St. Lucie), along with nine Broward County municipalities (Cooper City, Hollywood, Lauderdale Lakes, Lauderhill, Lighthouse Point, Margate, Pembroke Pines, Plantation and Wilton Manors), as well as the

city of Venice in Sarasota County. The affected population totals about four million.

Solar energy has long-term economic and environmental benefits, but the traditional application and permitting process for photovoltaic rooftop solar systems, which varies across Broward’s 31 municipalities, can be a barrier to those interested in retrofitting their homes or businesses for increased energy efficiency. In Broward, the Go SOLAR Rooftop Solar Challenge removes that barrier by offering home and business owners or their contractors a streamlined, online application process with standardized fees and uniform interconnection to utility systems. Increased access to financing is also a key goal of the program.

Dr. Diana Mitsova-Boneva, Ph.D., Associate Professor in the School of Urban and Regional Planning in FAU’s College for Design and Social Inquiry, and her students are reviewing local ordinances and existing best practices to facilitate solar-friendly planning and zoning. “Our program is dedicated to guiding students toward an urban future that is environmentally, economically and humanly beneficial, so the Go SOLAR project is an ideal way for students to get hands-on experience.”

“... the permitting process alone could take weeks to accomplish and the process varied by city and county.”

Emergency Alert Technology for the Profoundly Deaf



Palm Beach County Fire Rescue installs a fire alarm.

Imagine not being able to hear your smoke alarm go off at night while you are sleeping. Scary, right? Well, for almost 16,000 people with profound hearing loss in Palm Beach County, it's a reality. More than 155,000 additional seniors have some degree of hearing loss, making this an issue that alarms Palm Beach County Fire Rescue.

Through a memorandum of understanding with Vision 20/20 – a program supported by the U.S. Department of Homeland Security – Palm Beach County Fire Rescue partnered with the Charles Stewart Mott Center in FAU's College of Education, the Florida Association of the Deaf, the Hearing Association of America, Delray Medical Center, the Deaf Service Center and the Area Agency on Aging to study the effects of emergency alerting devices that are commercially available to the profoundly deaf community.

“The essential question here was ‘what method or methods work best to awaken people who have profound hearing loss in the event of a fire in their home?’” said Valerie Bryan, Ed.D., Charles Stewart Mott Eminent Scholar and Professor of Educational Leadership and Research Methodology. “The Palm Beach County Vision 20/20 committee wanted scientific data on methods for awakening, alerting and informing people with profound or total hearing loss.”

THE RIGHT SYSTEM

Investigators Bryan and Gerri Penney, Ph.D., Community Education Coordinator for Palm Beach County Fire Rescue, looked at the three most common methods of emergency alerting for the deaf community using sound, light and movement. The devices used were those commonly placed in homes to protect against fire. The sound device researched was a 520 HZ square wave with a voice alarm (VA); the light was a Gentex 177 high-intensity candela strobe (ISL); and the movement mechanism was an intermittent bed shaker (IBS) that is placed under the pillow or mattress of the sleeper. The researchers partnered with the Delray Deaf Service Center and the Delray Medical Center Sleep Lab to measure hearing levels and determine whether subjects awoke from Rapid Eye Movement (REM) sleep during activation of the various alerting devices. The quickness of subjects' reaction time to the awakening stimulus was also measured to determine the most successful of the three modalities.

The research showed that the 520 HZ square wave with voice alarm was the weakest performer: only two of the 19 participants awoke. On the other end of the spectrum, when the ISL was placed within three feet of the bed

and the IBS was activated all 19 subjects awoke. This proved that providing a salient alert system increases the likelihood that a profoundly deaf individual will become alert regardless of the level of sleep, including REM sleep.

As a result of the research, Palm Beach County Fire Rescue partnered with the Florida and Palm Beach County Association of the Deaf and the Area Agency on Aging to install 670 smoke alarms for the hearing-impaired senior adults and 57 of the research-recommended ISL/IBS systems in the homes of the profoundly deaf individuals.

“For those who are profoundly deaf, Palm Beach County Fire Rescue Volunteers visit the homes and install both the Lifetone alarm with bed shaker as well as the strobe smoke alarm in order to provide the highest level of awakening capability,” said June McMahon, President of the Florida Association of the Deaf. “Knowing they would be awakened in case of a fire brings incredible peace of mind to these individuals and their loved ones.”



The bedside alarm has a strobelight and movement feature.

‘Sit N Fit’ Chair Yoga to Help Osteoarthritis Patients



Ashtanga yoga, Kundalini yoga and Bikram yoga are all popular ways to increase strength, flexibility and balance and to reduce stress. Two FAU researchers plan to bring a new type of yoga into the mainstream: “Sit N Fit” Chair Yoga.

Ruth McCaffrey, D.N.P., FAAN, Professor of Nursing in the Christine E. Lynn College of Nursing, and Juyoung Park, Ph.D., Assistant Professor in the School of Social Work in FAU’s College for Design and Social Inquiry, received a \$389,000 grant from the National Institutes of Health to study the effect of the “Sit N Fit” Chair Yoga Program on adults 65 years of age and older who have osteoarthritis and are unable to participate in standing exercises.

“Sit N Fit” Chair Yoga was developed by the two researchers in a project originally funded by the Faculty Research Seed Grant Program of the Division of Research.

Although exercise and yoga are known

treatments for reducing pain and improving function in adults with osteoarthritis, up to 50 percent of elders cannot participate in traditional exercises or yoga classes due to poor balance, pain or fear of falling. The “Sit N Fit” Chair Yoga Program is a safe alternative because it is practiced while sitting in a chair or by using a chair for support during gentle yoga exercises.

“This grant provides us with the opportunity to collect evidence about the health outcomes and potential effectiveness of the ‘Sit N Fit’ Chair Yoga Program in elders with osteoarthritis,” said McCaffrey. “Creating an evidence-based program that can be replicated is important, as it has the potential to disseminate safe, effective, low-cost and widely available treatment for this disabling joint disease.”

According to the *American Journal of Managed Care*, osteoarthritis is a leading cause of pain and disability among elders, currently affecting 57 million people in the United States. The *Annals of the Rheumatic Diseases Journal* estimates that

70 percent of people over 70 years of age suffer from osteoarthritis and associated symptoms.

This two-year study measures physiologic outcomes such as pain, balance, gait speed and walking ability as well as psychosocial outcomes such as depression, life satisfaction, fatigue and the ability to participate in social interactions. Its potential impact on public health is high, as the program could help to keep elders in the community for a longer time and thus contribute to a reduction in the cost of healthcare for America’s aging population.

“The interdisciplinary focus of this project in the areas of physical and psychosocial health has the potential for broadening application across the health care professions,” said Park. “If our study supports the efficacy of this approach, we hope the ‘Sit N Fit’ Chair Yoga Program will be adopted wherever older adults congregate to help improve their functional ability.”

Addressing a Nursing-Pipeline Challenge

“There is a crisis brewing in perioperative nursing,” said Rose O. Sherman, Ed.D., R.N., Director of the Nursing Leadership Institute in the Christine E. Lynn College of Nursing. “We tend to look at nursing shortages as a global issue that impacts all specialties equally, but this is not true. Perioperative nurses – those nurses who work with doctors and patients in the operating room – have been concerned for many years about their somewhat unique challenges, but have had difficulty getting the attention of the rest of the nursing profession to tell their story.”



In collaboration with the journal *OR Manager*, Sherman conducted a nationwide study to examine perioperative nurse leader succession planning. While there are workforce shortages ahead in all areas of nursing, the study

findings, which included responses from 256 perioperative directors, indicate that there are unique issues in perioperative nursing because of a lack of effective succession planning.

Specifically, organizations that do not plan for large numbers of baby boomer nurses to retire in the next few years may find themselves vulnerable to increased errors, loss of efficiency and a decline in patient care.

Nurses working in perioperative settings tend to be older and more experienced than the general nursing workforce. Fifty-six percent of perioperative nurse leaders report that they are

already having problems with recruitment and 68 percent anticipate problems within five years, based on the age of their staff. There is great concern about the pipeline for both staff nurses and leaders.

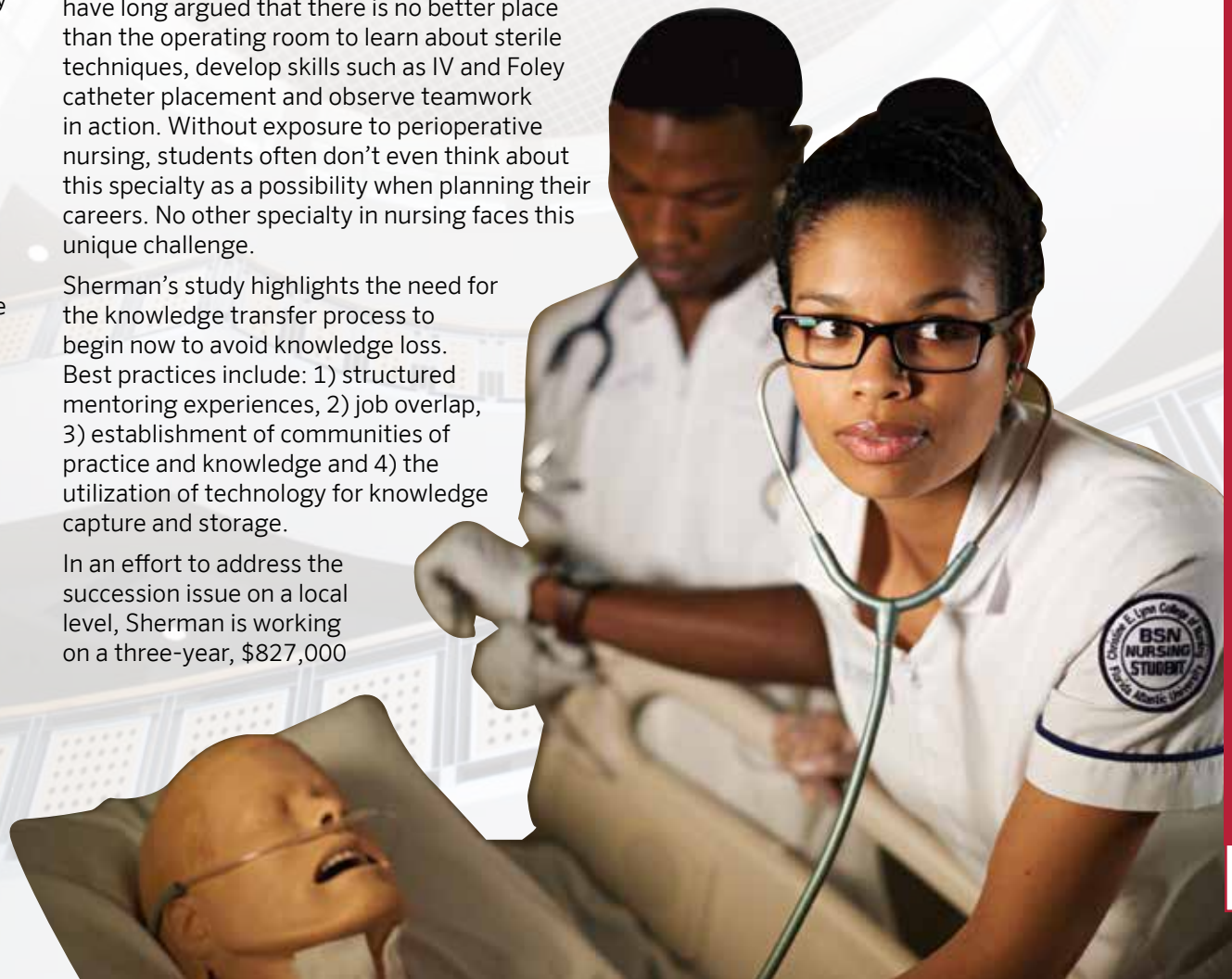
Younger nurses are not even exposed to perioperative nursing because it has been eliminated from the curriculum in most nursing programs in the U.S. Perioperative nurses have long argued that there is no better place than the operating room to learn about sterile techniques, develop skills such as IV and Foley catheter placement and observe teamwork in action. Without exposure to perioperative nursing, students often don't even think about this specialty as a possibility when planning their careers. No other specialty in nursing faces this unique challenge.

Sherman's study highlights the need for the knowledge transfer process to begin now to avoid knowledge loss. Best practices include: 1) structured mentoring experiences, 2) job overlap, 3) establishment of communities of practice and knowledge and 4) the utilization of technology for knowledge capture and storage.

In an effort to address the succession issue on a local level, Sherman is working on a three-year, \$827,000

grant from the Health Resources and Services Administration to expand and enhance the current Nursing Administration master's degree program offered by the College of Nursing to prepare emerging nurse leaders.

“Left unresolved, the pending recruitment challenges could lead to access and safety issues for patients and have economic implications for healthcare organizations,” said Sherman.



FAU Welcomes One of America's Top Malaria Scientists

According to the World Health Organization, malaria is the fifth leading cause of death by infectious disease worldwide, killing over a million people per year, most of them children under the age of five and pregnant women. The disease ravages sub-Saharan Africa and other tropical and sub-tropical areas in Asia and Latin America – in 2010, 216 million people were treated for the disease. The Center for Disease Control and

Andrew V. Oleinikov, Ph.D., Associate Professor of Biomedical Science in the Charles E. Schmidt College of Medicine, is working on just such a vaccine.

“Because we know people build immunity to malaria – virtually all adults in malaria-affected communities experienced malaria several times as children – we know a vaccine is possible,” said Oleinikov. “We’re hoping that our research on the pregnancy malaria vaccine could drastically reduce the dangers these women and their fetuses face during pregnancy and help to develop a vaccine for young children and travelers to stop the spread of the infection.”

Oleinikov’s research, funded by the National Institute of Allergy and Infectious Diseases, the Bill and Melinda Gates Foundation

and Grand Challenges in Global Health, focuses on malaria parasite biology and virulence factors. Primary research objectives include developing a pregnancy malaria vaccine for pre-clinical studies, understanding immunity to severe malaria in children and developing various new technologies for malaria research.

Oleinikov comes to FAU from Seattle BioMed, where he headed a malaria research laboratory. With nearly 100 of its scientists focused solely on malaria, Seattle BioMed is one of the nation’s leaders in research on the disease. After nine years there, Oleinikov decided that he was ready to return to an academic setting and welcomed the opportunity to continue his work at FAU.

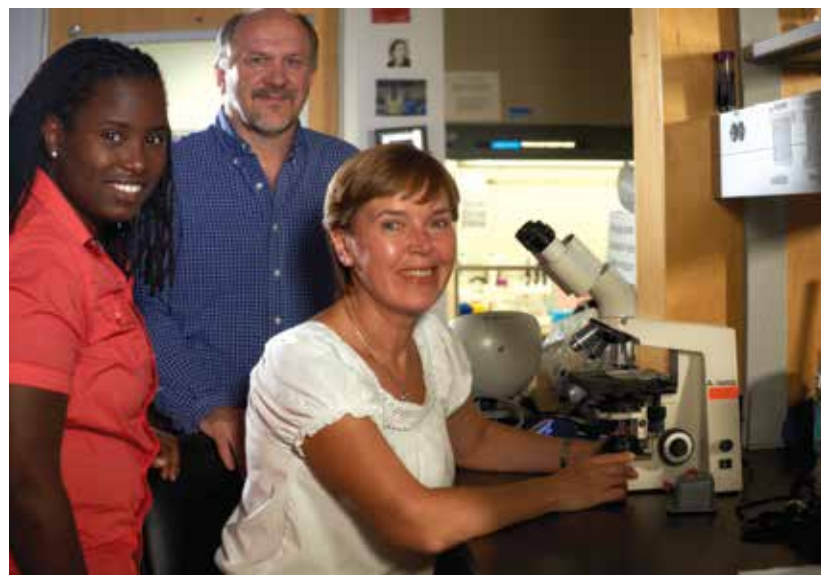
“... we know a vaccine is possible.”

— Dr. Andrew V. Oleinikov Ph.D.,
Associate Professor of Biomedical Science
Charles E. Schmidt College of Medicine

“Dr. Oleinikov is a tremendous addition to our team. His research on malaria shows amazing promise,” said John W. Newcomer, M.D., Executive Vice Dean in the Charles E. Schmidt College of Medicine and Interim Vice President for Research at FAU. “We are honored to welcome him to the faculty.”

Although he is hopeful and determined, Oleinikov believes the vaccine is still a long way off. Once a potential vaccine is identified, politics, economics and societal norms and beliefs will play roles in how it would eventually roll out. Yet he is not deterred.

“My goal is to reduce the transmission rate to break the cycle,” said Oleinikov. “That’s how we’ll make a difference for the communities in which malaria is endemic.”



From the left: Tonya Aaron, Technician, Dr. Oleinikov and Irina Oleinikov, Lab Manager, are searching for a vaccine for malaria.

Prevention estimates that the economic impact of malaria on governments, communities and families is \$12 billion annually, even without considering lost economic growth.

While treatment exists if the disease is caught early enough and bedding nets sprayed with insecticide can curtail its spread, the magic bullet would be an efficient and cost-effective vaccine.



Technology Development

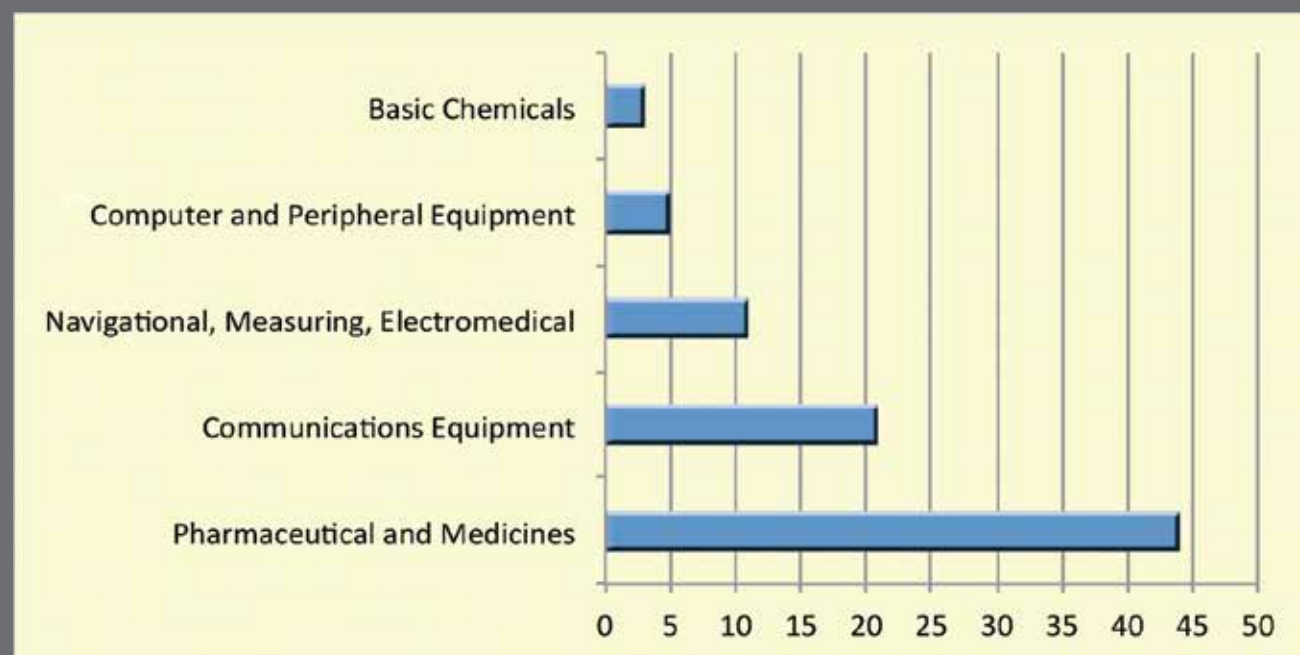
The Office of Technology Development (OTD) aims to make the products of FAU research more accessible outside the University and ensure that society benefits from them by fostering their swift, professional and effective development and commercialization.

Protecting intellectual property is the first step for OTD. In 2013, seven patents were issued for innovations developed at FAU and more are pending. One of the patents is for a method of displaying large amounts of data in an easy-to-read graphic format, created by Scott Kelso, Ph.D., Glenwood and Martha Creech Chair in Science and Professor of Complex Systems and Brain Sciences, and Emmanuelle Tognoli, Ph.D., Associate Research Professor. (A fuller description of their work can be found on page 20 of this report.) While this technology emerged from brain imaging research, it could be utilized in other areas including big data analysis in climate change, sea temperature monitoring and monitoring structural changes in bridge or building structures. The next step for OTD is to find commercial partners for this promising technology.

In the following pages, you'll read about other OTD efforts to bring FAU research to market, including the expansion of ventures such as INTERACT, a quality improvement program designed to improve early identification, assessment, documentation

TECHNOLOGY DEVELOPMENT INCOME (FY 2013)

\$130,273	License Income
\$450,000	License Related Sponsored Research Income
\$580,273	TOTAL License Income + Related Sponsored Research Income



and communication about changes in the status of residents in skilled nursing facilities. OTD also worked with Ken Dawson-Scully, Ph.D., to create a startup company called Eco Neurologics based upon licensed FAU intellectual property and focused on the development of novel drugs for epilepsy, migraine and brain injury. These are just a few of many exciting initiatives that are taking place at FAU.

OTD is working to ensure that FAU research results are made widely available, serving as a bridge from laboratory to industry to make certain that promising new technologies are translated into products and services that benefit our society and the world.

Research Park at FAU Receives Top Marks

The Research Park at Florida Atlantic University received a Silver Excellence in Economic Development Award in the category of “Partnerships with Educational Institutions for Communities with Populations Greater than 500,000” from the International Economic Development Council (IEDC).

“The Excellence in Economic Development Awards recognize the Research Park at Florida Atlantic University as being one of the leading organizations in the industry for innovation, creativity and successful strategies,” said Paul Krutko, IEDC Chair. “The Research Park uses creative solutions and inventive ideas and offers other regions a wonderful example to learn and benefit from.”

The award recognizes successes such as increasing research capacity and collaboration between FAU and the Park’s tenant companies; increasing the quality of students’ education through internships and visits to tenant companies; creating jobs for graduates; and increasing students’ ability to create their own companies as an outgrowth of their involvement with tenant companies.

In addition to enhancing its partnership with FAU, the Research Park continues to grow. Its Technology Business Incubator (TBI) has been expanded and several TBI start-ups have achieved notable technological advances, secured significant monetary investments and recruited prominent advisory board members.

TBI renewed its focus on technology companies and instituted a new Council of Advisors model to systematically mentor companies through the growth process.

With an already impressive roster of tenants, including Modernizing Medicine – which

nationwide, is among the Park’s newer tenants, along with Life of Purpose, a treatment facility that provides a research-based solution for young adults who have had their academic careers disrupted by substance abuse. People’s Trust Insurance Company opened its corporate headquarters in the Deerfield Beach building,



The Technology Business Incubator dedicated its expansion to the late C. Scott Ellington.

is listed by *Forbes Magazine* as one of the most promising companies in America – and MobileHelp, the market leader in mobile-personal emergency response system technology, the Research Park continues to welcome new companies. Electronic Payment Systems-Global, the largest provider of automobile billings and collection services for hospitals, physicians and EMS providers

with plans to create 200 new jobs to add to its existing workforce.

“The Research Park’s Board of Directors set a clear goal for it to become the preeminent place for innovation and R&D in Florida,” said Andrew Duffell, President and CEO of the Research Park. “We are working hard to create the right environment to achieve that goal.”

INTERACT Helping to Reduce Unnecessary Hospitalizations of Nursing Home Residents

Elderly residents living in skilled nursing facilities (SNF) are regularly transferred to hospitals for acute care – often because of a lack of appropriate staff training.

Interventions to Reduce Acute Care Transfers (INTERACT) is a quality improvement program designed to improve early identification, assessment, documentation and communication about changes in the health status of residents in skilled nursing facilities. Designed by Joseph Ouslander, M.D., Professor and Senior Associate Dean for Geriatric Programs in the Charles E. Schmidt College of Medicine, and Ruth Tappen, Ed.D., R.N., FAAN, Christine E. Lynn Eminent Scholar and Professor in the Christine E. Lynn College of Nursing, INTERACT focuses on reducing the frequency of potentially avoidable transfers to the hospital. Such transfers can result in complications of the patients' conditions and billions of dollars in unnecessary expenditures.

“Through the guidance of industry professionals using the INTERACT program and national experts, we have taken the INTERACT initiative from a toolkit concept to a complete and comprehensive quality improvement program,” said Ouslander, who has led an interdisciplinary team in developing the program. “The INTERACT project team has delivered improvements specifically designed to enable SNFs to address and prevent 30-day hospital readmissions more proactively than ever before.”

Commercial interest in INTERACT has been growing since 2010. Licenses have been signed with a wide range of companies, including Brookdale Senior Living, the nation's largest provider of long term care communities; the

Electronic Health Record software vendor HealthMEDX, LLC; an innovative start-up company called LoopBack Analytics, which provides focused metric-based analysis of healthcare systems; and Advanced Answers on Demand, Inc., the nation's leading software provider for continuing care retirement

communities, providing an integrated tiered approach based on residents' needs, ranging from independent condo-like housing to skilled nursing facilities. In all of these settings, INTERACT is providing a method to optimize care for patients while reducing unnecessary and expensive hospitalizations.



The screenshot shows the INTERACT website with a red navigation bar. The main heading is 'Interventions to Reduce Acute Care Transfers'. Below the navigation bar, there is a section titled 'What is INTERACT?' which describes the program as a quality improvement initiative. To the right of this section is a banner for 'INTERACT NIH Evaluation Participants' with a link to login. Below the text is a photograph of three people in a library setting. Further down, there is a section titled 'What is the purpose of INTERACT?' which explains the program's goals. To the right of this is an 'Announcements' section with several bullet points about new tools and licenses. At the bottom right is a section titled 'Publications Related to INTERACT'.

Commercial interest in INTERACT continues to grow.



Collection an Arsenal of Hope Against Disease

A central argument in favor of environmental conservation is that we often don't know what we've lost until it's gone. In the context of drug discovery from natural products, the case is even more compelling: If species disappear in the destruction of rain forest or ocean habitats, for example, we may lose life-saving treatments without ever knowing it.

By amassing a collection of thousands of marine invertebrates, microbes and fungal isolates over the course of four decades, researchers at FAU's Harbor Branch Oceanographic Institute (HBOI) have worked to ensure against such loss. The more the scientists look for answers, the more they find. One specimen, a deep-water sponge called *Asteropus*, yields a natural product that has antimicrobial activity against the human pathogen methicillin-resistant *Staphylococcus aureus*, commonly known as MRSA, as reported in a study published by HBOI researchers in *Journal of Natural Products*. The work was funded by the National Institutes of Health (NIH) as part of the Molecular Roadmap project.

The NIH is supporting other looks into the HBOI library as well. In 2013, Associate Research Professor Esther Guzmán, Ph.D., and Research Professor Amy Wright, Ph.D., received a grant to find compounds targeting the receptor for advanced glycation end products, an important regulator of inflammatory, stress and cell survival pathways whose expression in pancreatic cancer cells appears to contribute to the aggressiveness of the disease. This new work complements Wright's ongoing NIH grant-funded effort to find novel compounds with activity against pancreatic cancer.

"To date we have identified more than 100 marine natural products with cancer-fighting properties," said Wright. "Our research is defining which ones can be used as medicines or as tools to better understand the molecular basis of disease."

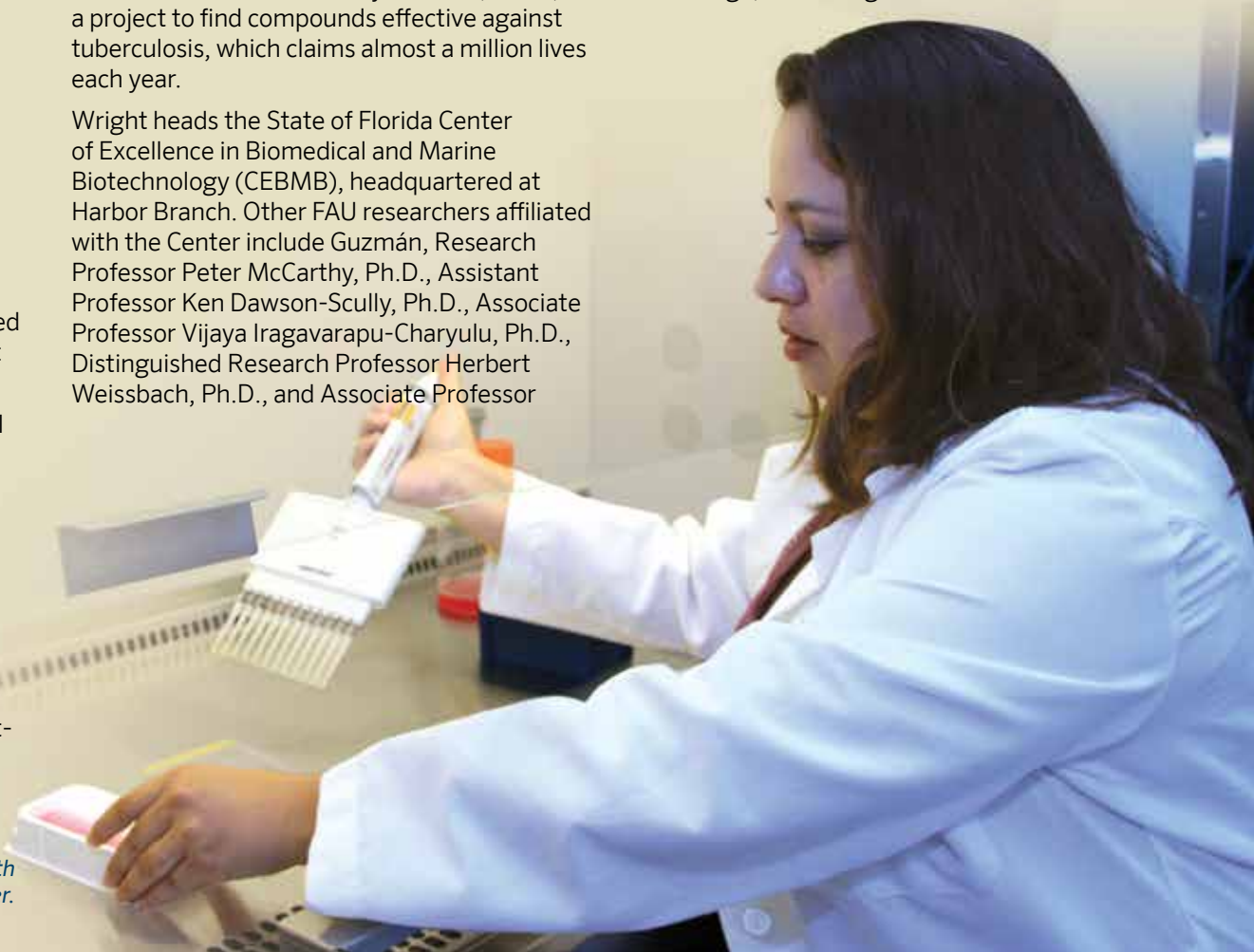
Wright also received a grant to collaborate with University of Central Florida (UCF) Professor Debopam Chakrabarti, Ph.D., on developing compounds from invertebrates that can be used to treat malaria, and she is a co-investigator with UCF's Assistant Professor Kyle Rohde, Ph.D., on a project to find compounds effective against tuberculosis, which claims almost a million lives each year.

Wright heads the State of Florida Center of Excellence in Biomedical and Marine Biotechnology (CEBMB), headquartered at Harbor Branch. Other FAU researchers affiliated with the Center include Guzmán, Research Professor Peter McCarthy, Ph.D., Assistant Professor Ken Dawson-Scully, Ph.D., Associate Professor Vijaya Iragavarapu-Charyulu, Ph.D., Distinguished Research Professor Herbert Weissbach, Ph.D., and Associate Professor

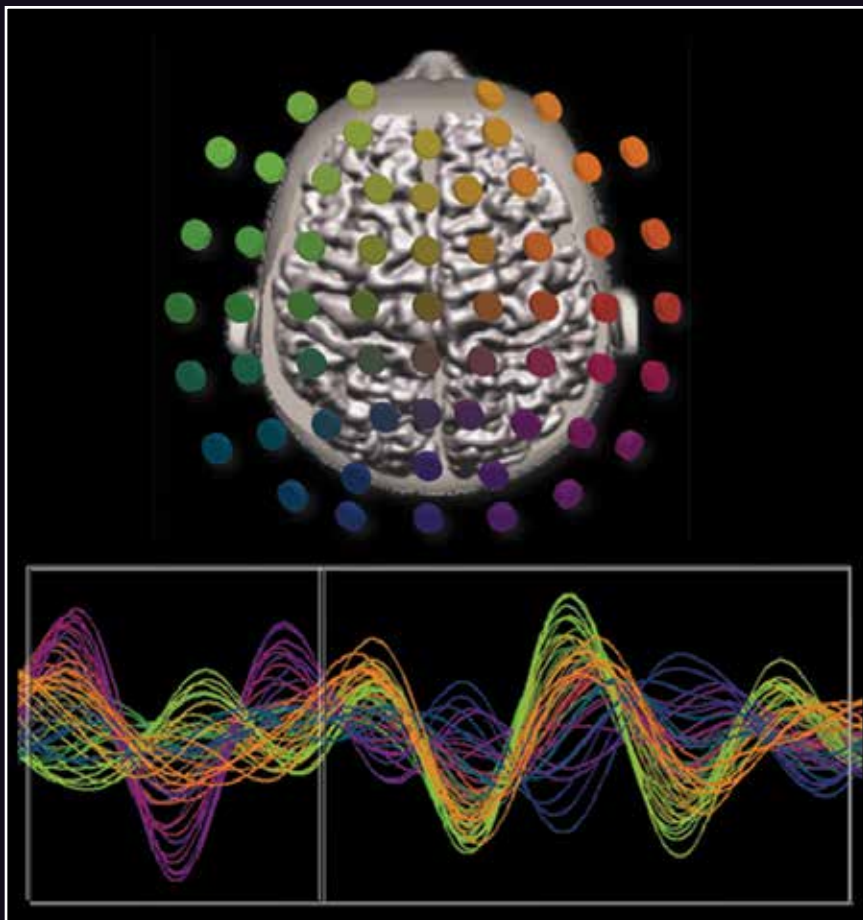
Lyndon West, Ph.D. The CEBMB brings together groups with established expertise in marine biotechnology, functional genomics and bioinformatics to discover and develop new medicines and transfer new technologies related to marine drug discovery to the industrial sector.

"The Harbor Branch collection is one distinguishing feature of the Center, and the more we can share these rare organisms, the greater the opportunity that life-saving treatments will emerge," said Wright.

Dr. Guzmán works to find compounds with the potential to fight pancreatic cancer.



Patent for 5D Visualization Method to Understand Big Data



What looks like a piece of art – a snapshot of hundreds of beautifully intertwined wavy lines on a computer screen – is actually a solution to a problem that has plagued researchers for years.

With their newly patented “system and method for analysis of spatio-temporal data”

five dimensional (5D) colorimetric technique, neuroscientists Emmanuelle Tognoli, Ph.D., and Scott Kelso, Ph.D., both researchers in the Center for Complex Systems and Brain Sciences at FAU, have created a tool that allows analysts to visualize large amounts of spatiotemporal data (variables in both space and time) in a simple, easy-to-read graph.

Until now, spatiotemporal problems have been analyzed either from a spatial perspective (for instance, a static map of gas prices in July 2013) or from a temporal one (evolution of gas prices in one county or the national average) but not simultaneously from both perspectives. Without knowledge of both space and time in such studies,

analysts face a conundrum. Because important information resides in the interdependence between the two, neither view alone provides the full picture. For instance, gas prices may increase at different times in different regions of the U.S. (and for different reasons). Tognoli and Kelso note that such complexity is often crucial, yet difficult to grasp.

The 5D colorimetric technique is able to portray variables that encompass both space and time – for instance, foreclosure rates in different states, epidemiological data tracking a virus or temperature records. The technique has already been used to examine climatic records of sea surface temperature at 65,000 points around the world over a period of 28 years, and it provided scientists with a clear understanding of when and where temperature fluctuations have occurred.

“A considerable number of problems in our society are spatiotemporal ones,” said Jeffrey Anderson, Ph.D., Associate Vice President for Research and Director of Technology Development at FAU. “With this new tool, we are much better equipped to tackle big data, to see the big picture.”

While the 5D colorimetric technique will work for virtually any type of big data, Tognoli and Kelso were simply looking for an easy way to display the enormous amount of data from their research on brain coordination when they designed this tool.

“As President Obama said when he announced the BRAIN initiative, we need to understand the dynamic brain in action. Combining this new method with conceptual and theoretical tools in real experiments will help elucidate the basic coordination dynamics of the brain,” said Kelso.

It’s wonderful when a solution that’s been developed to deal with one specific problem turns out to have broad applicability,” said FAU President John Kelly. “The 5D colorimetric technique will be put to good use in many fields, allowing researchers to get a more comprehensive understanding of the data they’re studying.”

FAU Neuroscientist Searching for Treatment for Epilepsy, Migraines and Stroke

What can fruit flies teach us about minimizing stroke damage? A lot, it seems. Turns out, fruit flies can withstand “zero oxygen for many

hours with absolutely no detriment to any neural function and no damage to the brain,” says Ken Dawson-Scully, Ph.D., Associate Professor of Biological Sciences.

Dawson-Scully discovered that the key to the flies’ ability to spend long periods without oxygen is a biochemical process known as the protein kinase G (PKG) pathway, which triggers the onset of a protective, coma-like state.

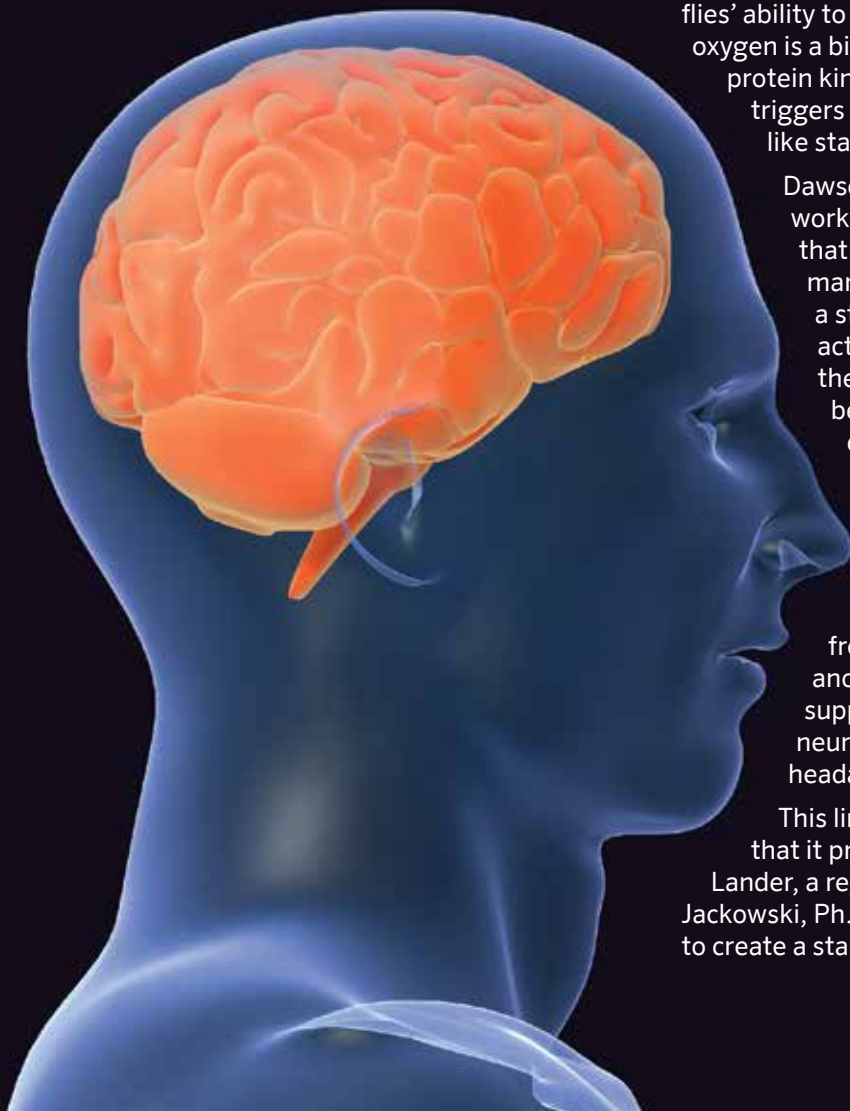
Dawson-Scully and his team have been working on identifying compounds that can activate this pathway in mammals. In a person who suffers a stroke, for example, a PKG activator could potentially double the amount of time the person has before experiencing extreme brain damage, giving doctors more time to dissolve a clot.

Dawson-Scully foresees possible drug therapies that would help not only stroke patients, but people suffering from any condition associated with anoxia (lack of oxygen in the blood supply), including spinal cord injury, neurodegenerative disease, dizziness, headaches and migraines.

This line of research is so promising that it prompted entrepreneurs Ferris H. Lander, a registered patent agent, and George Jackowski, Ph.D., a cardiovascular biochemist, to create a start-up company called Eco

Neurologics, Inc., based on FAU’s patents. Through the licensing agreement with Eco Neurologics, Inc., Dawson-Scully received a \$353,000 grant to support his laboratory at FAU and expand his patent portfolio. Dawson-Scully is serving as the lead scientific consultant to Eco Neurologics, Inc.

“We are at a critical stage in developing therapies for these devastating diseases, and this support initiates a strong relationship between Eco Neurologics, Inc., and FAU,” said Dawson-Scully. “This corporate relationship establishes the infrastructure for the company’s success and aligns FAU with the neuroscience focus of our neighboring institutes, Scripps Research Institute Florida and the Max Planck Florida Institute for Neuroscience.”



FAU Partners with Global Pharmaceutical Company

Drug discovery is a long and painstaking process. It can take attempts with thousands of compounds to find *one* that *might* have some potential for disease treatment. Access to the quantity of compounds necessary to get one “hit” — active compounds with medicinal potential — and research collaborations.” is a constant challenge faced by the big pharmaceutical companies.

So in a move wholly atypical for the industry, pharmaceutical giant Eli Lilly launched a novel program called Open Innovation

Drug Discovery, aimed at collaborating with universities and other research facilities. Through this program, participating members agree to submit proprietary compounds for screening in Lilly’s state-of-the-art laboratories. If the compounds prove to have commercialization potential, Lilly will have the right of first engagement while the partner maintains intellectual property (IP) rights to the compounds. The goal of the Open Innovation Drug Discovery program is to help find and develop new medicines.

Salvatore Lepore, Ph.D., Professor of Chemistry at FAU’s Charles E. Schmidt College of Science and a former Lilly postdoctoral research fellow, learned about the program through a former colleague at Lilly. He instantly recognized the opportunities it could offer.

“This unique program is a win for both Lilly and its university partners,” said Lepore. “Participating FAU researchers acquire expensive, publication-quality biological data while Lilly gains access to a diversity of compounds that could lead to “hits.”

As part of the agreement, FAU researchers, including Lepore and his colleagues in the Department of Chemistry and Biochemistry, Lyndon West, Ph.D., and Stephane Roche, Ph.D., will submit compounds to Lilly to determine their activity in a variety of biological assays. If these compounds prove interesting, Lilly will move forward with their development as potential drugs and, in some cases, include the original contributor of the compound in the research and development process. Lilly’s research team provides all evaluation data free of charge while FAU retains IP rights to the compounds.

“We realize that only an incredibly small number of compounds ever make it through the screening process to eventually become drugs. But the key to finding a starting point in a drug discovery program is to screen numerous compounds with diverse chemical structures. The benefit to FAU is that Lilly is going to analyze our compounds and send us high-quality biological testing data that otherwise would be very difficult to obtain and we’ll be able to publish those data in scholarly journals, making them available to scientists everywhere,” said Lepore. “If one of our compounds proves to have great potential, Lilly will likely partner with us, as the lab that produced it is the optimal source for more of the compound for extended studies.”

The partnership with Eli Lilly provides FAU researchers with publication-quality biological data.

FAU Students Turn Smartphones Into Lifesaving Devices

Smartphones may soon turn into lifesaving devices if the student winners of the 2013 FAU Business Plan Competition have their say.

Stadson Technology – a company that got its start in an FAU classroom during a groundbreaking interdisciplinary course titled “Android App Design and Project Management” – won first place in the student category of the competition, receiving \$15,000 in cash and \$40,000 in services for its app to turn students’ smartphones into emergency-warning systems.

“The app is like

a high-tech flare with a brain,” said Mathew Hudson, an FAU graduate and President of Stadson Technology. “In an emergency, the phone would help police pinpoint a student or faculty member’s location and send a packet of information to help assist responders. It’s an instant link that every school deserves.” The company’s marketing plan targets elementary, middle and high schools as well as colleges and universities.

The app, called HelpN, bridges the gap between the user and the emergency service provider. HelpN is a patent-pending technology that can instantly access specific functionalities on a smartphone and reduce the time to alert authorities.

The app has been developed for download for iPhone and Android.

The Boca Raton-based company, whose executive team is made up of six FAU students and recent graduates, got its start in the Technology Business Incubator in the Research Park at FAU. The company plans on making money by selling its app to schools.

Stadson’s executive team first came together in an

Android App class co-offered by the College of Engineering and Computer Science, the College of Business and the Dorothy F. Schmidt College of Arts and Letters. Under the tutelage of four instructors – Ravi Shankar, Ph.D., M.B.A., Professor in the Department of Computer and Electrical Engineering and Computer Science in the College of Engineering and Computer Science; Francis McAfee, M.F.A., Associate Professor in the School of Communication and Multimedia Studies in the Dorothy F. Schmidt College of Arts and Letters; Michael Harris, Ph.D., Chair of the Department of Anthropology in the same college; and Jeanne McConnell, M.B.A., Instructor in the College of Business – students were given practical experience as members of cross-disciplinary teams that were able to create viable products using Android software. The experiential learning course was designed to expose students to the entire product and business development cycle for a mobile application.

“Students are getting invaluable experience in working with other team members in a microcosm of the real world and its challenges,” said Shankar. “We have been working across disciplines in developing mobile applications in different courses since Fall 2009 and have created 60 other marketable applications, working with 600 students from the high school to graduate levels.”

Winning the FAU Business Plan Competition was a good start, but Hudson and his 33-member team have even loftier aspirations.

“This is my passion and my heart – to be able to save people’s lives with technology,” Hudson said. “It was great to win, but we are just getting started and will continue to keep innovating.”

The executive team of Stadson Technology is comprised of FAU students and recent graduates.



Scholarship and Creative Accomplishments

In addition to sponsored research programs and technology development, an extraordinary array of scholarly and creative work is conducted at FAU. While scholarly endeavors do not always bring in large amounts of funding from outside sources, they are vitally important to a university's mission. Faculty and students at FAU have studied and provided solutions for real-world problems ranging from political campaign spending to repairing records damaged by Hurricane Sandy. Our faculty members were recognized for excellence in dozens of fields – two featured in these pages received awards for writing and teaching. And a discovery of a monkey species by a team that included an FAU anthropologist was named to the Top 10 New Species List for 2013.

FAU's recently implemented Distinction through Discovery initiative allows undergraduates to focus on a wide variety of research endeavors, ranging from building a race car to studying ants with one of the top researchers in the field.

The stories on the following pages provide a sampling of the outstanding work that is being carried out across the University.



Monkey Discovered by FAU Researcher Makes Top 10 New Species List for 2013

Along with an amazing glow-in-the-dark cockroach, a harp-shaped carnivorous sponge and a tiny frog that is the smallest vertebrate on Earth, the lesula monkey is one of the newly discovered species to make the 2013 Top 10 New Species list compiled by the International Institute for Species Exploration at Arizona State University.

Kate Detwiler, Ph.D., Assistant Professor of Anthropology, was part of the team that discovered the monkey, *Cercopithecus lomamiensis*, while working with John Hart, Ph.D., Scientific Director of the Lukuru Foundation, in the Lomami Basin of the Democratic Republic of Congo.

The lesula is an Old World monkey well known to locals but newly known to science. This is just the second new species of monkey discovered in Africa over the past 28 years. Scientists first saw the monkey as a captive juvenile in 2007. Detwiler describes the shy lesula as having human-like eyes. More easily heard than seen, the monkeys perform a booming dawn chorus. Adult males have a large, bare patch of skin on the buttocks, testicles and perineum that is colored a brilliant blue. Although the forests where the monkeys live are remote, the species is hunted for bush meat, making its status vulnerable.

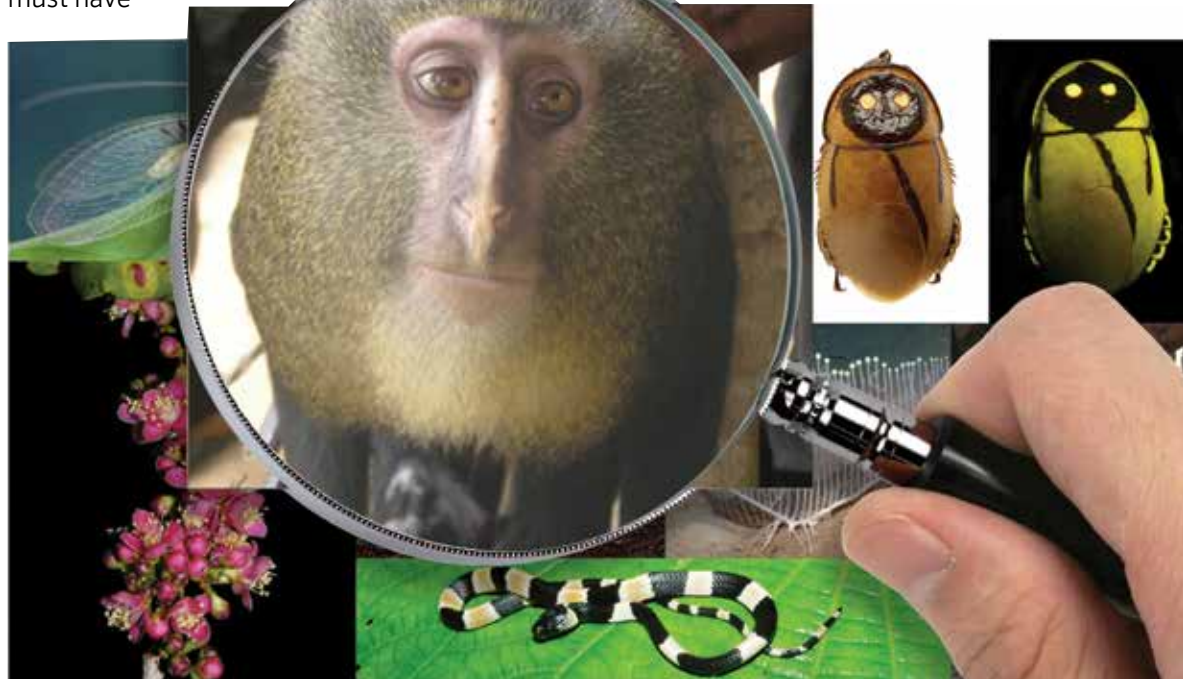
A global committee of taxonomists – scientists responsible for species exploration and classification – selected the top 10 from more than 140 nominated species out of an estimated 18,000 species named last year. Rounding out the year's Top 10 list is a snail-eating false coral snake, flowering bushes from a disappearing forest, a green lacewing, a hangingfly fossil, a

tiny violet and a black staining fungus.

To be eligible, species must have been described in compliance with the appropriate code of nomenclature, whether botanical, zoological or microbiological, and must have

geographic and natural history diversity.

The Top 10 New Species list is released each year on or about the anniversary of Carolus Linnaeus' birth on May 23. Linnaeus is the "Father of Taxonomy," and his work in the mid-18th century was the beginning



In 2013, the lesula monkey was among the top 10 species discovered.

been officially named during calendar year 2012. Committee members were free to use any criteria they wished, keeping in mind that the purpose of the Top 10 is to draw attention to biodiversity and the science and institutions engaged in its exploration. They also were encouraged to pay attention to taxonomic,

point for the modern system of naming and classifying plants and animals.

Discovery of the new species of monkey created such excitement that the Smithsonian Museum highlighted the find in its newsletter and put a banner on display showing a photo of the lesula.

Creative Writing Associate Professor Receives Prestigious Literary Awards



Professor Bucak won two prestigious awards for her writing.

“The news reporters first said they didn’t know what caused the explosion, but my mother, who taught English in Turkey for nine years, said, ‘Of course it was the gas. It was always the gas.’ She was right, and that line made it into the story,” said Ayse Papatya Bucak, Associate Professor of Creative Writing in FAU’s Dorothy F. Schmidt College of Arts and Letters, about the real life news story that inspired her to write “The History of Girls.”

Bucak was awarded the prestigious 2013 PEN/O. Henry Prize for her short story about a group of girls buried under rubble in the dark. Considered by *The Atlantic Monthly* to be “the nation’s most prestigious award for short fiction,” the PEN/O. Henry Prize recognizes 20 of the best short stories of the year, selected from thousands published in literary magazines in the U.S. and Canada. The winning stories are featured in an annual anthology by Anchor Books.

“The History of Girls,” first published in the journal *Witness*, is a moving portrayal of a group of Turkish girls trapped in the rubble after a gas explosion at their school. Connecting their struggle to make sense of this misfortune to wider universal themes of girls’ and women’s rights in patriarchal societies, Bucak creates powerful voices of solidarity in the face of tragedy, woven together through the power of storytelling.

“The History of Girls” is part of a collection of stories Bucak is writing that all have something to do with her “version of Turkishness.”

“I was born in Turkey but raised in the U.S., have a Turkish father but an American mother, and a Turkish name but not the Turkish language,” said Bucak. “As a result, I’m only comfortable writing stories that reflect Turkey the way I experience it, which is largely through an American lens, through the newspaper, through literature and folk tales and through my father.”

In addition to the PEN/O. Henry Prize, Bucak won the Pushcart Prize, an award given annually for the best poetry, short fiction and essays published in the small press, for her short story, “Iconography,” which is about a Turkish girl at an American university who goes on a hunger strike.

“I’m particularly happy to win a Pushcart, as the series supports small and independent presses, which are really the life-blood of short story writers,” said Bucak.

“All of us in English are extremely proud of Papatya,” said Eric Bertlatsky, Ph.D., Chair of the Department of English. “Her winning of these two prestigious awards brings much-deserved attention to her work, and to our M.F.A. program in Creative Writing.”

The Science, Engineering, Technology and Mathematics Adventure: Teaching the Teachers

Science, technology, engineering and mathematics (STEM) education has become a major focus of public education in the U.S. in recent years. Because of a perceived decline in STEM education – which leads to decreased competitiveness in the global arena – the federal government and agencies such as the National Science Foundation are placing major emphasis on improving education in these fields.

So where do you start to improve STEM education? Turns out, it has to happen long before the students enter the classroom. Teachers themselves have to be taught how to teach STEM subjects. For more than two decades, David Devraj Kumar, Ed.D., Professor of Science Education in the College of Education, has been doing just that.

Kumar makes science meaningful for future teachers by integrating science with technology, mathematics, engineering and language arts. He is a champion of developing interactive computer tools for problem-based, real-world learning in abstract subjects such as nanotechnology aimed at developing problem-solving skills in school children. He has successfully directed a project with funding from the E.M. Kauffman Foundation to develop and field test a series of web-assisted, integrated STEM problem-based learning modules in nanotechnology.

Kumar was recognized with a STEM-Champion Award during STEM Expo 2013, presented by the International STEM Education Association. The STEM-Champion Awards set the standard of excellence in the promotion of integrated STEM

education. To be named a STEM-Champion Award recipient is to join an elite group of education innovators.

“He has achieved sustained pioneering advances in pursuit of the rational adoption

In addition to the STEM-Champion Award, Kumar has received numerous other honors, including the Sir Ron Nyholm Education Prize (Medal and Lectureship) of the Royal Society of Chemistry. He has been invited to present



Dr. Kumar receives the STEM Champion Award.

of new pedagogic approaches that will lead to educational integration of the hitherto-divided fields of science, technology, engineering and mathematics,” said John Baglin, Ph.D., Physicist Emeritus at the IBM Almaden Research Center and Vice President of the International Council for Materials Education. “The STEM adventure will thrive in the hands of enthusiasts and visionaries like Dr. Kumar.”

“I am humbled to receive this recognition by peers in the STEM community,” said Kumar.

highly regarded endowed lectures and has been elected to membership in several scientific honor societies. Kumar is Past Interim President of The American Institute of Chemists, and he serves as Editor-in-Chief of the refereed scientific journal The Chemist.

“Dr. Kumar has done so much over the years to raise the profile of the University in the national and international arena, and we are proud of his accomplishments,” said FAU Associate Provost Anthony Abbate.

STEM Education: A Top Priority



FAU and community leaders gather to discuss STEM education.

The College of Engineering and Computer Science and Broward County Public Schools (BCPS) Innovative Programs Office co-sponsored a “Growing STEM” summit that brought together leaders in government, industry and education to discuss how to advance the agenda for change in STEM education, policy and workforce development.

“FAU is very pleased to partner with Broward County Public Schools to develop and expand STEM education,” said Mohammad Ilyas, Ph.D., P.E., Dean of FAU’s College of Engineering and Computer Science. “All of our attendees were inspired to consider how they can be involved in helping to set new standards of achievement in STEM-education initiatives.”

The “Growing STEM” program is part of the STEM initiative in the Magnet Schools Assistance Program grant awarded to BCPS by the U.S. Department of Education. The purpose of the grant is to help increase student achievement and create interest in STEM

disciplines at the post-secondary level, as well as in a variety of STEM-related careers. The college was chosen to assist BCPS to design a curriculum suited for middle school students. FAU faculty, directed by Ali Zilouchian, Ph.D., P.E., Associate Dean for Academic Affairs and a Professor in the college, hosted the 2012 STEM Summer Teachers Academy, the 2012 and 2013 STEM Summer Student Academies and the 2013 Teacher Workshop to help implement the new curriculum in six Growing STEM Magnet middle schools – Apollo, Lauderhill, Margate, McNicol, Parkway and Silver Lakes.

STUDENTS ADAPT AND INNOVATE

The STEM Teacher Academy and Workshop provide teachers with innovative instructional strategies that integrate key STEM foundational principles and processes to promote rigor through innovative thinking in order to create meaningful project-based learning experiences for students.

The STEM Student Academies were designed to provide challenging experiences for students from participating schools. Students worked on six engineering projects that introduced them to civil, mechanical, electro-mechanical, electronics, solar energy and robotic engineering concepts. Projects included designing a solar boat, vehicle brakes, electric motors, a robotic arm, bridges and a model of a hurricane-resistant house.

The projects emphasized solving real-world problems and challenged students to work collaboratively, reach consensus within time and material constraints, present their findings and explain their decision-making processes.

Students completed the projects while working at FAU’s Davie campus, and they toured FAU’s SeaTech ocean engineering research center in Dania Beach. Each project created opportunities to inspire students to reach beyond their existing knowledge, make discoveries through critical thinking and adapt through innovation.

Student Ambassadors Leading Undergraduate Research and Inquiry

“My passion for researching civilization and society, systems and cultures is my ultimate hobby,” said FAU senior Alexander Bruno, Philosophy major and peer mentor.

And when academic research is one’s hobby, it’s a natural fit for Bruno to want to mentor his fellow students.

He, along with nine other motivated undergraduate and graduate students, jumped at the opportunity to become part of FAU’s first Peer Mentor program, organized through the Office of Undergraduate Research and Inquiry (OURI). As peer mentors, these students serve as ambassadors for the University’s quality enhancement plan, Distinction through Discovery. They work as a team to develop awareness of undergraduate research and inquiry at FAU by presenting at orientations and other University and community events. They also host workshops for undergraduate students, teaching them how to get involved in research and inquiry, create effective posters and deliver “elevator pitches” describing one’s research.

The peer mentors, who are active at FAU’s Boca Raton, Davie and Jupiter campuses – also hold office hours to help students who need one-on-one advice about getting started in research.

“Sometimes the students have an idea that they might want to do something research-oriented, but they don’t know what or even how to ask their professors for guidance,” said Arely Baugh, a graduate student peer mentor and Women’s Studies major. “It’s fun for me to help them figure out what they want to do. Plus, in the process I always end up learning something new, too. We all benefit and I love that!”

As peer mentors, the students are actively involved in the Council of Scholarship and Inquiry (CSI), a club

focused on promoting undergraduate research. With more than 60 members, the club is still growing and pushing the effort to expand undergraduate research. Peer mentors and CSI members work together to develop innovative ways to share their interest and active engagement in research and promote the many opportunities available at FAU.

“I am so proud of all these students,” said Donna Chamely-Wiik, Ph.D., Associate Scientist in the Chemistry Department and OURI Director. “In just two years we’ve launched the *Florida Atlantic University Undergraduate Research Journal* and established our peer mentoring program. It is a testament to these students that we have been able to accomplish so much.”

Chamely-Wiik also is proud of the recently launched Distinction through Discovery Faculty Curriculum Grant Program, which provides seed funding for the incorporation of undergraduate research and inquiry practices into the upper-division curriculum. So far, eight grants have been awarded to faculty teams representing six different colleges. Successful applicants did a superior job of explaining how curricula would be strengthened to achieve targeted student learning outcomes.

“In the end, it’s all about getting the undergraduate students excited about research in a field that really ignites a spark in them,” said Chamely-Wiik. “As professors, we all feel passionately about our fields of study and we hope to pass that enthusiasm on to our students.”

Student peer mentors, such as Melanie Pineda, are leading the push to incorporate research into the undergraduate curriculum.



FAU High School Students Building Electric Supercar

“Electric cars are the next big thing and I want to be a part of that,” said Andrea Padron, a junior at FAU High School and future electrical engineer.

She’s on a team of about two dozen FAU High School students, including several freshmen, who are dedicating their Saturdays and some weeknights to building a flex-fuel supercar that will be capable of driving 100 miles per charge, go from zero to 60 mph in under four seconds and have a total range of more than 400 miles through range-extension options such as biodiesel, hydrogen fuel cell and solar power.

This is no small task, given that the students are building the car from scratch. While other teams that they will compete against are retrofitting existing vehicles, the FAU High students started with a DDR Motorsport GT4 kit car – donated by Advanced Green Technologies – that came in pieces, including a chassis, front suspension, rack and pinion, steering column, an unpainted fiberglass body and an enormous bag of washers,

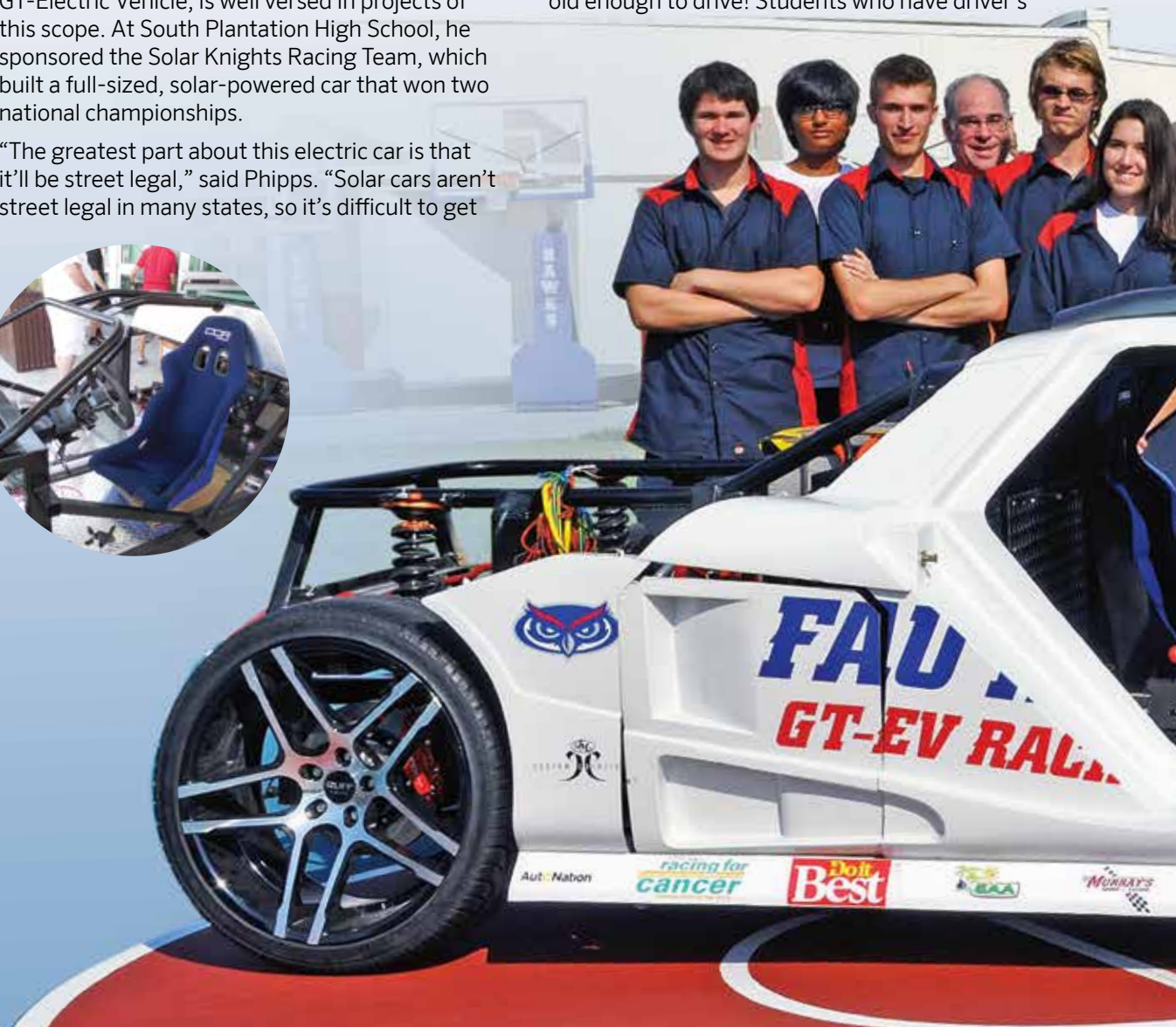
nuts and bolts. They also pulled parts from a Toyota MR2 that was donated by U-Pull-It.

Allan Phipps, District Science, Technology, Engineering and Mathematics (STEM) Coordinator and Project Leader for the FAU High GT-Electric Vehicle, is well versed in projects of this scope. At South Plantation High School, he sponsored the Solar Knights Racing Team, which built a full-sized, solar-powered car that won two national championships.

“The greatest part about this electric car is that it’ll be street legal,” said Phipps. “Solar cars aren’t street legal in many states, so it’s difficult to get

to competitions. But with this electric car, you’ll see a shiny metallic blue sports car with a big FAU spirit mark on it rolling down the highway on its way to competitions.”

And the drivers? Only those students who are old enough to drive! Students who have driver’s



licenses earn the right to drive the car based on sweat equity. But that doesn't detract from the experience for the younger students. Freshman Nikita Storozhenko, 14, is looking at this whole project as a learning tool to help him on his path to becoming an aerospace engineer.

All the students involved, many of whom plan to become engineers, are thrilled to get the hands-on experience. Over the summer, upperclassmen participated in a course that helped them become more knowledgeable about certain aspects of building the car. Padron, 16, said she focused on the electrical side of things while others focused on its motor, body, weight or balance.

All of this is made possible by a cadre of mentors and sponsors. Each time the FAU High students gather to work on the car, adults, including Phipps, faculty and graduate students from the College of Engineering and Computer Science and professionals from DDR Motorsports and High Voltage Hot Rods, are

there to guide them each step of the way. Other sponsors, including Advanced Roofing, Advanced Green Technologies, Do it Best, Rebirth Auto and U-Pull-It, have helped fund the car, which is expected to cost about \$60,000.

While looking at a tangle of dozens of wires and a lithium battery pack that spans the entire width of the car – Padron summed up her experience in a few words: “This is an amazing opportunity.”



Wilkes Honors College Student Conducts Research at Harvard University

All of the students at FAU's Harriet L. Wilkes Honors College conduct undergraduate research before they graduate, but not all of them have the chance to do so at an Ivy League university. That's exactly what Wilkes Honors College senior Tokio Sano did. He spent a month at Harvard University, working on some very big research about some very small creatures: ants.

Sano, who concentrated in biology at the Honors College, has been interested in entomology since his arrival at the college in 2010. So it came as no surprise to his professors and peers that when an opportunity arose for him to conduct biological research at one of the most prestigious universities in the country, he jumped at the chance. In 2013, Sano traveled to Boston to continue work he began under James Wetterer, Ph.D., Professor of Biology in the Honors College and a world-renowned expert in the field of ant research.

While at Harvard, Sano worked under David Lubertazzi, Ph.D., an ant researcher and one of the minds behind the creation of Antwiki, a collective effort to catalogue all species of ant, which is one of the Earth's most populous organisms.

"I was responsible for adding Dr. Wetterer's ant specimens that he collected from around the world to a database, as well as adding information to Antwiki," explained Sano.

This process involved painstakingly examining collected ant specimens and recording information about them in databases. He also had the opportunity to accompany some of the lab researchers on field expeditions, helping them to collect and catalogue specimens and taking the opportunity to study the organisms in their natural environment.

"The most enjoyable experience was going on specimen-collecting trips with the staff," says Sano. "They were so knowledgeable about the wildlife in the Boston area."

A research opportunity such as this is a dream come true for most undergraduate students, and for Sano it was no different. He returned to FAU with a renewed passion for biology and heightened excitement for his own research in the field.

"The experience has refocused my interest to organismal studies," Sano explains. "The opportunity to go out in the field and conduct research is very appealing to me."



Debunking ‘Give Mom a Break’ Theory When Dealing With the Baby Blues

Anyone who’s been there knows the first few weeks and months with a newborn aren’t easy. Many new mothers struggle with everything from changing diapers to breastfeeding to feeling as if every decision is a life or death situation. Feeling down during these weeks is so commonplace that colloquially it’s called “the baby blues.” Well-meaning family members rush in to help and often take the baby right out of the mother’s arms in order to “give mom a break.”

But according to Nancy Jones, Ph.D., Associate Professor of Psychology and Director of the Developmental Psychophysiology Lab at FAU, this is exactly the wrong thing to do. Even though our culture practically demands that fathers, grandmothers, aunts and friends all come to the rescue of a mother who might be experiencing mood swings, the baby blues or even some level of postpartum depression, Jones contends that the best place for the baby to be is in its mother’s arms, both for the baby’s psychological and physical health and for the mother’s well-being.

“It is important for both the mother and the infant to continue to breastfeed and spend time experiencing skin-to-skin contact,” said Jones. “The cultural norm of taking the baby away from the mother when she’s down is actually counter-productive.”

Jones and colleague Krystal Mize, Ph.D., Visiting Professor in the Charles E. Schmidt College of Science, are conducting research that aims to demonstrate that breastfeeding and touch have a positive influence on the mother’s affective engagement even when the mother is experiencing depression. Additionally, they

believe that neurological and socio-emotional development will be bolstered for infants who breastfeed and receive skin-to-skin parent contact throughout their early development.

MOTHER-CHILD BONDING

This research, funded in part by a Division of Research Faculty Research Seed Grant and a dissertation award to graduate student Jillian Hardin, examines the links between infant brain activity, levels of the hormones oxytocin and cortisol and socio-emotional development as a function of the mother-infant feeding and interactive touch patterns. Jones expects to find that the mothers’ levels of oxytocin will correlate with their depression status and their infants’ oxytocin levels and that the mothers’ and infants’ oxytocin levels will predict the interactive patterns between the two. The study will shed light on the relationship between oxytocin and cortisol and the roles these play in stress-reduction in early development.

Jones hopes that studies of this type will encourage doctors, nurses and friends and family members to recognize the importance of breast-feeding and skin-to-skin care.

“We are already seeing changes in society,” said Jones. “There’s a strong push for breastfeeding, and we hope studies like ours will reinforce the mother’s decision to breastfeed. In cases where the mother is experiencing depression, it is even more imperative to have this bonding experience with the baby.”

Team members explore the effect of breastfeeding on infants' and mothers' emotions.



Getting a Grasp on Political Campaign Advertising



It may seem that there's money to burn in a country in which the two major political parties spent more than \$6 billion dollars on advertising for the congressional and presidential races in 2012. But any campaign manager will say that's not the case. Every dollar counts, right?

But not every dollar is well spent, according to Mirya Holman, Ph.D., Assistant Professor of Political Science in the Dorothy F. Schmidt College of Arts and Letters, who conducted a study to see if political ads actually get the intended "bang for the buck."

Specifically, Holman and co-author Monica Schneider, Ph.D., Assistant Professor at Miami University, Ohio, looked into the use of campaign "microtargeting" – using enormous databases containing specific information about particular voters, including party affiliation, frequency of voting, contributions and volunteerism – to determine where to spend political advertising dollars.

"We know that campaigns increasingly engage in microtargeting, but we know very little about whether these targeted messages work at all, how they work and what the effect is across the group," said Holman. "We hope to demonstrate that identity-based targeting, or ads based on an identity rather than on an interest or an issue, activate group membership and thus increase evaluations of the candidate."

Their research, funded by the National Science Foundation's Time-Sharing Experiments in the Social Sciences, focused on how women react when targeted by both

female and male candidates based solely on their identity as women.

TARGETING SPECIFIC GROUPS

"We expect that these messages only work when the identity is matched; that is, women respond to gender-targeting from female candidates, but introduce a male candidate or a male voter, and the effects disappear or even lead to a decline in evaluations of the candidate," said Holman. "Our findings suggest that candidates should utilize identity-targeting in very careful ways. For example, a targeted email might be very successful because it will reach only the intended recipients, but a radio or television ad that evokes identity might be much less effective, or effectively cancel itself out."

Some ads, such as the television ads in previous presidential election cycles that featured Laura Bush claiming that "W Stands for Women" and Michelle Obama telling women that "our votes will be important," can actually serve to cue feelings of threat among men. This is an example of how identity-based advertising at the mass media level could be ineffective and possibly detrimental to the campaign.

Despite widespread use of identity-based advertising by campaigns, the effects are not broadly understood and have drawn little scholarly attention. The results of Holman's study could profoundly affect how campaign managers advise candidates about reaching their target audiences.

On the Record: A Project to Save a Rare Collection



Maxine Schackman, Director of the Recorded Sound Archives at Florida Atlantic University's Wimberly Library, and sound technician Ben Roth, prepare a stack of records that the RSA rescued for cleaning following Hurricane Sandy.

As Hurricane Sandy ravaged homes and businesses along the northeast coast of the U.S., its high winds and torrential rain damaged thousands of one-of-a-kind personal collections that may be lost forever.

But one set of treasures still has a fighting chance. Peter Muldavin, the world's leading expert on American vintage children's records, found 786 duplicates of his more than 17,000 kiddie records in a flooded Long Island storage facility following

the October 2012 superstorm. Rather than give up, he contacted the Recorded Sound Archives (RSA) in FAU's Wimberly Library in an attempt to salvage the records, which were produced between 1920 and 1958.

Muldavin, known as the "Kiddie Rekord King," donated the water-damaged records to the RSA, which collects, organizes and protects access to digitized copies of vintage audio recordings. An effort has been undertaken at the RSA to digitize

the sound on the records and restore the jacket images.

MAKING LEMONADE

"Mr. Muldavin understood our unique qualifications in this area and presented us with both a challenge and an opportunity," said Maxine Schackman, the RSA's Director. "We are excited to be working with such rare and wonderful artifacts from the 20th century. I can't wait to see the reaction when we are able to share our work online."

The covers of many of the records featured beautiful artwork, story books and paper doll cut-outs that had to be discarded because of mildew and mold. However, the images on them are being preserved digitally and restored to their original condition through the use of Adobe Photoshop. Some of the records are warped and many are encrusted with mud, requiring hand washing. To help with the restoration, the RSA purchased a vinyl record flattener, a device that slowly heats a warped record between heavy metal plates.

This is the most extensive restoration ever attempted by the RSA, which has been restoring phonograph recordings for more than a decade. Many of the digital images and music files from well-loved kiddie records of years gone by will be available through RSA's password-protected Research Station.

"It's serendipity," Muldavin said of his connection with the RSA. "The damaged records had no value in the marketplace of collectors, and I thought they had no value to anyone. FAU is turning lemons into lemonade."

FAU Researchers and Scholars of the Year

2013 RESEARCHERS OF THE YEAR:

Borko Furht, Ph.D., Professor in the Department of Computer and Electrical Engineering and Computer Sciences and Director of the Center for Advanced Knowledge Enablement (CAKE), an Industry/University Cooperative Research Center funded by the National Science Foundation, has built the framework for interaction between University faculty and 22 CAKE member companies in the critically important areas of information technology, communication and computing. During his career at FAU he has received 29 grants totaling more than \$12 million.

Dr. Vijaya Iragavarapu-Charyulu, Ph.D., Associate Professor in the Department of Biomedical Sciences, researches breast cancer and the inflammation that promotes tumor growth and metastasis. She has received funding from the National Institutes of Health and the Florida Department of Health and has published in major tumor immunology journals. Iragavarapu has established a collaborative project with Boca Raton Regional Hospital to develop therapies to treat breast cancer. Since joining FAU in 1999, she has received 9 awards totaling nearly \$1.5 million.

Xavier Comas, Ph.D., Assistant Professor in the Department of Geosciences, is researching carbon cycling as related to climate change in a wide variety of peatlands, including subtropical systems such as the Everglades. His research will help define the balance between carbon accumulation and losses in these peatland systems and how disturbances such as climate change may potentially impact the relationship. Since joining FAU in 2007, Comas has received more than \$2 million in funding for his research.

2013 SCHOLARS OF THE YEAR:

Len Sperry, Ph.D., Professor in the Department of Counselor Education, focuses on researching core competencies in counseling and psychotherapy. He has published 234 articles in peer reviewed journals, 56 professional books and 107 book chapters. He is an editor or on the editorial board of 13 journals, and he was named the founding Co-Editor-in-Chief of the American Psychological Association's new journal Spirituality and Clinical Practice. Sperry has developed FAU's master's degree program into a national leader in competency-based education in counseling.

Rose Sherman, Ed.N., R.N., Professor in the Christine E. Lynn College of Nursing, studies the development of current and future nurse leaders. With a grant from the Health Resources and Services Administration to pilot an enhanced master's degree program in nursing administration, Sherman hopes to address the leadership shortage the nursing industry expects to face in the next decade. One of her continuing education programs was selected by the Johnson and Johnson Foundation as their "Gift to Nursing" in 2013, and close to 20,000 nurses have completed the program.

Vladimir Kulić, Ph.D., Assistant Professor in the School of Architecture, studies architectural history, with a specialization in the socialist and post-socialist world and the global dissemination of architectural culture during the Cold War. His book, "Modernism In-Between: The Mediatory Architectures of Socialist Yugoslavia," explores architecture as a tool of social, cultural and ideological mediation between various metropolitan models. Since his arrival at FAU in 2008, Kulić has emerged as one of the leading historians of East European architecture. He was awarded the prestigious Bruno Zevi Prize for a Critical/Historical Essay in Architecture.

The Researchers and Scholars of the Year at the 2013 Honors Convocation.



Anthony Barbar

Dr. Rose Sherman

Dr. Borko Furht

Dr. Vladimir Kulić
Dr. Vijaya Iragavarapu-Charyulu

Dr. Xavier Comas

Dr. Len Sperry

“A university’s greatness can be measured by its performance in three areas – the quality of education it delivers to its students, the relevance of its research activities to ‘the real world’ and the effectiveness of its outreach to the community. ... FAU is one of the youngest universities in America to achieve distinction in all of these arenas.”

— John Kelly, Ph.D., President, Florida Atlantic University



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Making Waves

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