DEAR ALUMNI, PARENTS AND FRIENDS,

Northeastern’s success in innovation and research—and Bouvé’s significant part in this—no doubt invites and strengthens the research interests of our students. Earlier this year, the Carnegie Classification of Institutions of Higher Education, which includes 4,644 institutions nationwide, recognized Northeastern as one of the 115 universities at the highest research activity level. Additionally, we are one of only 15 universities who moved into this category since the previous ranking, in 2010. This standing reflects our investments in research, faculty recruitment, the quantity and quality of student applications, and our fundraising capacity.

It is my pleasure to report that our undergraduate students are increasingly engaged in the research with faculty members. We are finding that more and more students come to Bouvé seeking research opportunities that appeal to their natural curiosities and their desire to benefit from expert mentorship. In fact, Bouvé is now third among all the colleges at the University in terms of the number of successful submission to the Provost’s Undergraduate Research and Creative Endeavors Program, which provides small awards to support student research.

Bouvé’s strength in research and practice is evidenced by two stories in this issue of Vital Signs. Our cover story reports on Professor Maria Dolce’s initiative to integrate primary care and dental practices in an effort to improve the overall health and well-being of patients. We also describe the efforts of Professor Ganesh Thakur and his laboratory team to create new molecules that lay groundwork for therapeutics to alleviate pain and the symptoms of diseases such as glaucoma.

Our accomplished faculty help us attract graduate and undergraduate students and postdoctoral fellows who bring special qualities that we value: an early dedication to and involvement in meaningful service activities; experience in leadership roles that foster collaboration; reflective learning; and excellent communication skills. Given the variety of audiences with whom our students interact, these traits will serve them well as emerging health professionals and researchers.

We very much appreciate your willingness, as loyal alumni and friends, to provide us with ideas on how to engage others in the real world—a world that is undergoing transformation in so many domains that affect the future health of populations and influence Bouvé’s ongoing contributions to the health sciences. In addition, your financial contributions are vital to the support of our students and programs.

Sincerely,

John R. Reynolds, PharmD
Interim Dean, Bouvé College of Health Sciences
COVER STORY

For Vulnerable Patients, a New Health Care Model .................................................. 2
At an innovative teaching clinic, Bouvé and Harvard fuse the expertise of dentistry and primary care nursing

SPOTLIGHTS

Innovation at School of Nursing ................................................................. 6
The Navigator ......................................................................................... 8
Gloria Harris Cater PhD, RN, FNAP’67
Two Brothers, One Career Path ............................................................... 9
Adeoye Owolewa P’13 and Sadik Owolewa P’18

FEATURE

Beyond Medical Marijuana ....................................................................... 12
A drug discovery pioneer aims to create safer more effective therapies

IN EVERY ISSUE

Gifts in Action ...................................................................................... 10
Bouvé Updates .................................................................................... 16
Planned Giving .................................................................................... 19
For these world travelers, Northeastern was a compass
Bouvé Faces ........................................................................................ 20
Faculty Viewpoint .............................................................................. 21
Using brain imaging to map damaged links between the brain and movement after stroke
FOR VULNERABLE PATIENTS,
a New Health Care Model
At an innovative teaching clinic, Bouvé and Harvard fuse the expertise of dentistry and primary care nursing.

The mouth is a window into the body, offering clues to overall health and wellbeing. Got bleeding gums? Tooth plaque? Sores that won’t heal? These could be warning signs for cardiovascular disease, diabetes, cancer, or other serious medical problems. Too often, such conditions go undiagnosed because dentists and primary care providers operate independently, without sharing information. But researchers led by one professor at Bouvé’s School of Nursing are teaching the two fields to collaborate.

“Our goal,” says Associate Professor Maria Dolce, “is to transform U.S. health care, starting at the dentist’s chair.”

In February, armed with a $1.2 million grant from the U.S. Department of Health and Human Services Health Resources and Services Administration, Dolce and co-investigators launched an experimental teaching clinic at the Harvard School of Dental Medicine, in Boston. Their Nurse Practitioner-Dentist Model for Primary Care — “the NP-D Model” — targets low-income, elderly, and underserved minority patients.

“The whole point of our model,” Dolce says, “is to intercept people with oral health problems and link them to a primary care nurse practitioner on site, who can coordinate medical care they may need.”

The NP-D Model delivers care to populations — poor, elderly, Hispanic, African American, and Native American — who are disproportionately burdened with oral diseases associated with larger systemic, chronic problems.

Dean of Nursing Nancy Hanrahan calls Dolce a “thought leader” in a nationwide trend toward interdisciplinary, “interprofessional” health care. “Harnessing the power of dentistry and nursing is a cutting-edge model of care that enhances health-professions education,” she says, “and offers patients access to care they might not otherwise have.”

How it Works

In a single visit, patients see a dental student and a primary-care nurse practitioner student. In pairs, the students, who are supervised by faculty, take medical histories, do oral exams, review X rays, and discuss treatment planning. Patients are also offered a wellness exam.

Of patients age 65 and older, 20 percent report having no primary care provider. A senior nurse practitioner can assess their mood, risk of falling, weight and nutritional status,
The Oral Cavity: A Gateway to Care

The mouth is a portal through which caregivers can learn to discern a patient’s health status. Intercepting patients at the dentist’s chair makes sense, given that millions suffer from oral diseases and associated, often undiagnosed or undertreated medical problems.

• For adults aged 30 years and older, 46% have periodontal disease, and 9% have severe periodontal disease. (National Health and Nutrition Examination Survey (NHANES 2009-2012)

• Among adults aged 20–64, 91% have dental caries and 27% have untreated tooth decay (NHANES 2011-12)

• More than 40 percent of adults 20 years and older at or below the poverty level have at least one decayed tooth, compared to 16 percent of non-poor adults (U.S. Centers for Disease Control)

• According to one U.S. survey, 20 million people saw a dentist but not a medical professional (American Journal of Public Health, 2012)

• 16.4 percent of adults under age 65 did not receive needed dental care because they could not afford it (National Center for Health Statistics, 2011)

• About 25 percent of adults aged 60 years and older no longer have any natural teeth (U.S. Centers for Disease Control)*

“Oral Diseas: A Silent Epidemic

In this country, an estimated million people suffer from caries, gum problems, and other forms of oral disease. In 2000, the U.S. Surgeon General declared a “silent epidemic” in his landmark report, Oral Health in America.

But it was in 2009 that Dolce, then a doctoral student at New York University, discovered the impact on poor oral health on systemic disease. For her dissertation, she analyzed the stories of 500 cancer survivors.

“One story stayed with me,” she recalls, about a man who endured persistent mouth sores and bleeding gums. “He visited his dentist twice and his doctor once, but neither of them connected the dots. So he did his own Internet research, and it turned out he had leukemia and had to be hospitalized immediately.”

The solution, she realized, lay in giving dentists, nurses, physicians, and others a common body of knowledge about the link between oral and systemic disease. For example, plaque, a reservoir of bacteria on teeth, can ignite respiratory infections, including pneumonia. Bleeding gums may signal malnutrition or diabetes. Eroded tooth enamel could hint of purging and eating disorders.

Oral diseases are eminently preventable through proper diet and routine care, but too often, Dolce says, “dental care is an afterthought.” Millions can’t afford it. What’s more, such diseases may advance undetected until pain drives patients to a dentist or a hospital emergency room.

A 2007 tragedy drives home her point. Twelve-year-old Demonte Driver of Baltimore died after an infection from an untreated tooth abscess spread to his brain. His plight put a spotlight on the oral health crisis, yet the problem persists.

“This epidemic is largely a matter of economics,” Dolce says. “To address it, we have to change the way the health professions work.”

* Professor of Nursing Maria Dolce RN, PhD
Measuring Outcomes

Interprofessional education grounded in practice is just one of the researchers’ goals. In addition to training 120 student teams over three years, Dolce and co-principal investigator John DaSilva, vice president of DSDM, will evaluate their NP-Dentist model by analyzing patient outcomes. Among those they’ll track are individuals with chronic conditions like diabetes and cardiovascular disease, which research has linked to periodontal disease. Fundamental health indicators like blood glucose and blood pressure will also be measured.

Finally, Dolce and DaSilva will develop a roadmap of the program so other nursing and dental schools can follow their lead. Key to their model’s design is its Northeastern-style emphasis on experiential learning, including co-op and service learning in local communities.

“We have had a siloed approach to education in the health professions, with nurses, physicians, physician-assistants, pharmacists, and others mastering distinct roles and expertise,” Dolce notes. “But with cross-disciplinary education, they can work together to promote oral health as an essential component of general health and wellness.”

Dolce is ahead of the curve. In 2013, with a grant from the DentaQuest Foundation, she and her Bouvé colleagues began integrating oral-health instruction across all 29 health-education programs, from pharmacy and applied psychology to speech and communications disorders. Dolce and the NPD Model’s program director, Jessica Hollman, created a free online curriculum, the Oral Health Toolkit, to help health educators spearhead integration.

In Harvard, she says, she found an ideal collaborator. The Harvard School of Dental Medicine was among the first to unite medical and dental students in their initial two years of classroom instruction.

"Interprofessional demonstration projects such as the NPD Model for Primary Care send an important message," says HSDM Dean R. Bruce Donoff. To articulate it, he quotes Pulitzer Prize-winning author Louis Menand:

“The key to reform of almost any kind in higher education lies not in the way that knowledge is produced. It lies in the way that the producers of knowledge are produced.”
Innovation at School of Nursing

Are you a nurse with the next big idea?

Clearly the answer from more than 200 participates at the first ever Nurse Innovation & Entrepreneurship Summit and Hackathon is a resounding “yes”!

Nurses, healthcare professionals, mentors and ventures from every industry gathered over the weekend of June 17-19 to explore overnight innovative solutions to pressing healthcare challenges — managing dementia, suicide prevention, holistic health, contagion prevention, cardiac resuscitation and care models and print and digital media to attract and inspire nurse innovation, were among some of the business plans created — all in less than 48 hours. The panel of judges comprised of key sponsors came from Exergen, Meditech and the Health Sciences Entrepreneurs program. They had the difficult task of determining the top prize winners from the 8 pitches made.

“Take hold of the excitement generated over these last few days and don’t lose sight of your passion for your idea. Every pitch made today is a winner. Go out and make it happen.” (Chip Ach DMSB’09, Senior Architect, athenahealth)

For more details and video highlights of this program go to: http://www.northeastern.edu/nurseinnovation/
Special thanks to our Nurse Innovation & Entrepreneurship Summit and Hackathon Sponsors:

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Honorable mention hackathon team from Alche + Me prepare for their presentation. Team includes from top left Matt Butler DMSB’16, Marie Berry BSN’86, MS’17, Valeria Ramdin, BSN’92, MS’95, PhD’16, Kim Lamoutagne and Jesse Cook.

Keynote speakers Patricia C. Dykes of HMS & BWH and Kathryn Bowles of UPenn with event co-organizer Laura Mylott, Bouvé School of Nursing.

9 teams and with over 90 participants in the first Nurse Hackathon. Congratulations to all our Nurses!
When Gloria Harris Cater PhD, RN, FNAP graduated from Northeastern with her associate’s degree in nursing in 1967, there were few nurses of color she could look up to. Cater, a native of Boston, remembers seeing no African American registered nurses at the renowned Boston Children’s Hospital, where she did three co-ops and took her first job.

Reflecting on her long career, Cater says smart, ambitious students who looked like her had few role models, let alone mentors. “Back then,” she muses, “we didn’t know what mentoring was.”

What Cater did have was encouragement from friends and family. Her parents, Anniebelle and Fletcher, insisted she go to college. At her beloved Charles Street A.M.E. Church, the Rev. Walter C. Davis and his wife, Phyllis, exhorted her to have faith in herself. And an older sister, Myrna, became a registered nurse — “proof,” Cater notes, “that I could do it too.”

With a soul-deep commitment to God, family, community, and lifelong learning, Cater began building credentials in what she calls “a caring profession.” She started in the Boston Children’s Hospital emergency room, at a time when she and her husband, Dr. Willie J. Cater P’67 — on his way to becoming an orthopedic surgeon — were house parents at a home for young mothers near Boston. Through stints at the Visiting Nurse Association and community health centers, Cater earned a bachelor’s degree from Boston University and a master’s from UMass-Lowell while also raising three children. And at the Wellesley College Health Service, Cater served for 18 years as a nurse practitioner and a director. “I loved teaching my patients one-on-one,” she says.

In 2006, that passion propelled her to new roles at Roxbury Community College (RCC), where she joined the nursing school faculty. Four years later, she was named dean of health sciences and became the first African American to earn a doctorate in nursing from UMass-Boston; she wrote her dissertation on faith community nursing and type 2 diabetes in the African American community.

But it was at Simmons College that Cater’s role as a student mentor was set. “It was my duty,” she insists, to help launch the college’s Dotson Bridge and Mentoring Program for underrepresented minority students in nursing. Today, having retired from RCC, she is one of 18 nursing professionals who spend several hours a week helping students navigate stressors — such as academic and financial challenges, childcare struggles, and workplace tensions — that can derail their ambition.

“Mentoring offers personal support even parents can’t provide,” Cater explains, pointing to one mentee, a working single mother of three from Ghana who is still struggling to master English, as an example. “Students need a mentor to be their guide and to show them that, yes, they can succeed.”

Cater’s influence extends widely. On the home front, daughter Dawn is a family nurse practitioner, son Jon is a Northeastern engineering alumnus, and son James is working on a master’s degree in energy systems. At the church where she has worshiped for 50 years, Cater, ordained since 2010, helps congregants sort out health issues and ministers to their practical and spiritual needs.

Mentoring is really about coaching and caring, Cater says. Above all, “it’s a way to elevate more students of color in the profession I love.”

In this 2015 family portrait, Gloria Harris Cater is surrounded by (from left) husband Willie, sons Jonathan and James, and daughter Dawn.
Two brothers — one born in the U.S., the other in Lagos, Nigeria — share the same ultimate wish: to serve the community through careers in pharmacy. And in choosing the same degree path, both Adeoye and Sadik Owolewa, P’13 and P’18, respectively, look to family for inspiration.

For his commitment to Northeastern and to service, Adeoye credits his parents, who met as undergraduates. Settled in Roxbury, Massachusetts, their father, Ayo Yakubu-Owolewa PAH’79, is a laboratory technician at Mount Auburn Hospital, near Boston, and their mother, Bolade E’79, is a civil engineer with the Massachusetts Housing Authority.

It was their maternal grandmother who piqued Sadik’s curiosity about how medications affect patients. “Once a year she’d go to the U.S. to pick up medications she needed, and she would ask me about them,” he explains. Combing the Internet to answer her questions, he became fascinated by the complexity of drug interactions and how they could harm patients. “I figured, ‘I can help with that.’”

Adeoye, Sadik’s senior by five years, says he had Sadik in mind when he found too little support for students of color — especially foreign-born students — who were casting about for an academic path. After considering engineering, he discovered pharmacy by shadowing a family friend. In his senior year at Bouvé, Adeoye resolved, for the sake of his brother and younger classmates, “to make their road easier than mine was.”

With administrators’ support, Adeoye founded a peer-mentoring program — a hub of resources and friendly advice — for students curious about majoring in pharmacy. “We hold the ropes and pull each other up,” he explains. From the freshman and second-year pre-pharmacy classes, Adeoye had seven mentees. The program’s goal is to get students through their tough third year in the major; after graduating, peers can network and share ideas about their practice.

Growth Opportunities

Sadik, who left Lagos to join his parents in 2003, is now knee-deep in the second of three co-ops at Northeastern. Having experienced working at Massachusetts General Hospital in Boston, he’s now at a community health center. Wondering about the benefits of doing research in industry for his third co-op, he’s intent on using the opportunity “to help me grow.” Meanwhile, he volunteers as a math and science tutor for high school students, easing their way to — who knows? — perhaps careers in pharmacy. Since graduating, Adeoye has lived and worked in Washington as a Rite-Aid pharmacist. He relishes his level of responsibility “in the middle of everything,” at the intersection of “patients, physicians, insurers, the law, policy, and public health.” Like his brother, he tutors young students, eager to get them excited about STEM fields.

“My strength is talking to people in the community. It’s important to reach them where they are,” Adeoye says. “By paying attention and asking the right questions, you can make an impact.”
Gifts in Action

David Bear Scholar for Research in Neuropharmacology and Drug Discovery

Through the generosity of Dr. David Bear, a founder, chair, and chief medical officer at Covectra and board chair at MedSentry, a graduate student or postdoctoral researcher will receive a generous stipend to work at Northeastern’s Center for Drug Discovery under the guidance of a tenured professor. This research will investigate neurotransmitter receptors and signaling and have the potential to impact drug discovery and development. The recipient of this award will begin in the fall of 2016.

West Health Institute Gift to Support Autism Research

The Gary and Mary West Health Institute, a nonprofit medical research organization in San Diego, has donated the technical and clinical assets of its autism research program to Bouvé. The institute created prototype software similar to a gaming platform, and did feasibility studies to see how it could provide care and therapy suitable for delivery at home—a comfortable setting for both children with autism and their families. The West Health Institute donated these assets to Bouvé because it views Bouvé’s cross-disciplinary autism research with the College of Computer Information and Science (CCIS) to be one of the best initiatives of its kind, and it feels that this gift creates the ideal opportunity to improve access to high-quality behavioral therapy for all patients in need.

Matthew Dandurand Autism Spectrum Research Fund

Patricia PT’80, and Kenneth Dandurand PAH’78, have made a gift to establish an autism research fund in tribute to their son Matthew, who lived with autism until his death at age 16. “It is important to us to support individuals like Matthew to be successful, who fall within the mid-to-higher functionality range but face challenges communicating to the world at large. We believe that Dr. Matthew Goodwin and his colleagues are creating novel and important evaluative tools that will increase the understanding of autism spectrum disorders and, ultimately, improve the lives of those living with them,” comments Ken Dandurand. An autism research symposium in spring 2017, in part supported by this fund, will bring together scientific experts, thought leaders, families, and other stakeholders in a collaborative discussion and idea exchange.
concerning the socio-emotional needs of individuals on the autism spectrum.

If you wish to participate in this initiative as an attendee, donor, or sponsor, contact Jennifer Trapp at j.trapp@northeastern.edu or 617.373.8831

New Endowed Scholarship Named for Jane Clow Smalley

Jane Clow Smalley, Boston Bouvé, PT’63, has established an endowed scholarship in her name for current and future students studying physical therapy at Bouvé. In addition to gifts to the endowed scholarship, she is also supporting the scholarship with annual gifts so that the scholarship can be started immediately, and she looks forward to meeting its recipients. She decided to set up the scholarship out of gratitude for the exceptional education afforded her by Bouvé. Through this scholarship she seeks to give back, with the goal of enabling students to be well trained and give their patients the best quality of life possible.

Gift from Carol Roberts for Student Scholarships

Carol Roberts, Boston Bouvé, BB’60, a recently retired faculty member of Springfield Technical Community College, has made a gift through a charitable gift annuity with Northeastern University to benefit the Boston Bouvé Faculty Scholarship, which she has been supporting since 2000. She has previously given annuities to Bouvé to support the Marjorie Bouvé Fellows Program and the Founders Room Project. Her current gift will add to the scholarship fund for physical therapy students that she established in 2000 to honor the physical education and physical therapy faculty who taught at Boston Bouvé College in the 1950s and 1960s.

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Dean’s Circle Members support Bouvé College with an annual donation of $1,000 or more. Donors listed as of June 1, 2016. To find out more about becoming a member of the Dean’s Circle, please call Julie Norton, 617.373.4839.

Carol Junker Roberts BB’60 and 2016 Boston Bouvé Faculty Scholarship recipient Kailie Pesko DPT’17
BEYOND MEDICAL MARIJUANA

A drug discovery pioneer aims to create safer more effective therapies
That’s the quest of Ganesh Thakur, an Associate Professor of pharmaceutical sciences and an expert in chemical synthesis and drug design. Backed by expert collaborators in four countries and $2.4 million from the National Institutes of Health, he’s closer to his goal than what one might think.

Marijuana and its extracts are legal in 24 U.S. states for medicinal uses: to treat pain and nausea in cancer, wasting and loss of appetite in AIDS, and ocular pressure in glaucoma, a leading cause of blindness worldwide. Yet marijuana remains a federally controlled substance, linked by research to impaired motor control and muddled thinking.

Scientists have been trying to separate marijuana’s therapeutic benefits from its unwanted effects for more than 50 years. The holy grail is safer, more effective, and longer-lasting drugs based on a growing understanding of how marijuana’s key ingredients—compounds called cannabinoids—act on the brain and nervous system.

Thakur’s approach is new. His synthetic drugs target the same protein on cells that cannabinoids do, the CB1 receptor protein, but zero in on a different, strategically chosen site on the molecule. His drugs, known as positive and negative allosteric (“different site”) modulators—PAMs and NAMs—work by selectively amplifying cannabinoids’ positive therapeutic effects while dialing down the negatives.

With a team of Northeastern graduate students and research partners in the U.S., Canada, and the U.K., Thakur is testing his PAMs and NAMs in cell cultures and lab animals, with encouraging results.

Since 2010, Ganesh Thakur has been opening up a new frontier in medicinal chemistry. His synthetic drugs—safe, longer-lasting alternatives to medical marijuana—show promise for treating glaucoma, cancer, Huntington’s disease, post-traumatic stress disorder, and many other conditions.

Among Thakur’s chief collaborators is University of Aberdeen pharmacologist Roger Pertwee, a respected worldwide leader and co-discoverer of the first endocannabinoid in 1992 and the first allosteric site in CB1 in 2005—Pertwee is upbeat about Thakur’s designer drugs.

“This collaboration provides me with a great opportunity,” Pertwee says. “There is a growing amount of preclinical evidence that CB1 allosteric modulators could, and should, be developed as potentially very important new medicines.”
The Good and the Bad

Since the late 1980s, researchers have been shining light on how cannabinoids—including the psychoactive cannabinoid tetrahydrocannabinol, or THC—interact with brain cells to produce positive and negative effects. Given restrictions on marijuana's use, most studies have involved its extracts, but in recent years therapeutic trials have engaged users of marijuana itself.

These studies showed what civilizations have noted for 4,000 years: Cannabinoids elevate mood, relieve pain and nausea, quell anxiety, and boost appetite. Unfortunately, they can also impair memory, erode our ability to think and reason, disrupt motor coordination, and spur binge eating, according to the National Institute on Drug Abuse. What’s more, they are habit-forming.

“A large body of evidence suggests cannabinoids harm the brain in ways that may be lasting,” notes Thakur. “Most vulnerable are young, chronic users, including teenagers, whose brains are still developing.

“These problems are a big reason why marijuana remains a federally controlled substance,” he adds—“marijuana can be obtained only by prescription for medical purposes and grown legally only in some states and for use by individuals in small quantities.

When marijuana is smoked, its touted beneficial effects are fleeting. So too are those of THC extracts and another active marijuana ingredient, cannabidiol, although all have gained traction as therapies for patients who lack effective options. They relieve the neuropathic pain seen in diseases ranging from cancer and heart disease to diabetes. They offer hope to patients who suffer wasting from anorexia and AIDS. And they ease muscle spasticity in multiple sclerosis, curb epileptic seizures, and relieve anxiety—even in cases of post-traumatic stress disorder.

Why are cannabinoids’ effects so profound and so varied? It’s because they mimic naturally occurring compounds, known as endocannabinoids, found throughout the brain and other organs. Endocannabinoids are neurotransmitters that transmit chemical messages throughout the nervous system, maintaining homeostasis across organ systems. Because they are quickly broken down, their effects are short-lived.

When patients use some form of marijuana, the plant’s cannabinoids displace the body’s own natural cannabinoid, hijacking CB1 receptors and activating them. “As a result of the resulting nervous-system activation, we feel blissful—or ‘high,’” Thakur says. But our pain subsides for at best a few hours, and we lose balance, motor control, and mental focus. “We need a better solution.”

NAMs AND PAMs

Enter Thakur’s allosteric modulators. Like a great marriage counselor, they enhance and intensify communication between two partners: CB1 receptors and the body’s own endocannabinoids. Their action is important because CB1 signaling is weak under disease conditions.

One subset of these drugs is called positive allosteric modulators, or PAMs, because they strengthen and prolong CB1 receptor’s activity, Thakur says. “The exciting result we see in animal models is PAMs’ beneficial effects, such as their pain-fighting power.”

Meanwhile, PAMs avoid unwanted side effects. “We see no hyperstimulation of appetite or distortion of mood,” Thakur explains. “No weakened muscles or loss of motor coordination. No cognitive impairment.”

CB1 PAMs have the potential to be a totally new type of painkiller, Thakur says: “Imagine a drug as potent as heroin and other opioids, minus the drawbacks of addiction, constipation, and tolerance.” By “tolerance,” he means the body’s adaptation to these drugs over time, to the point where they cease to work unless the dosage is increased—a phenomenon that can lead to intolerable side effects or a risk of overdose.

CB1 PAMs have yet another upside: neuroprotective powers. They offer hope for managing glaucoma, the world’s second-leading cause of blindness after cataracts and “universally the most feared disability,” says Thakur.

According to the World Health Organization, glaucoma has plunged 60 million people into darkness. As fluid pressure...
in the eyeball rises, the optic nerve and light-sensitive retinal ganglion cells (RGCs) are destroyed.

In mice, one of his PAMs appears to safeguard RGCs. “We have 1.2 million of these cells in our eyes, but we lose them as we age; in glaucoma, we lose them much faster,” Thakur reports. Thakur’s collaborators at Dalhousie University in Canada showed that after a few days of topical treatment, the number of these cells in the diseased eye was double that of the control group—a finding on which Thakur hopes to build as groundwork for moving PAMs from animals to humans.

Because the CB1 receptor is ubiquitous, he says, PAMs have potential roles in battling a range of other diseases, from Huntington’s disease and multiple sclerosis to autism.

Thakur’s lab is also building exciting variations on PAMs: the negative allosteric modulators, or NAMs. These drugs dial back CB1 signaling, raising hope for curbing the acute cravings seen in addiction.

“NAMs could combat obesity by suppressing food cravings and overeating,” Thakur says. “They also have potential for combating alcohol, tobacco, and drug addiction.”

When it comes to unmet medical needs, PAMs and NAMs are being hailed by cannabinoid experts as breakthrough drugs, he adds. “These compounds could serve as safe medications for diseases that currently have no effective treatments, let alone cure.”

The road from lab animals to patients is long for any new medication, Thakur notes. To expedite testing for his drugs and to move them to higher mammals, he is seeking philanthropic support.

“With flexible funding from private donors, we can move faster,” Thakur explains. “We can also support the world’s best graduate students and recruit more to this new field.”

The fact that his novel drugs boost the impact of the body’s own endocannabinoids may make them more acceptable to the public than marijuana’s cannabinoids, Thakur adds. “We’re building on a therapeutic route Mother Nature has already given us.”

Like a pied piper for research on cannabinoid PAMs and NAMs, Ganesh Thakur is drawing a crowd. The world’s leading experts are testing his designer drugs in cell cultures and lab mice. Meanwhile, Thakur is recruiting more bright minds to the effort.

In 2015, he recruited organic chemist Sumanta Garai from India, to help make the lab’s novel compounds “druggable”—to improve their solubility, selectivity, and potency in vivo. “I arrived with no experience as a medicinal chemist, but with Ganesh as my mentor I’ve learned quickly,” says Garai.

In turn, he passes all he knows on to the lab’s master’s and doctoral degree students.

“Young PhDs and graduate students are the engines of all great research universities,” Thakur says. “They run the experiments that have enabled the lab to establish proof of principle of our novel PAMs and NAMs as potential drugs in animal models of human diseases—for example, their ability to lower intraocular pressure and reduce neuropathic pain and ease muscle spasticity in Huntington’s disease.”

A top priority for Thakur is raising funds for fellowships and stipends for these young scientists. Peter Schaffer, a graduate student in medicinal chemistry arrived in the lab last fall, lured by the challenge of creating new drugs for neurological disorders. A drug may be potent in a cell, he observes, but if it can’t reach its target, what good is it?

“Thakur innovated the field of CB1 PAMs and NAMs—it’s remarkable,” Schaffer says. “He’s also invented more efficient ways to make compounds—to speed up the whole process dramatically.”

Back in 2010, Abhijit Kulkarni says, he was “starstruck” by the drug discovery process in Thakur’s bustling lab, which “has its own culture and charisma.” He helped Thakur set up the lab with equipment and procedures and never looked back.

“I’m improving my lab techniques, meeting my textbook heroes at conferences, publishing in the best journals,” says this graduate student, who will receive his PhD degree later this year.

“The central nervous system is the body’s command center,” Kulkarni notes, adding proudly, “It’s rewarding to work on medicines that could save people from blindness and the debilitating effects of so many diseases.”
Bouvé Updates

COMMUNICATION SCIENCES AND DISORDERS

Tunaweza Children’s Centre offers co-op

Titi Pamela Kakonge, founder and CEO of the Tunaweza Children’s Centre in Kampala, Uganda, provides an extraordinary opportunity for co-operative education experiences for Bouvé students. The center serves special-needs children. Kakonge’s own special-needs daughter, who at first was taken to Boston for care, inspired her to bring the service closer to home. Every semester, Kakonge participates in the Bouvé physical therapy (PT) and communications sciences and disorders (CSD) employer panels for students who wish to go abroad. She has mentored three CSD and five PT students who have supported her center’s day programs and the community. The students learn local methods of therapy and cultural values by interacting with teachers, administrators, and parents on a regular basis and gain an understanding of working with children on their daily activities. Two CSD students are planning to volunteer this summer at the center, and many PT students have done so in the past. Kakonge and the PT and CSD co-op faculty and students will be presenting at the 2016 Global Internship Conference in Boston. In addition, Associate Professor Therese O’Neil-Pirozzi, ScD, CCC-SLP will be conducting a one-month “Dialogue of Civilization” in Uganda this summer and will be visiting the center with 14 students.

PHYSICIAN ASSISTANT

Northeastern University reclaims MAPA Challenge Bowl title

The PA Class of 2016 took first place in the 2015 Massachusetts Association of Physician Assistants (MAPA) Challenge Bowl held on October 24. They bested teams from the PA programs at Tufts University, Boston University, Massachusetts College of Pharmacy, Bay Path University, and Springfield College. Alf Carroll, the NUPA 2016 Challenge Bowl team captain, commented, “The MAPA Challenge Bowl was a great chance to interact with students from other Massachusetts programs and join with them in a friendly competition. I think our team worked really well together and were prepared to take on the challenge. We are all so glad that we were able to represent our program and make them proud by winning it this year!” Many first-year students came out to support and cheer the second-year Challenge Bowl team. Tim Lens PA’17, said, “It allowed us to realize the great amount we had already learned in two months and how far we will have come when we join the Challenge Bowl next year. I’m so proud to be a part of the Northeastern PA program.” The students gave a special thanks to Professor Dipu Patel-Junankar PA-C, for her expert coaching of the team.

SCHOOL OF PHARMACY

Alexandra Kolwicz wins top honor in APhA-ASP national competition

Third-year pharmacy student Alexandra Kolwicz took first place in the 2016 APhA-ASP (American Pharmacists Association–Academy of Student Pharmacists) National Patient Counseling Competition (NPCC). Aiming to foster better patient educators, the competition starts at the local level to select pharmacy representatives to compete in the NPCC at the annual APhA meeting. A student from each school or college is selected out of thousands of competitors in the U.S. The candidates are given five minutes to counsel a patient on the appropriate use of a randomly identified prescription drug. Consulting select sources, students determine how to best educate this patient with the given prescription and are judged based on their performance. Ten finalists are then invited to participate in the final round, in which the five-minute counseling must accommodate patient anxiety, anger, or apathy. The School of Pharmacy is grateful to the students and advisors.
who played a role in Alex’s success. All ten finalists receive cash prizes from APhA-ASP and CVS Health.

### PHYSICAL THERAPY, MOVEMENT AND REHABILITATION SCIENCES

#### Developing measures of arthritis in children

Professor and Chair Maura Daly Iversen PT, DPT, SD, MPH, FNAP, FAPTA, has received a Fulbright award in support of her continuing research in rheumatology, which emphasizes nonpharmacologic interventions for people with arthritis. With Fulbright support, Iversen is launching an initiative to modify adult measures for use in children with juvenile arthritis and to validate a video-based measure of daily activities. Her research collaborators are associated with the Department of Women’s and Children’s Health and the Division of Rheumatology at the Karolinska Institute and Astrid Lindgren’s Children’s Hospital, Stockholm. Since patient-reported outcomes are vital to medical decision-making, finding a way to understand the impact of arthritis in children is crucial.

### INTERDISCIPLINARY PROGRAMS

#### Students create meeting to understand lessons learned from HIV-AIDS

The University Scholars Program and the Center for Community Service hosted the San Francisco Public Health Alternative Spring Break (ASB) from March 5 to 12. The ASB was planned by team leaders Tavia Allen PT’17, and James Evans COS’17, to address current public health issues. Their subject: HIV-AIDS and changes in public perception of the infectious disease. San Francisco was the epicenter of the epidemic and therefore an appropriate venue in which to explore how residents confronted the disease through education, advocacy, and the provision of resources for prevention and continued care. The team leaders felt it important to understand the number of resources available in various communities in San Francisco due to the work of organizations and coalitions. The students who participated came from a variety of Bouvé and undergraduate disciplines: Kween Agba: first year behavioral neuroscience; Elise Dovletoglou: first year economics and environmental science; Felipe Castellano-Macias: first year physics; Sydney Mokel: second year international affairs; Joseph Schenosky: third year international affairs and economics; Rachel Shapiro: fourth year chemical engineering; Jay Shome: second year computer engineering; Mike Tormey: first year civil engineering; Deborah Vasquez: first year environmental studies/international affairs; and Kalil Menezes: second year biochemistry. Collaborators included the San Francisco AIDS Foundation and Project Open Hand.

### HEALTH SCIENCES

#### Symposium focuses on disease prevention and population health

On March 14, the Department of Health Sciences hosted a symposium titled “Changing the Rules: Strengthening the Links Between Health Care and Public Health,” featuring a keynote speech by John Auerbach, distinguished professor of practice in health sciences at Northeastern and former Massachusetts commissioner of public health. He is currently serving as associate director for policy at the U.S. Centers for Disease Control and Prevention. Auerbach spoke of three buckets of prevention, which helps all healthcare professionals attend to the community factors that can have a documented impact on health: traditional clinical preventive interventions, such as seasonal flu vaccines and screening for obesity; (2) innovative prevention interventions that extend care beyond the clinical setting, such as taking note of any buildings where asthmatic patients live that may be responsible for their illness; and (3) total population or community-wide interventions, such as an approach that might promote a healthy behavior, i.e. smoking bans or cigarette taxes. The symposium also featured a panel discussion of public health, which included Monica Valdez Lupi, JD, MPH, executive director of the Boston Public Health Commission; Myechia Mint-Er-Jordan, MD president and CEO of the Dimock Community Health Center; Trent Honda, director of the Physician Assistant program at Bouvé, and Kristin Madison, Northeastern professor of law and health sciences.

### NURSING

This first ever Nurse Innovation Entrepreneurship Summit & Hackathon drew more than 200 nurses and healthcare professionals who explored and created innovative business plans that will bring about extraordinary changes in patient care. For the full story, turn to page 6.
APPLIED PSYCHOLOGY

Associate Professor Changiz Mohiyeddini has developed the William James Lecture Series, named after the father of psychology. This monthly series serves as an inclusive function in the department through which faculty and students share their research and scholarship with each other. Some of the topics presented and discussed include “Black Power Movements’ Impact on Higher Education”, “Descriptive Studies of Children’s Play”, and “Translational Research on Anxiety and Disorders”.

Participation in international conferences presents opportunities for faculty to gain global visibility and exchange ideas and perspectives with international scholars. In March, Associate Professor Rachel Rodgers gave the keynote address, on feeding behavior, at the Portuguese National Congress in Porto, Portugal. She is also an invited symposium speaker at the International Congress of Psychology in Yokohama, Japan, in July 2016. Professor and Department Chair Karin Lifter and Associate Professors Emanuel Mason and Changiz Mohiyeddini will present their “Project Play” work at the International Society for Early Intervention in Stockholm in June. These ongoing collaborations with international scholars, including faculty members Chieh Li (China) and Rob Volpe and Amy Briesch (Germany), continue to broaden our perspective in innovative forms of assessment.

The students participating in Karin Lifter’s spring 2015 seminar “Assessment and Intervention with Young Children” developed a report on social-emotional development for the Massachusetts Department of Public Health (MDPH). This report contained a review of the literature on social-emotional development and its implications for practice. We are pleased to report that the MDPH has incorporated these findings into its revision of practices in serving infants and toddlers with developmental delays and their families.

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AKASH SHAH HS’16 – HAROLD D. HODGKINSON ACHIEVEMENT AWARD

This award is based on distinguished scholastic achievement with due consideration of character, personality, qualities of leadership, cooperative work experience and service in voluntary organizations and activities. The Hodgkinson Award is a university-wide award and is one of the highest honors that a senior at Northeastern University can receive.

PETER DZAUGIS PT’17 – THOMAS E. MCMAHON AWARD

Dean Thomas McMahon will long be remembered as a warm and caring individual who was always ready to lend a helping hand or attentive ear to students and staff alike who sought out his counsel and support. This award is presented annually to a senior in the human service professions who in the course of his/her Cooperative Education work has demonstrated exceptional integrity and character combined with a high degree of devotion and commitment to serving the needs of fellow human beings.

KAYLA JOYAL PHARMD’17 – GARNET AWARD

The Garnet Award recognizes one junior or middler who has demonstrated the same core values as the Compass Award; s/he makes an impact in the community while showing promise for even greater success at Northeastern in the future.

NICK MARTIN HS’16 – COMPASS AWARD

The Compass Award provides each undergraduate College the opportunity to recognize one senior student who has shown commitment to the following set of core values: leadership, volunteerism, academic integrity, and commitment to Northeastern.
Few couples are lucky enough—or adventurous enough—to stalk such exotic flora and fauna as the rufous-tailed hummingbird, the African harrier hawk, and the Egyptian goose, not to mention the acacia tree and the low-growing New Zealand burr. But Alfred and Joy Viola have photographed these and other species on seven continents as leaders of the Penguin Society, a traveling band of alumni, faculty and staff from Northeastern, where their careers and their 53-year marriage began.

It was on one fine day in 1957 that Al, an organic chemist from Boston University with five job offers to choose from, joined the Northeastern faculty. A prolific researcher who also loved teaching, Al was asked to launch a PhD program for the Department of Chemistry and Biological Chemistry—“a big responsibility at age 29,” he recalls. Upon his return from a sabbatical in Australia in 1985, the chair for the department of Chemistry asked Al to teach chemistry to pharmacy students in what is now the Bouvé College of Health Sciences. This unexpected move proved deeply satisfying for Al. In 1991, students voted him “Teacher of the Year.”

Meanwhile, Joy’s career bloomed. In 1958, she strode unannounced into the office of then-university president Carl Ell, looking for work. She had just been turned down by the Christian Science Monitor’s editor, who “said I’d only get married and quit,” she recalls. With degrees in journalism and political science, Joy secured a spot in the university’s Press Bureau and stayed at Northeastern for 33 years, editing publications, writing presidential speeches, and editing a 10-volume encyclopedia of education before retiring in 1991 as dean of international affairs.

The Violas have a passion for canines and other causes, including Northeastern. With 74 years of service to between them, upon Al’s retirement in 1998 they established the Joy and Alfred Viola Undergraduate Award Fund, supporting six students each year in chemistry and pharmacy. Through their will, they’ll support those scholarships in perpetuity.

“At Northeastern,” Al observes, “we each found our calling—and each other.”

What will your legacy be? To support Northeastern through your estate plan or other means, please contact the Office of Gift Planning at 617.373.2030 or giftplanning@northeastern.edu, or visit northeastern.edu/giftplanning.
Bouvé Faces

FIRST ANNUAL DEAN’S CIRCLE RECEPTION
DMSB faculty Ravi Ramamurti, George Behrakis P’57, H’98 parent Karen Koh and friend David Bear

WOMEN WHO EMPOWER - THE FUTURE OF HEALTHCARE
Keynote presenter, Ellen Zane former CEO and President of Tufts Medical Center

ANNUAL SCHOOL OF PHARMACY SCHOLARSHIP AND AWARDS CONVOCATION
Alycia Gelinas P’16, William Gouveia P’64, MHP’66 and Lucianne West P’16

EMPOWER MIAMI CAMPAIGN GATHERING
BHS Director of Development Kathy Cotter, Louise Aurelien MSN’00, Sarah Scott Pharm D’17 and Norma Gerton MSN’00

HEALTH SCIENCES ENTREPRENEURS DIGITAL HEALTH EVENT
Joseph Fleming P’70, MS’71, John O. Moore (Twine Health), Jason Sibley (Flare Capital Partners), Ned Sahin (Brain Power LLC), Chip Ach MBA’09 (athenahealth), Jack Reynolds, John Tremblay E’92, MBA’98
Movement is a quintessential function for any animal species, and humans are no exception. Imagine the seemingly infinite variety of ways that the simple action of writing your signature might be achieved: with hand or foot, on a tabletop or whiteboard, with pen, brush, or spray can. Now consider the innumerable movements each of us performs daily. How does our brain—a 3-pound grapefruit-size mass of about 100 billion neurons, each connected to as many as 10,000 other neurons—achieve incalculable repertoires of action?

Which neural networks does the brain resort to using when recovering from trauma, such as stroke, a leading cause of physical disability in the United States? Is the brain retracing an existing but impaired neural path, or finding a compensatory work-around? Why do certain interventions work for some patients but prove ineffective in others? How much and what type of practice is needed to restore meaningful levels of function?

Using brain imaging to map damaged links between the brain and movement after stroke, my lab aims to harness virtual reality to restore those links.

Movement is a quintessential function for any animal species, and humans are no exception because they have a hard time engaging in even the simplest movements. How can a person hope to regain motor skills if he or she cannot engage in that essential prerequisite practice?

Enter 3-D immersive virtual reality. Here, a researcher or clinician can create and control any desirable training parameter, enabling patients to play a piano, lift a cup of coffee, or perform other challenging activities virtually. We hope that with sufficient repetition in virtual reality, a repertoire of functional movements may be translated in part to the real world. We also use visual illusions, such as mirror feedback, to trick the brain into activation even when severe impairment makes movement impossible, a paradigm we are exploring to aid individuals with profound paralysis.

As neuroscientists and clinicians have long known, the brain is, paradoxically, both extremely fragile and powerfully resilient. Now, armed with unprecedented technological advances, we can begin to harness the brain’s resilience. By putting researchers and clinicians in the driver’s seat, we can guide individuals’ recovery from physical disability and empower them to regain their lives.

These questions are at the core of research in my laboratory. Using functional magnetic resonance imaging and noninvasive electromagnetic stimulation to the brain, along with electromyography, a measure of muscle activation, we can literally peek into the dynamics of the human brain. By pairing these measurement tools with high-precision motion capture, robotics, and feedback presented through virtual reality, we can draw clear links between the neuroanatomy and neurophysiology of the nervous system and movement-coordination patterns affected by disease.

Exploring gaming platforms as novel tools for stimulating the brain, we aim to establish a scientific basis for therapies that can ignite the recovery process and mitigate disability. A main goal is to overcome the challenge facing individuals who have moderate-severe hand impairment after stroke. Rehabilitation options for such individuals are limited because they have a hard time engaging in even the simplest movements. How can a person hope to regain motor skills if he or she cannot engage in that essential prerequisite practice?

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Preparing Healthcare Leaders to Foster Health and Well-Being

Through the Empower Campaign, the Bouvé College of Health Sciences will build on its momentum of excellence and rise to meet longstanding and emerging healthcare challenges confronting our global community.

Join with us as we pursue this ambitious goal, so that more practitioners of science-based healthcare may be “Bouvé-prepared.”

MAKE YOUR GIFT AT WWW.NORTHEASTERN.EDU/BOUVE
or contact Kathleen Cotter, Associate Dean and Director of Development, Bouvé College of Health Sciences, at k.cotter@neu.edu or 617-373-2637.

Communication Sciences and Disorders faculty member Rupal Patel and her extraordinary venture, VocaliD, gave 16 year old Max Plansky his own voice! This event took place amongst Max’s closest friends and family, including the NU Basketball team that considers Max part of the team.