FEBRUARY Duke Cancer Institute researchers discover that psoralen, a natural component in figs and celery used to treat skin conditions, has a second mechanism of action that makes it effective against certain aggressive breast cancers.

MARCH A national study led by Duke psychiatry researchers finds that brain imaging using radioactive dye can detect early evidence of Alzheimer’s and may predict future cognitive decline among adults with mild or no cognitive impairment.

MAY A team of Duke biochemists identify an antibody that simultaneously blocks the sensations of both pain and itching in mice.

JUNE A study led by Duke infectious disease scientists shows that a new single-dose antibiotic is as effective as a twice-daily infusion given for up to 10 days in patients suffering from methicillin-resistant Staphylococcus aureus (MRSA), a potential solution to the problem of antibiotic resistance.

JUNE Researchers at Duke Cancer Institute are able to shrink deadly neuroblastoma tumors without causing bleeding using a modified version of the blood thinner heparin—a potential new therapy.

JUNE Duke Cancer Institute researchers show that BPA, a chemical commonly used in plastics, appears to increase the proliferation of breast cancer cells and diminish the effect of anti-cancer drugs.

JUNE A Duke Cancer Institute-led study shows that a drug currently used to treat men with late-stage prostate cancer actually stems disease progression and extends survival in early-stage patients who have not yet received chemotherapy—an effective new treatment strategy.

Thank you for your generous giving to Duke Medicine this year. We are pleased to share news about advances in research, patient care, and education that are making a difference in the lives of children and adults at home and around the world. None of this
transformational work—in discovery science, translational medicine, and education for the great scientists and clinicians of tomorrow—would be possible without the support we receive from generous and visionary individuals and organizations. With your partnership, Duke Medicine is making forward progress in health and medicine.
A New Approach to Autism

MARCUS FOUNDATION STUDY USING UMBILICAL CORD BLOOD TO TREAT AUTISM, CEREBRAL PALSY AND STROKE

In the small play area adjoining the lobby at the Duke Center for Autism and Brain Development, Christian Meredith, 4, plays with blocks and plastic animals, clutching a snack bag full of crackers in one hand. Jen Newman, a research project coordinator, keeps him company while his mother Jennifer speaks with researchers in a nearby room.

The office door opens, and the rest of Christian’s family walks in. It takes a while: he has five older brothers and sisters, stair-stepped from ages 6 to 14. His father, Trip Meredith, herds the flock from the rear.

Christian, wearing a green T-shirt that says “Grand Slam Home Run!” on the front, bolts from the play area and leaps into his brother Chase’s arms. “Hey, buddy!” says Chase, the oldest. Christian makes the rounds, getting hugs and high fives from everybody, as Jennifer emerges from the interview room.

Christian was diagnosed with autism when he was 2. The whole Meredith clan made the trip from their home in Nashville, Tennessee, to Durham in early October 2014 so that Christian could participate in an ambitious Duke research program exploring the use of umbilical cord blood cells to treat autism, stroke, cerebral palsy, and related brain disorders.

A $15 million award from The Marcus Foundation, an Atlanta-based philanthropic organization, will fund the first two years of the planned five-year, $41 million project by Joanne Kurtzberg, MD, chief scientific and medical officer of Duke’s Robertson Clinical and Translational Cell Therapy Program, and Geraldine Dawson, PhD, director of the Duke Center for Autism and Brain Development.

Kurtzberg and Dawson hope to develop cell-based therapies that can potentially restore brain function in people with the disorders, for which there currently are no medical treatments that directly address its core symptoms. If successful, the study could lead to further clinical trials to potentially decrease disabilities and improve the quality of life for millions of children and adults.

VALIDATION AND TEARS

When Christian Meredith was approaching his second birthday, Jennifer noticed that his speech was developing slowly. A speech language pathologist told her what signs to look for, but also cautioned her not to be overly concerned: Christian was still young, and boys tend to develop more slowly than girls. Plus, as the youngest of six kids, it was bound to be hard for him to get a word in edgewise.

“Our pediatrician told me the same thing,” says Jennifer. “But I knew in my gut that something was not quite right. Two different
specialists came to our house to evaluate him, and they both said, ‘I’ve been here for 20 minutes and he hasn’t even looked up to acknowledge that somebody’s here.’ That’s when something struck me: Christian didn’t make eye contact with my husband or his siblings. He did with me, but not with anyone else.”

She did her own research and became convinced that Christian most likely had autism. Some friends and family tried to persuade her otherwise, she says, but she felt certain. Comprehensive evaluations at Vanderbilt University confirmed her suspicion.

“For a moment I felt validated, because I had been right,” Jennifer says. “But in the next instant I was crying. Because the reality of it hit, and you think, ‘Now what do we do?’”

FUNDING NEW APPROACHES
Some 2 million people in the United States have autism spectrum disorder, a group of conditions affecting social communication and behavior. Stroke kills an average of nearly 130,000 in the U.S. every year, while cerebral palsy currently affects an estimated 764,000 children and young adults.
The Marcus Foundation, established by Bernie Marcus, the co-founder of The Home Depot, has a long-established interest in autism, stroke, cerebral palsy and other neurological conditions, as well as stem cell research. It supports biomedical research projects that are close to clinical application, that may bring novel therapies to bear on disorders without existing treatments, and that are unlikely to receive funding from traditional sources such as the National Institutes of Health.

Kurtzberg and Dawson’s project will consist of a series of clinical trials using umbilical cord blood cells to treat approximately 390 children and adults with autism, 100 children with cerebral palsy, and 90 adults with stroke. Based on previous research, Kurtzberg and Dawson hypothesize that cord blood may promote repair of dysfunctional or damaged areas of the brain.

The initial phase of the program is a preliminary trial involving 20 pediatric subjects with autism using their own cord blood banked shortly after they were born. Five years hence, the project is scheduled to conclude with the completion of Phase II trials using donated cord blood in children with autism and cerebral palsy and adults with stroke.

GREEN LIGHT

When Christian was born, the Merediths banked his umbilical cord blood. They hadn’t done this with any of the previous five children, and even now Jennifer can’t really explain why she felt compelled to do it with him.

“Everybody asks me that, and all I can say, if I’m being honest, is that I try to be a prayerful person, and I feel that God had a hand in guiding me,” she says. “I had read about banking cord blood during my fourth pregnancy, and I thought it sounded interesting and potentially helpful. But I didn’t act on it then, or with the fifth, probably just out of laziness.”

But when she became pregnant with Christian, she was firmly convinced that they should do it.

“My husband and talked about it,” she says. “It’s expensive, so it’s not something you do lightly. He said, ‘How strongly do you feel about this?’ I said ‘Pretty strongly,’ and he said, ‘Then let’s do it.’ It’s a little like buying insurance. You might not ever need it, and hopefully you won’t, but if you do you’ll be glad you have it.”

After Christian’s diagnosis, the Merediths enrolled him at the Brown Center for Autism in Nashville, where individual therapy and group classes have helped him significantly improve his language and social skills.

The Cord Blood Registry, where his blood was banked, alerts families to research trials involving stem cells. In June 2014, the registry issued an announcement about Kurzberg and Dawson’s project.

“I saw an email about the Duke study, and within 20 minutes I had responded,” she says. “Christian met all the initial criteria, and after a lot of communications and tests back and forth, we were invited to come to Duke. After some behavioral assessments, they told us it was a go and gave him a green light for the stem cell transplant.”

“Autism, stroke, and cerebral palsy are all neurologic conditions that impair function and quality of life for these children and adults. If we can make that better, it will have a huge personal and societal impact.”

Joanne Kurtzberg

ENORMOUS POTENTIAL

Cord blood cells are collected without risk to the mother or baby from the placenta, which is otherwise discarded as medical waste after a baby is born. After collection, the cells can be frozen and stored for future use in blood stem cell transplantation or cellular therapies.

Kurtzberg’s previous research has shown that cord blood cells can reduce inflammation and help repair damage in the brain caused by inherited pediatric brain diseases. A recently published Duke study indicates that treating children with their own cord blood cells can have similarly beneficial results in cases of hypoxic ischemic encephalopathy.

The new study will try to determine whether cord blood cells will have the same effect in cases of autism and stroke. Using methods developed by Dawson, the study will examine whether the therapy not only improves behavioral outcomes in children and adults with autism, but also reshapes the patterns of brain activity.

“The whole program has enormous potential,” says Kurtzberg, director of the Pediatric Blood and Marrow Transplant Program, director of the Carolinas Cord Blood Bank, and co-director of the Stem Cell Laboratory. “Autism, stroke, and cerebral palsy are all neurologic conditions that impair function and quality of life for
these children and adults. If we can make that better, it will have a huge personal and societal impact.”

Kurtzberg and Dawson also will explore the key question of whether the beneficial effects of cord blood can be achieved by treating patients with donated cord blood rather than only with their own banked blood cells. If that is found to be true, it could make cord blood treatment available to the largest numbers of patients in need.

“We all want to have a treatment that, if it’s effective, would be accessible to everyone,” says Dawson, who joined the Duke faculty in 2013 as a professor in the Department of Psychiatry and Behavioral Sciences.

‘NO DOWNSIDE’
The stem cell transplant itself was almost anticlimactic, Jennifer Meredith says. Clinicians attached a bag containing about 70 ccs of Christian’s bright red umbilical cord blood to an IV and let gravity feed it into his arm. The cord blood infusion took no more than 20 minutes.

The Merediths will bring Christian back to Duke in six months, and again in a year for follow-up scans and assessments to evaluate his progress.

“I feel great about it,” Jennifer says. “I feel like there is absolutely no downside. There is only upside potential. How could you pass up this opportunity?”

Thanks to his therapists, teachers, and other practitioners—not to mention his large and loving family—Jennifer and Trip are confident that Christian has a happy and productive life ahead of him. They are also hopeful that the Duke study may yield important medical progress, both for him and untold others.

“We have been the beneficiaries of decades of research into autism, and regardless of whether this project benefits Christian, hopefully it will benefit other children,” says Jennifer. “It’s been a hard journey, and we don’t know what the outcome will be. But we feel like it’s going to be great.”

> Families interested in enrolling a child in the study should contact Duke at cordbloodtherapyinfo@dm.duke.edu or 844-800-CORD (844-800-2673).
Toss a pebble into a pond. A ripple radiates outward. At first it alters only the surface nearest the point where the pebble struck, but it expands until it reaches the shoreline all around. Soon it is clear that one small pebble has changed the entire pond.

That’s the analogy that Adam Perlman, MD, MPH, FACP, executive director of Duke Integrative Medicine, uses to describe an ambitious new program that is designed to do no less than transform health care in America.

The Leadership Program in Integrative Healthcare, funded by a $1.4 million grant from The Bravewell Collaborative, intends to prepare a cohort of health care leaders to bring about that transformation by advancing the field of integrative medicine, which focuses on prevention, health maintenance, early intervention, and patient-centered care.

With the help of Bravewell—a foundation that supports integrative medicine as a more effective and economical approach to health care—the Duke course will help participants learn how to incorporate the principles of integrative medicine into their own institutions. The idea is that the change they create there will, like those ripples in the pond, eventually radiate throughout the health care system. The course, explains Perlman, invites each leader “to be that pebble.”

“The Bravewell Collaborative recognized a need to develop leaders within organizations and institutions that could bring about the transformation
of health care consistent with the principles of integrative medicine—a more holistic, patient-centered approach,” says Perlman, the program’s director. “Although many institutions have some clinicians with some integrative training, you need people with both a knowledge of integrative medicine and also the leadership and business acumen to build thriving programs. It’s a challenge to find people with that combination of skills. That’s the need that this program will address.”

Christy Mack, president and co-founder of The Bravewell Collaborative, says the demand is acute for the kind of transformative leaders the program is designed to produce.

“How we’ve been bombarded with requests for leaders in this field,” she says. “Many, many institutions are interested in moving toward an integrative medicine model, but again and again we’ve heard, ‘Who can we get to lead this effort?’ They just aren’t there.”

AGENTS OF CHANGE
Mack was among a small group of philanthropists who formed The Bravewell Collaborative in 2002 to try to shift the focus of American health care to integrative medicine in order to create a better economic model and greatly improve public health. In the years since, the collaborative has created its initiatives, implemented its strategies, and convened its networks of partners to further that goal.

To an impressive degree, they have succeeded. Integrative medicine has become an important facet of care at many private and public health care organizations, including the U.S. Veterans Health Administration, which in 2011 hired Tracey Gaudet, MD, former director of Duke Integrative Medicine, as the first director of its Office of Patient Centered Care and Cultural Transformation. In academic medicine, 60 institutions are now part of the Consortium of Academic Health Centers for Integrative Medicine, formerly chaired by Duke’s Perlman.

The progress has been so substantial that Bravewell believes that it has reached its objective of setting integrative medicine on a path toward expansion. Accordingly, the organization is in its sunsetting phase and will close its doors in fall 2015.

“Bravewell always felt that its goal was to not exist,” says Mack. “When Bravewell was founded, we established a finite period of time to accomplish our goals. And now, almost 15 years later, with the successful collaboration of our strategic partners, we can proudly say that we have even surpassed them.”

Once the decision to sunset was made, Bravewell knew it had to establish legacy projects, initiatives that would serve to maintain the momentum and ensure that progress would continue. For its health care partners, that meant creating a mechanism to educate and inspire health care leaders who can be agents of change.

“How do you transform culture?” says Mack. “We’re looking at a completely different business model. We’re looking at a completely different approach to clinical practice and to research. It’s a whole system change. Without good leaders, you will never be able to make that transformation.”

A HISTORY OF LEADERSHIP
The Bravewell Collaborative issued a request for proposals for programs that could move integrative medicine forward on a national scale. Of the many responses, one stood well apart from the pack.

“Bravewell felt there was absolutely no contest,” Mack says. “The panel was blown away by how comprehensive, how well thought-out, and professionally presented Duke’s proposal was. Duke’s proposal was driven by the same vision Bravewell has had for 15 years. It’s what Adam Perlman has wanted to do all along.”
It should have come as little surprise that the $1.4 million award to launch the Leadership Program in Integrative Healthcare should have come here. Duke has a long history of leadership in integrative medicine, dating back at least to the early 1990s, when a group of visionary Duke doctors and then-Health System Chancellor Ralph Snyderman, MD, began the process that established the Duke Center for Integrative Medicine in 1998.

“There has been a new wave of interest in wellness, preventive medicine, and lifestyle issues that can make an enormous difference in an individual’s health,” says Perlman. “We see a lot of desire on the part of medical centers and health systems to do a better job in those areas, and we are recognized as one of the leaders in that. So we are getting a lot of interest from groups that come to us to learn from our expertise and our model of care.”

Mack is well acquainted with Duke Integrative Medicine; in fact, at the request of Snyderman and the Duke University Health System, she and her husband John, though their family foundation, provided over $10 million in 2004 to build the state-of-the-art, award-winning 27,000-square-foot Duke Integrative Medicine facility on the Center for Living Campus. The Mack Foundation also provided the funding to launch Duke Integrative Medicine’s pioneering Integrative Health Coach Professional Training program.

AN EXPANDING VISION
As of October 2014, more than 90 applicants had applied for one of the 35 spots in the inaugural program, which will begin in February of 2015. The applicants, who come from throughout the U.S. and across the globe, include medical directors, CEOs, and other top executives and administrators from health systems, wellness foundations, public health departments, and other institutions.

The yearlong course, hosted by Duke’s Integrative Medicine in collaboration with the Duke’s Fuqua School of Business, will feature a faculty consisting of experts in integrative medicine, business, and leadership from across the world.

The course will include three brief retreats at Duke, an extensive online curriculum, a personalized mentorship with a faculty member from the Fuqua School of Business, and a final project, which will amount to a business plan each participant can take back to his or her institution and, as it were, drop the pebble into the pond.

“At the end of the day, our hope is that a lot of the concepts will get more widely integrated and made seamless within the system,” Perlman says. “It’s not, ‘Oh, you need a cardiologist, so now we’ll go talk to the integrative cardiologist.’ It’s more that thought would be given to how stress, diet, lack of exercise, lack of sleep might all be affecting your cardiologic health, and what changes we can help you make in those areas. All of that would be part of your experience.”

What is Integrative Medicine?
“Integrative medicine is an approach to care that puts the patient at the center and addresses the full range of physical, emotional, mental, social, spiritual, and environmental influences that affect a person’s health. Employing a personalized strategy that considers the patient’s unique conditions, needs, and circumstances, it uses the most appropriate interventions from an array of scientific disciplines to heal illness and disease and help people regain and maintain optimum health.”

The Bravewell Collaborative

“So we are getting a lot of interest from groups that come to us to learn from our expertise and our model of care.”

Adam Perlman

UPDATE: Duke Forward Progress Winter 2015
Diagnosis, At Last

BY APPLYING A RESEARCH TOOL TO BAFFLING CLINICAL CASES, DUKE SCIENTISTS ARE CHANGING THE LIVES OF CHILDREN WITH RARE GENETIC DISEASES.

> by Angela Spivey

Cara Greene, just turned two, rocks on a toy fire engine at a park near Duke University Medical Center. “I’m riding on a fire truck,” she exclaims with joy, raising her hands in the air.

Just four months earlier, Cara’s arms were practically paralyzed. Her parents and doctors were baffled as to how to help her.

A research study led by Duke geneticists David Goldstein, PhD, and Vandana Shashi, MD, changed that.

Cara is just one child the Duke team has helped using next-generation genetic testing. By sequencing only the genes that actually code for proteins (the exome, which is where most genetic diseases arise), scientists can save time and expense. Poring over exomes in minute detail has led to answers that have made a big difference in some families’ lives. As a result, Duke has been named one of six clinical sites in the Undiagnosed Diseases Network, sponsored by the National Institutes of Health. Each site will receive grants of about $7.2 million over four years to investigate baffling cases.

Goldstein and Shashi hatched their first collaboration on a drive back from a National Institutes of Health meeting in Washington D.C. Flights to Durham were canceled because of bad weather. The two, who hadn’t met before, rented a car along with Duke psychiatrist Joe McEvoy, PhD. Talking about her clinic, Shashi mentioned her frustration when she had exhausted all of the clinical genetic testing available but still couldn’t find an answer. That
happens with about half of the patients seen in most genetics clinics. Goldstein brought up exome sequencing and how it would one day change medicine. They had the whole study planned by the time they got back to Durham.

In late 2013, Cara was a busy toddler pushing her stuffed animals around in a stroller. Just two weeks before Thanksgiving, she had a high fever. Shortly after she recovered, she began having abnormal eye movements—fast back-and-forth and up-and-down motions (nystagmus).

A neuro-ophthalmologist at Duke Eye Center ruled out a brain tumor. Over the next few weeks, Cara’s fingers began trembling while she sat in her high chair trying to pick up food. Her parents, Kristen and Clayton, who lived in Raleigh, North Carolina, at the time, brought her to Duke every week for an appointment or test. Because of the fever that preceded the trouble, pediatric neurologists suspected an autoimmune disease. But none of Cara’s symptoms completely matched the possible diagnoses. Then, in January 2014, a test showed that her retinas weren’t functioning properly. Cara’s doctors admitted her to the hospital. They called in Shashi because the retina abnormality suggested a genetic disorder.

Shashi talked with Kristen and Clayton about sequencing Cara’s exome via a commercial clinical lab. But no one was convinced that the problem was genetic because it had started so suddenly. Maybe the retina test result was a false positive. Cara’s doctors and parents hoped they were on the right track with an autoimmune diagnosis. Cara had been started on a treatment for that—steroids and intravenous immunoglobulin.

When the Greenes next saw Shashi, in February 2014, the treatment had yielded mixed results. Some of Cara’s symptoms would lessen for a week or so, but then they’d come back. And she had new problems. She had begun having trouble swallowing. She could no longer raise her arms to steady herself, so if she stumbled, she would fall flat on her face. Cara became scared to try to walk.

Shashi offered to sequence Cara’s exome as part of the collaboration with Goldstein. Exome testing through a commercial clinical lab would take three to six months, but Shashi could expedite it if it were done at Duke.

A whole team of scientists scoured the exomes of Cara and her parents for clues. After DNA sequencing and computer processing, the scientists ended up with a list of mutations that were possible suspects. Slave Petrovski, PhD, a postdoctoral fellow in Goldstein’s lab, went over the list gene by gene, narrowing it down based on information about Cara’s symptoms and the various genes’ functions. After the list was culled to half a dozen or fewer mutations, the entire team reviewed it. “This is a lot of attention to each individual exome, much more than would be done clinically,” Goldstein says.

Just three weeks after Petrovski began poring over the data, he emailed Shashi. Cara had two mutations in a gene associated with a rare condition called Brown-Vialetto-Van Laere syndrome (BVVLS) that can strike anywhere from infancy to young adulthood. Both of Cara’s mutations would knock out a protein that transports riboflavin (a B vitamin) inside cells. Previously there was no effective treatment for the disorder, but just in the past two years, other researchers have discovered that high doses of riboflavin helped a few patients dramatically.
Because the exome testing was part of a research project, normally the findings would not be presented to the patient’s family until they were confirmed by an independent clinical lab. But even an expedited clinical test would take three weeks. Shashi didn’t want to wait that long. “Cara was continuing to deteriorate,” she says. “We decided we needed to act on this quickly.” The team explained the urgency to the chair of the Institutional Review Board (the organization at Duke that approves research involving human participants), and an exception was granted.

The team gave the Greenes the news that same week, and Shashi prescribed Cara a high dose of riboflavin (1,500 times the daily requirement). Kristen was so eager to do something to help her daughter that she picked up the prescription at the Duke Children’s and gave Cara a dose in the lobby.

Four months after that first dose, Cara is doing much better. She can play again, though she tires easily. She no longer has trouble swallowing, and she’s regained some of the movement in her arms. “She really likes to stand in front of a full-length mirror and watch herself lift her arms up in the air,” Kristen says. “She looks in the mirror and gives herself a high five.”

Why does such a simple treatment work? Shashi explains that normally, three proteins control riboflavin transport among cells. Cara’s mutations meant that one of those three was missing. The high dose of riboflavin likely floods the two remaining working proteins, so they can pick up the slack.

In other children, BVVLS has progressed so far that the respiratory muscles weaken, requiring use of a respirator. Riboflavin therapy has reversed that for some. Kristen and Clayton are thankful that they found a diagnosis for Cara as soon as they did. They had feared that if Cara’s condition were genetic, there would be little they could do to help her. “The exome testing saved Cara’s life and is giving her a chance at life again,” Kristen says.
Well Connected  > by Angela Spivey

BASS CONNECTIONS FUND SPARK COLLABORATION AND INNOVATION

How does a nursing professor with a PhD in family and child development start a collaboration with a neuroscientist? For Leigh Ann Simmons, PhD, MFT, it all began in yoga class.

Simmons, an associate professor of nursing, had just received review comments on her application for a federal research grant. She wanted to investigate whether levels of a particular amino acid (branched chain amino acids, or BCAAs) are elevated in women who experience postpartum depression. BCAAs are abundant in high-protein diets, and they have been associated with obesity, insulin resistance, and depression. So Simmons thought, maybe BCAAs could be used as a biomarker to identify women at risk for postpartum depression. Then health care professionals could intervene before depression develops, perhaps with a special diet.

The grant-application reviewers loved Simmons’ idea. But they wanted to see some preliminary data in pregnant animals before they’d consider funding her proposed human study. Previous studies had linked these amino acids to depressive behavior in rats, but only in males.

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The thought of conducting an animal study herself was new to Simmons. She had never even worked with mice before.

With all this on her mind, Simmons went to yoga class as usual. Her friend and colleague, Staci Bilbo, PhD, an assistant professor of psychology and neuroscience, happened to be in class too. Afterward, Simmons asked her if she had ever manipulated diet in her mouse studies. It turns out she had. That conversation led to a collaboration.

While the connection came via yoga class, the funding to conduct the research is courtesy of Bass Connections, a university-wide initiative that aims to engage faculty and students in teams working to tackle complex issues, and to expose students to inquiry across disciplines. Bass Connections was launched in 2013 with a $50 million gift from Anne and Robert Bass.

Just as Simmons’ project crosses the lines between nursing and neuroscience, other Duke University School of Nursing researchers are leading Bass Connections projects that span the globe, from Asia to Africa, as well as Duke’s campus, from computer science to economics.

MASK ON MOM

It’s fitting that Simmons connected with Bilbo during yoga class; Simmons has long focused on helping women live healthy lives and is an integrative health coach and yoga teacher herself. While Bilbo is primarily interested in how diet and other events during pregnancy affect the health and behavior of offspring, Simmons is interested in the mothers. “You know when you’re on a plane, and the pilot will say, ‘If we have to drop the oxygen masks, make sure you put on your mask before you take care of your child?’ My research has always been about mask-on-mom,” Simmons says. “When we help mom, then we’re de facto helping the kids.”

The team is examining levels of BCAAs and incidence of depression in females who have just given birth—both mice and humans. Though BCAAs are important for building muscle, they are found at higher levels in the average Western diet (what Simmons calls “the McDonald’s diet”). In addition, BCAAs are naturally produced at higher levels during pregnancy, as the mom’s body builds a baby. “If you’re eating a diet that actually enhances branched chain amino acids, and then you’re pregnant, and that is also increasing their production, maybe some women reach a threshold that pushes them over the edge, contributing to postpartum depression,” Simmons says.

Students working on the project are gaining experience in both animal research and human behavioral research. For instance, one PhD nursing student is administering a questionnaire that the human moms take right after giving birth, regarding their diets and their behavior. An ABSN student is measuring

“If you’re eating a diet that actually enhances branched chain amino acids, and then you’re pregnant...some women reach a threshold that pushes them over the edge, contributing to postpartum depression.”

Leigh Ann Simmons
maternal care and other behavior of mice that are fed diets with different levels of fat and branched-chain amino acids. The students are also getting experience in metabolomics, which uses advanced technology such as mass spectrometers to analyze the presence of metabolites in blood and other tissues, as a way of understanding how diet and other factors affect the body. The students will be able to compare metabolomics results, including signatures left behind by BCAAs, in blood samples from both mice and women, and find out how they correlate with behavior.

Simmons herself is spending time learning to conduct animal research in Bilbo’s lab, such as behavioral tests and laboratory assays. “I want to be able to talk with authority about all aspects of the research. I can’t do that unless I’ve done it myself,” Simmons says. “I also like it because in that aspect, the students are teaching me.”

PREPARING FOR THE GLOBAL DEMENTIA PANDEMIC

Baomu. Loosely defined, the word means caregiver. While the term is unfamiliar in the United States, it’s commonplace to many families in China caring for an aging family member with dementia. The word denotes the informal system in which largely untrained rural people in need of work travel to more affluent, urban areas of the country to live with and care for people with dementia, much like an au pair might live full time with a family to care for a child.

Dementia has been called the next global pandemic; it’s estimated that worldwide the number of people with dementia will triple by 2050, according to Alzheimer’s Disease International. Bei Wu, PhD, professor and director of international research at Duke University School of Nursing, is documenting how people across the globe care for their family members with the disease. Wu has long conducted research on aging in China, where her 101-year-old grandmother still resides. One of her latest projects, funded by Bass Connections to begin in July 2014, will document how caregiving for people with dementia gets accomplished in China and Sri Lanka, and it will reveal opportunities and needs for training programs.

In the United States, families affected by dementia are likely to get help from a trained home health aide or a certified nursing assistant. But just because the United States has a more formal system of caregiver training doesn’t mean that the West has the issue all figured out, Wu says. “Our goal is to find out how we can facilitate collaboration between the two developing regions, as well as share our experiences and learn from theirs,” she says.

Collaborator Kirsten Corazzini, PhD, an associate professor of nursing, points out that both the baomu system and the Western system have their drawbacks. “There are big issues around what happens when a caregiver is residing with the family 24-7, including human resource issues such as developing skills, and ensuring caregiver and care recipient quality of life,” Corazzini says. On the other hand, studies have pointed out that the United States suffers from the opposite problem—lack of consistency in an ever-changing cast of caregivers. No one country has the complete answer, and that’s why it’s important to conduct qualitative interviews before forming any hypotheses, Wu says.

Improving care for people with dementia is a challenge that must be tackled systematically and globally, says Eleanor McConnell, PhD, MSN, GCNS, BC, an associate professor of nursing. “Moving forward, if we are a global society, it’s really not acceptable for affluent countries to import people to solve their workforce problems,” she says. “We need to think about, how do we collectively develop a work force? And, how do we pay for this?”

To that end, the project involves faculty and students from not only nursing, but also computer science and economics.

IMPROVING ANESTHESIA CARE IN THE DEVELOPING WORLD

If you’re an experienced health care professional in a developing country where your skills are desperately needed, do you take time away from serving patients to get the validation of a college
Wu and Corazzini are exploring the benefits and drawbacks of the ways the U.S., China, and Sri Lanka deliver care to people with dementia.

degree? Or do you stay on the job and watch people with less experience move ahead of you in the ranks?

Nurse anesthetists in Ghana, Africa, won’t have to make that choice if Brett Morgan, DNP, CRNA, assistant professor of nursing, has his way. As part of his long-term interest in improving anesthesia care in developing countries, Morgan is adapting a traditional curriculum for nurse anesthetists into a distance learning program. “The goal is that these nurse anesthetists can stay working in their communities while reaching the objectives that are necessary to get their baccalaureate degree,” Morgan says.

In the United States, there is about one anesthesia provider for every 4,000 people. In some developing countries, the ratio is as low as one in a million. “Surgeons are giving their own anesthesia, or finding laypeople to do it, or else there simply is no access to surgical care because there is no one to administer anesthesia,” Morgan says.

Nurse anesthetists in Ghana have traditionally been trained in a hospital-based diploma program and are considered of a lower rank than general nurses. To increase the number of providers and the quality of care, Morgan had previously helped establish a baccalaureate degree program for nurse anesthetists at Ghana’s University for Development Studies. Now he’s adding this executive-education-style distance program. “The current system in Ghana isn’t perpetuating the profession of nurse anesthetist very well,” Morgan says. “We hope this distance-learning program will be another part of the solution.”

Morgan is collaborating with faculty in the Duke Global Health Institute and the Department of Computer Science. The first step is designing a tablet-based platform to be used to teach the bulk of the courses. Later, Duke faculty, students in the nursing master’s program, and medical residents and fellows in the anesthesia residency program will travel to Ghana to implement the tablet platform, train faculty and students there, and conduct a survey of health care systems and communities.

“Surgeons are giving their own anesthesia, or finding laypeople to do it, or else there simply is no access to surgical care...”

Brett Morgan
MARION BROOME TO LEAD NURSING SCHOOL

Marion E. Broome, PhD, RN, FAAN, has been named dean of Duke University School of Nursing, vice chancellor for nursing affairs at Duke University, and associate vice president of academic affairs for nursing at Duke University Health System. Before coming to Duke, Broome served as dean of the Indiana University School of Nursing since 2004.

Regarded as a national leader in pediatric nursing, Broome has received research funding from the American Cancer Society, the National Institutes of Health, and private foundations.

"Nursing is becoming ever more important in the changing landscape of contemporary health care, and Duke's School of Nursing has assumed a leadership role in this development," said Richard H. Brodhead, PhD, Duke University president. "Marion Broome is wonderfully well equipped to continue the school's upward trajectory, and we are delighted to welcome her to Duke."

Broome's primary area of research is in pain interventions for children, but she has also honed expertise in research ethics related to the informed consent of children in research, research misconduct in clinical trials, and ethical dilemmas in publishing.

She is currently editor-in-chief of Nursing Outlook, the official journal of the American Academy of Nursing and the Council for the Advancement of Nursing Science.

In addition to Broome's appointment, Mary Ann Fuchs, DNP, RN, FAAN, vice president of patient care and system chief nurse executive for Duke University Health System, was named associate dean of clinical affairs in the School of Nursing. The appointments are structured to enhance the partnership and alignment between the health system and school.

KORNBLUTH NAMED DUKE PROVOST

Sally Kornbluth, PhD, has been named to succeed Peter Lange as provost of Duke University. Kornbluth has been vice dean for basic sciences in the School of Medicine since 2006. She is also a James B. Duke Professor of Pharmacology and Cancer Biology.

As provost she will have broad responsibility for leading Duke's schools and institutes, as well as admissions, financial aid, libraries, information technology, and all other facets of the university's academic life.

"A distinguished researcher and mentor, [Sally] has won high praise for her administrative gifts as a creative problem solver in service of academic excellence," said Duke University President Richard H. Brodhead, PhD. "She combines a deep love of Duke with keen intelligence about the challenges facing higher education."

KIRK, MD’87, PHD’92, HS’95, TO HEAD DEPARTMENT OF SURGERY

Allan D. Kirk, MD, PhD, was appointed chair of the Department of Surgery and surgeon-in-chief for Duke University Health System in May. A graduate of the School of Medicine who also trained at Duke, he was professor of surgery and pediatrics at Emory University, scientific director of the Emory Transplant Center, and vice chair for research of the Emory Department of Surgery. He is an internationally recognized surgical scientist and leading authority on transplant immunology.

In addition to his Duke education and training, he completed a multi-organ transplantation fellowship at the University of Wisconsin in 1997 and served in the U.S. Navy from 1997-2001, reaching the rank of commander and serving as principal investigator at the Naval Medical Research Center. In 1999 he became the inaugural chief of the National Institutes of Health Intramural Solid Organ Transplant Program and later served as senior investigator and founding chief of the Transplantation Branch at the National Institute of Diabetes and Digestive and Kidney Diseases.
O’BRIEN NAMED CHAIR OF NEUROLOGY

Richard J. “Rich” O’Brien, MD, PhD, joined Duke University School of Medicine as chair of the Department of Neurology in July.

O’Brien was professor of neurology, neuroscience, and medicine and chair of the Department of Neurology at the Bayview Campus of The Johns Hopkins Medical Center. He also served as associate dean for research at Johns Hopkins Medicine. His current research focuses on the effect of aging and neurodegenerative disorders on brain plasticity in animals and humans. In addition to his research, O’Brien is an active clinician, treating patients with neurodegenerative and cerebrospinal fluid disorders.

O’Brien received his undergraduate degree, MD, and PhD at Harvard University and completed a residency in internal medicine at the Massachusetts General Hospital and a residency in neurology at Johns Hopkins Hospital. He is a member of the leadership teams of the Baltimore Longitudinal Study of Aging and the BIOCARD study and has received multiple National Institutes of Health and foundation grant awards.

REED APPOINTED CHAIR OF PEDIATRICS

Ann M. Reed, MD, joined Duke University School of Medicine as chair of the Department of Pediatrics in August.

Reed was chair of the Department of Pediatric and Adolescent Medicine at Mayo Clinic and interim director and physician-in-chief for the Mayo Clinic Children’s Center in Rochester, Minnesota. She was also professor of pediatrics and medicine at the Mayo Medical School and a consultant in the Division of Rheumatology in both the Departments of Pediatric and Adolescent Medicine and Internal Medicine.

Reed received her MD from the Medical College of Ohio. She completed an internship and residency in pediatrics at Children’s Hospital Medical Center of Akron and a fellowship in clinical immunology/rheumatology at Northwestern University/Children’s Memorial Hospital in Chicago. She also completed a research fellowship in a molecular genetics laboratory at the University of Chicago. Reed was a tenured associate professor at the University of North Carolina in Chapel Hill and was active in a collaborative program with Duke, providing clinical care of pediatric rheumatology patients before her move to Minnesota. She continues to be active in the clinical care of children with dermatomyositis and autoinflammatory disease.

NURSING DEDICATES NEW WING OF PEARSON BUILDING

A new 45,000-square-foot wing of the School of Nursing’s Pearson Building was dedicated in April. The new wing houses classroom and study areas, including the Center for Nursing Discovery where students use simulators to practice patient care skills, audio and video recording studios, an audiovisual technology suite, and new offices for research and a dean’s suite. Gifts from several donors helped support the new wing.

AWARDS AND HONORS

Recent awards and honors received by Duke faculty include:

Institute of Medicine
Mary Klotman, T’76, MD’80, HS’80-’85
Chair, Department of Medicine
American Academy of Arts and Sciences
Michael Kastan, MD, PhD
Executive Director, Duke Cancer Institute

Lifetime Achievement Awards
Society of Neuro-Oncology
Darell Bigner, MD, PhD
Director, Preston Robert Tisch Brain Tumor Center at Duke
International Society of Behavioral Medicine
Redford Williams, MD
Professor of Psychiatry and Behavioral Sciences and Director of the Behavioral Medicine Research Center in the School of Medicine
Duke announces planned giving campaign

In June, Duke University announced a new goal of securing 1,200 new planned gifts during the seven-year, $3.25 billion Duke Forward campaign, which ends in 2017. Planned gifts can provide tax advantages and financial flexibility, and they take many forms, including bequests and retirement plans, life income gifts, charitable lead trusts, retained life estate gifts, and more. They strengthen the institution for the future and yield invaluable returns to students, faculty, and the Duke community for generations.

Blackwell headlines Duke Forward events

More than 4,000 Duke alumni and supporters attended a presentation by Kimberly Blackwell, T’89, MD, during a Duke Forward event at the American Museum of Natural History in New York City in May. Blackwell, a professor of medicine, assistant professor of radiation oncology, and director of the Breast Cancer Program at Duke Cancer Institute, was one of Time’s 100 most influential people in the world in 2013. She has played a major role in the development of revolutionary non-chemotherapy based approaches for treating breast cancer. The event was part of Duke Forward on the Road, a series of campaign events being held in cities across the country. Blackwell also was keynote speaker at a Duke New Jersey Alumni Association event in October and a Duke Forward event in Boston in November.

Duke Children’s gala

Saturday, March 21, 2015, 6 PM
Washington Duke Inn & Golf Club

For more information contact Amelia Howle at 919-385-0033 or amelia.howle@duke.edu.

Heart Center celebrates 25 years, 1000 transplants

A series of events for former trainees, faculty, staff, donors, and patients was held in September to celebrate the 25th anniversary of Duke Heart Center. The Heart Center is also celebrating its 1,000th heart transplant at Duke, the first institution in its five-state United Network for Organ Sharing (UNOS) region to achieve this milestone. This accomplishment is shared with only a handful of transplant centers nationwide.
The Hudson Building at Duke Eye Center is on track to open in July 2015. It was funded in large part by $16 million in gifts from Durham-based LC Industries, the country’s largest employer of visually impaired people. With its four-story lighted LED tower and prominent Duke stone, the Hudson building will enhance the patient experience, allow for expanded services, and anchor the Eye Center’s nationally recognized translational research. The building is named to honor William Hudson, president of LC Industries and chair of the Duke Eye Center Advisory Board.

Duke Medicine’s successful track record in vaccine research has led to its selection as a Vaccine and Treatment Evaluation Unit (VTEU) by the National Institute of Allergy and Infectious Diseases. VTEU’s evaluate vaccines, treatments, and diagnostics to protect people from infectious diseases, including emerging public health needs.

Duke was the only new site named since 2007 to the existing group of eight VTEUs. Each institution has the potential to receive funding estimated to be up to $135 million annually over a seven-year period. Duke’s VTEU will be administered through the Duke Human Vaccine Institute, already a leader in the fight against infectious diseases, with programs at the vanguard of developing vaccines for HIV, flu, tuberculosis, dengue, and others.

More than 220 guests attended the 45th Anniversary Celebration of the Davison Club, the School of Medicine’s annual giving club. The program featured Billy Andrews, T’76, MD’80, HS’80-’86, president of the Davison Club; Sam Katz, MD, former chair of the Department of Pediatrics; and Robin Mansour, medical student body president. Pictured above are current medical students who attended, including from left, back row, Trevor Dickey and Matt Susko, and front row, Lauren Ring, Duriel Hardy, George Li, and Kyle Miller.
> **20 YEARS OF RADIOTHON**

Duke Children’s celebrated the 20th anniversary of the MIX 101.5 Radiothon in February. More than 230 volunteers accepted donations and pledges of support from people who called in from across the community and state. Patient families shared their personal experiences, and Duke athletic coaches David Cutcliffe and Mike Krzyzewski, honorary campaign champions for Duke Children’s, each gave a live interview. Radiothon is the largest annual fundraising event for Duke Children’s each year, raising a grand total of $16,448,658 over the years to provide critical support for children’s specialty care, clinical research, and patient and family services.

**Thank you MIX 101.5 and the greater North Carolina community!**

**$1.07 million** for Duke Children’s

> **MAKING MIRACLES, $1 AT A TIME**

Duke Children’s is a proud member of Children’s Miracle Network (CMN) Hospitals, a network of 170 children’s hospitals across the US and Canada that raises money and awareness for local children’s hospitals. In its 31-year history, CMN Hospitals has raised $4 billion, most of it $1 at a time through programs like miracle balloon icon sales, peer-to-peer fundraising campaigns, and community-based events. Money raised through CMN Hospitals campaigns stays in the community to help local children’s hospitals. At Duke Children’s, the local CMN Hospital for the Triangle, Triad, and Wilmington regions, these funds help support research, clinical care, advocacy, and family support programs. Organizations throughout the community serve as partners and sponsors, including Walmart, Duke Children’s biggest partner, which helped raise $1,250,450 in calendar year 2013.

**Thank you Duke Children’s Miracle Network!**

**$3.9 million** for calendar year 2013

> **SHARED PASSIONS FOR CANCER RESEARCH**

Elizabeth Harden, MD’78, HS’81-’84, says her Duke medical education and training influence her every day. “The Duke colleagues I met and continue to work with and the excellence demanded of us made me the doctor I am today,” she says. She and her husband, Richard Hoefer, DO, regularly collaborate. She is a medical oncologist, and he is a surgical oncologist. Together, they have made an estate gift to support Duke Cancer Institute’s (DCI) mission to bridge boundaries to advance multidisciplinary cancer care. Their gift supports both of their passions: it will create an endowed pilot fund for research and a professorship within DCI. “Bench research that gets translated to the bedside gives me the tools I need to take care of my patients,” says Harden. “We wanted to make sure Duke has the funding to keep good people,” says Hoefer.

**Thank you Elizabeth Harden and Richard Hoefer!**

Estate gift for Duke Cancer Institute
> **A MIND BLOWING KICK!**

At the 2014 World Cup in Brazil, a paraplegic young man, wearing a specially constructed exoskeleton and cap fitted with electrodes, was able to make his foot kick a soccer ball using only his thoughts. That small kick was the result of three decades of work conducted at Duke by Miguel Nicolelis, MD, a distinguished professor of neuroscience and co-director of the Duke Center for Neuroengineering. Now, thanks to a gift from The Duke Endowment in Charlotte, North Carolina, people from North Carolina and throughout the region may soon benefit from NE2, a new neuro-rehabilitation and neuro-enhancement laboratory that will conduct multidisciplinary clinical research at the intersection of neuroscience, neuroengineering, rehabilitation, and robotics. The laboratory is a collaboration between Nicolelis and Michel Landry, BScPT, PhD, chief of the Division of Physical Therapy. Its aim is to develop new therapies, neuroprostheses, and neurorobotics to improve mobility and quality of life for people who have suffered severe neurological injuries due to spinal cord injuries, stroke, or diseases that limit mobility, such as Parkinson’s.

Thank you Duke Endowment!

$1 million for Duke University School of Medicine

> **GIVING THANKS FOR A LIFE SAVED**

Gerhard and Ruth Cless turned to Duke in 2002 when their son, Bryan, was diagnosed with a malignant brain tumor. It was a difficult time, but today Bryan is the healthy father of four children. The Clesses, who say they believe Duke’s brain tumor team is “the best in the world,” have been partners with the Preston Robert Tisch Brain Tumor Center at Duke since 2003, serving on the Board of Advisors. They established a fund for brain tumor research, and this year they created the Cless Family Neuro-oncology Professorship. Endowed professorships allow Duke to attract and retain world leaders in science and medicine.

Thank you Ruth and Gerhard Cless!

$2.5 million to the Preston Robert Tisch Brain Tumor Center at Duke

> **SPECIALIZED TRAINING FOR FOSTER FAMILIES**

Families who open their homes for foster care make a commitment to nurture children who often come with emotional, behavioral, and educational disabilities. Today, those families are seeing children with more serious problems than ever before. Some states, including North Carolina, are now mandating evidence-based training to help families provide the best possible care for foster children. Often the training is tied to state funding. A training program developed at Duke by Maureen Murray, LCSW, an assistant professor of psychiatry, is one of the top two nationally ranked by the California Evidence-based Clearinghouse for Child Welfare. The demand for training—from North and South Carolina and increasingly from across the country—exceeds Duke’s capacity to provide it. Thanks to a gift from The Duke Endowment in Charlotte, North Carolina, the program will be expanded for agencies in both states, and will be disseminated as a model for other states.

Thank you Duke Endowment!

$1.3 million for the Together Facing the Challenge training program

> **A GIFT OF TIME—FOR RESEARCH AND EDUCATION**

In today’s health care environment, academic medical centers like Duke are challenged to protect faculty time for research and education. Biomedical research is the reason academic medical centers historically have driven breakthroughs in science and medicine. Education is the only solution to a projected shortage of physicians and scientists for the future. Endowed professorships enable Duke to attract and retain the best faculty members, who will elevate research, education, and ultimately the most advanced care for patients. Thanks to a gift from the Nanaline H. Duke Trust, the Department of Surgery has one more endowed professorship.

Thank you Nanaline H. Duke Trust!

$2.5 million for the Department of Surgery
An experimental brain tumor vaccine developed at Duke by Matthias Gromeier, MD, has given South Carolina nursing student Stephanie Lipscomb new hope. After having a modified form of the polio virus injected directly into her tumor, 22-year-old Lipscomb is now cancer-free more than two years after the tumor first occurred. Gromeier spent two decades working on the polio virus vaccine at Duke’s Preston Robert Tisch Brain Tumor Center.