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The University of Massachusetts Medical School Magazine

YEAR IN REVIEW 2013

Two UMMS researchers rock the scientific world:

For Katherine Luzuriaga,
'functional' HIV cure offers real hope

Jeanne Lawrence's long shot pays
off for silencing Down syndrome



A MEMORABLE YEAR TO REVIEW

Two remarkable discoveries by UMass Medical School faculty captured the attention of the world this year, as hope for a cure for HIV became less of a dream, and the extra chromosome causing Down syndrome was silenced in the lab. These are just two of the many accomplishments of our faculty, all of whom have their own stories to tell of how they became passionate about their work. This year-in-review issue of *UMass Med* magazine explores the different pathways to success taken by Katherine Luzuriaga, MD, and Jeanne Lawrence, PhD. It also showcases an institutional culture that nurtures scientific breakthroughs.



Photo on cover:
Katherine Luzuriaga, MD, left,
and Jeanne Lawrence, PhD,
in the Albert Sherman Center.
Photo by John Gillooly.

The University of Massachusetts Medical School, the state’s first and only public academic health sciences center, educates physicians, scientists and advanced practice nurses to heal, discover, teach and care, with compassion. Our mission is to advance the health and well-being of the people of the commonwealth and the world through pioneering advances in education, research and health care delivery.

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Two researchers took different approaches to tackling very different health issues. The common denominator was an institutional culture of support and creativity that nurtured their pathways to success.

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Katherine Luzuriaga, MD, and her team of collaborators showed that intense antiretroviral therapy just hours after birth may cure HIV-infected infants, saving them from a lifetime of expensive treatment. Twenty years in the making, the development may also have global applications for adults with HIV.

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Jeanne Lawrence, PhD, took an out-of-the-box approach to tackling the complex issues involved in silencing the extra chromosome that causes Down syndrome. Her non-traditional research pathway reflects a passion for human genetics that has deep and personal roots.

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As you read about the dynamic UMass Medical School community, you'll frequently come across references to our partners and programs.

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Chancellor's Message

At UMass Medical School, innovation and collaboration are both necessary and commonplace: science moves so rapidly and research problems are so complex that the best minds are those that can imagine new approaches and follow new ideas, wherever those ideas seem to lead. Yet even in an environment such as this, rich with possibility, words such as "innovative" and "collaborative" do not adequately capture the excitement or the achievement of some of the work being done here. This year, among many important stories, there were two moments—by two multidisciplinary research teams led by two extraordinary thinkers—that stand out.

Those two thinkers are featured on the cover of this annual report: Katherine Luzuriaga, MD, professor of molecular medicine, pediatrics and medicine, and our newly appointed vice provost for clinical and translational science; and Jeanne Lawrence, PhD, professor and interim chair of the department of cell and developmental biology. Both made national headlines this year because of groundbreaking work. Both have been so successful at answering difficult

“These breakthrough discoveries are the sorts of achievements that talented minds supported by a biomedical research infrastructure use to advance their fields in surprising ways.”



Michael F. Collins, MD
CHANCELLOR, UNIVERSITY OF MASSACHUSETTS MEDICAL SCHOOL
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questions because they enthusiastically embrace innovation and collaboration. In the case of Dr. Luzuriaga, she began her research in a field where a diagnosis of HIV was almost unquestionably a death sentence; now, a disease that biomedical research has turned into a chronic illness may have a cure visible on the horizon. For Dr. Lawrence, a deep interdisciplinary understanding of human genetics and a scientist's grasp of new research tools led her to do something that conventional wisdom presumed was too complicated: silencing a whole chromosome. What was thought to be impossible now suddenly seems much more likely.

At the opening of the Albert Sherman Center in January, I gave this charge: “To change the course and history of disease—that, and no less, is what brings us here today.” Gifted colleagues like Dr. Luzuriaga, who came to UMass Medical School with an intense interest in infectious disease and an intense compassion for her pediatric patients, and Dr. Lawrence, whose teaching experience in the medical school's genetics course gave her a rare understanding of both the science and the human experience of Down syndrome, represent the dedication and creativity that our faculty demonstrate each day.

Underpinning these great scientific accomplishments is the power of research funding. These breakthrough discoveries are the sorts of achievements that talented minds supported by a biomedical research infrastructure use to advance their fields in surprising ways. Not long ago, curing HIV and silencing Down syndrome were considered dreams. Thanks to essential support from the National Institutes of Health, these dreams are closer to reality.

As we look to the future of this academic health sciences center, innovation and collaboration will be needed more than ever. Working closely with our clinical partner, UMass Memorial Health Care, we have begun a process for a new strategic plan that will leverage the strengths of both to meet the profound challenges of human disease and effective health care delivery in a time of fierce competition for resources. Academic health sciences centers such as this one will change more in the next five years than they have in the previous 50, and we intend to lead that transformation from the front.

There is much to be optimistic about because of the people here, such as Katherine Luzuriaga and Jeanne Lawrence. They are just two among an outstanding faculty and a committed staff. Working together, no institution has a better chance of being successful in the future.

Different approaches, similar determination

Two UMMS researchers rock the scientific world

Reports of two scientific breakthroughs by UMass Medical School researchers and their colleagues continue to make international headlines, one involving a “functional” cure of a HIV-positive baby, and the other offering hope that the extra chromosome responsible for Down syndrome might be silenced. The researchers took very different approaches to tackling very different health issues—one a disease that is particularly deadly in low-resource settings, but can now be managed with expensive, life-long treatment; the other a genetic disorder with associated concerns such as congenital heart disease, leukemia and cognitive defects, with hundreds of overrepresented genes once deemed too complicated to tackle.

In fact, the only common denominators joining these two stories might be the similarly dogged determination of Katherine Luzuriaga, MD, professor of molecular medicine, pediatrics and medicine, and Jeanne Lawrence, PhD, interim chair and professor of cell & developmental biology, and the institutional culture of support and creativity at UMMS that nurtured their different pathways to success. They also both benefited from extensive National Institutes of Health funding and sustained support from colleagues on campus and around the country.

Dr. Luzuriaga, who has worked for 20 years with researchers around the world to end the HIV/AIDS epidemic, came to UMMS through a mentored fellowship. Thanks to a framework provided by the NIH and other funders, she and her collaborators may have uncovered evidence that aggressive treatment hours after birth has the potential to save the youngest HIV patients from the burden of life-long antiretroviral treatment, and she is optimistic that future research will show promise for adults as well.

In contrast, Jeanne Lawrence, PhD, interim chair and professor of cell & developmental biology, worked independently on an out-of-the-box approach to genetic research, fueled by a personal interest in improving the lives of people with developmental disabilities. While she has kept her work largely confined to the Worcester campus, the outcome of her research has wide implications, as a better understanding of the genetic pathways that underlie the syndrome may lead to a new route to gene therapy for myriad other genetic conditions, including Alzheimer’s disease.

Both of these breakthroughs lay crucial groundwork for a better understanding of health issues once thought too complex to solve. UMass Medical School’s institutional culture of support encourages all UMMS researchers to remain optimistic as they look for new approaches, new answers, new hope. **U**

‘Functional’ HIV cure offers real hope

Katherine Luzuriaga, MD, says ‘functional’ cure of HIV in infants may transform treatment of a still-deadly disease

On the list of *Time*’s 100 most influential people of 2013 are the usual assortment of celebrity musicians, actors, athletes, politicians and businesspeople—and Katherine Luzuriaga, MD. Dr. Luzuriaga, professor of molecular medicine, pediatrics and medicine, and vice provost for clinical and translational research, was recognized along with two colleagues, Hannah Gay, MD, and Deborah Persaud, MD, for their functional cure of an HIV-positive infant. More than just a chance to hobnob at the gala reception, the doctors’ collective inclusion on the *Time* list sends an important message about science and medicine in the United States today.

“Our inclusion on the *Time* 100 list places science in the public eye and in a very favorable light,” said Luzuriaga. “Any time the popular press recognizes a scientist and the importance of the scientific process in changing our lives, it’s a good thing.” That kind of recognition could lead to a better understanding by the general public of what it means for their tax dollars to support researchers through NIH funding, as well as to encourage donations to foundations or academic institutions to support further research. And that, in turn, “can create wins for patients,” said Luzuriaga.

The case involved an infant born to a woman who had not received prenatal care and therefore had not been diagnosed as HIV positive before delivery. When the child was born, Dr. Gay, a pediatrician at the University of Mississippi, started therapeutic antiretroviral treatment within 30 hours of birth, even before the baby tested positive for HIV. Unlike the standard prophylactic treatment, which is administered for six weeks and followed with therapeutic doses only after an infection is diagnosed, this more aggressive approach continued until the child was 18 months old, when the mother stopped coming for follow-up visits. After five months in which no additional treatment was administered, the child’s blood was retested with standard measures. No trace of HIV was detectable; there was also no sign of HIV-specific antibodies.

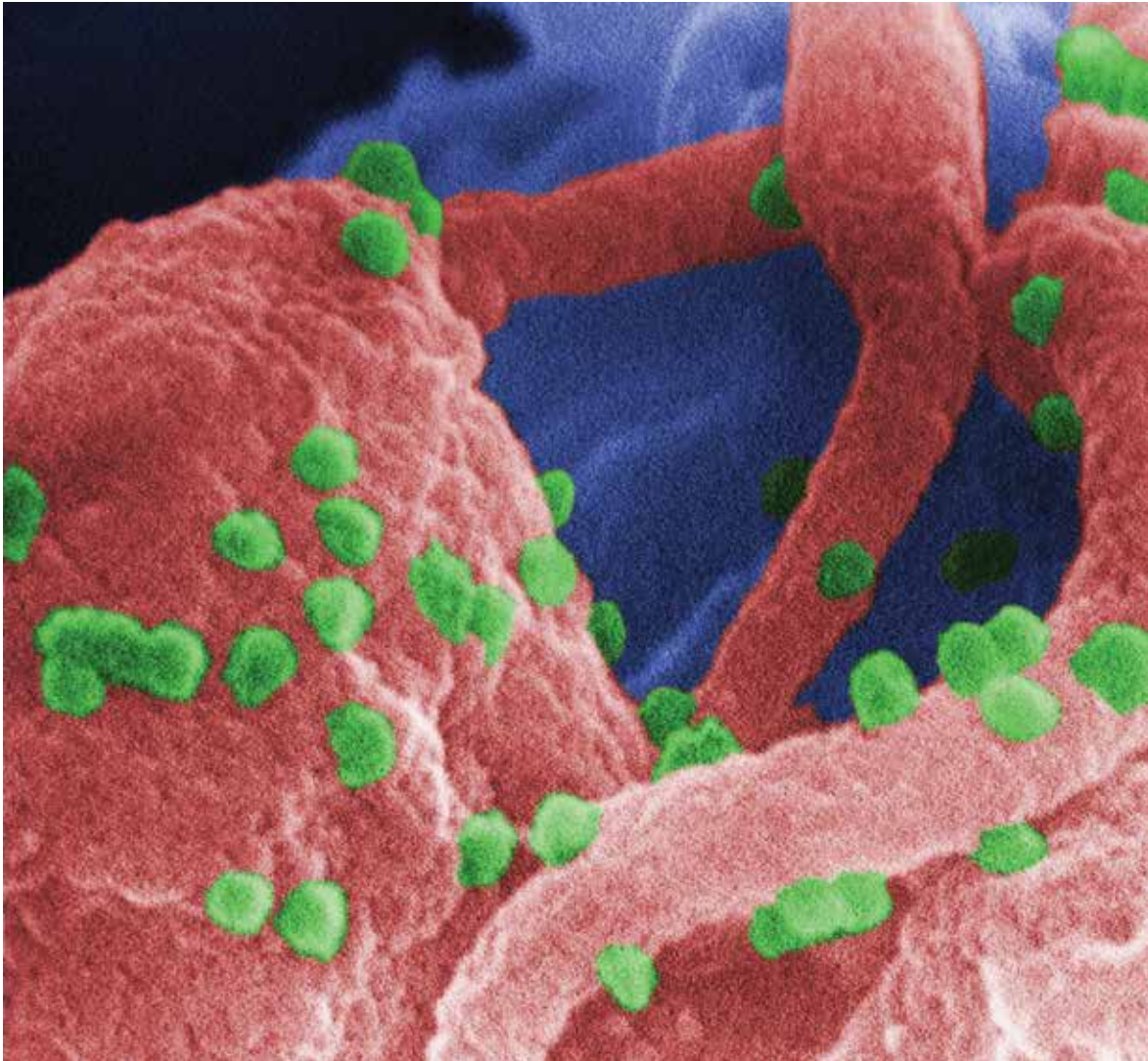
Gay consulted with Luzuriaga, who immediately contacted a long-time colleague, Dr. Persaud, associate professor of pediatrics and infectious diseases at the Johns Hopkins Children’s Center. Luzuriaga and Persaud used highly sensitive molecular virology and immunology techniques to evaluate the baby’s blood for persistence of HIV. The baby has remained healthy and has not experienced an HIV rebound in follow-up. The team’s paper reporting the case was published in the Oct. 23 online edition of the *New England Journal of Medicine*.

The so-called “Mississippi baby” is just one case, but the takeaway—that ongoing treatment initiated early in an infant’s life has the potential to cure HIV infection—is significant. There is a big if, however, and that’s whether it’s possible to routinely diagnose newborns. Standard diagnostic methods use antibodies to search for infection but, because of the third-trimester maternal transfer of antibodies, that’s not a perfect approach. Properly diagnosing an infant, then, requires nucleic-acid-based detection methods to find any HIV nucleic acids in plasma,

By Sarah Zobel



Using highly sensitive molecular virology and immunology techniques, Katherine Luzuriaga, MD, showed that aggressive antiretroviral treatment of an infant just hours after birth ‘functionally’ cured a baby in Mississippi. At right, HIV-1 is shown as green spheres in this scanning electron micrograph. [CDC Public Health Image Library]



“There are places in the world where this experiment can be continued to show that the result is, in fact, real, and then people can begin to think about applications that go beyond.”

— John Sullivan, MD

which calls for a lab with trained technicians—at a significant cost. It’s not practical in many parts of the world where HIV remains unchecked so, as of now, the best chance of eliminating maternal-child transmission remains testing during pregnancy. With the mother on antiretrovirals, transmission rates drop to near zero.

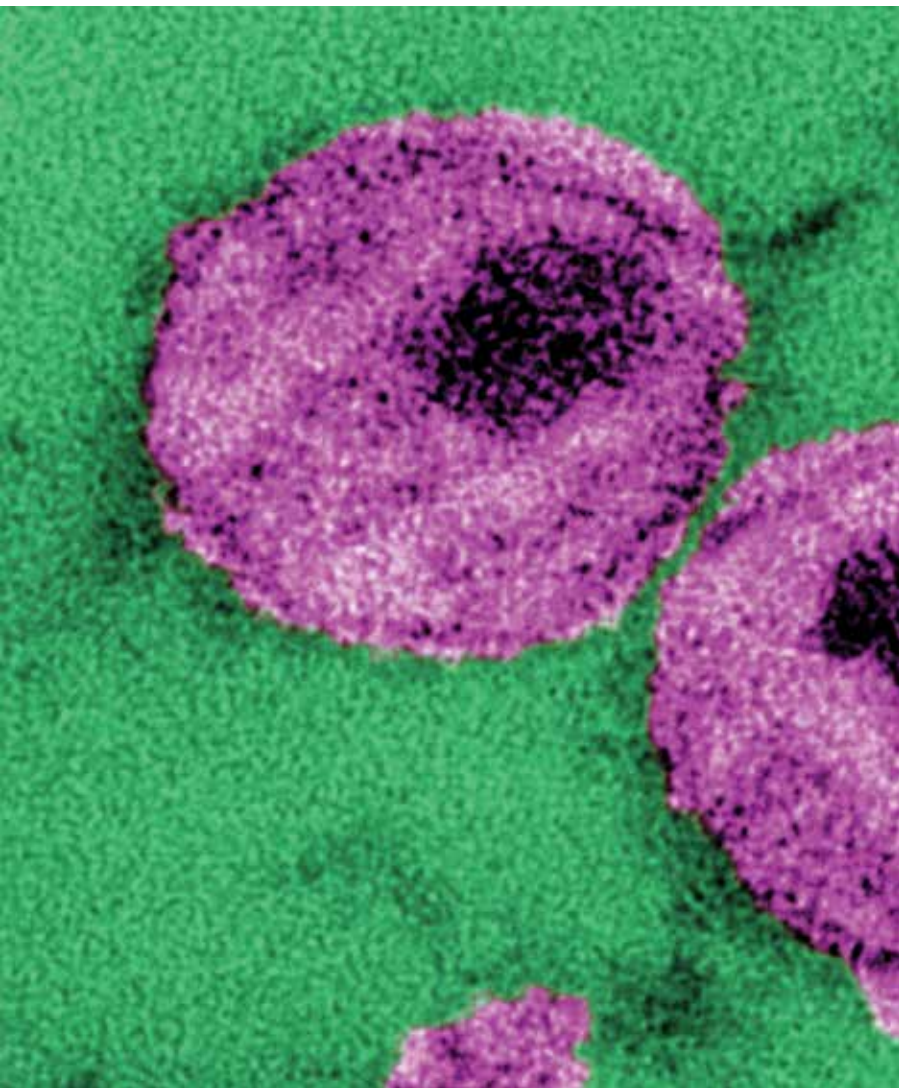
The functional cure itself was two decades in the making. In 1987, Luzuriaga arrived at UMass Medical School as a fellow in viral immunology in the lab of John Sullivan, MD, professor of pediatric immunology & infectious diseases. Together, they established a maternal-child AIDS clinic in response to the growing numbers of HIV-positive mothers and children. Through the new practice, they could directly address the speed with which signs of infection progressed in children—by age 2, more than 50 percent of HIV-positive children will be severely symptomatic. They were also part of NIH’s clinical trials network and, through that, were able to conduct an initial set of studies on infants and treatments that would test their hypothesis that early treatment could alter both the clinical course and, potentially, set points of latency.

“Everything we did was going bench to bedside,” said Dr. Sullivan, “and back to the bench.” In 1997, with Luzuriaga as principal investigator, they published their findings in the *New England Journal of Medicine* that intervention within the first three months of life with a combination of zidovudine (AZT), didanosine and nevirapine was effective at suppressing HIV infection.

Many of the clinic’s patients were from families across the region, so Luzuriaga and Sullivan established locations in Lowell and Lawrence. Many families were stressed socioeconomically so they built a team that included social workers and others to provide global assistance to families, and covered travel, phone bills and food costs, as needed. With proper adherence and careful use of AZT, the number of new patients gradually dropped. Today, the average age of clinic patients is 16, and the focus is on longer-term health issues including management of lipids and a healthy diet. After a lifetime of antiretroviral therapy, such patients may be at greater risk of diseases related to aging—in particular, coronary disease—and Luzuriaga and her team are engaged in long-term follow-up studies of the consequences of early exposure to antiretrovirals.

“We’ve made significant strides,” she said, “but are there newer issues that they may face as they go along?”

Luzuriaga remains concerned about women and newborns who aren’t treated early on. The standard recommendation is that every pregnant woman be tested for HIV; anyone who presents at labor and delivery with no documentation of having done so receives a rapid test. In the United States, Europe, Australia and Thailand, some 30 percent of infants born to HIV-positive mothers who were not treated with antiretrovirals while pregnant will be infected—the Mississippi baby is one such example. With antiretroviral therapy, less than 1 percent of infants are born infected, which translates to about 100 cases annually in the



Katherine Luzuriaga, MD, and her two colleagues, Deborah Persaud, MD, and Hannah Gay, MD, were honored at the 2013 Time 100 gala for being among the most influential people in the country. At left, this thin-section transmission electron micrograph shows the ultrastructural details of HIV virus particles, or virions. [CDC Public Health Image Library]

United States. The numbers are higher in sub-Saharan Africa, where the penetration of interventions has not been as extensive; in low-resource settings, a better infrastructure is needed to get medications to patients and simultaneously ensure their adherence.

“There are places in the world where this experiment can be continued to show that the result is, in fact, real,” said Sullivan of the Mississippi baby case, “and then people can begin to think about applications that go beyond.”

Luzuriaga and Persaud have recently collaborated with the NIH-sponsored International Maternal Pediatric Adolescent AIDS Clinical Trials network to develop a protocol to test whether very early potent antiretroviral therapy can clear HIV infection in infants. Data from several small adult studies also suggest that early treatment may allow some adults to eventually go off therapy and control their infection.

Collaboration will be key to learning how the virus-host dynamic plays out, and in moving from the lab to the clinic. To further those efforts, Luzuriaga was involved with the founding of the Center for Clinical and Translational Science, which spans the five UMass campuses and which she now directs. UMCCTS allows for the creation of multidisciplinary teams to address myriad medical issues; build devices that can be used in diagnosis or patient management; or take advantage of skills and equipment, such as a request for the creation of a specific protein or the

Data from several small adult studies also suggest that early treatment may allow some adults to eventually go off therapy and control their infection.

use of a mass spectrometer. It is, said Luzuriaga, “an institutional attempt at building capacity for generating cross-disciplinary collaborations that will facilitate translation of basic science discoveries.” The collaboration also incorporates UMass Medical School’s MassBiologics, the only non-profit, FDA-licensed manufacturer of vaccines and biologic products in the United States, providing opportunities for cross-campus biologics manufacturing.

One impetus behind the establishment of the UMCCTS was to pair UMMS with the University’s Lowell-based engineering program, and an early outcome was the Massachusetts Medical Device Development


Group, better known by its acronym M2D2. The not-so-veiled reference to *Star Wars* suits Luzuriaga, who said that long before she went to MIT as an undergraduate, she was very much at home in the world of science and math students.

Born in Venezuela, Luzuriaga was raised in the Philippines, first coming to the United States to attend college. She’d planned to be a primary care pediatrician, but her passions for microbiology and immunology found a focus during her second year of medical school, when the first descriptions of patients with AIDS appeared in the literature. With a month to design and complete an elective—she’d spent her first two years at the University of Connecticut School of Medicine before transferring to Tufts University School of Medicine—she chose viruses and the immune system and was, she said, “hooked.” She trained in pediatrics and infectious disease, and arrived at UMMS as a fellow prepared to begin research in viral immunology, specifically the Epstein-Barr virus. But the sudden rise in numbers of HIV-infected women and infants led to a refocusing of Luzuriaga’s energies.

Nearly three decades later, Luzuriaga is pleased that researchers know as much as they do about HIV, observing that it is better understood than many other viral infections. She attributes that to a strong patient advocacy effort, coupled with NIH-funded advances in technology, basic understanding of HIV infection, and HIV clinical trials. Continuous NIH funding, along with backing from organizations that include the

American Foundation for AIDS Research and the Elizabeth Glaser Pediatric AIDS Foundation has been key. Luzuriaga was named an Elizabeth Glaser Scholar in 1994 and an Elizabeth Glaser Scientist in 1997. She continues to collaborate with other Elizabeth Glaser scientists, including Persaud and UMMS colleague Paul R. Clapham, PhD, associate professor of molecular medicine and microbiology & physiological systems, observing that the human relationships the funding fosters have resulted in better science through collaborations. The success with Gay and Persaud was possible because they were able to move quickly, thanks to the framework provided by NIH and the other funders.

Luzuriaga’s own children are 18 and 22 years old. She was pregnant with her first son alongside her early clinic patients, and notes somberly that many of those women and their children are no longer living.

“But by the time I had my younger son,” she said, brightening, “we had ARVs we could use, and almost all of those kids are alive. That’s been gratifying.” 

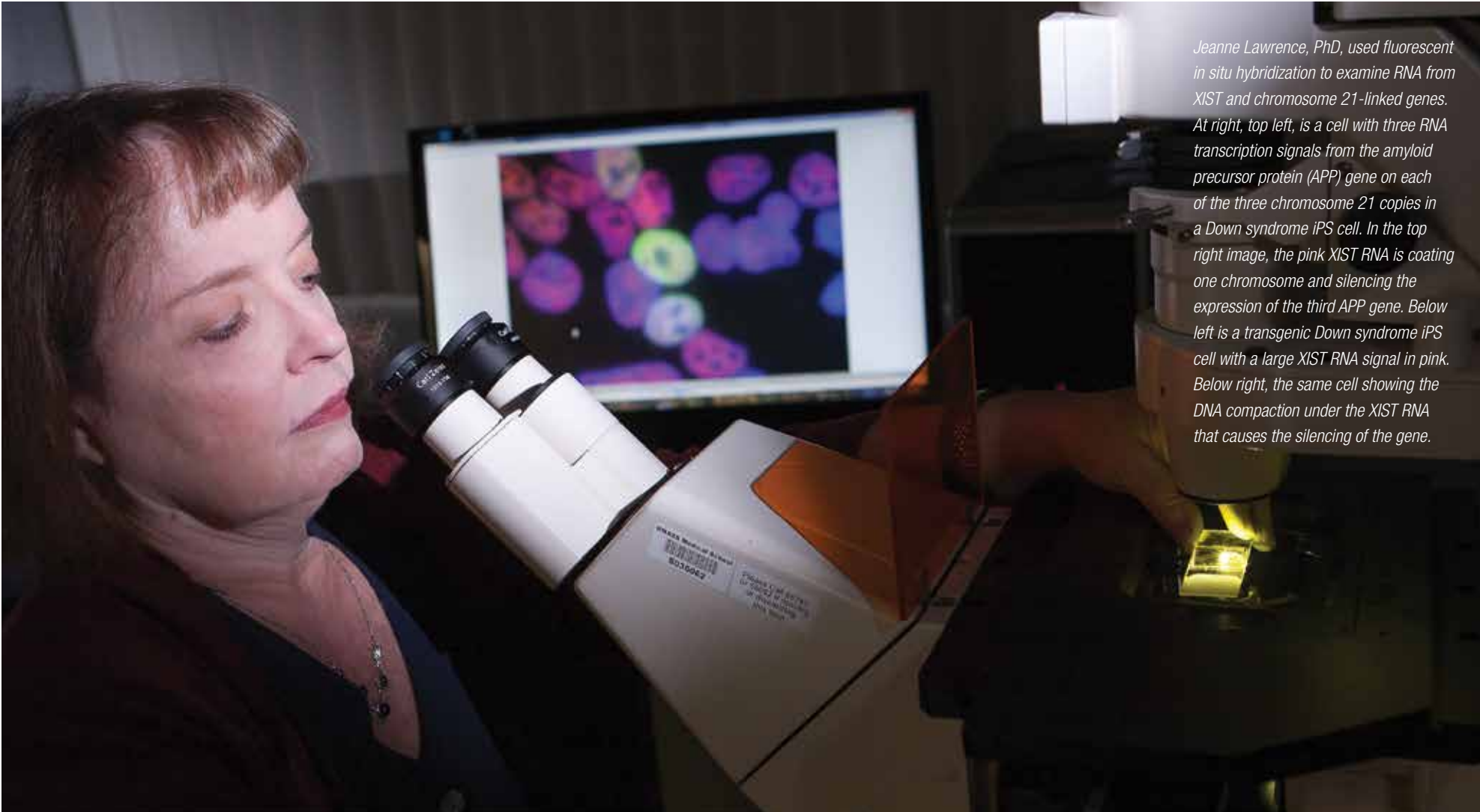
A long shot pays off

After others said it was impossible, Jeanne Lawrence, PhD, silenced the extra chromosome in Down syndrome in the lab.

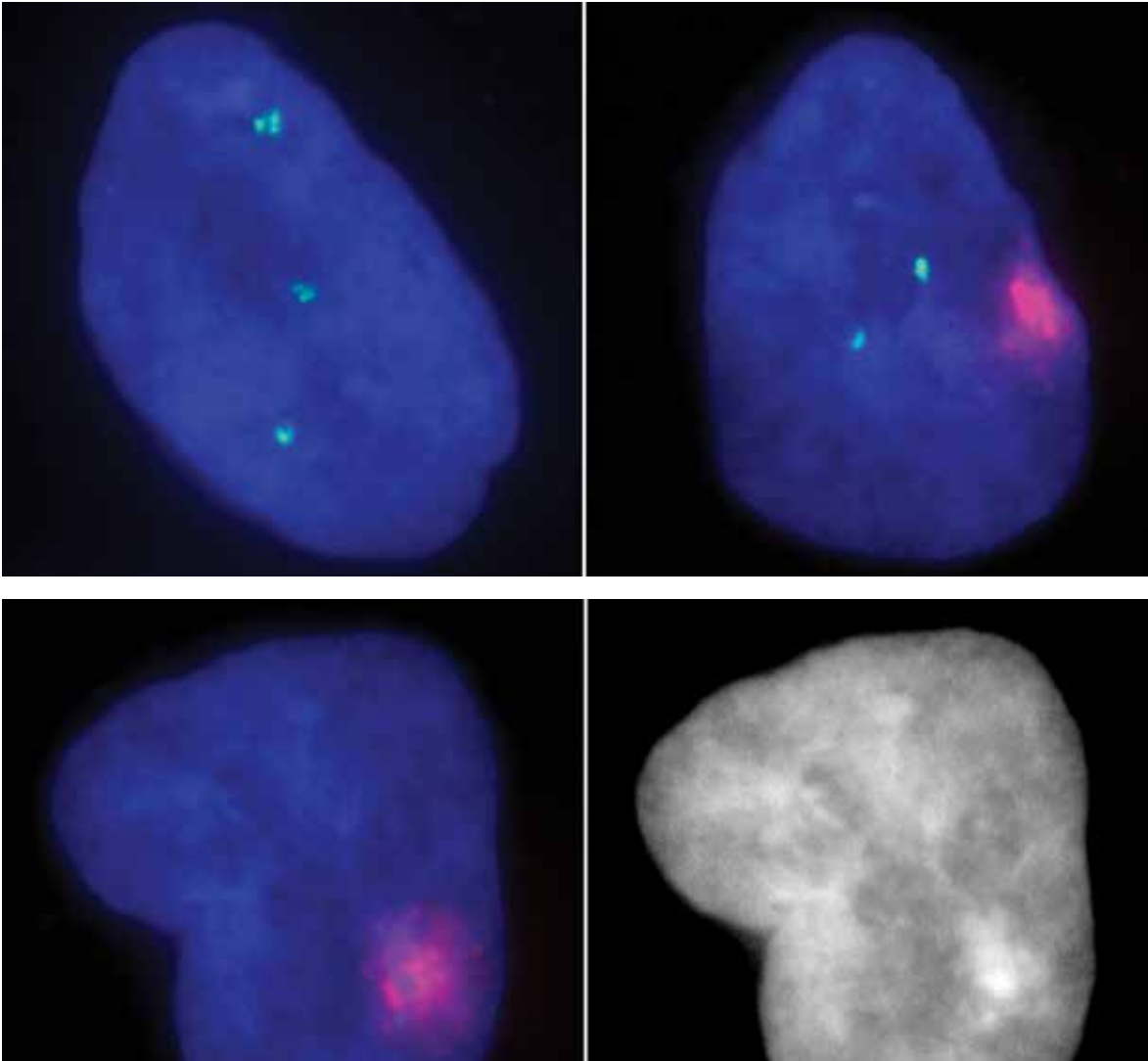
Jeanne Lawrence, PhD, is routinely described as an out-of-the-box thinker, someone who looks at the same problem others have long grappled with from an entirely new perspective—where others see the impossibilities, she said, she likes to see the possibilities. That tactic recently helped Dr. Lawrence, professor and interim chair of cell & developmental biology, prove that the extra X that's found on chromosome 21 and is responsible for Down syndrome can be silenced, a bold endeavor that other scientists either hadn't considered, or thought too challenging to try. Though it's not a cure for Down syndrome, it is a step toward one day significantly diminishing the far-reaching effects of that and other chromosomal disorders.

It's work that in some ways has deep and personal roots. Lawrence points to two early sources of her determination to help those born with disabilities. The first was a summer job at a local pool while she was in college. Asked if she'd be willing to give swimming instructions to eight adults with Down syndrome, Lawrence, who'd had no prior exposure to the disorder, agreed because, she reasoned, there was no reason not to. At the end of the summer, after she'd taught the group the basics and performed a few rescues of over-eager swimmers who'd headed for the deep end, the diminutive Lawrence met with the pool's director, who thanked her and said of the special request, "I asked you last because you're the smallest. But everyone else had said no, and you said yes."

By Sarah Zobel



Jeanne Lawrence, PhD, used fluorescent in situ hybridization to examine RNA from XIST and chromosome 21-linked genes. At right, top left, is a cell with three RNA transcription signals from the amyloid precursor protein (APP) gene on each of the three chromosome 21 copies in a Down syndrome iPS cell. In the top right image, the pink XIST RNA is coating one chromosome and silencing the expression of the third APP gene. Below left is a transgenic Down syndrome iPS cell with a large XIST RNA signal in pink. Below right, the same cell showing the DNA compaction under the XIST RNA that causes the silencing of the gene.



“I look back and I think, I didn’t know that it was ever going to work!”

— Jeanne Lawrence, PhD

Reaching further back, to her childhood, Lawrence recalls the second influence: Patsy Sutton, a cousin who was some 20 years her senior and had cerebral palsy. Lawrence and her family routinely drove Sutton to appointments and took her swimming and on outings.

“I never thought *I’m helping someone who’s disabled*,” said Lawrence. “I just did it because I enjoyed her company. But today, I always have the perspective that if I’m getting up and walking around and have all my faculties, I’m actually very lucky.”

Lawrence went to Stevens College in Columbia, Missouri, intending to teach elementary school. But uninspired by the coursework, she refocused her studies on music before discovering “the intersection of science and society, philosophy and religion” in her junior year. When the dean summoned her to his office right before graduation, she was stunned to learn that she was first in her class. The prize was a fellowship to the University of Missouri, where she enrolled in her first real science courses. That led to a master’s in human genetics and counseling from Rutgers, and a PhD in developmental biology from Brown. Wanting to stay involved in what she calls the “people angle” of science, upon arrival for her postdoctoral fellowship at UMMS, Lawrence quickly signed up to teach human genetics, later going on to direct the entire course. (Among other things, she lectured on the question of nature versus nurture, and was pleased to have a real-life

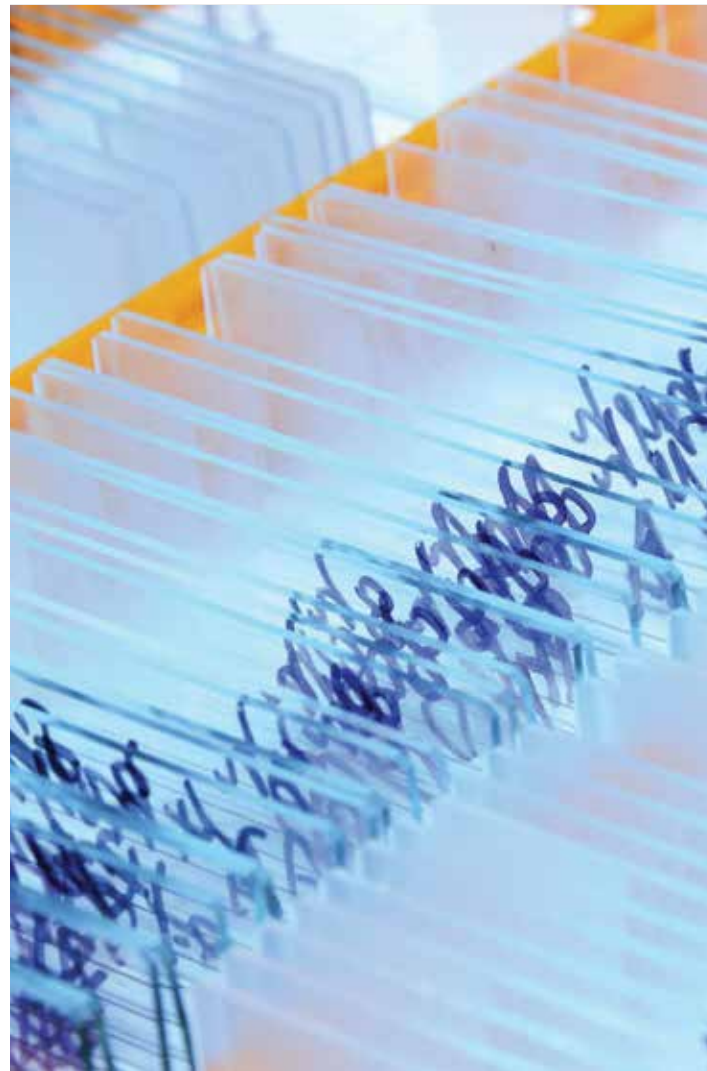
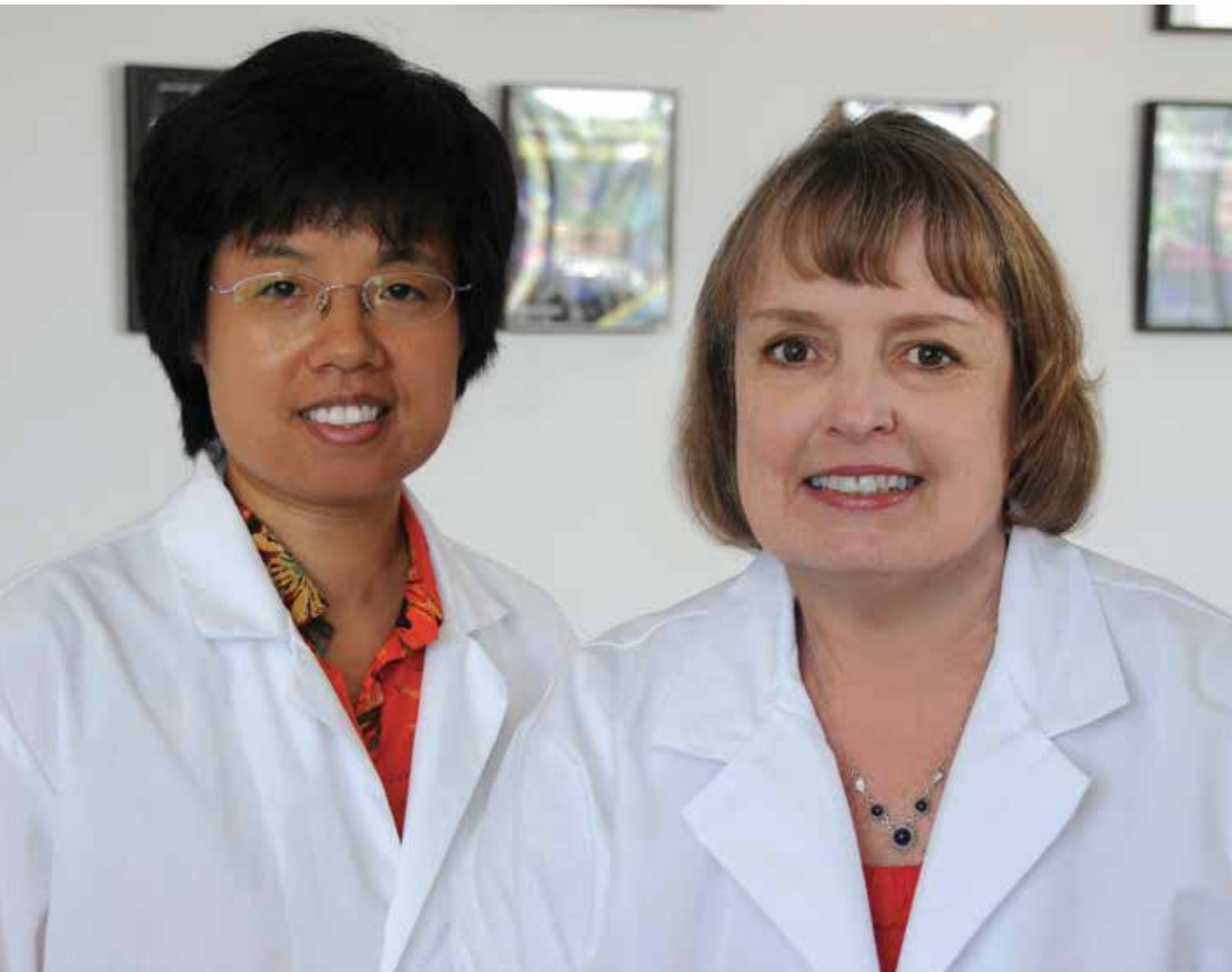
test case in her own house when she gave birth to identical twin sons; she also has a third, older son.) In particular, she taught chromosomal abnormalities, bringing in patients with Down syndrome, sickle cell anemia, Huntington’s disease and their families for special sessions designed to engage students in what it means to live with a given condition. One family whose daughter has Down syndrome attended so regularly that Lawrence was inspired to advocate for the establishment of the Patient as Educator Award, naming them as the first recipients.

At the same time, Lawrence was busy in the lab, where she was studying RNA molecules directly in cells rather than extracting them, in order to fully understand their organization and behavior. To that end, she had spent three years during her first postdoctoral fellowship attempting to develop fluorescent in situ hybridization, or FISH. At the time, it was thought that fluorescence was too insensitive to detect RNA in cells. So she spent years working without a microscope, labeling her probes with radioactivity and rapidly quantifying the radioactivity of multiple cell samples hybridized with those probes, in order to speed up the process of optimizing methods for FISH.

“I look back and I think, I didn’t know that it was ever going to work!” said Lawrence of the three years she spent just studying how to make FISH more successful. Eventually, she published a quantitative analysis of in situ hybridization in *Nucleic Acids Research*, which in

turn led to publication in several high-visibility journals. Her lab then extended the technique to examine RNA from XIST (X inactive specific transcript), a notably large gene that had been identified by Hunt Willard and Carolyn Brown in the early 1990s. While there was initial disappointment that the gene didn’t encode a protein, Lawrence and her team determined that the gene made a unique “chromosomal” RNA that, indeed, controls X inactivation in women—what Lawrence laughingly calls the “first equal opportunity.” But if XIST could silence the X chromosome voluntarily, could it also be redirected to silence a different chromosome? Some literature and studies in her own lab with Lisa Hall, PhD, assistant professor of cell & developmental biology, said that it would be possible to a degree, but no one had shown it was possible to insert XIST into a specific chromosomal site, or tested whether it would be able to silence the chromosome entirely. And if it was able to, could gene therapy control the trisomy of chromosome 21 in individuals with Down syndrome? Extrapolating from there, might scientists then be able to control the entire genome, whose various components are in a perpetual state of silencing and functioning?

The key issue unique to individuals with Down syndrome, however, is that hundreds of the genes are overrepresented, and developing gene therapy that can address a defect in a single gene has been challenge enough. Correcting an entire chromosome would seem nearly impossible. Undeterred, Lawrence and her colleagues looked to XIST.



“I’m a big believer in the idea that if you can show the first step, things can work out,” said Lawrence. “You break through one barrier—don’t worry that you have to break through *all* the barriers, just break through the first, biggest one and then see what you can figure out.”

— Jeanne Lawrence, PhD

Jeanne Lawrence, PhD, right, with Jun Jiang, PhD, who successfully showed that XIST could silence a different chromosome, 19, opening the door to work on chromosome 21.

They planned to use genome editing as a sort of scissors and glue to cut and paste DNA at a specified site.

Lawrence applied for and received an Exceptional, Unconventional Research Enabling Knowledge Accelerating (EUREKA) grant from the NIH in 2008. Midway through writing the EUREKA grant, Lawrence met with Provost and School of Medicine Dean Terence R. Flotte, then newly arrived at UMMS, for an honest assessment of the project, and was relieved to get his support.

“The sheer creativity and originality of Jeanne’s ideas was what made them so appealing. If you don’t take crazy chances in research sometimes, you will never make a real breakthrough,” said Dr. Flotte, the *Celia and Isaac Haidak Professor of Medical Education* and executive deputy chancellor.

Like so much of science, it was not a speedy process, and Lawrence found the genetic engineering aspect daunting. She contacted Sangamo BioSciences, which had developed zinc finger nucleases that could act as scissors, but the company was skeptical that inserting a gene of XIST’s size would be possible. As this was very expensive technology, they agreed to collaborate, but required that Lawrence and her colleagues first prove it could be done, using the technology on a different chromosome, 19. This was a success, which Lawrence credits

to Jun Jiang, PhD, instructor of cell & developmental biology, who had joined her laboratory and helped to push the project forward.

One development in stem cell biology, that of induced pluripotent stem (iPS) cells, was fortuitously timed. Lawrence and her team quickly recognized they could bypass the ethical issues surrounding embryonic stem cells but still take advantage of stem cells as an unparalleled resource. Lawrence also appreciated that working with a trisomic cell meant there was no possibility of ill effects from silencing a chromosome, since there was a spare. Lawrence’s lab worked to silence chromosome 21 with XIST for five years.

By April 2013, Lawrence was ready to share on a broad scale the news that attaching XIST to a trisomic chromosome 21 would, indeed, silence it into inactivity and keep it that way, and she did so at the Global Down Syndrome Foundation’s Workshop on Cognition in Down Syndrome. Shortly thereafter, the team published a paper detailing their findings in *Nature*. The professional response has been uniformly positive; in turn, Lawrence is quick to applaud those scientists who have been working in the field for decades, pleased to at last be able to discuss openly both the work and the next steps, which include reproduction of the experiment in a mouse model.

Still, there’s no real cure for Down syndrome on the horizon, and there may never be. So many genes are affected that it’s almost inconceivable that science could reach them in the embryonic stage. But what the research may mean is that some of the major health associated concerns—congenital heart disease, leukemia, cognitive defects and Alzheimer’s—could one day be significantly mitigated, something that many of Lawrence’s patient families have written to share their relief about. And in the short term, because it’s now possible to compare cells with a chromosome on and then switched off, there is an opportunity to look at what cell pathologies and gene pathways underlie the syndrome, and identify targets for drug therapies, including gene interactions that might be responsible for Alzheimer’s disease in the larger population.

Lawrence’s lab is now busy investigating several potential applications of this “trisomy silencing” technology. She is also pursuing the basic science implications of so-called “junk” DNA, determining whether it plays a role in XIST RNA’s ability to silence an entire genomic region, and expects to soon publish these findings.

The average lifespan of an individual with Down syndrome has already improved from the days of routine institutionalization, when a resulting failure to thrive was commonplace; today, many adults with Down syndrome enjoy some measure of independence, including holding

jobs. But others, said Lawrence, exist just under that threshold, and she’s hopeful her work’s legacy will include biomedical therapies that, coupled with the existing educational therapies, will be the difference. It’s a tall order, and one that Lawrence recognizes will take time.

“I’m a big believer in the idea that if you can show the first step, things can work out,” said Lawrence. “You break through one barrier—don’t worry that you have to break through *all* the barriers, just break through the first, biggest one and then see what you can figure out.” **U**



Kristina Deligiannidis, MD



A bio-marker for the baby blues

When post-partum depression struck, new mother Nicole Caliguiri didn't know what hit her.

"I was having a hard time functioning and wasn't feeling like myself. I went into what I referred to as the 'robot stage' where everything was mechanical and I was just doing things because I knew they had to be done," she said.

Post-partum depression affects one in eight new mothers—many who, like Caliguiri, don't realize what is wrong until, weeks after giving birth, they are suffering severe symptoms including sadness, loss of interest in activities, feelings of hopelessness, anxiety, and changes in sleeping and eating patterns. Symptoms may impair a woman's ability to care for her baby, and may even lead to thoughts of suicide or harming her child.

Fortunately, Caliguiri eventually sought treatment and fully recovered. And when she became pregnant again, her obstetrician suggested that she participate in a clinical trial that might help her avoid a relapse, while helping researchers find out why some women might be susceptible to the disorder.

"We want to be able to identify what the risk factors are, watch for the first symptoms before new mothers are in crisis mode, and be able to intervene before it's harder to pull them out of it," said psychiatrist and neuroscientist Kristina Deligiannidis, MD. Dr. Deligiannidis, assistant professor of psychiatry and obstetrics & gynecology, is principal investigator for a five-year, \$900,000 grant from the National Institutes of Health to learn why women develop post-partum depression.


"This is one of a very few currently funded NIH grants that are dedicated to understanding the biological underpinnings of postpartum depression," said Deligiannidis, who is also medical director of the Depression Specialty Clinic at UMass Memorial Medical Center, where she treats women suffering from depression during pregnancy or the post-partum period.

"It allows us to measure mood symptoms and hormones throughout pregnancy, and use specialized, multimodal brain imaging techniques available at UMass Medical School to understand how brain areas important for mood and behavior are connected and how hormones affect brain circuitry in those women who develop depression," she said.

The work began several years ago with a two-year pilot study funded by the UMass Center for Clinical and Translational Science. The study was conducted by Deligiannidis and Constance Moore, PhD, associate professor of psychiatry and associate director of translational imaging. Deligiannidis and Dr. Moore hypothesized that low levels of a neurotransmitter called gamma-aminobutyric acid, believed to be associated with depression, in combination with other neurotransmitters and changes in brain hormone levels, may be an indicator for women who are more prone to post-partum depression.

"We were struck by the extent to which our findings went beyond our initial hypotheses," Deligiannidis said. "We demonstrated for the first time that mothers who developed the condition had much weaker connectivity between several brain areas compared to healthy post-partum mothers. We also identified a hormone related to progesterone that may be abnormal in pregnancy in those women who later developed post-partum depression." These findings led to the awarding of the NIH grant in an extremely competitive funding environment.

As a study subject, Caliguiri completed paperwork, had some additional tests done on her routine blood work taken during prenatal check-ups and, several weeks after the birth of her second daughter, completed her involvement with a non-invasive brain scan.

"By better understanding the interaction of brain hormones and neurotransmitters during and after pregnancy, we're aiming to identify a biological risk marker and develop an inexpensive blood test for it," said Deligiannidis. "It might then be possible to intervene more proactively before the illness manifests, so that we can reduce a woman's risk of developing depression after she gives birth." 

By Sandra Gray

» Highlights of video features on UMassMedNow.
See the full videos: www.umassmed.edu/pockets

EDUCATION	COMMUNITY	RESEARCH
<div></div> <div>JOY AND RELIEF AT MATCH DAY Shouts of joy and relief filled the room this March as 123 graduating medical students learned where they would spend the next four to six years in residency training. Once again, about half of students matched in primary care residencies. In this video, meet former nurse Jesse Colombo, who is off to Dartmouth-Hitchcock Medical Center for his residency.</div> <div>GRANT CONFIRMS ELITE STATUS OF MD/PHD PROGRAM The MD/PhD program received a grant from the National Institute of General Medical Sciences Medical Scientist Training Program (MSTP) that rewards outstanding programs for training physician-scientists. Forty-three of the top programs in the country—and only one other in Massachusetts—receive MSTP funding. Hear program director Gyongyi Szabo, MD, PhD, and MD/PhD students Asia and Ashley Matthew talk about the award in this video.</div> <div>OPTIMISM ABOUNDS DURING CONVOCAATION WEEK 2013 UMass Medical School celebrated Convocation 2013 in September with a week of events that saluted faculty, students and scholarship and marked the beginning of the new academic year. This video captures the excitement and joy that prevailed, as well as the reasons UMass Medical School has much to celebrate and more to achieve, according to Chancellor Michael F. Collins.</div>	<div>“Don’t trust your drug dealer. The individuals that are using these products need to be aware that Molly is not the Molly they thought it was. It could range anywhere from caffeine to talcum powder to cocaine to other amphetamine substances.” Toxicologist Richard J. Church, MD, assistant professor of emergency medicine, on the club drug Molly, an allegedly pure form of Ecstasy.</div> <div>WARNINGS FOR TANNING BEDS Mary Maloney, MD, professor of medicine, supported the Food and Drug Administration’s proposal to issue warnings on the skin cancer risks associated with tanning bed use, and urge children under 18 not to use them. Dr. Maloney served on the FDA advisory panel that recommended the changes. In this Expert’s Corner video, hear her talk about the dangers.</div> <div>SOOTHING WORDS FOR MARATHON VICTIMS James Broadhurst, MD, MHA, assistant professor of family medicine & community health, was one of 13 members of a medical team from the UMass Medical School and UMass Memorial community who were volunteering at the Boston Marathon medical tent in April. Hear him talk about his role of providing comfort amid the chaos of the bombing’s aftermath.</div> <div>A FULL-CIRCLE JOURNEY FOR CANCER SURVIVOR Fourth-year medical student Daryl Blaney was successfully treated for childhood leukemia at UMass Memorial Children’s Medical Center when he was just three years old, a formative experience that inspired him to become a doctor himself. Hear him talk about why he supports the UMass Medicine Cancer Walk.</div>	<div>YOU ARE WHAT YOU EAT—EVEN THE LITTLEST BITES Sometimes you just can’t resist a tiny piece of chocolate cake. Research by scientists at UMMS raises the possibility that even small amounts of these occasional indulgences may produce significant changes in gene expression that could negatively impact physiology and health. In this video, A.J. Marian Walhout, PhD, professor of molecular medicine, describes how metabolism and physiology are connected to diet.</div> <div></div> <div>PREDICTING FLU FOR BETTER VACCINES Robert W. Finberg, MD, chair and professor of medicine, is lead investigator on a \$12 million project to develop new ways of predicting how the influenza virus changes and evolves in response to antiviral drugs and the human immune system. This approach has promise for becoming a pivotal tool in creating a more effective vaccine against the virus. Learn more in this Expert’s Corner video.</div> <div>“We really need to shift our conversation away from what exactly people should be eating to how to get people to change their behavior.” Sherry Pagoto, PhD, associate professor of medicine, calling for an end to the “diet debates” in a <i>Journal of the American Medical Association</i> commentary.</div>

Faculty honored at optimistic Convocation

Chancellor Michael F. Collins painted an optimistic picture of the future of the academic medical center during his annual Convocation speech in September, saying, “Why am I optimistic at this new beginning? Because together, we are UMass Medicine.”

Collins awarded Chancellor’s Medals to four distinguished faculty members:



Richard Glew, MD, professor of medicine and microbiology & physiological systems, who received the Chancellor’s Medal for Distinguished Teaching;



Thomas Grisso, PhD, professor of psychiatry, who received the Chancellor’s Medal for Distinguished Scholarship;



Richard S. Irwin, MD, professor of medicine, who received the Chancellor’s Medal for Distinguished Clinical Excellence; and



Judith K. Ockene, PhD, MEd, MA, the *Barbara Helen Smith Chair in Preventive & Behavioral Medicine* and professor of medicine, who received the Chancellor’s Medal for Distinguished Service.



Four faculty members were invested as named chairs at Investiture in September. From left: Dale L. Greiner, PhD, the Dr. Eileen L. Berman and Stanley I. Berman Foundation Chair in Biomedical Research; Silvia Corvera, MD, the Endowed Chair in Diabetes Research; Ellen M. Gravallese, MD, the Myles J. McDonough Chair in Rheumatology; and Catarina I. Kiefe, MD, PhD, the Melvin S. and Sandra L. Cutler Chair in Biomedical Research; with Chancellor Michael F. Collins.

Bitter taste receptors in airway cells could help treat asthma attacks

An interdisciplinary team of scientists at UMass Medical School has taken a step forward in understanding how the substances that give some foods their bitter flavor also act to reverse the contraction of airway cells, a process known as bronchodilation. This effect may one day be harnessed to provide improved treatments for airway obstructive diseases such as asthma and chronic obstructive pulmonary disease.

“I am excited that someday, with more research, there may be a new class of bronchodilators which are able to reverse an asthma attack quicker and with fewer side effects than is currently available to patients,” said Ronghua ZhuGe, PhD, associate professor of microbiology & physiological systems and senior author of the study.

The sense of taste is mediated by taste receptor cells bundled in our taste buds. Bitter taste receptors most likely evolved to help alert the body to potentially harmful foods that have spoiled or are toxic. Over the last few years scientists have come to realize that these receptors are present in many other cells throughout the body besides the tongue. Specifically, bitter taste receptors on smooth muscle cells in the airway act to relax the cells when exposed to bitter-tasting substances.

A hallmark of an asthma attack is excessive contraction of smooth muscle cells, which causes narrowing of the airways and subsequent breathing difficulties. The fact that bitter substances can relax these smooth muscle cells suggests that they may have the potential to halt asthma attacks and in fact could even be an improvement over current treatments since the relaxation effects are quite fast; experiments in mice suggest they are also stronger.



Hockey player and brain tumor survivor turns to nursing to give back

‘I wanted to go into nursing because I truly believe I was given a second chance.’

Brain tumor survivor James Ennis won’t waste a moment of his second chance. Diagnosed with a rare brain tumor at age 13, the UMass Boston graduate and captain of its 2012 hockey team came full circle in September when he accepted his registered nurse pin alongside classmates in the Graduate School of Nursing.

“I wanted to go into nursing because I truly believe I was given a second chance,” said Ennis, 25, of Roslindale, who is studying to become a nurse practitioner in the Graduate Entry Pathway (GEP) Class of 2015. “I have always felt that if I could ever be in a position to help someone the way the doctors and nurses were there for me, there would be no other option.”

Ennis was among the 29 advanced practice nursing students presented with their nursing pins during Convocation Week activities in September. The GEP program, for individuals with a baccalaureate degree in a field other than nursing, leads first to registered nurse licensure and then to advanced nursing specialties.

For Ennis, it’s been a hard-fought journey since a random injury during a hockey game led to the discovery of the tumor. “I’d been playing hockey since I was 4 years old, and I took a hit to the chin in a game when I was 13,” he said. “I didn’t feel right. I knew I was off and my coaches did too.”

An MRI revealed something suspicious, and it was later confirmed to be an atypical choroid

plexus tumor. He underwent aggressive brain surgery at Children’s Hospital, followed by many months of physical therapy. “I was told I might never play hockey again,” he said. “I had to learn how to walk again.” The prospect of not getting back on the ice compelled him to work harder.

“That’s what pushed me. I always knew I wanted to play college hockey,” said Ennis, who has had no sign of regrowth since the tumor was removed.



Alumnus leads UMass Memorial Health Care

Eric W. Dickson, MD, MHCM, FACEP, was named UMass Memorial Health Care’s president and chief executive officer in February, succeeding John O’Brien, who retired after serving in the role for 10 years. Prior to his appointment, Dr. Dickson was president of the UMass Memorial Medical Group.

Dickson is a 1995 graduate of the School of Medicine, where he also completed his residency in emergency medicine. He is professor of emergency medicine and senior associate dean for UMass Memorial Medical Group, as well as a physician in the emergency department at UMass Memorial Medical Center. Dickson also earned a master’s in health care management from the Harvard School of Public Health in 2007.



New online tool provides insight for parents of children with autism

A new interactive online tool designed to teach parents how to help their children with autism develop and progress was unveiled by UMass Medical School as part of its “Light it Up Blue” event recognizing Autism Awareness Month in April.

Discovering Behavioral Intervention: A Parent’s Interactive Guide to Applied Behavioral Analysis (ABA) was created by autism and behavioral experts at the Eunice Kennedy Shriver Center at UMMS. Rigorously tested by parents and educational professionals, the guide teaches parents to understand and use evidence-based ABA practices.

“As a parent, when you first get a diagnosis of autism for your child, there’s so much information out there. You need a comprehensive source that can directly affect your child’s development and progress,” said Maura Buckley, MPA, product manager at UHealthSolutions, the UMMS affiliate that will market the guide and related products via its new UDiscovering website.



1 million+ vaccines distributed to underserved communities

“Tetanus and diphtheria continue to be serious threats to public health in many parts of our global community.”

— Mark S. Klempner, MD

Tens of thousands of people in the Dominican Republic, Kyrgyzstan and Tajikistan received crucial vaccines in February, thanks to a donation by MassBiologics of UMass Medical School to Project HOPE, a global nongovernmental organization dedicated to making health care available for people around the globe.

More than one million doses of the tetanus and diphtheria (Td) vaccine were distributed to underserved communities that were in need of the medicines. The Dominican Republic held a nationwide vaccination campaign in April and the donated vaccine supported the Ministry of Health's commitment to address public health needs. The medicines destined for Central Asia were delivered in a humanitarian airlift operation by the U.S. Department of State.

The Td vaccine was manufactured by MassBiologics, the only non-profit, FDA-licensed manufacturer of vaccines and biologic products in the United States.

“Tetanus and diphtheria continue to be serious threats to public health in many parts of our global community,” said Mark S. Klempner, MD, executive vice chancellor for MassBiologics and professor of medicine, pictured at left. “Tetanus is a particular risk to newborns in many developing countries. By vaccinating pregnant women, we can prevent disease and death among these babies and their mothers.”

‘Speed dating’ for prospective students

The School of Medicine has adopted a new interview process known as Multiple Mini Interview's (MMI), designed to reveal qualities in candidates that are most aligned with the school's core professionalism competencies.

The new interview process is similar to speed dating in concept: The applicant is presented with questions, issues or scenarios at eight separate stations, each of which is staffed with a different interviewer or rater who subsequently evaluates the candidate's performance. The applicant spends eight minutes at each station. The interviewers are selected from among a pool of UMMS faculty, clinicians, educators, students and staff.

While each rater is unique, they follow a script to ensure that all students have similar interview experiences.

“Students like the MMI because they have multiple opportunities to shine,” said Mariann Manno, MD, professor of pediatrics and emergency medicine and associate dean for admissions for the School of Medicine.

“With the traditional interview process, a terrific student could have a bad interview. With the MMI, a single bad review can be neutralized by the reviews of multiple other raters.”



Phone app helps doctors make the right call in treating heart patients

A smartphone app built upon a multinational database developed and coordinated by the UMass Medical School Center for Outcomes Research (COR) will help doctors worldwide more easily identify patients who are at risk of dying within three years of a heart attack.

The app, which uses the Global Registry of Acute Coronary Events (GRACE) developed by a team of faculty members from COR, a part of the Medical School's Department of Surgery, will help doctors, nurses and paramedics quickly calculate the severity of a patient's condition and help them offer the most appropriate immediate and long-term treatments, including whether or not a patient needs to be transferred to a cardiac care unit.

GRACE is an international observational database of outcomes for patients who are hospitalized with acute coronary syndrome, which enrolled more than 70,000 patients from 100 hospitals in 14 countries between 1999 and 2006. The GRACE study provided a key basis for the ongoing National Institutes of health-funded Transitions, Risks, and Actions in Coronary Events-Center for Outcomes Research and Education program, which is led by Catarina Kiefe, MD, PhD, the *Melvin S. and Sandra L. Cutler Chair in Biomedical Research* and chair and professor of quantitative health sciences and professor of medicine.

Depression linked to increased risk of diabetes, cardiovascular disease

Post-menopausal women who use antidepressant medication or suffer from depression might be more likely to have a higher body mass index (BMI), larger waist circumference and inflammation—all associated with increased risk for diabetes and cardiovascular disease, according to a study led by UMass Medical School investigator Yunsheng Ma, PhD, MD, MPH.

The findings of the UMMS study indicate that both elevated depressive symptoms and antidepressant use are each significantly associated with higher BMI and waist circumference; elevated depressive symptoms are associated with increased levels of insulin and insulin resistance; and antidepressant use is associated with increased C-reactive protein levels, a marker of inflammation, which increases the risk of type 2 diabetes and cardiovascular disease.

“It may be prudent to monitor post-menopausal women who have elevated depression symptoms or are taking antidepressant medication to prevent diabetes and cardiovascular disease,” said Dr. Ma, associate professor of medicine, who with UMMS colleagues analyzed data from the landmark Women's Health Initiative.

Americans living longer, healthier lives

Researchers synthesizing data from multiple government-sponsored health surveys conducted over the last 21 years have shown that Americans are living longer, are reporting fewer symptoms of disease, have more energy and show fewer impairments in everyday tasks than a generation ago. According to the study authors, a 25-year-old person today can expect to live 6 percent or 2.4 quality years longer than their 1987 counterpart. Meanwhile, a 65-year-old person will gain 1.7 quality years, a 14 percent increase from a generation ago.

Thanks to improvements in health care, many conditions are far more treatable today than 25 years ago, according to Allison Rosen, MD, associate professor of quantitative health sciences and senior author of the study. Heart disease, for instance, was potentially much more debilitating a generation ago and patients often suffered a decline in quality of life as a result.

“Today, it is far less likely that a patient recovering from a heart attack will become institutionalized or need around-the-clock care the way they once might have,” Dr. Rosen said. The researchers also found that health gains made as a result of smoking cessation programs were being offset, in part, by increases in obesity.



GSN alumna brings primary care to Africa



A new health clinic has risen from the scrubby terrain in a remote part of Ghana. It's empty now, but with continued local and international support, it will soon be staffed and equipped to bring primary care to the community's impoverished men, women and children.

“We want to influence policy and change the fundamental mindset about the value of primary care,” said Worcester nurse

practitioner, Ghanaian native and Graduate School of Nursing alumna Ama Ahenkorah, MS, FNP, who spearheaded the project. “The way we can affect change is to get a space of our own in which we can prove that we can get better outcomes with preventive primary care than acute hospital care.”

Ahenkorah is founder and president of the not-for-profit international organization Boston Medical Services Ghana, which she established to “bring primary care to Africa through Ghana.” UMass Medical School is among a cadre of international collaborators who have signed on to help make Ahenkorah's vision a reality.



1.

1. Freeman named sixth HHMI investigator

Marc R. Freeman, PhD, associate professor of neurobiology and a leader in the study of glial cells, was named a Howard Hughes Medical Institute (HHMI) investigator.

“This is a tremendously exciting moment for me and my lab,” Dr. Freeman said. “Being named an HHMI investigator provides us the stability to continue chasing down the most interesting questions about basic glia biology.”

A member of the UMMS faculty since 2004, Freeman was a postdoctoral associate when he became interested in glial cells, the brain’s most abundant and overlooked cell type. Working on a type of neural stem cell division that generated both neurons and glia, he realized how little was actually known about glial cells and saw a tremendous opportunity to explore new territory.

Although they comprise more than half of all human brain cells, glial cells often take a backseat to their better known cousin, the neuron, among neurobiologists who thought these cells played only supporting roles in the central nervous system. That thinking has begun to change, thanks in part to the work done in the Freeman lab. Experiments by Freeman have shown that glial cells are major players in the development, function and health of the nervous system.

Freeman joins five other HHMI Investigators at UMMS.



3.

2. GSBS students receive HHMI fellowships

Graduate School of Biomedical Sciences students Meetu Seth (left) and Harleen Saini are among 42 international predoctoral students who received Howard Hughes Medical Institute fellowships that will support them as they complete their graduate studies at U.S. universities. The highly competitive fellowship is funded at \$43,000 per year for up to three years.

3. Candib honored as Five Star Doctor

Lucy Candib, MD, professor of family medicine & community health, was honored as the 2013 recipient of World Organization of the Family Doctors’ (WONCA) Five Star Doctor Award. She was selected from among family physicians worldwide. The award was conferred at WONCA’s World Conference, which was held in the Czech Republic in June.

The recipient of the worldwide Five Star Doctor Award is a family physician who has made a significant impact on the health of individuals and communities through personal contributions to health care and the profession.



4.

4. Szabo elected to Hungarian National Academy of Sciences

Gyongyi Szabo, MD, PhD, professor of medicine and vice chair of research for the Department of Medicine, was elected to the Hungarian National Academy of Sciences.

The 184th General Assembly of the Hungarian Academy of Sciences voted on new members of the scientific community in a closed session of academicians. With the new members, the Hungarian National Academy of Sciences has 303 regular, 193 external and 235 honorary members. Dr. Szabo was recognized for her contributions to the study of liver diseases and immunology.

5. Medical student studies retinal disease with HHMI award

Second-year medical student Tedi Begaj spent his summer conducting research on a degenerative retinal disease that can lead to blindness as a fellow in the lab of Howard Hughes Medical Institute (HHMI) and Harvard Medical School researcher Constance Cepko, PhD, thanks to a Summer Medical Fellows Program award from the Howard Hughes Medical Institute.

The prestigious HHMI summer fellowship provides no more than 20 medical students nationally with the opportunity to perform research in the labs of current HHMI investigators, with the goal of fostering a love of research in future physicians and deepening the pool of physician-scientists.



5.



6.

6. Torres named Searle Scholar

Eduardo M. Torres, PhD, assistant professor of molecular medicine, joined 14 other researchers across the country in the chemical and biological sciences who have been named 2013 Searle Scholars.

The Searle Scholars Program makes grants to selected academic institutions to support the independent research of outstanding young scientists who have recently been appointed as assistant professors on a tenure track. Each recipient is awarded \$300,000 to support his or her work during the next three years.

7. Soumana wins two prestigious awards

Graduate School of Biomedical Sciences student Djade Soumana has received two prestigious research awards: a Ruth L. Kirschstein National Research Service Award for Individual Predoctoral Fellows from the National Institute of General Medicine, and a HOPE Scholarship from the Biomedical Science Careers Program. Soumana is a third-year student studying hepatitis C drug resistance in the laboratory of Celia Schiffer, PhD, professor of biochemistry & molecular pharmacology and director of the Institute for Drug Resistance.



7.



8.

8. Ambros wins top research award

The 18th Keio Medical Science Prize was awarded to Victor R. Ambros, PhD, the *Silverman Chair in Natural Science* and professor of molecular medicine. Keio University annually awards the Keio Medical Science Prize “to recognize researchers who have made an outstanding contribution to the field of medicine or life sciences.” It is the only prize of its kind awarded by a Japanese university. Six previous winners have gone on to win the Nobel Prize.

9. Carpenter honored for simulation presentation

Dawn Carpenter, DNP, assistant professor of nursing, received the 2013 National Organization of Nurse Practitioner Faculty (NONPF) Poster Presentation Award at the 39th Annual NONPF Conference for her poster presentation “Simulation to Facilitate Interprofessional Education.” The project used human patient simulation with acute care scenarios in which interprofessional health care professionals, including nurses, pharmacists, respiratory therapists and nurse educators, focused on teamwork and collaboration.

10. Benjamin elected president of national neuropsychiatric group

Sheldon Benjamin, MD, professor of psychiatry and neurology and vice chair of education for the Department of Psychiatry, has been elected president of the American Neuropsychiatric Association. He was installed at its annual meeting held in Boston in April.



10.



9.



11.

11. Irwin receives Pioneering Spirit Award

Pulmonologist Richard S. Irwin, MD, professor of medicine and a leading advocate for interdisciplinary collaboration between medicine and nursing, received the GE Healthcare-AACN Pioneering Spirit Award from the American Association of Critical Care Nurses. The award was given at the 2013 National Teaching Institute & Critical Care Exposition in Boston. This AACN Visionary Leadership Award recognizes significant contributions that influence high acuity and critical care nursing.

12. Lee named chair of pediatrics

Mary M. Lee, MD, has been appointed chair of the Department of Pediatrics at UMass Medical School and physician-in-chief of the UMass Memorial Children’s Medical Center. Dr. Lee, professor of pediatrics and cell & developmental biology and director of the division of pediatric endocrinology, has served as interim chair since October 2012. She has been at UMMS and UMass Memorial since 2004 and succeeds Marianne E. Felice, MD, who led the department since 1998.

13. Davis wins Beering Award

Roger J. Davis, PhD, Howard Hughes Medical Institute Investigator, *H. Arthur Smith Chair in Cancer Research* and professor of molecular medicine and biochemistry & molecular pharmacology, has been named the recipient of the Indiana University’s 2013 Steven C. Beering Award for outstanding advancements in biomedical and clinical science.



12.



13.

Graduate School of Nursing

Ellen Venditti, MS, RN, CPHRM, FASHRM, '96, senior director of risk management for UMass Memorial Health Care, was recently named president-elect of the American Society for Health Care Risk Management. Ellen has worked for UMass Memorial Health Care for 25 years. She resides on Cape Cod and is the happy grandmother of six grandchildren.

Elysa Doherty, MS, RN, '00, is an adult nurse practitioner specializing in psychiatry. Elysa says the GSN program prepared her very well for her career.

School of Medicine

1970s

William Fischer, MD, '79, retired from his career as a family practitioner with Capital Region Family Health in Rensselaer in May 2012. He resides in Schenectady, N.Y., with his wife, Wanda Adams Fischer. They will celebrate their 40th anniversary in August, and they have three grandchildren.

Andrew J. Miller, MD, '79, was awarded the Community Educator Award for 2011-2012 for sustained excellence in undergraduate medical education in the community setting. Andy is co-chairing his 35th reunion committee.

Arnold Mandelstam, MD, '79, says he is often reminded of his superb education at UMMS. Dr. Sandy Templeton's lessons in critical and logical thinking continue to influence his practice. Arnold plays the piano and is an avid runner; he enjoys three married children, two grandchildren and his wife of 32 years.

1980s

Alice (deRivera) Haines, MD, '81, has started a free clinic at Trinity Jubilee Center in Lewiston, Maine, and is particularly interested in immigrant, international and asylee health. She has volunteered in post-quake Haiti and the Dadaab refugee camp in Kenya.

Michael J. Lemanski, MD, '83, was named a fellow of ACEP and a fellow of AAFP, and associate professor of emergency medicine at Tufts University School of Medicine. He is a member of the ACEP Coding & Nomenclature Committee, chair of Workgroup 4, and member of the ACEP Reimbursement Committee.

Adam Altman, MD, '84, was recently elected medical director of Pennsylvania Eye and Ear Surgical Center. He will soon celebrate his 25th wedding anniversary with his wife, Robin.

Robert Lancey, MD, '85, now serves as the medical director of the Bassett Healthcare Network in Upstate New York.

Joe Disa, MD, '88, was elected as a director of the American Board of Plastic Surgery.

1990s

Elizabeth Steiner, MD, '91, experienced a career change on Jan. 5, 2012, when she was installed as a state senator in Oregon, having been appointed to fill a vacant seat. She says she finds that being a family physician in academic medicine was excellent training for being a legislator. Visit www.elizabethfororegon.com.

Carolyn Roy-Bornstein, MD, '91, recently authored a memoir, *Crash: A Mother, a Son, and the Journey from Grief to Gratitude*.

Ned Stolzberg, MD, '93, was recently chosen as medical director of a new palliative care service at Arrowhead Hospital in Glendale, Ariz.

Joseph Bouvier, MD, '96, is a pediatric advanced urgent care/emergency physician at Phoenix Children's Hospital.

David Shaff, MD, '99, is the chief of anesthesiology at the Brigham and Women's Hospital.

2000s

Linda E. Schmidt, MD, '00, is working and living happily in Portland, Ore., as a child and adolescent psychiatrist. She sees patients at a community mental health center and her private practice.

Jeffrey Hopkins, MD, '00, is the chair for the Department of Emergency Medicine at Milford Regional Medical Center. In 2012, he was elected to the executive board of the Massachusetts College of Emergency Physicians. In 2013, he was elected to the Board of Trustees at Milford Regional Medical Center.

David FitzGerald, MD, '00, is seeing patients and doing research on traumatic brain injury at the V.A. hospital in Gainesville, Fla. He says he and his family miss the winters in Massachusetts.

Greta Boynton, MD, '00, has accepted a new position with SoundPhysicians as division chief of Hospital Medicine at Baystate Medical Center in Springfield.

Glen Gaebe, MD, '03, and wife **Liz Fray, MD '04**, returned to Massachusetts with their two daughters. He has been appointed to the active medical staff at Milford Regional Medical Center and will see patients at UMass Memorial Orthopedics at Milford.

Emily Ko, MD, '04, graduated from the University of North Carolina Gynecologic Oncology Fellowship in June 2012. She received the American Society of Clinical Oncologists Young Investigator Award and the Gynecologic Oncology Group Young Investigator Award.

Danielle Wyant, MD, '05, is a pediatric neurologist with Raleigh Neurology Associates.

Andrew Cocchiarella, MD, '05, was appointed chief of anesthesia and medical director of perioperative services at Marlborough Hospital in September 2011.

Mark Johnson, MD, '06, is the general surgeon for the U.S. Naval Hospital in Sigonella, Sicily. He served as ship's surgeon from August 2011 to August 2012 on the U.S.S. Ronald Reagan.

Heather Smith, MD, '07, was elected to the AMA Foundation Board of Directors.

Shira Fischer, MD, PhD, '09, and Gad Marshall are thrilled to announce the birth of their second daughter, Hadas Aliza, in February 2013.

Jose F. Abad, MD, '09, completed his residency in family medicine at the University of California Davis Health System and is practicing family medicine as well as teaching residents and medical students. He and his wife reside in Sacramento.

Jeffrey Phillips, MD, '09, joined Family Doctors LLC in Swampscott in May.

2010s

Erik Domingues, MD, '10, is recently engaged to Kasia Baczewska, a registered nurse at St. Vincent Hospital. They are planning an August 2014 wedding.

Ruth Levesque, MD, '11, and her husband welcomed their daughter, Olivia Pearl Levesque, on May, 20, 2013.

Charlotte Moriarty, MD, PhD, '11, and her husband, Adam, welcomed twins, Ryan Davis and Emma May, on Jan. 25, 2013.

Noah Rosenberg, MD, '12, married **Christa Lovett, MD, '12**, in Amherst. Noah completed his family medicine residency at UMMS, where Christa continues her residency in pediatrics.

Graduate School of Biomedical Science

Ramesh C. Kovi, PhD, '09, is a veterinary anatomic pathologist at the University of Minnesota.

Cherilyn (Cheri) Sirois, PhD, '11, is a research professor in the Center for Translational Research at the Universidad de las Americas in Quito, Ecuador. She is a general coordinator for research activities in the Department of Education Quality and Faculty Development. She welcomes anyone in the UMMS community interested in collaboration, or in visiting Ecuador, to contact her at csiros@udla.edu.ec.

School of Medicine Reunion

Celebrating the 40th reunion of the Medical School's first graduates in the Class of 1974, as well as the Classes of 1979, 1984, 1989, 1994, 1999, 2004 and 2009.

Saturday, May 3, 2014

UMass Medical School
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An Alumni Association revitalization

In an effort to expand the impact of the UMass Medical School Alumni Association, Irv Heifetz, MD '79, president, and Andy Miller, MD '79, vice president/treasurer, are collaborating with the Office of Alumni Relations to recruit enthusiastic alumni who would like to influence the future of the association. The reinvigorated team will build on past successes and refine the association's mission to reflect the needs of today's alumni community.

"This is a turning point for the Alumni Association," said Anastasia Grady, director of alumni and parent relations. "Enthusiasm from alumni is palpable. With the guidance and experience of such dynamic leaders, the team will hit the ground running."

Alumni who are interested in bolstering the efforts of the UMMS Alumni Association may contact Anastasia Grady at anastasia.grady@umassmed.edu or 508-856-1593.

Reunion classes support future students through scholarships



Chancellor Michael F. Collins joins members of the Class of 1988 to celebrate their 25th Reunion.

Class Year	Reunion Class	Participation	Total Class Giving
1978	35th	49.2%	\$72,200
1983	30th	45.9%	\$53,351
1988	25th	50%	\$61,125
1993	20th	34.3%	\$42,066
1998	15th	47.6%	\$30,421
2003	10th	32.1%	\$9,867
2008	5th	24.5%	\$3,150

Members of the 2013 School of Medicine Reunion classes have chosen to continue to ensure that the best medical education remains financially within reach for all. Together, they have made the second-annual Class Gift Campaign extremely successful. To celebrate their Reunion and their time at UMass Medical School, they have chosen to honor current and future students by establishing the transformative gift of an endowed scholarship. Combined, the reunion classes established five endowed scholarships, two current-use scholarship and one additional family-endowed scholarship. These scholarships will be awarded annually to promising medical students based on financial need. In addition to these scholarship initiatives, alumni have also been very generous in supporting a variety of needs throughout the academic health sciences center.

The Alumni Association was established in 1977 by dedicated and grateful graduates who recognized the importance of maintaining a relationship with their medical school and each other. In 1978, the group pioneered a vital mission to support student scholarships.

Under the continued leadership of Dr. Heifetz and Dr. Miller, the Alumni Association has held many successful reunions and scholarship fundraising efforts, becoming an essential part of the Medical School. In the current academic year alone, more than \$200,000 in scholarships were awarded.



2013 Financials

Education

- 3,022 Number of faculty (including voluntary)
- 331 Basic science full- and part-time faculty
- 2,522 Clinical full- and part-time faculty
- 169 Nursing faculty

School of Medicine

- 486 MD students
- 32 MD/PhD students
- 3,583 Alumni

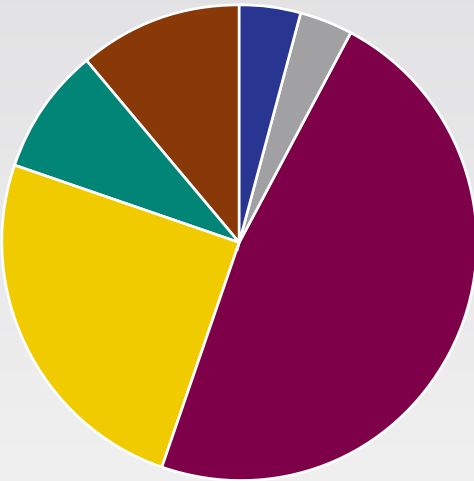
Graduate School of Biomedical Sciences

- 319 PhD students
- 32 MD/PhD students
- 20 Clinical & Population Health Research students
- 8 Master of Science in Clinical Investigation students
- 586 Alumni

Graduate School of Nursing

- 47 MS students
- 77 Graduate Entry Pathway students
- 28 PhD students
- 31 Doctor of Nursing Practice students
- 993 Alumni

FY '13 Funding and Revenue



\$870.2 million Total

- \$41.1 million State appropriation
- \$33.1 million State contracts*
- \$447.1 million Public service
- \$233.0 million Research (sponsored activity)
- \$81.0 million Sales and services**
- \$103.7 million Other revenue***

*Provide mental health and pediatric services for those who cannot afford private care.
**Examples include MassBiologics and New England Newborn Screening Program.
***Mass Life Sciences capital revenue of \$16.7 million not included

Total Research Funding – Fiscal Year Ending:

June 30, 2010	\$255,314,898
June 30, 2011	\$287,991,128*
June 30, 2012	\$249,677,737
June 30, 2013	\$242,336,429

*Includes \$39 million in American Recovery and Reinvestment Act funding.

Technology Management – (\$ in thousands)

For Fiscal Year:	2010	2011	2012	2013
Invention disclosures	68	60	80	73
U.S. patent applications	64	47	39	62
Licensing agreements	4	5	16	4
Sponsored research agreements	\$1,337	\$3,085	\$4,888	\$2,986
Licensing revenue	\$38,377	\$34,821	\$52,642	\$33,823



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By Reza Hosseini Ghomi SOM '14



Two years ago, I remember sitting by the window in a hospital room with my eight-year-old Sidekick, who was being treated for rhabdomyosarcoma, there for chemotherapy. Sidekicks is a student-led initiative at UMass Medical School that matches medical students with pediatric oncology patients in order to build long-term, nonmedical relationships. On this visit, he was watching his favorite cartoons and so was unresponsive to my attempts at engagement.

My own five-year anniversary of remission from Hodgkin's lymphoma had just passed the week before. It was the day we had a chemotherapy lecture as part of our cancer course in my first year of medical school. I remember thinking how I couldn't believe it had been five years; it felt like a century at the time. I felt like it had to be a different person who went through all of that treatment, pain and fear five years prior. I am now officially cured, according to oncologists, although I don't really feel any different.

I sat wondering if my Sidekick would someday feel the same way, or if he would even have the opportunity. We had bonded quickly; I suppose our shared experience provided a comfort beyond words or gesture. He asked me questions that would break my heart each time: "Am I going to die?" or "Do you think my cancer will come back?" I never found a response for those questions I felt was sufficient. But thanks to my own experience, there were plenty of questions I did feel comfortable answering, and felt useful in doing so.

Now, I'm coming up on seven years cancer-free, and my Sidekick is into his second year. I have just returned from watching him play in his final football game of the year. The odds were certainly not in his favor, but look at him now. He's back to being a kid again. I recently attended his mother's wedding where, during the reception, she found us racing outside among the trees. I guess some of us never grow up.

No matter how hard I try, I can't find any sense in what he went through, and when I ask him, he just says he's glad it's over. It's hard to think he might be able to look back on his experience and see something positive in it like I have, but what do I know? What I did learn was to be comfortable with not knowing what to do and, often, doing nothing. I learned my presence could be healing as long as I was fully present with my Sidekick, or any patient for that matter. Practicing letting go of my preoccupation with my to-do list allowed for healing only realized in the moment.

Early in my third year of medical school, I had no idea where I was going or what field I was interested in. My head would spin just thinking

about it. Now in my final year, what helped me more than anything else decide on what type of medicine to practice was remembering what previous experience had taught me: to look for those little coincidences, those signs that somehow are always there to show us the way. Those situations that seem to just happen without you trying. The ones where you feel comfortable, beyond thought or explanation. The ones that give you a glimpse of yourself at your best. Those moments you truly participate in a patient's healing and know it without words or expression. They may be subtle and sometimes fleeting, especially in medical school, but they're there.

When I get caught up in all of the mental gymnastics to rationalize certain judgments about certain experiences and fields, I remind myself to step back and look for those signs. After all, it's not too hard to believe I'm on the right path when medical school has given me so many opportunities for learning—like those with my Sidekick.

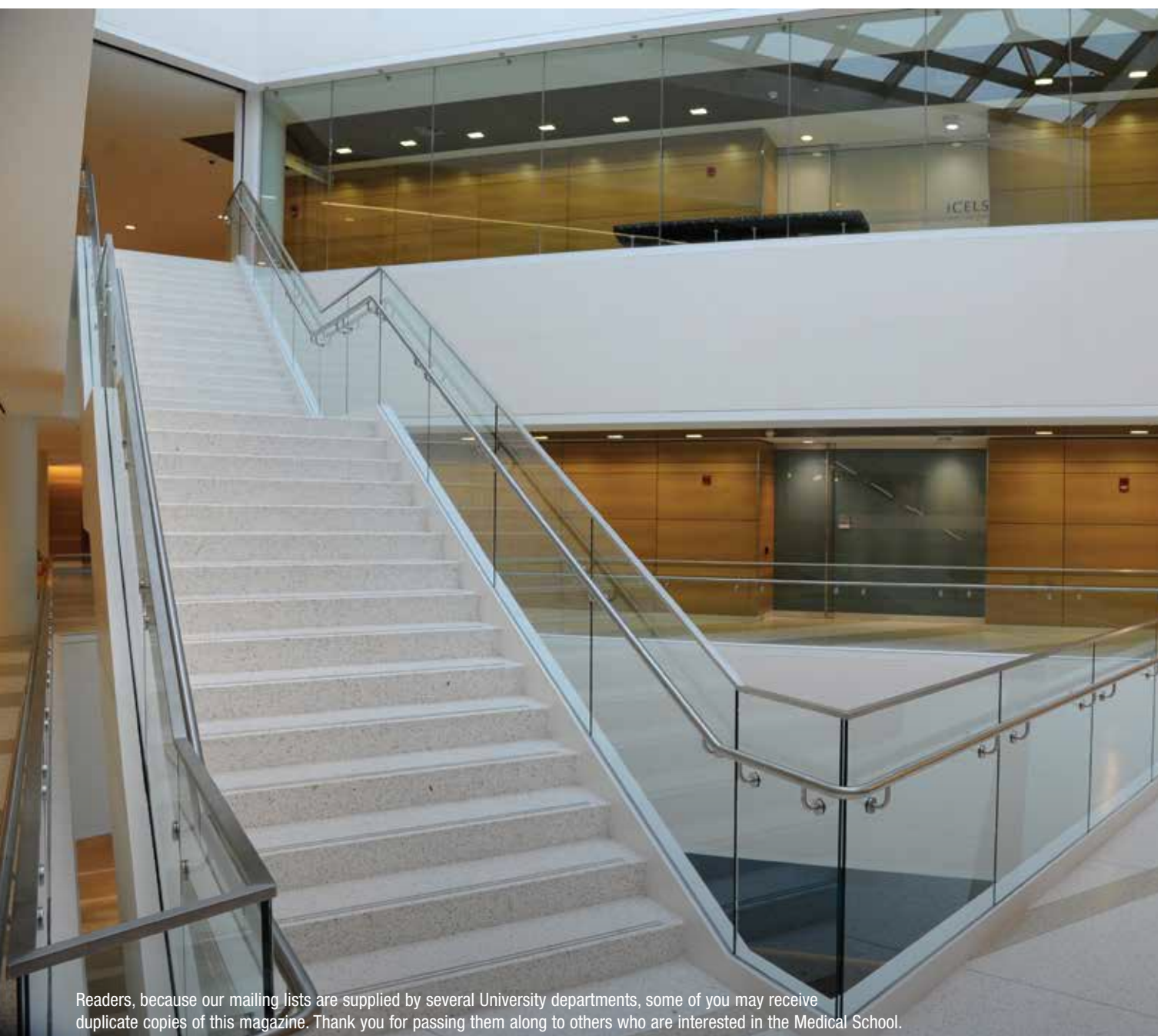
REZA HOSSEINI GHOMI SOM '14, WHO GREW UP ON CAPE COD, CONTINUES TO CHECK IN REGULARLY WITH HIS SIDEKICK, DYLAN. AS HE REACHES THE HALFWAY POINT OF HIS FOURTH YEAR IN MEDICAL SCHOOL, HOSSEINI GHOMI IS INVESTIGATING PSYCHIATRY RESIDENCIES IN MASSACHUSETTS AND THE PACIFIC NORTHWEST.





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