

TMC | PULSE

THE OFFICIAL NEWS OF THE TEXAS MEDICAL CENTER — VOL. 2 / NO. 3 — APRIL 2015

Cowboys and Injuries

.....
Behind the scenes at RodeoHouston

RODEO HOUSTON

INSIDE: FIRST-CLASS INNOVATORS, P. 5 >> SPOTLIGHT: RICE PRESIDENT DAVID W. LEEBRON, P. 10 >> MICRO-SIZED SAVIORS, P. 26

CAMBRIDGE PARK COURT



From the \$360's

Medical Center

Gated Community · Guest Parking Spaces

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From the \$780's

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Free-Standing · Fourth Floor Terrace

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Montrose

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5

First-Class Innovators

Hailing from across the globe, 22 companies have been welcomed into the inaugural class of TMC|X.

14

Moments of Calm

MD Anderson's weekly Little Yogis class aims to help young patients relax and build confidence through a combination of yoga, visualization exercises and games.

16

Cowboys and Injuries

Since 1931, the Houston Livestock Show and Rodeo has been one of the city's most beloved events. Its success depends on thousands of dedicated volunteers, including many from right here in the medical center.

26

Micro-Sized Saviors

Researchers explore connections between autism and gastrointestinal disorders with hopes of harnessing bacteria to unlock groundbreaking new therapies.



SPOTLIGHT: RICE UNIVERSITY // p. 10

WITH RENOWNED ACADEMIC PROGRAMS, BELOVED SPORTS TEAMS, AND A BEAUTIFUL CAMPUS, RICE UNIVERSITY IS AMONG THE COUNTRY'S TOP RANKING UNIVERSITIES. RICE PRESIDENT DAVID W. LEEBRON DISCUSSES THE UNIVERSITY'S PRIORITIES FOR THE FUTURE, AND HOW THEY ARE POSITIONED TO KEEP UP WITH THE CHANGING LANDSCAPE OF HIGHER EDUCATION.

31

United We Stand

Through tactical partnerships and accelerated research and development, Texas A&M Health Science Center stands at the ready to fight the next global bio-threat.

32

Eyes on the Prize

Offering an alternative to topical eye drops, researchers at Baylor College of Medicine have developed a nanowafer drug delivery system that has the potential to provide relief for patients suffering from eye injuries and ailments.

36

Accolades

38

Short Takes

40

Calendar

ON THE COVER: Bareback rider Steven Peebles holds on tight to bronco Twin Cherry during RodeoHouston's BP Super Series.

PRESIDENT'S PERSPECTIVE



ROBERT C. ROBBINS, M.D.
*President and
Chief Executive Officer,
Texas Medical Center*

In March, we had the pleasure of welcoming Wayne Roberts, CEO of the Cancer Prevention & Research Institute of Texas, to give the Texas Medical Center community a bit more of an understanding of his institute's priorities and goals. This program has provided the support and infrastructure for important cancer prevention programs, funds for basic research and translating fundamental discoveries into commercialized products for the improvement of human health. You can read more about their visit in this issue of Pulse.

Opportunities like those offered by CPRIT, the Texas Emerging Technology Fund and the Texas Enterprise Fund are extremely important as we seek to make Houston a leading destination for life science and innovation. This is also an area of interest to our campus' health policy community, as state legislators appropriate these funds. These programs are examples of how taxpayers can invest in the future of Texas, creating jobs and providing the collaborative environment and ecosystem for discoveries that will cure cancer, heart disease, Alzheimer's and other devastating diseases. It is essential that programs like these continue.

CPRIT's mission is particularly powerful, in no small part, because Texas voters believed in it enough to make it happen, and that is what we see every day within the Texas Medical Center. Passion and dedication help drive new discoveries. It is exciting to see what can emerge when the right people and resources come together to further research.

A handwritten signature in dark ink that reads "Robert C. Robbins". The signature is written in a cursive, flowing style.

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A young boy with short brown hair, wearing a teal t-shirt and khaki shorts, is sitting barefoot on a thick, textured tree branch. He is looking directly at the camera with a slight smile. The background is a soft-focus view of other tree branches and leaves, suggesting a natural, outdoor setting.

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First-Class Innovators

The Texas Medical Center welcomes 22 companies from around the world to the inaugural class of its accelerator program

BY ALEX ORLANDO

Every day, innovative solutions in health care are redefining the boundaries of possibility. In the world of wound closure, where staples and sutures can create an entry point for infections, the next generation of surgical adhesives looms on the horizon. While identifying cognitive impairment—from sideline concussion assessment to early detection of Alzheimer's—can seem nebulous and imprecise, a mobile tablet technology seeks to detect issues of brain functionality in five minutes or less. Despite meticulous efforts to scrub away mold and mildew, health care-acquired infections and allergens in our schools, homes and workplaces still seep through—but one company's antimicrobial technology aims to fill in those gaps. As a multitude of different electronic medical records applications are brought into the clinical landscape, innovators are striving to make the Texas Medical Center the most interoperable health network on the planet.

These breakthroughs represent just a few of the companies that were welcomed into the inaugural class of TMC|X—the accelerator program that serves as one of the core components of the Texas Medical Center's Innovation Institute. Housed within a stylish 100,000-square-foot facility, almost unrecognizable from its former days as a Nabisco cookie factory, barring the original factory floors and pipes, TMC|X is designed to catapult the development of early-stage companies. Hailing from across the globe, including Germany, Israel and throughout the United States, 22 TMC|X startups were selected from a pool of over 260 applicants.

"We're extremely proud to welcome the first class of startup companies into TMC|X," announced Robert C. Robbins, M.D., president and chief executive officer of the Texas Medical Center. "Our job here is to help make you successful in every way that we possibly can—to help you realize your hopes and your dreams. There is no doubt that your



talents and innovations will change not only Houston, but the world."

In choosing companies that would help establish the burgeoning entrepreneurial ecosystem of TMC|X, and winnow down the expansive pool of applicants, no corners were cut.

"Our intention was always to take a select number of companies," explained William F. McKeon, executive vice president and chief operating officer of the Texas Medical Center. "We wanted the best of the best so that we could really focus our resources around these companies—it's about helping them achieve success while connecting them with the resources available in the heart of this incredible medical city."

"The unifying thread is that our team who looked at this really identified companies that have the potential to advance care," he added. "Whether that's in the form of a technology to monitor blood loss during surgery or a new method of wound care, in each case we truly felt they had something compelling to offer to the medical community."

TWENTY-TWO COMPANIES WERE SELECTED FROM A POOL OF OVER 260 APPLICANTS TO PARTICIPATE IN THE INAUGURAL CLASS OF TMC|X—THE ACCELERATOR PROGRAM OF THE TEXAS MEDICAL CENTER INNOVATION INSTITUTE.



TOP: Alexander Schueller, president of Medical Adhesive Revolutions, pitches his company's biomedical marvel—a surgical adhesive that has the potential to improve wound closure. **LOWER LEFT:** Clay Phillips, vice president of business development for LaunchPad Central, Andrea Kates, chief executive officer of LaunchPad Central, and Robert C. Robbins, M.D., president and chief executive officer of the Texas Medical Center. **LOWER RIGHT:** During the first day of the program, entrepreneurs mingled with their fellow classmates.

INAUGURAL TMC|X CLASS

Company	Description
	Develops absorbable medical devices that serve a purpose and then vanish without intervention
	Developed the first fully automated glucose control system specifically for the needs of hospital and surgical care
	Mobile measurement of brain function
	A better way to clean your ears
	Online marketplace connecting freelance bioinformatics scientists with custom projects in academia and industry
	Through their PHP technology, provides 24/7, real-time disinfection of air and surfaces where people live, work, and play; ideally suited for office and health care environments as it provides safe, continuous treatment with no disruption to daily routines
	Catalyzing discovery and empowering people through interactive data visualization
	Commercializing Designer Collagens, a versatile medical device platform, for biomedical needs
	The world's first FDA-approved real-time monitor for surgical blood loss
	A balance diagnostics company that quantifies balance, empowering users to be proactive about their health
	Non-ablative surgical hemostasis for highly accurate sutureless and surgical repair using human serum albumin-based materials
	Next generation surgical adhesives

THE COMPANIES COME FROM ACROSS THE GLOBE, INCLUDING GERMANY, ISRAEL, AND THROUGHOUT THE UNITED STATES.



Delafield Solutions, whose technology aims to safely control microbial threats in all types of environments, get settled into their new space at TMC|X.

In navigating the rigorous application and interview process—one that included an online peer-review evaluation that ranked all 260 companies followed by a more comprehensive examination by a multidisciplinary team—a cross-section of advisors from Texas Medical Center institutions and the Houston community all provided equal input.

“Having broad representation from across the medical center is absolutely critical to our success,” noted George L. McLendon, Ph.D., the Howard R. Hughes Provost and professor of chemistry at Rice University, who acted as an advisor during the selection process. “All of us tried to review companies as thoroughly as we could so that we could get good collective input on not only the strength of their organization, but the fit to what we were trying to accomplish within the Texas Medical Center.”

Those sentiments were echoed by Alexander Izaguirre, Ph.D., vice president and chief technology officer of information technology at Baylor College of Medicine, who also lent his expertise. “I think there’s a hidden gem here that hasn’t been talked about—these companies are seeking out opportunities among all of us, and they’re the ones who are going to hear what our needs are,” he said. “Inherently, in the process, they’re going to shine a spotlight on all of these collaborative opportunities. I’m really excited to see how this plays out.”

Thorsten Melcher, senior director of new ventures and partnerships at Johnson & Johnson Innovation, as well as a TMC|X advisor, provided some input on the qualities that pave the path to commercialization for aspiring startups. “Success is really dictated by the three ‘T’s: technology, team and timing,” he observed. “Those things have to come together in some sort of productive configuration and it has to be something that is financeable. By being a part of TMC|X, and paying close attention during the selection process, hopefully we’ll be able to avoid some common pitfalls that entrepreneurs encounter.”

The Texas Medical Center and Johnson & Johnson Innovation continue to solidify their relationship, sowing the seeds for the arrival of JLABS @TMC—an addition to Johnson & Johnson’s network of life science incubators that will include a new facility located within the Texas Medical Center’s Innovation Institute.

TMC|X will provide a comprehensive and practical curriculum to assist participating founders on their entrepreneurial path. Startups will spend the first two weeks of the program in Lean Launch Boot Camp—an intensive series of workshops, presentations and hands-on events to crystallize their value proposition, determine their market fit and glean insights through customer discovery. LaunchPad Central, an organization striving to accelerate

commercialization and uncover opportunities for growth for early-stage companies, led the Lean Launch Boot Camp. The roots of their approach can be traced to co-founder Steve Blank’s lean methodology for rapid iteration and growth—they have since become the gold standard for startups, accelerators, governments and large corporations seeking to speed up the trajectory from idea to impact.

“We’re here to help kick off this accelerator,” explained Andrea Kates, chief executive officer of LaunchPad Central. “The conventional approach focuses on things like benchmarks, market research, focus groups and other traditional tools—but it turns out those elements don’t work that well in taking a startup from the initial idea to commercial success. One of our mantras is to ‘get out of the building’ or ‘get out of the laboratory.’ We have our entrepreneurs go out into the market and dig in deeply, in the form of over 100 customer discovery interviews, to figure out the right customer for their idea.”

Following the Lean Launch Boot Camp are a series of topical sessions and workshops structured to help startups surpass common hurdles in commercializing medical technologies. Successful entrepreneurs, subject-matter experts, industry professionals and hospital leaders will guide the participating companies in everything from intellectual property to fundraising.

“Over the past couple of years, we’ve had a very successful research track, and all of our technology has been well received in the academic world, but now we need to figure out how to get it off the bench so that people can utilize it,” said Brooke Russell, Ph.D., vice president of EMC Technologies—a company that is designing collagens for biomedical needs—as well as assistant professor at the Center for Infectious and Inflammatory Disease at Texas A&M Health Science Center Houston (TAMHSC) Institute of Biosciences and Technology. “I hope that we come out of this program with a well-formulated business model and a clear path towards our first clinical trial.”

For Delafield Solutions, a company aiming to provide round-the-clock, real-time disinfection of air and surfaces in office and health care environments, the wealth of clinical settings available are a rich deposit for validating their

product’s viability. “We’re constantly looking to challenge our technology,” said Jeff Castille, executive vice president of operations at Delafield Solutions. “We’ve learned that to properly represent our capabilities, we have to be tested in a lab environment. It’s about verifying whether or not we have a product that can be commercialized in that context—we believe we do, and we’re looking for opportunities to prove that.”

In cultivating an entrepreneurial ecosystem, connecting people and resources isn’t always enough. For Niko Skievaski, co-founder of Redox, a company aiming to make it easier to integrate with electronic medical records, knitting together institutions electronically as well as interpersonally is key.

“We’re trying to solve a problem that is one of the biggest issues of technology adoption in health care,” he said. “We want to figure out how to make this medical center one of the most interoperable places in the country. If the Texas Medical Center is going to establish itself as the hub of innovation, that innovation can’t happen without technology adoption, and technology adoption can’t happen without some sort of interoperability solution.”

Some companies have crossed oceans to be here at TMC|X. Alexander Schueller, president of Medical Adhesive Revolution—a company that has developed a polyurethane surgical adhesive with the potential to reinvent wound closure—came all the way from Germany to access the treasure trove of opportunities that the Texas Medical Center offers. “Being here, we have a unique inroad to the Texas Medical Center—its resources, people and key opinion leaders that will help us shape our strategy,” he said. “The mentorship that goes along with this program is going to be a huge component—there are some very advanced and experienced people here to support us. Most importantly, the environment that they’ve been creating here for all of the teams is so rewarding. I’m looking forward to exchanging ideas with these amazing people. It’s all about helping each other.”

Enveloped by that atmosphere of solidarity and support, it’s hard to imagine what these companies aren’t capable of achieving. ■

INAUGURAL TMC X CLASS	
Company	Description
	Creating novel medical treatments based on carbon nanotube fiber technology; flagship product is CardioLinea, a minimally invasive and restorative treatment for ventricular cardiac arrhythmia
	Commercializing a noninvasive monitor of fetal cerebral blood oxygenation that will reduce the incidence of cerebral palsy and unnecessary cesarean section
	A bracelet pulse oximetry platform that provides continuous supervision of pulmonary, heart and sleep-related diseases to empower preventative care
	Creating an automated, intelligent referral process that matches patients, treatments and providers to increase revenue retention, enhance care coordination and improve patient satisfaction
	The modern API for EMR integration; making it easier to integrate with EMRs
	Driving efficiency by building a digital nervous system for hospitals, extending the capabilities of modern EHR systems with human-centric sensors and analytics software
	Provides a collaborative annotation and visual search platform for physicians analyzing medical images
	Collects all of the digital conversations around a patient onto a single trusted cloud-based platform; connects all of the providers responsible for a patient’s well-being, across departments and beyond the hospital walls, in a single Care Map, closing gaps of care and enabling better health
	Using a connected device with cutting-edge lighting technology to provide access to clear skin for patients affected by conditions caused by the immune system
	Creating Internet interventions for problems with sexuality and fertility related to cancer and other chronic illnesses



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If Eleanor isn't moving, she isn't happy. There's skiing, wakeboarding, rock climbing, and the more down to earth activities like biking to the store. When she needed surgery on her ankle, she was worried.

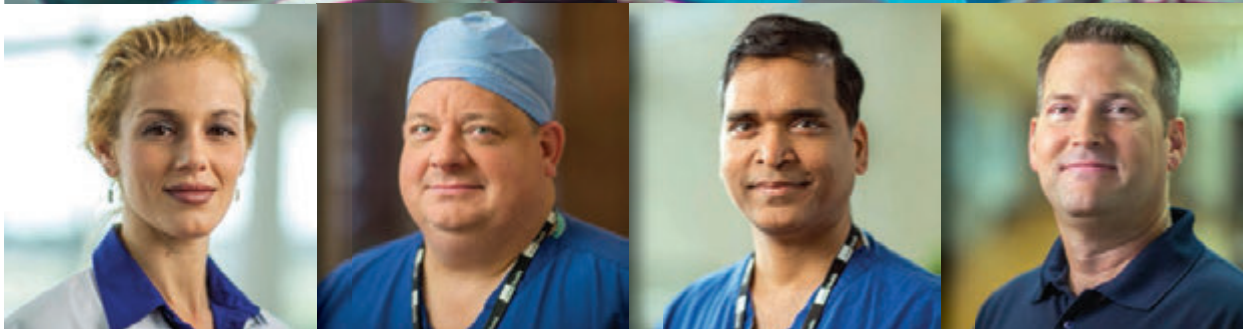
She came to UTMB Health and benefited from a multidisciplinary team of surgeons, doctors, nurses, and physical therapists who knew that Eleanor needed aggressive treatment to return to her active lifestyle. They kept her informed at every step. *"I'm a Nurse Practitioner. I practice what I preach about staying active and healthy. When it came time for rehab, the people here made sure I stayed with the plan. You get out of it what you put in."*

Today, Eleanor is back to her old tricks, which also happened to include kicking up her heels and dancing at a friend's wedding.

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Left: Nikoletta Carayannopoulos, DO, Chief, Orthopaedic Trauma Surgery

Center Left: Joel Patterson, MD, FACS, FAANS, Chief, Division of Neurosurgery

Center Right: Vinod Panchbhavi, MD, FACS, Chief, Division of Foot and Ankle Surgery

Right: Gregory McGowen, PT, Cert MDT, AIB Certified in Vestibular Rehabilitation, Rehabilitation Services

The four clinicians featured here are representative of the whole team of specialists spanning our musculoskeletal services.

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THOUGH IT WAS A “COINCIDENCE” THAT FIRST LANDED DAVID W. LEEBRON IN ACADEMIA, TODAY HE PROUDLY SERVES AS PRESIDENT OF RICE UNIVERSITY. HE SAT DOWN WITH TEXAS MEDICAL CENTER EXECUTIVE VICE PRESIDENT AND CHIEF STRATEGY AND OPERATING OFFICER WILLIAM F. McKEON FOR A LOOK AT THE UNIVERSITY’S GROWTH DURING HIS 11-YEAR TENURE—FROM A LARGER AND MORE DIVERSE STUDENT POPULATION, TO A RENEWED COMMITMENT TO THE ARTS.

Q | Can you tell us about your formative years?

A | I grew up in a suburb of Philadelphia and was the second of five children. And so far as I can remember, I had a good childhood, with a wonderful family. My brother is a writer, and I tell my children that they can be anything they want to be except a writer, because the first thing that most writers write about is their dysfunctional families. I went to a small Quaker school in Philadelphia, the William Penn Charter School, even though I’m not Quaker. It was a great education. I am very loyal to my high school and grateful for the values and perspectives that it inspired in me.

I grew up with probably more interest in science than other subjects. International experiences were also an important part of my teenage years. I took my first overseas trip to Scandinavia with the Boy Scouts when I was 13, and then when I was 16 I went back as an exchange student in Germany. And then my family hosted a string of visitors from Sweden, Switzerland, Mexico, Japan and Germany. So that was a somewhat different aspect of growing up in a suburb of Philadelphia.

Q | I find it interesting that your undergraduate degree from Harvard is in history and science. That is unique.

A | My mother did want me to be a doctor, so I was trying to humor her, although I didn’t think that was a likely outcome. And I was interested in science even though I didn’t think science would be my career. I just liked science.

So I was looking for a major that would allow me to do some of the things I wanted to do. I came upon this major that was administered by the Department of History of Science, but it was called history and science, because they thought it was too narrow just to study the history of science. Thus the major would include some

science courses, and some history courses, and some history of science courses—courses that ranged from 19th century German history to advanced cellular biology.

Q | When you were heading the Law Review, did you anticipate a career in academia?

A | Not really. Although some of my friends in law school thought I should be an academic, I didn’t actually have any particular interest in being an academic. I decided to clerk for a judge following law school, applied only to one, and ultimately went out to Los Angeles to clerk for her. She promptly resigned. Really, it was not my fault. She resigned to become the first secretary of education. So there I was in Los Angeles, having made this big decision to go out to Los Angeles specifically to clerk for this federal judge, and I was jobless. So I had to figure out what I was going to do. Through a total coincidence, some folks at UCLA had called me about some colleagues of mine in law school, to ask whether I thought they would be interested in academia. After we talked about that, the person from UCLA said, ‘Well, now that your judge has resigned, what are you going to do?’ I said, ‘I don’t know. Maybe I will work for a law firm, maybe I will teach. I don’t know. But I think I would like to stay out here in L.A. for a while.’ So he said, ‘Well, let me get back to you.’ It turned out UCLA had a professor who was on leave in New York and was supposed to come back to teach a course in the spring and didn’t want to come back. So they said, ‘Would you be interested in teaching this basic course for first-year law students?’ The course was called torts.

So I went to UCLA in the spring and taught torts, and had a great time. But then I left and traveled around the world for about four months. I thought I was going to go back to Philadelphia and get a job, and then I realized I didn’t

“The student body has been fundamentally transformed—it is much more diverse, national and international, as befits an internationally renowned research university.”

really know anyone in Philadelphia anymore except my family. I decided that I wanted to go to New York instead. So I got a job with a law firm there.

But I didn’t enjoy the private practice of law that much. I thought, ‘Gee, that teaching thing was pretty good.’ And so I went on the teaching market, and received a few job offers and ended up at NYU.

Q | Can you share with us your perspective of how Rice University has changed during your tenure?

A | Rice was a great place, and I had great predecessors, each of whom had made a terrific contribution to the institution, and some in areas I am interested in. But people talked about Rice being ‘behind the hedges,’ and students getting outside of the hedges. Rice was seen as quite separate from the city, and many people came to Rice despite the fact that it was in Houston, instead of because it was in Houston. So that’s one thing that was important to me. This was an urban university, and we needed to take advantage of that.

The second issue is what were its relationships globally? And at that time, we had very little going on in Latin America and in China. We really focused on that. Here we are in Houston, and Latin America had to be a big piece of what we were trying to achieve. China is a great set of opportunities for us. Thus, that was also a focus.

We looked at some of the issues around size. We were a very small university. So we decided to grow 30 percent. At Rice, that’s not a huge absolute number, about 900 more undergraduate students. But you will

find very few universities that have undertaken growth at that percentage level. And that allowed us to be much more national and international. So a big priority was building out the reputation of the university. A lot of that has to do with where your students are coming from. And then, having great people in public affairs who can get the word out.

Another thing was that the university needed to be really, really clear about its mission and ambition. Rice has had conflicted identities at different times. We really delayed participation in the federal research programs, and didn’t take any federal research money until the 1960s. We had some extraordinary programs, including in nanotechnology and bioengineering, but we needed to strengthen our research profile.

We also weren’t as diverse a university as we could have been. Today we are one of the most diverse elite private universities in the country. We are the only member of the Association of American Universities on Princeton Review’s ranking of the top 10 for interaction among students of different socioeconomic, racial and ethnic backgrounds. AAU is made up of the 60-some best research universities in the country, public and private, and Rice is the only one on that list. Today, we have no majority ethnic or racial population on the campus, much like our home city of Houston. The student body has been fundamentally transformed—it is much more diverse, national and international, as befits an internationally renowned research university.

“Many people today talk about the threat to higher education from technology, but I like to talk about the opportunity from technology.”

For the full interview, visit TMCNews.org

We have also continued a century-long process of broadening the university. Rice was initially the Rice Institute, with a strong focus on science and engineering, because in the words of our founder, that's what Houston needed. We must continue to invest in those core strengths. But over the past few years, we have also put a lot of emphasis on the arts, including art on the campus. We now have some of the best campus art anywhere, including major pieces by James Turrell, Jaume Plensa and Mark di Suvero. We were also very fortunate to benefit from the generosity of the Brown Foundation in helping us establish an art history Ph.D. program. We are about to, with the generosity of the Moody Foundation, open a new Moody Center for the Arts. So we have made a whole new commitment to the arts on this campus. Of course, we already had the Shepherd School of Music, which was spectacular and among the best in the world. We are hopeful it will be even more spectacular, and we are working to build a new center for music and the performing arts. These projects, together with the existing Media Center, will create a whole new arts part of our campus. And I think that's going to change the image of Rice into more of an arts destination.

Q | With your background, I always thought there were two components of Rice that you must have considered strategically: establishing a law school and a medical school. Did you ever consider adding a law school?

A | Yes, we did. When I arrived, people would often ask me questions about Rice starting a law school, and what I said to them was, 'If someone came to me and gave me a check for \$200 million and said, 'This is for a law school,' I would be very inclined to take that check, with the permission of our trustees of course!' We hear a lot

of enthusiasm about Rice having a law school, but it's not something we would do from our existing resources alone.

But a law school would integrate really well with a number of the things that we do. Whether it's in engineering or philosophy or economics or political science or history, these are all fields, plus many others, that have connections to law. So we have built relationships with other law schools in the city. But Rice does have a history of adding different pieces, whether it's the Shepherd School of Music or the Jones Graduate School of Business or the Baker Institute. But above all, we stand for the excellence of what we do, and we don't take on new ventures unless we see a pathway to achieving that excellence.

We are really proud of what the Jones School, the Baker Institute and the Shepherd School have achieved. And the path isn't always straight or smooth. But those now are three extraordinary parts of this university, and getting better.

Q | What about a medical school?

A | In terms of Rice's position in the world of elite research universities, we have two disadvantages. One is size and the other is the lack of a medical school. And some of this really just goes more to reputation than anything else. Pound for pound, we are an extraordinarily productive research university. And in some areas, we are ranked top in the world for what our faculty accomplish. If you look, for example, at generation of NSF research dollars per faculty member, we do extremely well.

The question is thus what are we going to do to grow that? We grew the university, and that was important because it gives us a bigger footprint, a more national footprint and a more international footprint. But then, of course, it wasn't that many years ago, before I got here, that Rice didn't have

a big commitment to the biosciences. Under my predecessor, Malcolm Gillis, the university moved very substantially in that direction. And when I came in, we had the opportunity to build the Bioscience Research Collaborative at the intersection of Rice University and the Texas Medical Center. So we made a big additional push into the biosciences. We see the intersection, in particular, of nanoscience and bioscience as extremely important. But there is now the increasingly important intersection between biosciences and computational sciences, and materials science and medicine. These are areas where we aren't just good, we are really great.

And so that is something we can provide to the medical center. One thought is that if we had a medical school, that's an opportunity for increased integration, perhaps more than we might be able to achieve just by building deeper relationships. So we explored that opportunity with the Baylor College of Medicine, when Baylor was facing some challenges, and for various reasons, that did not come to fruition. But what came out of that was that we wanted to deepen these relationships. We might not be able to have a merger, but we wanted to deepen that relationship and others in the Texas Medical Center.

Q | How would you describe Rice's relationship with the Texas Medical Center?

A | In some ways, I think that relationship is becoming more important. Physically, we sit just outside of the Texas Medical Center and we are one of its member institutions. And so while all of the infrastructure was important to us, and had consequences for us, we weren't so much a direct participant in that. We are not a provider of medical services. Our provost and I have a little debate. He likes to describe us as the Switzerland of the Texas Medical

Center, and I, having studied some aspects of international law and history, prefer to describe us as the Sweden of the Texas Medical Center. There are several different types of neutrality, and the Swiss have one form, and the Swedes have a much more engaged and active form.

That's the model I see us in: we don't compete with the other institutions within the Texas Medical Center, but we have things they very much want to have access to and be part of. And all of the institutions of the Texas Medical Center have research, teaching and activities that we want to be a part of.

What is changing now is that the TMC is becoming a more substantive actor in helping create an integrated research and translational vision. When I interviewed Bobby Robbins, my reaction was, 'This is the guy,' and I thought we would never be able to recruit him. So I was very pleased when his appointment was announced. The TMC board did a fantastic job in consulting with the various institutions on that search and executing that great hire.

The Texas Medical Center has always done a great job. The question at the time of a leadership transition was whether the medical center was going to envision itself as something more, not only the infrastructure for us, but as a big part of the intellectual fabric and glue of the community. It's not going to all be easy, and one of the challenges for Houston is to get its extraordinary institutions to appropriately work together. We have the largest medical center in the world, but our ambition must be to be the greatest medical center in the world. And we aren't there yet. But if we can get these institutions to all work together, we have a really good shot of being there, whether it is in areas like tissue engineering, personalized medicine, imaging or biocomputation. Rice may be comparatively small, but we are a big player in many of those things.



We are on the tissue engineering landscape. We are on the nanoscience and nanotechnology landscape. We are on the health policy landscape. But we can do that much more effectively by leveraging what we do with other institutions, with each of these institutions identifying the areas where they are leaders and the areas where they are highly valued collaborators. And, frankly, it is important to be able to distinguish between those two.

Q | Looking ahead, what excites you most about the future at Rice?

A | I think we are looking at a lot of things. One, higher education is being transformed, and Rice is really well positioned for that. Many people today talk about the threat to higher education from technology, but I like to talk about the opportunity from technology. I have used two pie charts to suggest that in 1985, 75 percent of the value proposition of higher education was around the classroom experience.

But in 2025, that will be reduced to 25 percent of the value proposition, although it will still be very important. A group of Rice students went out on their own, after I did this, and they surveyed their fellow students, and because of the way it was done, they had a 99 percent response rate. They asked the students, ‘What do you see as the value proposition on your education?’ The pie chart they produced from the actual data and my made-up pie chart were nearly identical. I had only made one mistake in my clairvoyance, and that was instead of it being in 2025, it was in 2015. We have to deliver more to our students, and not just more but more effective research experience, mentoring experiences, international experience, entrepreneurial opportunities and internships. That’s going to be an exciting time for universities.

The second set of things is the research that we can participate in. Rice is a small place. It has this opportunity

to bring things together. So we are developing our strategy around big data. And that’s not just going to involve medicine in a big way, but also energy, urban studies and humanities research. So that’s a lot to come together. We are looking at a new effort in materials. In the biomedical area, if you are going to be putting materials into people’s bodies, they had better be precisely the right materials. And in the energy area, where you have problems with corrosion, or the environment—dealing with issues around fracking, for example—we need to create materials specifically designed for the task. We are a leader in materials science and nanotechnology, and we are going to be an even stronger leader in that area.

The Kinder Institute and urban policy is another area I am very excited about. Our new director, Bill Fulton, brings precisely the right experiences to amp up our contribution to understanding urban problems and to contribute to Houston’s solutions to those problems.

So when I look at it, it’s the three missions of research, education and service. And these missions are coming closer and overlapping more than they ever were before. Great research universities have been both engines of opportunity for individuals and a primary source of new ideas and innovation for our society. We need to ensure that we continue to play these roles in the most effective way possible.

And that’s what makes it exciting to be here. You are creating opportunities for young people and solving the problems of the world. What more could you ask for?

Q | Any closing thoughts?

A | We are very excited about what’s happening in the TMC under Bobby Robbins’ leadership. We think this is a great step forward for the city, and we look forward to participating in that. ■

Moments of Calm

The Little Yogis class at MD Anderson gives young patients a break from the stress of treatment and an opportunity to engage in creative play

BY SHEA CONNELLY

“Imagine you’re laying on the beach and it’s the most beautiful sunny day.”

It’s a cloudy, cool Tuesday at The University of Texas MD Anderson Cancer Center, but with their eyes tightly closed, the children in MD Anderson’s weekly Little Yogis class are relaxing on a tropical island.

“Hear the sound of the waves crashing,” says instructor Amie Koroncok, a mind-body intervention specialist at MD Anderson. “What do you want to do at the beach? Maybe build a sand castle?”

Beeping machines keep a steady beat, delivering medication to the young patients, but all thoughts of doctors and treatment fall away as Koroncok leads them through yoga poses, stories, visualization and deep breathing exercises and games.

Since late last summer, the Little Yogis class, part of MD Anderson’s Integrative Medicine Center, has given young patients and their families a break from the realities of intense medical treatment.

“It offers them a way to get out of the hospital, maybe not think about being in the hospital,” said Koroncok. “It gives them extra time to play and just be a kid.”

The class began at the request of parents, she added, who “were asking for something more integrative and holistic to help their children feel better.”

For Philandis Stovall and her kids Fre’derrick “Ziggy,” 7, and Zai, 4, Little Yogis is a welcome respite from hospital life. Ziggy was diagnosed with acute lymphoblastic leukemia (ALL) in 2012. He began treatment at MD Anderson after being diagnosed with central nervous system relapse of ALL in January 2014.

“With the diagnosis and having to be at the hospital every week and sometimes more than once a week, it’s kind of like they still get a chance to have a life and enjoy different activities,” said Stovall. “They always look forward to it.”

Ziggy’s younger sister, Zai, joins him in the Little Yogis classes, creating a bonding opportunity for the siblings. Zai is a ball of activity, full of a bright energy Stovall says helps Ziggy stay positive.

“When he was first diagnosed, he didn’t want to get up out of the bed. As a parent you see your child—they have this look like they want to give up,” Stovall recalled. “But when he saw his sister, he immediately wanted to get up and start moving. It’s kind of like a

“Yoga builds confidence because you’re doing things that you normally don’t think you can do.”

— AMIE KORONCOK

Mind-Body Intervention Specialist at The University of Texas MD Anderson Cancer Center

daily motivation and encouragement, like, ‘Hey, I can still be a kid.’ These classes help them play together and share.”

The idea of involving multiple family members has been a goal of the Little Yogis class since the beginning. Koroncok said she encourages parents to participate with their children. Often when a child is sick, a parent can fall into the role of caretaker, dispensing medicine and coordinating with the child’s health care team. Taking a class together helps restore the parent-child dynamic rather than that of caretaker and patient, she said.

Little Yogis has benefits for parents even when they aren’t directly participating in the class by giving them the time to meet other parents who can relate to the stresses of having a child in treatment. At a recent class, Stovall and another mother chatted and shared advice while watching their children enjoy the activities led by Koroncok.

Class size can fluctuate—some weeks eight or 10 kids will be present. Other times only one shows up. No matter how many appear, Koroncok leads them through a series of activities to help the kids relax and leave with smiles on their faces, ready to face their next challenges.

“I usually start with the breathing ball because that gets their attention,” she said. The breathing ball exercise involves taking a deep breath while opening a rainbow-colored expandable ball, then breathing out while closing it.

“I think that’s the most important thing, to teach them the breathing, so we do it first,” she explained. “Then just judging by who is in the classroom and whether they are paying attention, I might do some songs and incorporate yoga poses into the songs. I like to do at least one story and I try to pick stories that have animals, so we can mimic the animals.”

In addition to Little Yogis, MD Anderson has offered yoga classes geared towards adults for years. This reflects an overall growth in yoga practice over

the past decade. A recent study found over 20.4 million adults in the United States practice yoga, a 29 percent increase over the results of a 2008 study.

According to Catherine Powers, Ph.D., a licensed clinical psychologist at MD Anderson’s Integrative Medicine Center, yoga provides more than just physical exercise.

“Yoga allows patients to switch the autonomic nervous system from the sympathetic (i.e., the fight or flight response) to the parasympathetic (i.e., the relaxation response) nervous system,” she said. “Along with many other benefits, yoga may improve sleep, increase energy, help manage stress, and improve overall well-being. Oncology patients who are undergoing conventional medical treatments may have less treatment side effects and feel a greater sense of control over their bodies.”

Koroncok said the Little Yogis classes also bring the children increased confidence.

“Some of these kids, they’re afraid to move because they’ve been hospitalized, they’ve been in pain,” she said. “I think yoga builds confidence because you’re doing things that you normally don’t think you can do.”

Koroncok said she hopes to provide her little yogis with calming techniques and activities they can continue to employ after treatment and into adulthood.

“What I’m excited about is that the kids really enjoy the relaxation part. I’m hoping that they will take that with them as they grow older—that it’s really important to have a mindful relaxation portion in their lives,” she said. “I try to incorporate deep breathing with them every time they come in so they can learn that will make them feel calmer.”

Given the stressful and sometimes frightening nature of treatment, those moments of calm are precious. During a recent Little Yogis class, a sense of peace radiated from Ziggy. Despite the noise and distractions of a busy hospital and a rambunctious little sister, he laid quiet and still on his colorful mat, eyes closed, face relaxed, mind and body at ease. ■



During weekly Little Yogis classes, Mind-Body Intervention Specialist Amie Koronczok leads young MD Anderson patients through yoga poses, games and relaxation exercises.



Cowboys AND Injuries

At RodeoHouston, Texas Medical Center members are in the middle of the action, from patching up cowboys to giving young patients the thrill of a lifetime

BY SHEA CONNELLY

Each evening, the Houston Livestock Show and Rodeo pits man vs. beast, as cowboys and cowgirls urge their horses ever faster around barrels, rope steers, and try to stay astride bucking bulls that outweigh them tenfold. Meanwhile, behind the scenes, a team of volunteer physicians, chiropractors, athletic trainers and physical therapists organized by official health care provider Houston Methodist stands ready.

“Just because you manage to stay on the bull for eight seconds

doesn’t mean you didn’t get some bumps and bruises along the way,” said Patrick McCulloch, M.D., an orthopedic surgeon at Houston Methodist who has worked the rodeo for five years. “There are acute injuries that can happen during the rodeo events—we’ve seen fractured bones and dislocated joints, some pulled muscles. Often these are from a fall off a horse or off a bull. Sometimes they occur when a rider gets pinned between an animal and the railing or gate.”

If athletes are injured, they have

access to some of the best medical care they will see on the rodeo circuit. Houston Methodist organizes two centers: a medical center for anyone who is feeling sick with a cold or the flu, and an orthopedic center, equipped to provide stitches, on-site X-rays, and the kind of treatment offered in any high-level athletic training facility.

“I take care of the Houston Astros and Rice University, the Houston Ballet and NASA astronauts,” said McCulloch. “When these people agree to come to Houston to help make the Houston rodeo experience so exciting for everyone, we want to provide them with the same level of care we would provide our own Houston team athletes.”

Starting a little over an hour before the rodeo events kick off

each evening, the clinic buzzes with activity. Athletes file in for chiropractic adjustments or to get knees, ankles and shoulders taped. They consult physicians regarding previous injuries and get stretched and warmed up. Then it’s out to the arena to perform for thousands of roaring fans. A medical team stands on the sidelines throughout the night, always prepared to spring to action.

“Should someone get hurt in the arena, they will usually get up and run towards the side because, of course, at that point there may be a loose bull in the ring, and then we’ll escort them back to the facilities,” said McCulloch.

The volunteer medical workers marveled over the fact that they do not see many serious injuries at RodeoHouston, a testament to the caliber of talent. The athletes compete in Houston by invitation only. Being some of the top competitors in the country means they know how to stay on the horse or the bull—and when to get off.

“The guys are so highly skilled,” said Timothy Sitter, M.D., a Houston Methodist orthopedic surgeon and lead orthopedic surgeon on the RodeoHouston sports medicine team who has volunteered at RodeoHouston for 20 years. “If they’re getting into trouble, they’ll bail out.

“We’re always on the edge of our seats.”

— JACE DUKE

*Manager of Athletic Training at Houston Methodist and
Vice Chairman of the RodeoHouston Sports Medicine Committee*



Bareback rider Steven Peebles, left, is examined by Houston Methodist Athletic Trainer Jeff Collins.

Last year,
498 patients
visited the
RodeoHouston
clinic

They're not going to sit there and get their arm ripped out of the socket and ruin their entire career over one eight second ride."

Still, the possibility of an emergency remains a primary concern throughout the three weeks of competition.

"There's always an opportunity for mass trauma," said Jace Duke, manager of athletic training for Houston Methodist and vice chairman of the RodeoHouston Sports Medicine Committee. "You've got two athletes competing against each other and one of them outweighs the other by a couple thousand pounds. We've been relatively lucky here not to have anything too bad, but we're always on the edge of our seats."

For rodeo athletes, some of whom spend months on the road, staying healthy is essential. Other professional athletes—football, baseball, soccer players—are under contract and still get paid sitting injured on the sidelines. In rodeo, not competing means no paycheck.

"These guys will ride with broken bones—they will come to you and say, 'Look, put a cast on my arm, I'll ride with a broken wrist' or 'Can you brace up my knee enough to go out there?'" said Sitter. "There does come a point—and it happens occasionally during the rodeo—that a guy gets hurt bad enough for us to basically say, 'Look, you can't go in.'"

"Having a comprehensive medical team at a rodeo like we have here in Houston enables the rodeo athlete to speak with a variety of medical professionals and make the best decision regarding their health," said Duke. "It is our goal for them to leave Houston healthier than when they arrived."

Bareback rider Steven Peebles, who has competed at RodeoHouston six times, called the clinic setup in Houston a "lifesaver." Peebles, 25, from Redmond, Ore., spends months out of the year traveling the



Stripping chute worker Michael Ondrusek, left, consults Patrick McCulloch, M.D., a Houston Methodist orthopedic surgeon.

rodeo circuit, competing in about 75 rodeos per year. Though most provide medical assistance, not many offer the level of care available in Houston.

"I love it. It's saved my life a thousand times," he said. "I've had a lot of injuries in the past and they're always here to help us get ready to get on and get our muscles warmed up and when we're done, they're here to ice or pop joints back in."

For the volunteers like Sitter, McCulloch and Duke, helping the rodeo athletes is a pleasure that brings them back to NRG Stadium year after year. The rodeo sports medicine team spoke highly of the athletes, commending their positive attitudes and perseverance.

"They are young, tough, hard-as-nails kids, but they are the most polite people you'll ever meet," said Sitter. "They're always very, very

thankful for just anything we can do for them."

Though the professional rodeo stars are certainly one of the biggest draws of RodeoHouston, not far from the stadium where those athletes compete for a nearly \$2 million purse, a smaller crowd gathers each year for a gentler rodeo.

Over the past 27 years, the Lil' Rustlers Rodeo, held by RodeoHouston's Special Children's

“They are young, tough, hard-as-nails kids, but they are the most polite people you’ll ever meet. They’re always very, very thankful for just anything we can do for them.”

—TIMOTHY SITTER, M.D.

Orthopedic Surgeon at Houston Methodist,
Lead Orthopedic Surgeon for the RodeoHouston Sports Medicine Team

Three to
four athletes
receive X-rays
each night

The clinic goes through roughly **128 rolls of athletic tape** during RodeoHouston

Committee, has given hundreds of children with special needs the chance to feel like a real cowboy or cowgirl.

"The meaning of our entire committee and the events that we hold is to allow children to have a rodeo experience who would not otherwise get to have that opportunity," said Amie Dean, vice chairman of the Lil' Rustlers Rodeo. "We contact different programs in the surrounding areas that children are involved in so we can see what their needs are for Rodeo and how many participants they think they will have."

The participants check in at NRG Center, where a small band plays lively tunes and rodeo clowns weave through the crowd, drawing giggles from mini cowboys and girls. After donning special shirts and hats, as well as a rodeo number to wear in the arena, each child is paired with a volunteer.

"The volunteers take participants around to the different events in the arena," said Dean. "Once they've done as much as they want to do in the time we have, they can leave and get a trophy, a belt buckle and a gift bag."

This year, several children from Texas Children's Cancer Center participated in the Lil' Rustlers Rodeo, including eight-year-old Avaya, a long-term cancer survivor at Texas Children's. Avaya underwent surgery and chemotherapy in 2010 for a malignant tumor over her heart.

These days, Avaya is doing "awesome," said mom Kelley Holloway. And when her family heard about the opportunity to participate in the Lil' Rustlers Rodeo, they knew it was the perfect activity for the outgoing little girl.

"She absolutely loves the rodeo and anything that has to do with getting dressed up western, getting to ride on horses," said Holloway. "Whenever the rodeo comes around it's our favorite time of year, and we're really excited to be a part of it in this way."

With eyes shining and a big grin on her face, Avaya's joy was

unmistakable. As she and her volunteer cowboy progressed through the different events—"bull riding" on a seesaw made of hay bales, riding a real horse, petting baby animals—a rodeo announcer called out her name over the loudspeakers and she appeared on the giant video screen, just like a real cowgirl.

"I think it's really cool that people are able to do this for the kids so they can experience something that maybe not everyone gets to experience," said Holloway.

Elsy Espinoza, whose son, Caleb, also participated, echoed those sentiments.

"All these kids, Caleb and his friends, go through so much," Espinoza said. "For them to do something like this, it's really nice. It's a chance for them to have fun outside of the hospital and a chance for them to meet cowboys."

Caleb is also a cancer survivor who was treated at Texas Children's. Diagnosed with hepatoblastoma, a form of liver cancer, at only 16 months old, he received a liver transplant at the tender age of 18 months. Today, he is cancer free.

At three years old, Caleb could easily have been overwhelmed by the amount of activity during the Lil' Rustlers Rodeo, but the serious little boy took it all in stride. He progressed through the events with his volunteer cowboy and his mother by his side, documenting it all with her cell phone camera.

Like Espinoza, many of the parents get as much joy out of Lil' Rustlers as their children, which Dean loves to see.

"The expressions on the parents' faces might be one of my favorite things, because they're getting to watch their children experience something that they don't get to do on a regular basis," she said. "It makes all of the work so worth it. I wouldn't even call it work. It's just fun because you know that the end result is 100 times more than what you could imagine." ■



TOP: Three-year-old Caleb ropes a steer under the watchful eye of his volunteer cowboy.
BOTTOM: Avaya, 8, waves to the crowd at the Lil' Rustlers Rodeo.

RodeoHouston

Since 1932, the Houston Livestock Show and Rodeo has been one of the most beloved events in the city of Houston, raising millions of dollars to benefit the youth of Texas with the help of over **31,000 annual volunteers**.



TOTAL ATTENDANCE REACHED

2,483,193

VISITORS



VISITORS CONSUMED

68,000

TURKEY LEGS



LIVESTOCK COMPETITIONS
AND HORSE SHOWS BOASTED

30,476

ENTRIES



18

calves



22

lambs



47

piglets

WERE BORN IN THE BIRTHING CENTER

BY THE

Numbers



THE SHOW COMMITTED MORE THAN

\$24,000,000

TO SCHOLARSHIPS AND EDUCATION



RODEO ATHLETES COMPETED FOR A SHARE OF

\$1,690,000

IN PRIZE MONEY



3,200

CHILDREN PARTICIPATED IN MUTTON BUSTIN'



WAYNE ROBERTS, CHIEF EXECUTIVE OFFICER OF THE CANCER PREVENTION & RESEARCH INSTITUTE OF TEXAS, OVERSEES A PASSIONATE AND ENTHUSIASTIC STAFF, DEDICATED TO HELPING TEXAS' RESEARCHERS AND PUBLIC HEALTH SPECIALISTS IN THE FIGHT AGAINST CANCER. HE SAT DOWN WITH TEXAS MEDICAL CENTER EXECUTIVE VICE PRESIDENT AND CHIEF STRATEGY AND OPERATING OFFICER WILLIAM F. McKEON TO DISCUSS CPRIT'S VISION FOR THE FUTURE.

Q | Let's start at the very beginning. Can you tell us where you were born and raised?

A | I was born in Marion, Ohio, home to Warren G. Harding. Between my birth and arrival in Houston we lived in two places in Chicago, two places in Detroit, and Cincinnati. I viewed moving and new classrooms as par for the course.

I didn't understand what was happening. My father was a copywriter in the ad business, and this was during the 1950s recession. He kept being last in, first out. Finally he got tired of it, and asked 'Where is there no recession?' Someone said, 'Go to Texas,' and so we came to Houston. He finished his career here and clearly made the right choice. We arrived as I entered the third grade.

We lived in Westbury and I remember that every other weekend we would go downtown to Foley's. We'd drive up South Main and I'd look over to the right and see that first Baylor Medical building. I've enjoyed

watching the medical center campus grow—I'm an old Houston boy.

Q | Where did you go to school?

A | Middle school was Johnston Junior High—the Greyhounds. Then Westbury. Back then we were the kicking boy for Bellaire High, probably still are. Westbury has undergone major demographic change from then. In 1969, when I graduated, we were considered fully integrated. We had one black teacher and one black student. Back then it was a solid college preparatory high school. I went from there to The University of Texas.

Q | I was going to ask you about that. Why The University of Texas? Obviously, it's a great school...

A | I grew up following University of Houston sports and used UH as my backup. I thought about Rice, since I had some interest in the sciences. But I wanted

somewhere away from Houston. I never considered A&M, because at the time, they didn't admit women. I had a hard enough time getting a date in high school, so why would I want to go there? Seriously. As I learned later in my career from admissions officers, kids choose colleges for many reasons, many not the reasons their parents might expect.

I was lucky for choosing UT, but it was largely happenstance. Looking back, I attribute what success I've had to UT.

Q | Did you have a particular interest in government affairs? What led you in that direction?

A | At UT, I was looking at social sciences. I had a broad interest in a lot of fields. I didn't consider myself math-oriented, although I did well in math. I settled on government after my freshman year, and never looked back, though I did have a strong interest in English. I actually have more hours in English than

“With prevention, CPRIT has provided some two million services to Texans who might not otherwise have gotten cancer screenings or other preventive services.”

government. But in government, my interest was political socialization.

I was intrigued with how people develop their entire political and social belief structures. What is it that determines how you vote and establish your political biases? I had an inspiring professor who, in my sophomore year, introduced us to political socialization and I ran with it. For a time, I thought I'd get a master's and Ph.D. in political socialization. But it was not to be.

Q | When you look back on your professional career, what are some of your experiences that led to CPRIT?

A | Most of us know how we got to where we are today, but we never could have planned it from the outset. Looking back, my career is a logical progression but it took some unexpected turns. When I went to LBJ, I was interested in energy and environmental policy. Mind you, the oil embargo was affecting the economy and I'd had trouble getting a job, so why not energy policy? There would always be jobs in energy, or so I thought. After my master's, I was torn between staying in Austin with a fiancée who didn't want to relocate, or taking a job with the state energy office in Albany, New York. In Austin, the job being offered was state budget work, something I'd never considered. So two different career paths were available. I took the Austin job to make my fiancée happy, turned down New York and she promptly dumped me. That's it. That's how I started at the Legislative Budget Board, the budget-writing arm of the state legislature.

And it's great! Although I'd never considered state budgeting as a career, I quickly saw it was a fortuitous place to start. In fact, the job I started at the age of 26—and this says a lot about my self-confidence at the time—would've been a job I'd have been happy to retire from. Back then, the LBB gave enormous responsibility and latitude to entry-level staff. We'd meet with the lieutenant governor and speaker, senators and representatives. Our recommendations mattered and we were encouraged to make them. Furthermore, I started lucky by budgeting for agencies of higher education. This was key. The contacts I made in the early 1980s, I still use today at CPRIT.

After 17 years, again, fate reappeared in the form of then Lieutenant Governor Bullock who tapped me for his staff. This began my period on the staffs of statewide elected officials. When Mr. Bullock retired, I was recruited as Deputy Budget Director for George W. Bush. When Governor Bush became president, I opted to stay with incoming Governor Perry. The skills and contacts that led to success in those offices were honed by budgeting.

When I speak to students, I always promote

budgeting as a career. You can be interested in all the policy there is, but if you don't have the budget there is no policy. Sooner or later all policy crosses the budgeteer's desk. I think good CEOs everywhere—government, private sector, university—recognize this. This is why fiscal staff, along with lawyers, populate high levels of organizations. My connections acquired through budget work were deep and wide. I know people at all levels of state government in nearly every state agency and institution of higher education in Texas.

Success in the office of a statewide elected official depends upon one's ability to solve problems, to make government run. You fix problems through connections and trust built up over time. The staff are the ones that allow politicians—the policy makers—to govern effectively.

I'd gone to work at the UTHealth Science Center here in the medical center when CPRIT hit its bump in the road in 2012. Friends in state leadership offices were looking for someone to bring in who knew the legislative process, knew what legislators needed, and who appreciated the bureaucratic processes that may have been skirted by CPRIT. I got fingered. So those contacts, those problem-solving skills, that ability to connect the dots in the Capitol, that's how I got here.

Q | What excites you most about CPRIT?

A | Energetic innovation. The energy, the positive nature of the staff. It's best understood by example. I had someone who was hesitant to apply at CPRIT because she'd lost a daughter to cancer and thought CPRIT would be a grim or depressing place to spend a day. It's just the opposite. It's hope. It's a mission we're going to accomplish. Our staff is small but passionate, perhaps due to the high number of cancer survivors on board, all who want to beat this thing. It's also the interaction with our peer reviewers who are leaders in their fields. And it's the enthusiasm of our researchers, public health specialists and our translational researchers in early-stage companies working to get an idea to the bedside. It's an exciting, intellectually stimulating place with a heart.

Q | If you could wave a wand and have three things happen over the next five years, what would be really meaningful to you?

A | I would like several innovative advances to come out of our research programs. Whether that's knowledge that advances understanding for a treatment, or knowledge to prevent cancer—doesn't matter. I want at least three advances that Texans who put their trust in us can point to and say, 'There it is.' But I'm realistic enough to understand that scientific progress usually takes time and one advance builds upon another. I am

confident—because we aren't even half way through awarding the funds entrusted to us—that in the future, CPRIT will provide those advances. Will we completely cure cancer? Probably not. That's the nature of cancer. It mutates. It's ever changing.

Through product development, I'd like to stimulate the biotech life sciences industry in Texas. The innovations that you are doing here in the medical center—and you are certainly making them—will create the synergy to advance the biotech industry in Houston. I want our CPRIT awardees not only to be part of what is going on here, but also to make all of Texas the major player in life sciences in the nation. I not only want Texas to challenge the east and west coasts, I want Texas to surpass them. Big dreams for a big state.

The biotech life sciences are a frontier for the human spirit, just like the space program was in the '60s and '70s. What better place to do it than in Texas and through the wonderful institutions here in the Texas Medical Center. This is thrilling stuff.

With prevention, CPRIT has provided some two million services to Texans who might not otherwise have gotten cancer screenings or other preventive services. We have identified nearly 3,000 cancer precursors and detected nearly 1,400 cancers. We are giving people a chance, on a very personal level, to win their battle. Through our prevention programs CPRIT is saving lives now, and will continue to do so for our remaining years.

We have three legs to our stool: product development research, academic research and prevention. I expect big things from all three.

Q | Any closing thoughts?

A | I want to acknowledge Margaret Kripke, our chief scientific officer. She came to CPRIT in 2012 because she was angry that Texas might lose a golden opportunity with CPRIT. What a pillar of strength and human dynamo! Although I intended to be here only briefly in a fixer role, I remained because I wanted to see the original buzz and passion completely restored. And it is. The passion of our awardees, peer reviewers, the board and staff is infectious, and I caught it.

What overarches CPRIT is it's so Texan. I mentioned NASA. Why was NASA put here? Because it's Texan. It's our frontier mentality. Texans reach out to do big things. And in CPRIT, Texas is reaching out in ways that the rest of the country and world only dream about. Mark my words, by the time CPRIT is done, Texas will have a cluster of expertise unparalleled anywhere in the world. From that expertise will be the victories Texans deserve. And many of those victories will be here in Houston, right where we're sitting now. ■

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A Century of Service

The TMC Library celebrates 100 years of aiding research and preserving the history of medicine in Houston and beyond

BY SHEA CONNELLY

Over the past 100 years, the Houston Academy of Medicine - Texas Medical Center Library has weathered immense changes. From stretching the limits of space with thousands of books to embracing the digital age of online databases and e-books, the library evolved with the times. This year, as the TMC Library celebrates a century of history, it keeps an eye toward the future, while remaining dedicated to serving the students, faculty and medical community in Houston and beyond.

The original idea for the TMC Library dates back to 1904, when the Harris County Medical Society formed to discuss a medical library. It wasn't until over a decade later, however, that the idea became a reality.

"In 1915, the doctors of Harris County Medical Society formed a nonprofit arm that they called the Houston Academy of Medicine, specifically to provide library services for the doctors in Harris County," said L. Maximilian Buja, M.D., TMC Library executive director.

The Houston Academy of Medicine established a library in downtown Houston, which at first contained 1,875 books and 56 journals. The library swiftly outgrew its space, and by 1942 was one of the largest county society libraries in the United States.

Around the same time, the Houston medical community was undergoing a transformation. An act of the Texas Legislature created The University of Texas MD Anderson Cancer Center in 1941. Shortly after, in 1943, the MD Anderson Foundation purchased 134 acres next to Hermann Hospital to build a hospital district, and Baylor College of Medicine moved from Dallas to Houston, marking the beginning of the Texas Medical Center.

As the medical center grew, leaders at the Houston Academy of Medicine and Baylor College of Medicine decided to merge libraries to create

a single medical library. In 1949, the Houston Academy of Medicine - Texas Medical Center Library became an official member institution of the Texas Medical Center. By that time the TMC Library had outgrown its first space in the medical center. A new building would be necessary to accommodate the growing collection.

A site was identified, but it was not until Houston financier and philanthropist Jesse H. Jones donated \$600,000 that construction officially began. Aside from his donation, Jones dedicated significant time and energy to the library, consulting with the architect and conducting building inspections throughout construction. On September 9, 1954, the TMC Library moved into the Jesse H. Jones building, where it remains today.

"We are a unique library, the only one like it in the country," said Mary T. Stevenson, chief development officer at the TMC Library. "Most medical libraries are part of a university or department and they just serve that university. We serve various universities and educational institutions with various missions and priorities."

The Library Board has eight governing institutions and 13 supporting, non-governing member institutions. Since 1991, it has also been the South Central Regional Medical Library for the National Network of Libraries of Medicine.

"We provide resources from the National Library of Medicine to health care workers and laypeople throughout a five-state region," said Buja.

The TMC Library plays a pivotal role in preserving medical history as well, maintaining the John P. McGovern Historical Research Center. Dr. McGovern donated a large portion of his personal collections to the archive, including materials belonging to Dr. William Osler, often described as the "father of modern medicine."

The McGovern Center contains



“You know the Roman god Janus—looking forward and back at the same time? That’s what we do here.”

— L. MAXIMILIAN BUJA, M.D.
Executive Director of The TMC Library

treasures like documents from the Atomic Bomb Casualty Commission, original films of operations conducted by Denton A. Cooley, M.D., and the piece de resistance: a first edition book by Andreas Vesalius, a 16th century anatomist and physician.

"We recently had a professional appraiser look at the collection and he's valued it at \$3.6 million," said Buja. "The McGovern Foundation has given a \$500,000 gift to enhance the McGovern Center rare book room and we're making plans to do that in the near future."

Though the TMC Library team is proud of their historical heritage, they are also determined to keep up with the evolving way we consume information. Electronic usage is increasing all the time, and the library is implementing resources to accommodate remote research. The library recently purchased BrowZine, for example, which is free to library users. The mobile app allows users to create a virtual bookshelf where they can read and save articles and journals.

"Sixty-five percent of our collection is still print books, 35 percent is electronic books, but this will shift over time," said Buja. "More and more people want electronic and remote access so we're trying to be the best of both a physical library where students can study as well as a virtual library."

Throughout the rest of the year, the TMC Library will celebrate its centennial with events demonstrating how medicine has grown and changed over the past 100 years. An April 15 event will highlight medical advances made during the mid-20th century. An August lecture will discuss the colorful history of the Texas Medical Center. Meanwhile, new projects will continue to move forward, such as relocating the Rare Book Room to a more accessible location on the library's first floor.

"You know the Roman god Janus—looking forward and back at the same time?" said Buja. "That's what we do here." ■

Micro-Sized Savivors

Researchers studying links between autism and gastrointestinal problems in the pediatric population look to an unlikely source for groundbreaking new therapies

BY ALEXANDRA BECKER



Ruth Ann Luna, Ph.D., is pictured with her family. She hopes results from this study will benefit patients like her son, a six-year-old with autism who has limited verbal abilities and also suffers from GI problems. (Credit: Lindsay Moore)

Bacteria have long been regarded as the enemy—blamed for disease and infections, even anthropomorphized as tiny green monsters in literature and on television. But James Versalovic, M.D., Ph.D., the Milton J. Finegold Professor of Pathology at Baylor College of Medicine, pathologist-in-chief at Texas Children’s Hospital and director of the Texas Children’s Microbiome Center, and Ruth Ann Luna, Ph.D., an assistant professor of pathology at Baylor and director of medical metagenomics within the Texas Children’s Microbiome Center, are working together to change that perception.

“For many years we would just think of human cells while ignoring our microbial partners or pointing the finger to them as the bad guys causing infectious diseases. But the reality is, it’s just like humanity—we have a few bad actors, but most people are good-natured at heart. Most microbes are friendly with their habitats and hosts; they’re beneficial,” Versalovic explained. “In fact, we have more microbial cells in the human body than our own—100 trillion microbial cells versus 10 trillion human cells. We know that we have co-evolved with our microbial partners, and our challenge now in medicine is to facilitate that partnership and enable bacteria to work for us in a way that maximizes human health.”

So, could bacteria turn out to be the hero of modern medicine? Versalovic and Luna think so. Together with their teams at Baylor and Texas Children’s Hospital, the two researchers recently received a \$1.4 million three-year grant from the organization Autism Speaks to study potential connections between gastrointestinal problems and autism, focusing specifically on the profile of bacteria in the gut.

“Research has shown that there are inherent differences in the guts of children with autism than those without, such as differences in the type and amount of bacteria in their guts, changes in the tissues of their GI tract, and cases of chronic diarrhea or constipation,” Luna explained. “These gastrointestinal problems often worsen behavioral symptoms, and many children with autism are unable to communicate pain or what they’re feeling.”

It’s a connection Luna knows well. She is the mother of a child with autism who has limited verbal abilities and also suffers from significant GI problems.

“Before I noticed the behavioral issues, I was already acutely aware of the GI problems,” Luna said.

“Through trial and error, I began making some changes to his diet, which turned out to be very significant and explained a lot of the behavioral challenges. We’re hoping this study will help shed a light on connections like this so that we can tailor treatment options to kids depending on their bacterial chemistry. Ideally we can help treat their GI problems and in doing so, alleviate some behavioral issues that may be directly related.”

Luna is quick to note that despite there only being one clinical classification for autism, it is truly a spectrum disorder with varying degrees of severity. As such, treatment options for GI issues must be tailored depending on the child’s clinical and behavioral symptoms as well as their bacterial profile.

“There is no such thing as one autism,” said Luna. “There are several autisms and they are all different, so treatment is going to be different, too. A one-size-fits-all approach is not going to work.”

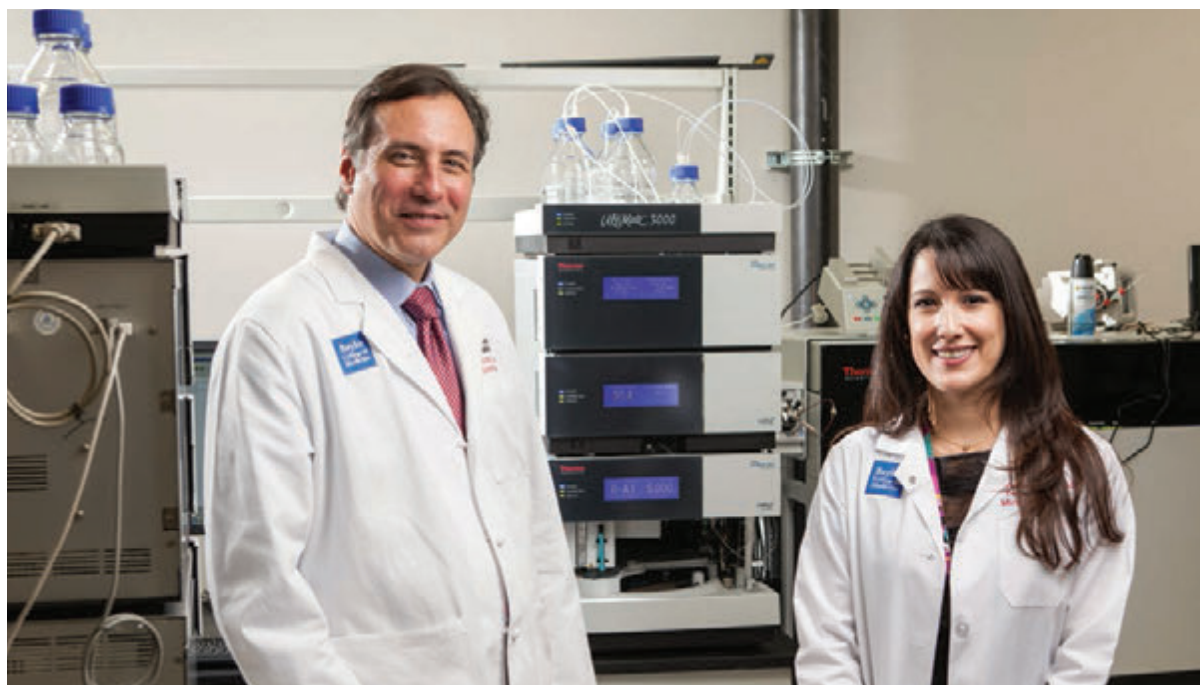
The first-of-its kind study will compare wide-ranging data related to gut bacteria, GI symptoms and behavioral issues to look for potential connections. It will analyze individual microbiomes—all of the bacteria and microorganisms present in the gut specimen—as well as the small biological molecules that can be isolated from that specimen, known as the metabolome, and use that data to evaluate metabolic disturbances in children with autism, identify any biomarkers of abdominal pain, and gain further understanding of the gut-brain-microbiome axis.

The gut-brain-microbiome axis refers to the biochemical signaling that occurs between the gastrointestinal tract and the nervous system. Luna and Versalovic are working to identify the specific impact of the microbiome on the brain and how harnessing bacteria in the gut could not only alleviate GI symptoms but potentially influence brain chemistry as well.

“The enteric nervous system, which governs the gastrointestinal system, is a huge part of the nervous system. We have a very extensive network in the abdomen and we have some evidence that the microbiome is signaling to the enteric nervous system and then also signaling to the brain and the central nervous system,” Versalovic explained. “So as we fill in the gaps, because there are many gaps at this point, we are hoping to understand the specific links: microbes making neurotransmitters or signals that affect neurons, neurons firing in the peripheral nervous system, and that activity ultimately affecting the central nervous system of the brain.”

Luna added that because of the intrinsic interconnectivity between the enteric nervous system and the central nervous system, shifting the balance of one would have an impact on the other.

“We think that by restoring gut health, we can perhaps repair some of the brain functions that may be damaged. The pathway goes in both directions. Certain bacteria are known to impact



James Versalovic, M.D., Ph.D., the Milton J. Finegold Professor of Pathology at Baylor, pathologist-in-chief at Texas Children’s Hospital and director of the Texas Children’s Microbiome Center and Ruth Ann Luna, Ph.D., assistant professor of pathology at Baylor and director of medical metagenomics within the Texas Children’s Microbiome Center.

LUNA AND VERSALOVIC ARE WORKING TO IDENTIFY THE SPECIFIC IMPACT OF THE MICROBIOME ON THE BRAIN AND HOW HARNESSING BACTERIA IN THE GUT COULD NOT ONLY ALLEVIATE GI SYMPTOMS BUT POTENTIALLY INFLUENCE BRAIN CHEMISTRY AS WELL.

neurotransmitters, so it stands to reason that the right community can cause the brain to function more effectively, while the wrong community could definitely tax the system by causing too much inflammation or by blocking pathways that provide energy to fuel neurons. We’re not saying we’re going to cure autism, but we may be able to reduce behavioral symptoms as we’re treating these gastrointestinal imbalances.”

Ultimately, Versalovic and Luna hope that studies like this will not only help researchers gain a more complete understanding of how the gut and the brain are connected, but also bolster new therapies based on microbiome science.

“We’re looking at medicine holistically, thinking about our microbial cells and human cells in tandem and using that knowledge to treat the whole human being,” said Versalovic. “We need to do a better job of recognizing these microbes as a part of us and then enabling them to work for us, either by maintaining the microbiome if it’s functioning well, replenishing the microbiome if it’s depleted, or supplementing the microbiome in a way that improves health.”

If successful, these therapies could have applications far beyond their initial objectives.

“In the future we could be using information about the microbiome to help maximize brain development

in infancy and early childhood, or maybe even influence human behavior in a positive way,” said Versalovic. “This research project will enable us to establish a foundation so that we can continue to pursue these connections between the microbiome and the brain.”

To gather the most comprehensive research on this topic to date, Luna and Versalovic are currently recruiting children ages four through 12 with autism, with or without GI symptoms; unaffected siblings of children with autism; and children without autism, also with or without GI symptoms. The enrollment of healthy children with no symptoms is critical for the success of studies such as this for data comparison and analysis.

The study is currently enrolling at three different sites including Baylor College of Medicine/Texas Children’s Hospital, The University of Texas Southwestern Medical Center in Dallas, and Nationwide Children’s Hospital in Columbus, Ohio. It involves a commitment of about two weeks, a stool specimen collected at home for testing, and a series of surveys and diaries to be completed by the parents. For more information or to enroll in the study, please contact Dr. Luna at raluna@bcm.edu. ■

Fueling the Future

On a mission to eradicate cancer, the Cancer Prevention and Research Institute of Texas (CPRIT) is using its resources to expedite research, innovation and prevention

BY ALEX ORLANDO

“CPRIT aims to serve the people of Texas, as well as the cancer patients of the world, by using the resources that they have entrusted to us. [...] It’s all about utilizing those services to eradicate cancer in the future.”

— THOMAS C. GOODMAN, PH.D.
Chief Product Development Officer
of CPRIT

At academic medical institutions, from Baylor College of Medicine to The University of Texas MD Anderson Cancer Center, researchers developing innovative cancer treatments monitor the hypnotic whirl of centrifuges and peer inquisitively through microscopes. At the same time, the metronomic drip of chemotherapy medication at a patient’s bedside offers the promise of hope and recovery. While companies construct bridges across the translational chasm spanning between academic insights and the marketplace, preventive efforts seek to reduce the burden of cancer by leveraging existing knowledge. But what spurs all of these developments?

In 2007, Texas voters overwhelmingly approved a constitutional amendment to establish the Cancer Prevention and Research Institute of Texas (CPRIT), authorizing the state to issue \$3 billion in bonds to fund groundbreaking cancer research and prevention programs across the state. CPRIT’s mission is to expedite innovation in academic research and product development research and to enhance access to evidence-based prevention programs throughout the state.

“I think the biggest question that the Legislature and the citizens of Texas had to deal with when CPRIT was enacted in 2007 was very simple: ‘Why cancer?’” said Wayne Roberts, chief

executive officer of CPRIT. “The reason is that cancer affects everyone—regardless of age, sex, ethnicity, race or geographic location. It has an impact on all of us, whether you’ve been diagnosed yourself or not.”

Cancer’s impact in Texas is profound. Last year there were more than 119,000 Texans newly diagnosed with cancer and 44,150 deaths, according to the Texas Cancer Registry. Based on an analysis by The Perryman Group, cancer cost the state \$162 billion in reduced annual spending last year. In addition, an estimated 786,000 jobs were lost due to cancer treatment, morbidity, mortality, and associated spillover effects.

In 2014, the National Cancer Institute awarded around \$200 million in grants in the state of Texas. CPRIT awarded about \$250 million for prevention, academic research and product development research—more than doubling the investment in cancer in the state.

“Since CPRIT was created by a constitutional amendment, the money that we have and spend is the money of the people of Texas,” affirmed Thomas C. Goodman, Ph.D., chief product development officer at CPRIT. “We want to make sure that we spend every nickel of that in the best way that we can to find new treatments and cures for cancers.

“That trajectory has several dimensions,” he added. “First and foremost, the engine for this enterprise is academic research going on at places like MD Anderson and other great institutions here in Texas, which provides the energy to drive the ideas and innovations. If you think about it, our program is like an automobile. The research is an engine—without the research nobody goes anywhere—but you still need a transmission, a differential and a great set of wheels. We try to provide that whole continuum.”



Rebecca Garcia, Ph.D., and Thomas C. Goodman, Ph.D.



LEFT: Wayne Roberts, Robert C. Robbins, M.D., and Thomas C. Goodman, Ph.D., provide audience members with an insight on the agency's functions. **RIGHT:** Wayne Roberts, chief executive officer of CPRIT, speaks to CPRIT's vision.



In the realm of academic research, CPRIT is giving priority to the prevention and research of rare and hard-to-treat cancers, including pediatric and adolescent cancers. There is also an emphasis on research around computational biology and analytic methods.

"We want to continue to recruit the very best cancer research talent in the state of Texas," added Roberts. "In terms of what CPRIT is going to leave behind, I think it's going to be the legacy of these researchers. If you stop and think that some of these junior faculty members have 25-30 years of productive research life left in them, CPRIT has already brought in over 2,000 years of research talent to the state of Texas. I predict that by the time that Texas is through with CPRIT, we will have the finest cluster of cancer expertise in the world, if we don't already."

Within the world of product development, CPRIT strives to bring companies to Texas that are likely to prompt commercialization, help existing companies evolve, and fund organizations that are likely to fill in the valley of death in scientific research—the translation from the clinic to the bedside.

"We're looking for scientific excellence but we also look for a product—something that's going to make a difference in the lives of cancer patients," said Goodman. "We've developed early translational research applications that aim at translating a specific insight, discovery or area of research

into products. That's something we've injected to stimulate this process and translate that tremendous energy in the engine into actual movement in the wheels."

At CPRIT, another program is directed towards the prevention of cancer, specifically targeting areas and populations where disparities in incidence or mortality exist. To date, CPRIT's prevention program has had a presence in all 254 counties across Texas—for a state that spans 800 miles, that's no easy feat.

"In the prevention program, we are touching people every day and know we are saving lives," said Rebecca Garcia, Ph.D., chief prevention and communications officer at CPRIT. "Just looking at lung cancer, if people stopped smoking, an estimated 80 percent of lung cancer deaths could be prevented along with 30 percent of other tobacco related cancers. If you look at all of the other preventative measures, from improving diet and a healthy lifestyle to infectious disease vaccinations, you could have a huge impact. These are all things that we already know work—we have done the research, we just need to get those preventive measures to people."

CPRIT's exhaustive evaluation process ensures that only the best of the best projects are considered for funding. "Our approach is very stringent and bureaucratic," explained Roberts. "We use a peer review process that

only funds merit-based applications from Texas-based entities. Our peer reviewers are from outside of the state of Texas and come from a broad cross section of backgrounds, from public health and research science to business and technology transfer. That is an intentional design to make sure that our process is as objective and free from conflict of interest as possible."

Advancing through such a rigorous level of scrutiny almost functions as a seal of approval for companies, opening the floodgates for outside sources of funding. "What we initially encourage, with our funding, has the potential to wake up the market," said Goodman. "CPRIT is never going to be in a position to fund a project all the way to the marketplace. But while we may only provide a fraction of what is needed to bring a product to market, we're also providing a mark of quality that invites the rest of the investing world to look more closely."

Recently, CPRIT's leadership team visited the Texas Medical Center to provide a crash course on their mission,

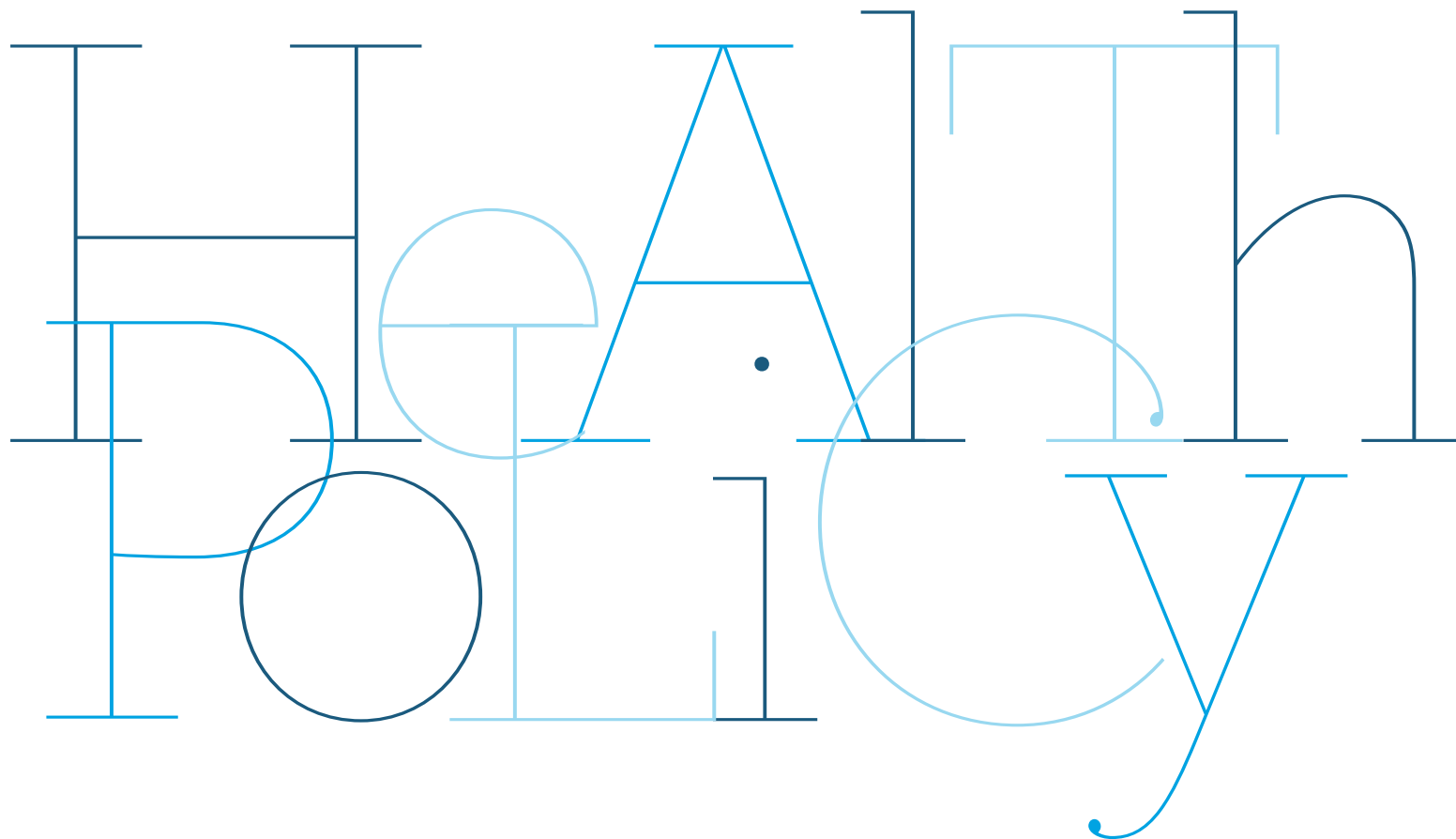
process and progress. An informal panel allowed audience members to ask questions about the agency's functions.

"It's to be expected that CPRIT has to continuously justify its existence," said Roberts during the question and answer session. "We're using taxpayer dollars on something that everyone is interested in and they want to see us produce results. As long as CPRIT continues with its high-quality peer review process, awards the best of the best that comes our way while acting transparently and accountably, then it's up to others to evaluate if CPRIT is a success and if we should continue in some form."

"CPRIT aims to serve the people of Texas, as well as the cancer patients of the world, by using the resources that they have entrusted to us," added Goodman. "The team that's at CPRIT today is completely focused on the journey of eradicating cancer through prevention, academic research, and product development research. It's all about utilizing those services to eradicate cancer in the future." ■

“I predict that by the time that Texas is through with CPRIT, we will have the finest cluster of cancer expertise in the world, if we don't already.”

— WAYNE ROBERTS
Chief Executive Officer of CPRIT



TMC | 72

TMC HEALTH POLICY PROGRAM

HERE'S HOW IT WORKS:

1

A state legislator (or staff), or member of the state, county or city administration goes to www.TMC72.org and enters a question on health data. This program is also available to TMC member CEOs and government affairs staff. The requester is always kept confidential.

2

The question is analyzed rapidly by our staff, who then go to work to provide data from a number of sources.

3

An answer is returned within 72 hours. See examples at right.

BY ARTHUR GARSON JR., M.D., MPH

DIRECTOR OF THE TEXAS MEDICAL CENTER HEALTH POLICY INSTITUTE

The day the legislative session opened, TMC|72 was born. TMC|72 is a program of the TMC Health Policy Institute that provides a 72-hour turnaround for requests for health data or analysis. As the session is proceeding and people are understanding what TMC|72 does, the requests are rolling in. And it's free.

REQUEST:

What are the top five health care issues/diagnoses for women aged 18-65 at 200 percent federal poverty level (FPL) and below? Information specific to Texas would be helpful.*

RESPONSE:

The most common diagnoses among women within this age group are similar, regardless of income; however, issues related to screenings, treatments and outcomes can be significantly different, depending on income.

Some background information is provided:

- In Texas, about 9.9 million people, or 37 percent of the total population, are below 200 percent FPL
- Approximately 3.3 million women in Texas are at or below 200 percent FPL
- Among women aged between 19 and 64 in Texas, 16 percent are below 100 percent FPL

Women who are under 200 percent FPL and uninsured receive less preventive care and less treatment for diseases and chronic conditions. They are more likely to have diagnoses of advanced stage disease, and have significantly higher mortality rates from many diseases... (Included 13 references)

** The federal poverty level is defined as \$11,670 for a single person, and \$23,850 for a family of four.*

REQUEST:

What data/evidence exists that shows how health care consumers who have cost sharing (e.g. co-pays) comply with providers' orders (e.g. follow-up visits), compared to consumers who do not participate in cost sharing?

RESPONSE:

Evidence from a 1970 study demonstrated that cost-sharing decreased the number of outpatient visits [...]. Surprisingly, this has not been studied recently [...]. In April, TMC is releasing the results of a survey addressing this issue. (Included 8 references) ■

United We Stand

With the growing threat of bioterrorism and newly emerging infectious diseases, Texas A&M cultivates strategic partnerships in preparation for the next national public health crisis

BY ALEXANDRA BECKER

Slow-growing vaccine candidates birthed from tobacco plants, bloodborne antigens exchanged through careful transfusion, compulsory quarantines, neon yellow hazmat suits, gloves, gowns, goggles—and lots and lots of bleach. These are the tools the world used to fight Ebola. But for a highly contagious disease that claimed its first victim in 1976, could we have been more prepared?

No one can say for sure, but in a globalized world marked by proliferate air travel and a mounting imbalance of chemical and biological intricacies, Gerald Parker, D.V.M., Ph.D., is committed to ensuring the nation is better equipped to confront the next big public health crisis—no matter how unlikely it may seem.

“There are a lot of challenges and opportunities in the bigger security arena and in bio-preparedness specifically that we need to worry about—both natural threats or intentional threats like bioterrorism,” said Parker. “But I’ve got to say that maybe one of the biggest threats today is complacency. The world really is a small place now and overnight we could be confronted with the next big pandemic. We need to be prepared and there has to be more focus on low-probability, high-consequence threats.”

Parker, whose 35-plus years of experience include over two decades of active duty in the Army Medical Department and extensive federal public service in the Department of Homeland Security, Department of Health and Human Services and the Department of Defense, was brought to Texas A&M Health Science Center (TAMHSC) in 2013 to serve as vice president for public health preparedness and response, as well as principal investigator of the Texas A&M Center for Innovation and Advanced Development and Manufacturing (CIADM). In 2014, he was appointed deputy director of the Texas Task Force on Infectious Disease Preparedness

and Response to help address the state’s capabilities to respond to the Ebola virus.

The Texas A&M CIADM is one of only three such centers in the country designed to ensure public health emergency preparedness through a public-private partnership with the U.S. Department of Health and Human Services. It is tasked with responding to potential pandemics or threats to public health, including naturally emerging diseases such as MERS, H1N1 and Ebola, as well as manmade chemical or biological warfare, similar to the anthrax-laced letters of 2001.

Rooted within TAMHSC, the CIADM leverages a wealth of resources from the institution. The goals of the Texas A&M CIADM are to ensure the U.S. can develop and produce life-saving vaccines and therapies quickly and also improve the overall ability to protect the health of Americans in situations involving biological threats.

“The center is really about accelerating research and development alongside the manufacturing of vaccines and therapeutics,” Parker explained. “The use of biotechnology to discover new approaches and platforms for developing countermeasures and therapies is currently happening at an unprecedented pace in this country, but we have to bridge those very promising discoveries from the laboratories to the development of a licensed product that can actually be used in trials or on the field.”

That gap between the laboratory and the field is known as the biotech valley of death, and it’s easy to see why.

“The investment required to bring a vaccine into clinical trials and to market is expensive and risky, so sometimes effective treatments are just sitting on shelves waiting for a market,” Parker explained. “The need for vaccines and therapies during the Ebola outbreak is a perfect example. We’ve had an understanding of the virus for over 20 years, and although the science behind it is



Gerald Parker, D.V.M., Ph.D., vice president for public health preparedness and response at Texas A&M Health Science Center and principal investigator for Texas A&M Center for Innovation and Advanced Development and Manufacturing. (Credit: Texas A&M Health Science Center)

very hard, in this late stage it seems like we really should have had more vaccine candidates available. Unfortunately, efforts were not being prioritized or focused earlier, so there were only two to three potential vaccine candidates in the research pipeline that could be rushed into manufacture and clinical trials.”

To help bridge the valley of death, Texas A&M is developing a new capabilities-based flexible and adaptable manufacturing platform.

“Our center is poised to surge for the development of medical countermeasures, but we need to see continued investment in the research and development stage—our ability to quickly advance vaccines and therapeutics is critical in this fight for global health security, because no one can predict what the next threat will be.”

Looking to his past in the military and federal government, Parker is using the lessons he’s learned in collaborative partnerships to fuel investments and further the center’s capabilities while improving global health security.

During his work with the Department of Defense, Parker built strong

partnerships with officials in South Korea, and in February, he was invited to Seoul to serve as the keynote speaker at an international symposium commemorating the establishment of the Biodefense Research Institute (BDRI) at Korea University. The visit was underscored by a signing of an official Memorandum of Understanding between TAMHSC and Korea University, establishing one of many strategic partnerships for the Texas institution.

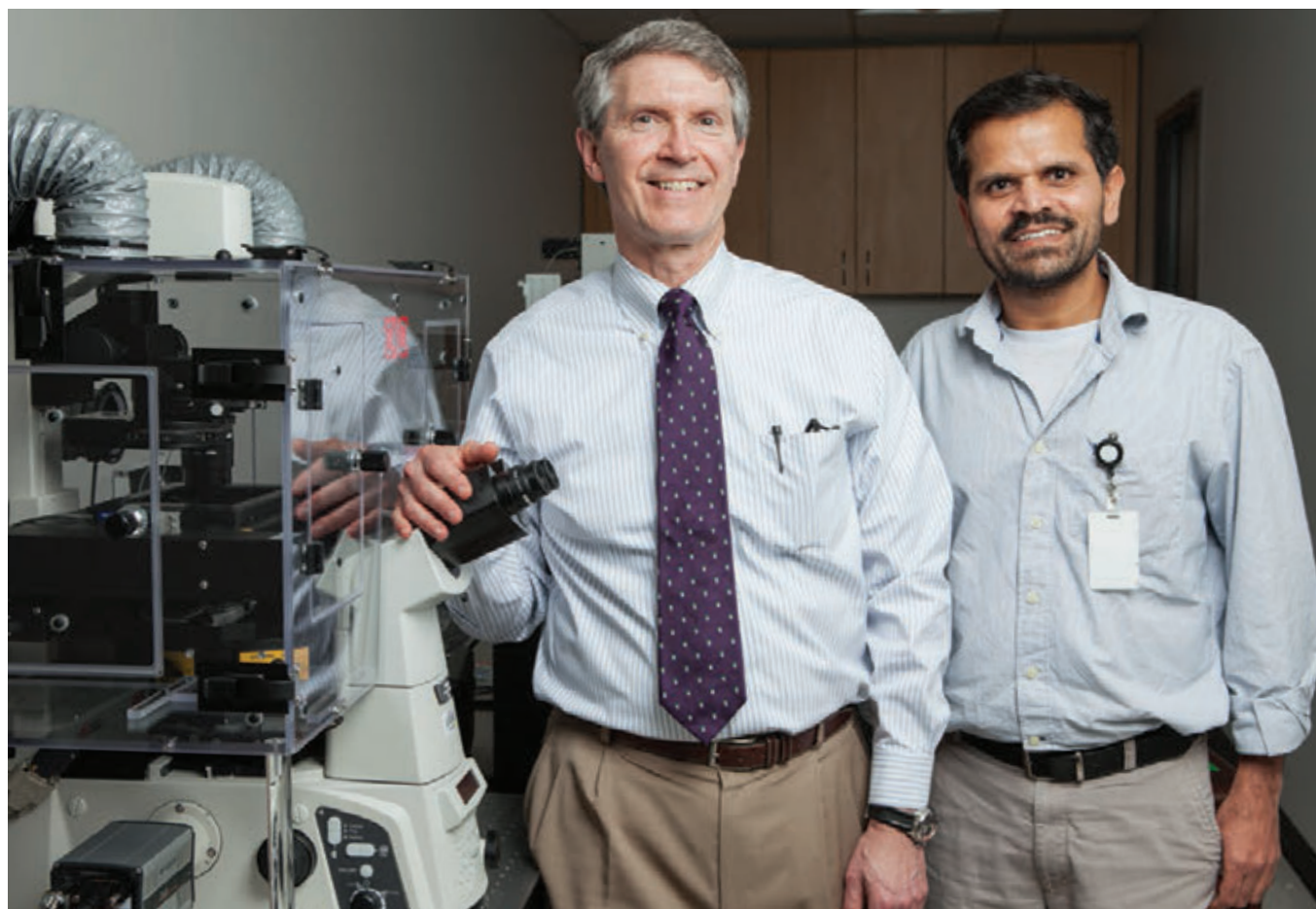
Because of South Korea’s location, experts are increasingly concerned about the possibility of a bio-threat in the area. In his address to officials from international governments, universities and the private sector, Parker commended Korea University for their commitment of resources and stressed the importance of the BDRI’s establishment in an academic institution with such a strong foundation in science.

“I’ve seen good policy and I’ve seen bad policy, but an attribute of good policy is that it is always based on good science.” ■

Eyes on the Prize

Reimagining the delivery system for eye medication, researchers at Baylor College of Medicine have developed a nanowafer technology that proves more effective than topical eye drops

BY ALEX ORLANDO



LEFT: Stephen C. Pflugfelder, M.D., and Ghanashyam Acharya, Ph.D., are leveraging their combined expertise to reinvent the way that eye medication is administered. RIGHT: The nanowafer drug delivery system—which allows for a slow, controlled release—consists of a small transparent disc containing arrays of drug-loaded nanoreservoirs, placed on the surface of the eye.



“I think this [technology] could be huge—it would enhance the effectiveness of the drug, improve compliance, and I think it will mark a major shift in the way that these drugs are induced.”

—STEPHEN C. PFLUGFELDER, M.D.
Professor of Ophthalmology at Baylor
College of Medicine

Your eye twitches subtly as the dispenser approaches the periphery of your vision, despite your best intentions to look away. As your fingers pry your eyelids open, a makeshift vise that seems ill-equipped to the task at hand, your lids struggle to clamp shut in defense of the looming foreign object. After a few failed attempts, resulting in several drops dribbling down your cheek, the elusive liquid finally hits its target, resulting in several minutes of furious rubbing and blinking. But how effective is all this aggravation at treating the underlying problem?

Most people can relate to the frustrating reality of using topical eye drops. While they might seem like

a necessary annoyance in treating eye injuries and ailments, using eye drops multiple times per day can cause side effects such as irritation and toxicity from high concentrations, while poor patient compliance also poses problems.

In response to these issues, researchers at Baylor College of Medicine have developed a nanowafer drug delivery system, where medication is slowly released from a nanowafer—a small transparent disc, containing arrays of drug-loaded nanoreservoirs, placed on the surface of the eye.

In their latest study published in *ACS Nano*, researchers found that in mice, the nanowafer drug delivery

system was more effective in treating corneal neovascularization, which results in severe corneal clouding and blood vessel ingrowth, than a topical eye drop therapy.

“One of our major discoveries has been that it looks like the short contact time of eye drops may not be sufficient for the medication to be effective,” noted Stephen C. Pflugfelder, M.D., professor of ophthalmology at Baylor and an author on the paper. “Eye drops are very inefficient because they are diluted by the tears and then rapidly washed away from the eye, leaving very little time for the medication in the drop to be picked up or absorbed by the tissue. This technology is a whole different

mechanism for achieving chronic, sustained levels—we’re finding much higher penetration into the tissue.”

Ghanashyam Acharya, Ph.D., assistant professor of ophthalmology at Baylor and senior author of the paper, developed the wafer technology to be placed on the surface of the eye, where it slowly dissolves while maintaining a high concentration of the drug in the tear film and loads up the tissue to provide better efficacy.

“Once you place the technology on the surface of the eye, slowly the drug will diffuse as tears come into contact with the wafer,” he explained. “Over a period of time, the drug will continue to diffuse into the eye and

spreads throughout the ocular tissue. Eventually, at the end of a predetermined period of time, it will dissolve and disappear.”

Researchers are now working on increasing the drug release from the nanowafer from once a day to one to two weeks. “The nanowafer contains these small wells,” explained Acharya. “So by controlling the depth and diameter of the wells, we can control the amount of drug that we deliver, as well as the release time. Some drugs you take for a week, while others take only a day to be effective, so we can modulate them as required.”

Using an animal model, the researchers sought to determine whether the wafer technology would deliver medication more consistently to the eye when treating corneal neovascularization, which can be blinding.

“Dry eye is the major thing that we’re targeting with this technology,” said Acharya. “Patients with that have to take eye drops regularly, and Steve is an expert in dry eye disease. That’s one thing that he told me when we started—this is the best way to address that condition, in both chronic and mild forms.”

“Most people think of dry eye disease as an annoyance, but it runs the spectrum from causing blindness all the way to being a minor source of aggravation that might simply require periodic eye drops,” added Pflugfelder. “There are people that are putting drops in every hour and they’re not getting relief and their corneas are still getting scarred. For moderate to severe chronic dry eye cases, this would revolutionize treatment. In terms of the magnitude of the problem, there are tens of millions of people affected by dry eye worldwide—it’s a huge market.”

Acharya and Pflugfelder believe that the nanowafer is not limited in the scope of its potential applications. Anything that has to do with the eye, from ocular injuries to infections, can be attempted.

“There are many conditions it could be used for,” said Pflugfelder. “From glaucoma, to treatment after an injury, to delivering anti-inflammatory therapy. It could even be used following surgery—if one wafer could be put in your eye after cataract surgery, then

that would be all the medication that you need.”

“Eye injuries are a big thing, especially military or combat-related injuries where soldiers sustain repeated trauma to the eye,” he added. “Putting in eye drops is usually the last thing on their mind, so if one of their physicians could put this in their eye right away, it might prevent a lot of the problems that develop weeks after the injury.”

There are other concealed benefits that this new technology might offer—because the nanowafer does not require refrigeration, it would prove useful in treating eye infections and injuries in developing countries.

“The nanowafer can actually stabilize the drug,” said Acharya. “In some countries like India and parts of Africa, during monsoon season, there are a lot of eye infections. In those parts of the world, where there may not be proper electricity or refrigeration, you can distribute the wafers to people who can use them whenever they want and only have to store them for a limited period of time. It completely avoids the necessity of refrigerating bottles of eye drops. That gets handy, particularly in resource-challenged settings.”

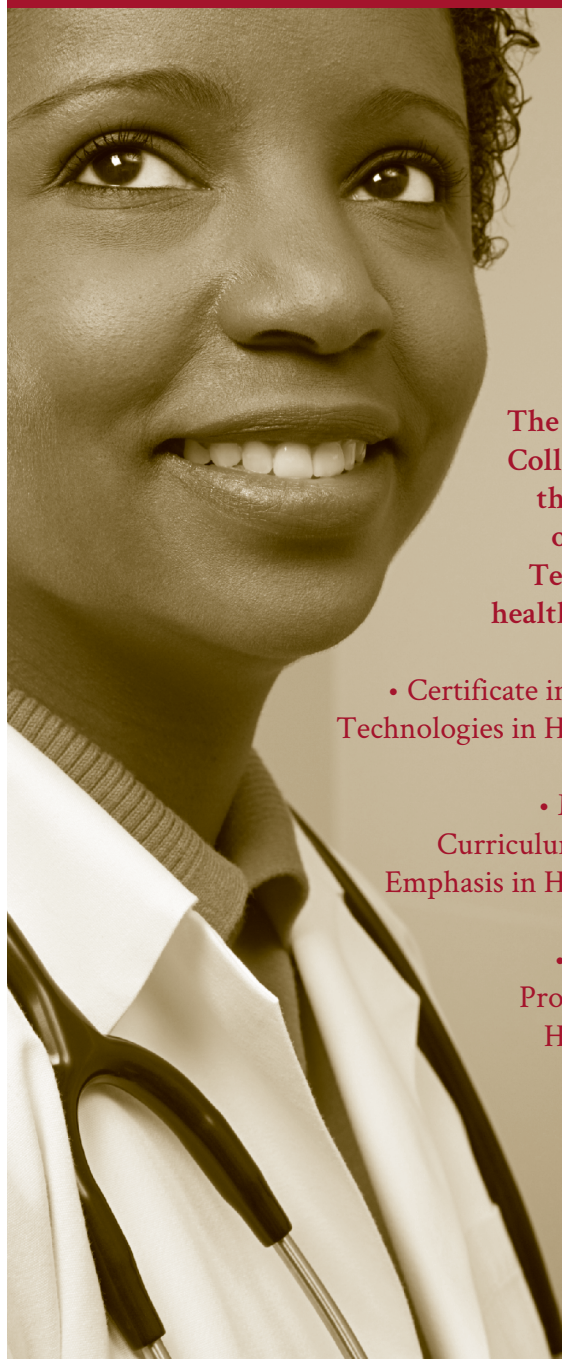
Leveraging their combined depth of expertise, Acharya and Pflugfelder’s partnership has been instrumental in allowing them to think outside the box. “This is a perfect synergy between a clinician scientist and a bioengineer or basic scientist—it’s a testament to how we can all come together to develop better devices,” said Acharya. “The driving force behind this project has been Steve’s constant encouragement and guidance. All of these things will keep on taking us farther.”

“Currently, almost all eye medication is dispensed in either eye drops or topical gels and ointments,” said Pflugfelder. “Right now, there are no other options for a sustained delivery system. I think this [technology] could be huge—it would enhance the effectiveness of the drug, improve compliance, and I think it will mark a major shift in the way that these drugs are induced.” ■

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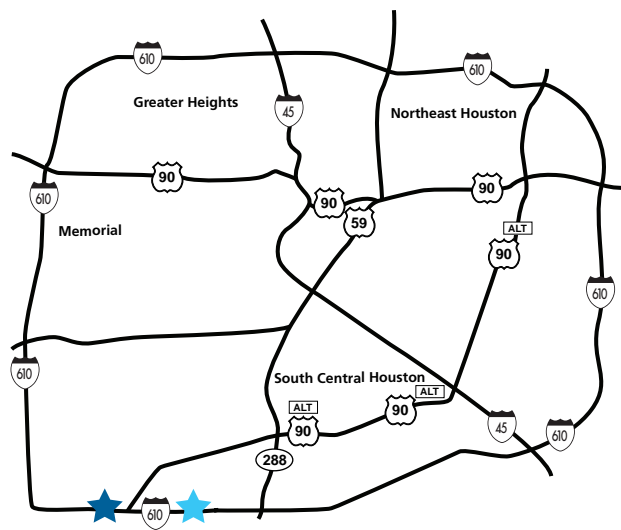
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ACCOLADES



JAMES H. BRAY, PH.D., associate professor of family and community medicine at Baylor College of Medicine, was elected as the 2015 president of the Texas Psychological Association (TPA). TPA's membership is comprised of more than 1,500 practicing psychologists and graduate students in the state of Texas. As president, Bray plans to work with the TPA staff to ensure that the practice of psychology is protected and expanded during the 2015 Texas Legislature. He has served on the TPA Board of Directors since 2013.



JOAN C. ENGBRETSON, DRPH, RN, who holds the Judy Fred Professorship in Nursing at The University of Texas Health Science Center at Houston (UTHealth) School of Nursing, was inducted as a Fellow of the American Academy of Nursing (AAN). A 2014 class of 168 new inductees joins about 2,200 fellows who are recognized by the AAN as nursing leaders in education, management, practice and research. Engebretson is a clinical nurse specialist in maternal child health and is certified as an advanced holistic nurse. She is also a Fellow in the Society for Applied Anthropology.



EVAN DOUGLAS COLLINS, M.D., orthopedic surgeon at Houston Methodist Hospital, was recently named chairman of the Houston Methodist Center for Performing Arts Medicine (CPAM). Collins is chief of the Houston Methodist Hand & Upper Extremity Center and a published author. Prior to joining the faculty at Houston Methodist Hospital and accepting a faculty appointment at Weill Cornell Medical College, he was the director of the Hand Fellowship and Chief of the Hand and Upper Extremity Department for many years at Baylor College of Medicine. He has served for the last two years as vice chairman of the CPAM.



ARTURO E. HERNANDEZ, PH.D., professor and director of developmental psychology at the University of Houston (UH), is among this year's recipients of the Friedrich Wilhelm Bessel Research Award. The award honors his work in mapping how the brain processes language. Hernandez believes this research could have applications for genetics, learning disorders, people with difficulty learning language or children with language delay, speech or sound issues. He is also the director of the Laboratory for the Neural Bases of Bilingualism at UH and is the author of the book, "The Bilingual Brain."



MICHAEL COLLIGAN, RN, lead perfusionist at the Texas Heart Institute, received the 2015 Best Paper Presentation Award at the 36th Annual Seminar of the American Academy of Cardiovascular Perfusion for his paper entitled, "The Optimal Number to Use When Estimating Patient Blood Volumes for Cardiopulmonary Bypass." Colligan received his M.S. in pharmacology and toxicology while completing the perfusion training program at the University of Arizona, and currently serves as a clinical coordinator and instructor for students at the Texas Heart Institute School of Perfusion Technology.



THOMAS "TREY" WESTBROOK, PH.D., associate professor of molecular and human genetics and of biochemistry and molecular biology at Baylor College of Medicine, has been named The Academy of Medicine, Engineering & Science of Texas' 2015 Edith and Peter O'Donnell Award winner in medicine, a prestigious honor given annually to one scientist across the state for outstanding innovation in medicine. Westbrook has made significant contributions to medicine by using novel technology developed in his lab to discover new genes that contribute to cancer.



BRIAN J. DUNKIN, M.D., medical director of the Houston Methodist Institute for Technology, Innovation & Education (MITE), will be installed as the new president of SAGES, the Society of American Gastrointestinal and Endoscopic Surgeons at the society's annual meeting. SAGES was founded more than 30 years ago with the mission of improving quality of patient care through education, research, innovation and leadership, principally in gastrointestinal and endoscopic surgery. Dunkin is a recognized leader in the field of minimally invasive surgery, surgical endoscopy, and the use of computer simulation to teach gastrointestinal endoscopy.



R. PATRICK WOOD, M.D., has joined LifeGift, a nonprofit organization that offers hope to individuals needing transplants in 109 Texas counties, full time as chief medical officer. Wood joined LifeGift as medical director in 1991 and has served on the Board of Directors for the past decade. In addition to being a former president of the Texas Transplantation Society, he has served on a number of United Network for Organ Sharing committees. He also established the liver transplant programs at the University of Texas, Memorial Hermann Health System, Texas Children's Hospital and CHI St. Luke's Health-Baylor St. Luke's Medical Center.



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Designing a Better Way to Study Stomach Flu

Rice University bioengineers are teaming with colleagues from Baylor College of Medicine and The University of Texas MD Anderson Cancer Center to apply the latest techniques in tissue engineering toward the study of one of the most common and deadly human illnesses—the stomach flu.

The bacteria and viruses that cause acute gastroenteritis often come from contaminated food or water and result in cramps, nausea, diarrhea and vomiting. In medical terms, these pathogens fall under the heading of “human enteric disease,” and while they may be common, they can also be deadly. Diarrheal diseases still account for about 17 percent of worldwide human deaths each year, and they are the second-leading killer of children five and younger.

One roadblock to studying enteric pathogens like human rotaviruses and

E. coli is that the organisms behave differently in humans than they do in animals typically used in medical research. Stem cell research has led to recent breakthroughs in the development of more realistic cell culture models, but there’s room for improvement.

“Infectious-disease labs that study enteric disease need better models that faithfully simulate the physiology of the intestine,” said Rice tissue engineering researcher Jane Grande-Allen, Ph.D., the Isabel C. Cameron Professor of Bioengineering. “This organ contains multiple types of cells that are arranged in complex patterns, and these tissues are constantly on the move. They contract and expand all the time, and we suspect some pathogens take advantage of that motion to mount their attacks.”

Thanks to a \$5.1 million grant from the National Institutes of Health,

“No single institution has all of that expertise, but thanks to the resources in the Texas Medical Center, we have assembled a team that is uniquely qualified to meet this challenge.”

— MARY ESTES, PH.D.

Cullen Chair of Molecular and Human Virology at Baylor College of Medicine

Grande-Allen and colleagues at Baylor and MD Anderson are embarking on a five-year program to create a bioreactor that more closely simulates the complex tissues and dynamic movements of the intestinal track.

“This kind of problem can only be solved with teamwork because it requires expertise in enteric disease, cell biology, tissue engineering, bioreactor design and more,” said Baylor’s Mary Estes, the Cullen Chair of Molecular and Human Virology and principal investigator on the grant

from the National Institute of Allergy and Infectious Diseases. “No single institution has all of that expertise, but thanks to the resources in the Texas Medical Center, we have assembled a team that is uniquely qualified to meet this challenge.”

Grande-Allen said the team’s five-year goal is to deliver a simple, easy-to-use and relatively inexpensive system that could be easily implemented by any infectious disease lab. ■

— Jade Boyd, Rice University

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Hospital First in the Nation to Use Digital SpyGlass Technology

CHI St. Luke's Health-Baylor St. Luke's Medical Center is the first hospital in the nation to use the new SpyGlass Digital System technology.

Isaac Raijman, M.D., chief of gastroenterology at Baylor St. Luke's, has performed the most procedures in the world using this new technology, which is yielding promising results in improving the efficiency of endoscopic diagnoses and procedures.

The single-operator device, produced by Boston Scientific, uses a digital sensor and, according to Raijman,

provides significantly clearer images than fiber optic imaging offered by previous technologies.

"It was like it lifted a curtain from my eyes—it was that dramatic," said Raijman, describing the previous images as "foggy and kind of hazy."

On a weekly basis, physicians from around the country are shadowing Raijman to learn more about the device. During a recent procedure, he was able to use the SpyGlass system to view images of a lesion on a patient's liver that would otherwise have been difficult to detect.

The patient was originally referred from another hospital to Raijman for an endoscopic retrograde cholangiopancreatography (ERCP) after liver tests yielded abnormal results.

"When I performed the ERCP, I injected contrast and it didn't show any abnormality except for the coloring being somewhat abnormal," said Raijman. "If I just stop there, I don't really have a specific diagnosis. That's where this SpyGlass technology plays an important role."

While holding a demonstration for a visiting physician, as well as Baylor St. Luke's colleagues, Raijman was able to show how the SpyGlass offers a more specific diagnosis for the same patient.

"In one single branch on the left side of the liver, there was mucous. It's not normal to have mucous there," he described. "As we were exploring that area, we saw a flat lesion in the bile duct

with fronds—it almost looked like an anemone." Raijman identified the lesion as a villous adenoma of the bile duct, which has a high possibility of turning into cancer.

"The impact of this is that now we have a specific diagnosis, we know exactly where within the liver it is, and he can undergo surgery and be cured," added Raijman. "We perform targeted biopsies; we can do specific breaking of stones and remove them from sites that otherwise would not be possible; and we can identify the cause of certain problems."

Presently, Raijman is one of only five physicians using the SpyGlass technology in the world, and has helped refine and develop the technology, which will be released nationally. ■

—Shea Connelly,
Texas Medical Center

“It was like it lifted a curtain from my eyes—it was that dramatic.”

—ISAAC RAIJMAN, M.D.
Chief of Gastroenterology at Baylor St. Luke's

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cnordt@houstonhospice.org

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11 **The Brain on Drugs**
Saturday, 10:30 a.m.-12:00 p.m.
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11 **2015 Memorial Hermann Circle of Life Gala "Hoopla!"**
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15 **The TMC Library Centennial – Celebrates the Greatest Generation**
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16 **Novel Insights Into Uterine Smooth Muscle Tumors**
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23-25 **Anesthesia History Association**
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24-26 **Together In Hope Conference**
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- Utilize integrated care among the care team to positively impact outcomes for the patient
- Discuss the implementation of mobile health technologies into clinical practice
- Explain current issues related to health policy, including the impact on patients and health care providers
- Identify ethical issues in health care delivery, medical treatment and decision making
- Provide appropriate care and counsel for patients and their families

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