TMC PULSE

THE OFFICIAL NEWS OF THE TEXAS MEDICAL CENTER — VOL. 1 / NO. 6 — OCTOBER 2014



Accelerating Innovation

Providing the resources and expertise to help drive innovation within the Texas Medical Center

INSIDE: ROSA OFFERS HOPE TO EPILEPSY PATIENTS, P. 4 >>> TAILORING TREATMENT, P. 16 >>> HEARTS OF GOLD GALA, P. 30



rosewoodstreetestates.com



1614 Rosewood Street

Museum District

Roof Terrace with Downtown Views Privately Fenced Yards Free-Standing Homes







westucourt.com



5303 Weslayan Street

West University Place

Roof Terrace Features a Fireplace Privately Fenced Yards Free-Standing Homes

From the \$730's





cambridgeparkcourt.com



8205 Cambridge Street

Medical Center

Free-Standing Homes with Private Yards Gated Community and Guest Parking Convenient to Medical Center

From the \$360's



Converse Park

conversepark.com



1921 Converse Street

Montrose

Roof Terrace with Downtown Views Free-Standing Homes Private Driveways

From the \$590's





bonniebraeterrace.com



1212 Bonnie Brae Street

Montrose

Free-Standing Homes with Private Yards Roof Terrace Adjacent to Game Room Elevator Capable

From the \$640's





713-868-7226

5023 Washington Avenue www.UrbanLiving.com



NMLS: 137773



ROSA Offers Hope to Epilepsy Patients

After suffering from debilitating seizures for nearly ten years, a young woman regained her life thanks to a robot named ROSA.



Spotlight: Mark A. Wallace

The president of Texas Children's Hospital discusses the maxims that drive him as a leader, and the pivotal career opportunity that he almost passed up.



Tailoring Treatment

The future of breast cancer research and treatment at MD Anderson Cancer Center looks bright, thanks to new recruits focused on breakthroughs in the field.



Accelerating Innovation

The Texas Medical Center Innovation Institute celebrates its first major milestone with the launch of TMCx.



INNOVATORS // p. 20

WHAT DRIVES INNOVATION? TWELVE INVENTORS AND ENTREPRENEURS FROM ACROSS THE TEXAS MEDICAL CENTER SHARE THE IDEAS THAT INSPIRE THEM, AND THE REAL-WORLD VALUE OF THEIR MOST SUCCESSFUL INNOVATIONS.

26 Industry Spotlight: Janiece Longoria

The Chairman of the Port of Houston Authority discusses the history, and the future, of the city's 52-mile deep-water shipping channel.

30 Hearts of Gold

On September 19, The Health Museum hosted an evening in honor of women who have made exceptional contributions in the fields of health and medical science.

38 Accolades

40 Short Takes

> 44 Calendar

PRESIDENT'S PERSPECTIVE



ROBERT C. ROBBINS, M.D.

President and

Chief Executive Officer,

Texas Medical Center

As part of the strategic planning process, leaders from across the Texas Medical Center discussed how we could best come together in creating an internationally recognized, globally competitive life science center here in Houston.

Of the five institutes that emerged from the Strategic Plan, each addresses a unique opportunity for the Texas Medical Center to help transform the future of medicine, through collaboration and bold decision-making. One of those institutes—innovation—is centered on a need that TMC leaders unanimously identified as one of the most important for this community. The only way for an invention to really impact human health is for it to become commercially available to those who need it.

To that end, we are pleased to announce the launch of the new Texas Medical Center accelerator—TMCx—located right here on the John P. McGovern campus. TMCx is the first component of the Innovation Institute. Through the collective expertise of partners across the city and state, the institute will help individuals and small start-up companies see their ideas through to market.

The cover of this issue of TMC Pulse shows the entryway to a space that is uniquely designed for innovators to develop game-changing technologies, processes and drugs. The Institute will offer communal working areas, lab space, conference rooms, and—more importantly—the experts to advise on everything from building a business model to understanding the legal process for securing a patent.

For us, the best way to invest in the future of the medical center is to foster innovation and collaboration to ultimately improve human health. The Innovation Institute is among the first steps to helping us achieve that goal.



TMC PULSE

Vol. 1 No. 6 October 2014

Robert C. Robbins, M.D.

President and Chief Executive Officer

Amanda D. Stein

Editor

astein@texasmedicalcenter.org

Shea Connelly
Associate Editor
sconnelly@texasmedicalcenter.org

Alex Orlando

Staff Writer

aorlando@texasmedicalcenter.org

L. Morgan Farrar

Business Strategist

Ben W. Howard

Graphic Designer

Contributing Photographers
Killy Photography
Nick de la Torre
Scott Dalton

NEWSROOM

713-791-8812 news@texasmedicalcenter.org

ADVERTISING

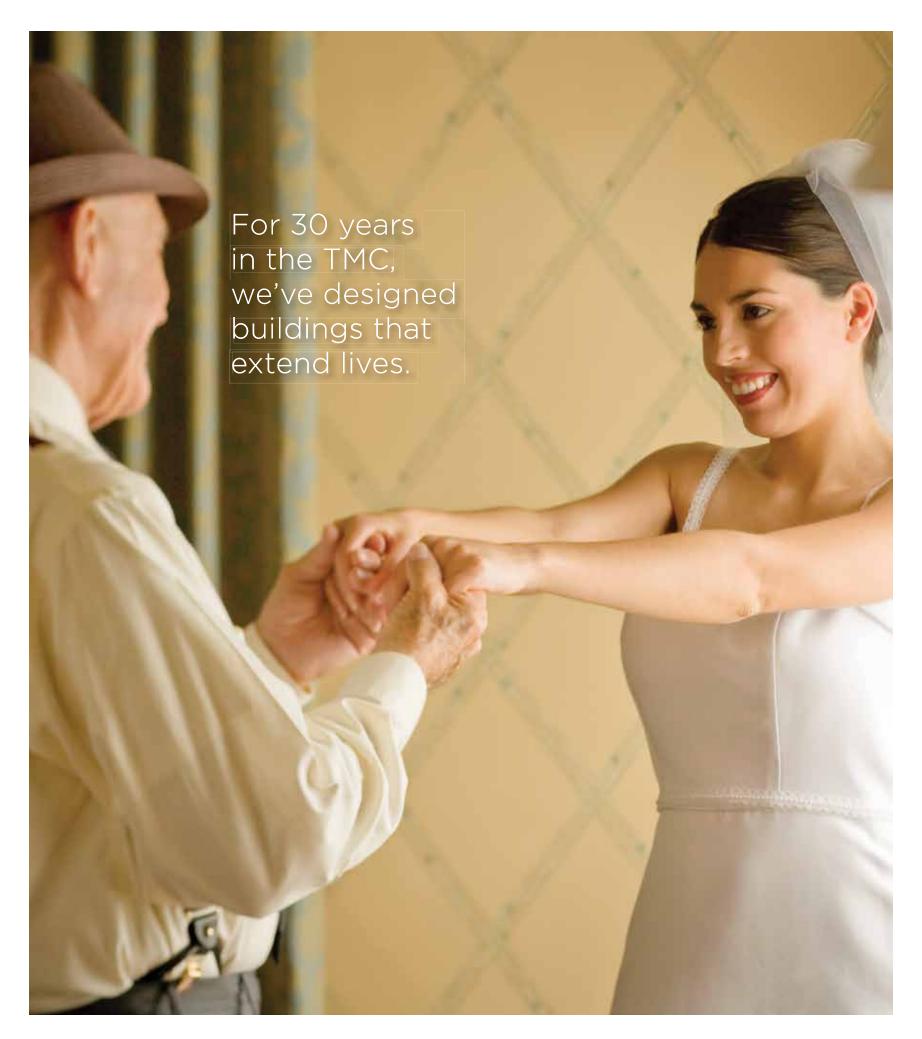
713-791-8894 newsads@texasmedicalcenter.org

DISTRIBUTION

713-791-6130 distribution@texasmedicalcenter.org

Texas Medical Center Pulse is a monthly publication of the Texas Medical Center, in Houston, Texas. Permission from the editor is required to reprint any material. Editorial/advertising information available on request.

Texas Medical Center News is a member of: Houston Press Club, American Medical Writers Association, Association of Healthcare Journalists, and American Advertising Federation



No firm has helped the Texas Medical Center advance more. 11 million square feet designed. Countless lives extended. Learn more at HealthcareArchitecture.com.

WHR ARCHITECTS[®]

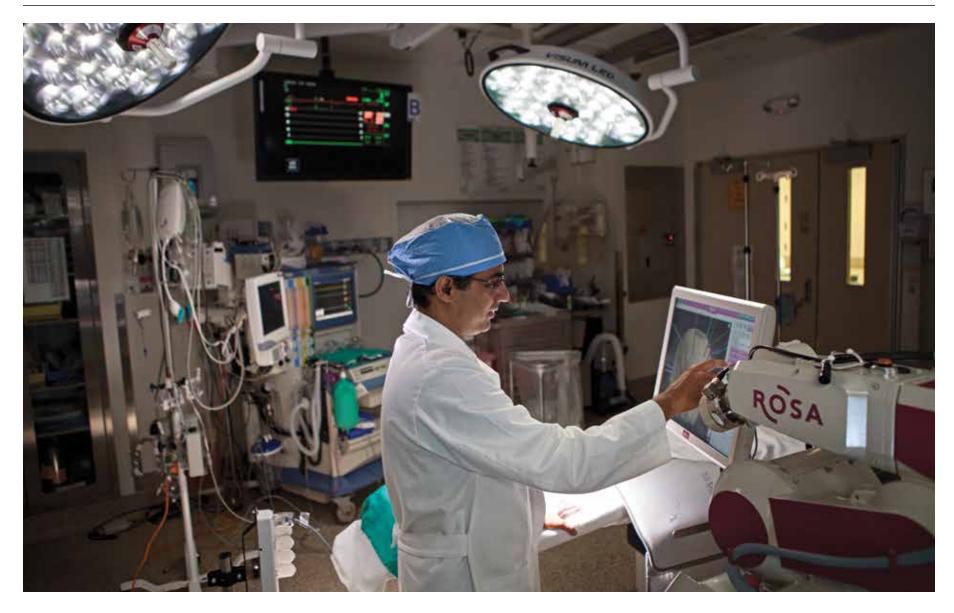
Architecture with People in Mind

THE LEADING HEALTHCARE DESIGN FIRM IN THE WORLD'S LEADING MEDICAL CENTER

ROSA Offers Hope to Epilepsy Patients

Using an advanced robotic service, doctors at Memorial Hermann are able to perform minimally invasive surgery to cure patients with severe epilepsy

By Zoe Quezada



At 20 years old, a young woman who suffered from refractory epilepsy feels as if she has been born again. For the bulk of her childhood, Lindsay Snyder struggled to have a normal life and was suffering from as many as four seizures a day. Now, thanks to a team of expert neurosurgeons at Memorial Hermann, a specialized robotic service (ROSA), and a dedicated team of neurologists, Lindsay is reclaiming her independence and ability to live a healthy, normal life.

Before her first seizure at the age of nine, Lindsay loved cheerleading and performing stunts for her squad. Then her seizures started, and Lindsay felt increasingly frustrated knowing that she was missing out on so many things. As the epilepsy worsened, she had to give up playing sports, a sacrifice that was especially difficult for her as the daughter of Texas A&M

University Defensive Coordinator Mark Snyder. At 16, when most of her peers were learning how to drive, Lindsay couldn't because of her illness. By her senior year of high school, she was told she was in danger of not graduating on time because of how much school she had missed.

"I can't explain how difficult it was," Lindsay said. "It was awful. I couldn't do anything by myself. I spent most of my days in the nurse's office at school. When I had a seizure at school, the EMS was required to come and so they came almost every single day. I missed so much class that I had to go in front of the school board and explain to them why I wasn't in class."

For years Lindsay and her family struggled to find the right medical treatment for her illness. Doctors ran several MRIs, EEGs and tests on Lindsay, but the results failed to reveal a specific cause or the brain region where the horrible seizures she was experiencing originated. Some doctors thought she was faking her seizures because she was stressed or desired attention.

Yet Lindsay and her family knew the seizures were real and weren't responsive to therapy or medication. Fortunately, during one of her visits to the doctor, a nurse informed Lindsay that there was something out there that could help her. The nurse told Lindsay about her personal struggle with epilepsy, and how she had been cured with a new, highly specialized surgery.

From that moment on, Lindsay was determined to have surgery. Yet she was still young and finding a hospital that could perform the surgery wasn't an easy task. Even today, there are only a few sites in the

world that would consider surgery in a case such as hers. Fortunately for her, in June of 2013 the Memorial Hermann Mischer Neuroscience Institute at the Texas Medical Center became one of three sites in the United States to offer a life-changing procedure using robotic stereoelectroencephalography (SEEG).

Stereoelectroencephalography is a 3-D approach to localizing seizures using very thin electrodes, placed with great precision, into specific brain regions. The ROSA stereotactic robot is used to place these electrodes accurately and has been successful in localizing the seizure focus in patients like Lindsay who suffer from severe epilepsy that cannot be treated with medication. Through advanced technology, ROSA can pinpoint exact areas of epileptic activity that are not always easily detectable. Then doctors can devise a plan to operate on the affected parts. Prior to robotic SEEG, neurosurgeons had to perform invasive craniotomies that cut into large portions of the skull in order to access the brain, posing a greater risk for human error. Now, by using the robot, neurosurgeons can deliver faster and more precise results in a less invasive manner. The electrodes are thin-measuring at .8mm thick—and operations can be completed in as little as two hours.

"In our desire to help our patient population, we have devised an approach that allows us to place electrodes with both great precision and speed in this innovative approach that allows us to evaluate patients with epilepsy who we had not been able to help in the past," said Nitin Tandon, M.D., director of epilepsy surgery at Memorial Hermann Mischer Neuroscience Institute at the Texas Medical Center, associate professor in the Department of Neurosurgery at The University of Texas Health Science Center at Houston (UTHealth) Medical School, and the neurosurgeon who performed Lindsay's operation. "If we had seen Lindsay two years ago, we may not have had a feasible option for her non-lesional, poorly lateralizable frontal lobe epilepsy. But using robotic SEEG, we were able to localize the epilepsy and then plan for a curative operation using ROSA."

In August of 2013, Lindsay became one of the first patients at Memorial Hermann to benefit from the ROSA robot. Since then, she has been seizure free and has been quickly moving forward with her life, accomplishing everything she had been desperately wanting to do.

"I was really nervous when I was going in," Lindsay said. "I kept saying I wasn't going to get nervous, but when I got in the surgery room, I started freaking out. When I got home my head was a bit sore and I had stitches and staples in my head, but after a few months, my life became amazing. I'm driving. I just got a job. I'm in college. I'm living my life the way I've always wanted to."

"It was such a heartbreaking thing to watch every day for 10 years, to see our precious daughter suffer and just literally get worse, day by day, before our eyes," said Beth Snyder, Lindsay's mother. "So to have her where she is now—a normal college girl who can go and do things that weren't possible for so many years—I just can't even put into words how overwhelming it is."

In just over one year, Tandon and his team at Memorial Hermann Mischer Neuroscience Institute have performed over 40 operations using the ROSA robot. Tandon feels especially grateful knowing he can provide this unique, life-changing operation for patients who previously were unable to manage their epilepsy.

"Epilepsy is a disease that really affects people's lives in terrible ways," Tandon said. "I've had so many people tell me the impact that it has had on their lives. Not being able to be left alone or take a bath without their parents or spouse being concerned because they could drown. Not being able to drive, which obviously has a huge impact on their social ability, economic abilities, and being unable to get to work, hold a job. I've had many patients with children who are desperate now to have surgery so that they can take their child to the park or drop them off at school. Being able to give people their life back is really gratifying. The single most rewarding thing we do as caregivers is to cure someone of a chronic debilitating illness."

At Memorial Hermann and UTHealth, neurosurgeons like Tandon work hand-in-hand with the epilepsy neurologists to provide patients with comprehensive care and total support. Melissa Thomas, M.D., Lindsay's epilepsy neurologist, and Giri Kalamangalam, M.D., work closely with Tandon to devise the precise SEEG plan that would most likely help localize the epilepsy in each individual case. Additionally, the hospital has a 12-bed Epilepsy Monitoring Unit, a magnetoencephalography program, a dedicated team approach that extends beyond neurosurgeons and neurologists to neuropsychologists, neuroradiologists and neuropathologists, and a support group to connect patients and families who are affected by the disease. Memorial Hermann also sponsors reunions for patients who have undergone surgery or epilepsy treatment. Each year the opportunities and technologies for patients with epilepsy continue to grow.

"There are so many things that we can do as caregivers to take away the stigma of the disease," said Tandon. "One of the things that I, or people like Lindsay, can do is to help people understand that epilepsy is not something they need to be ashamed of. It's just like having asthma, diabetes or something else that could be life-threatening in certain situations. Except in this case, it affects the brain and people seem to respond to that with more fear. Over the last ten years that I have been at Memorial Hermann, we have created an epilepsy program that is larger, more innovative and more comprehensive than anything in this region. We're very happy to be in the Texas Medical Center and to be able to bring more attention to our city and medical center. It is, in many ways, a work of passion. It's a lot of work to get people better, but it's very gratifying—indeed it's a privilege to be able to do what we do."



Being able to give people their life back is really gratifying. The single most rewarding thing we do as caregivers is to cure someone of a chronic debilitating illness.

— NITIN TANDON, M.D.

Director of Epilepsy Surgery at

Memorial Hermann Mischer

Neuroscience Institute

at the Texas Medical Center



Thanks to the ROSA stereotactic robot and the work of Nitin Tandon, M.D., facing page, Lindsay Snyder, pictured top, is living life as a normal college student, free from seizures. (Credit: Memorial Hermann-TMC)

TAKING A LITTLE TIME IN YOUR DAY MAY ADD YEARS TO YOUR LIFE.

SO WE MAKE SCHEDULING A MAMMOGRAM EASIER, ONLINE.





Our neurosurgeons successfully perform complex surgeries others won't attempt.

The Mischer Neuroscience Institute at the Texas Medical Center was among the first to perform minimally invasive epilepsy surgeries through stereo-electroencephalography (SEEG) and laser ablation. This advancement allows for seizure localization and treatment without invasive surgery. As pioneers of this approach, we have completed more cases than anyone in the nation. But that's just a fraction of what we do. From brain tumor resections to aneurysm repairs, we collaborate with UTHealth Medical School to perform more than 7,600 neurosurgical procedures every year – more than anyone in Houston. Together we are bringing the forefront of neuroscience to you.

Learn more at neuro.memorialhermann.org



Mischer Neuroscience Institute



ADVANCING HEALTH



WITH THIS YEAR MARKING HIS 25TH ANNIVERSARY WITH TEXAS CHILDREN'S HOSPITAL,
CEO AND PRESIDENT MARK A. WALLACE SAT DOWN WITH TEXAS MEDICAL CENTER
EXECUTIVE VICE PRESIDENT AND CHIEF STRATEGY AND OPERATING OFFICER
WILLIAM F. McKEON FOR A LOOK BACK ON A QUARTER-CENTURY OF GROWTH
AND THE QUALITIES HE BELIEVES MAKE AN EXCEPTIONAL LEADER.

Q | Can you tell us about your formative years?

A I was born in Oklahoma City on April 24, 1953, at St. Anthony Hospital. I went to public schools and then attended Oklahoma Baptist University in Shawnee, Oklahoma. I played basketball, as point guard. I had aspirations of going on to a Division I school, but I wasn't quite good enough. OBU was a school I was very familiar with. They had a great NAIA basketball programwe were national champions in 1966 and runner-up in '65 and '67. So we had a great team with a lot of good players, a couple who went on to play in the NBA for a few years. I received a great education and enjoyed playing basketball.

I grew up playing all sports in a time when we played neighborhood sports. We would get the guys together, go out in a field or someone's backyard and play ball—football, basketball, baseball, golf, tennis, etc. There were a lot of really talented athletes in my neighborhood. My two best sports were basketball and golf. I wanted to play D1 basketball and at about age 16, I went to a basketball camp in Edmond, Oklahoma. During a lunch break I wandered over to the library. I had nothing else to do, so there I was in the library, in my basketball shorts with tube socks up to my knees. I started reading some magazines, career manuals and so forth, and I read about this field called hospital administration. So remember, this is in 1968, and here I am at 16 reading about hospital administration in a career journal. The publications were talking about the prospects of health care and how it was going to change and grow because of Medicare and Medicaid being enacted in the Johnson administration in '65 and '66. There was going to be this expansion and proliferation of hospitals and hospital beds, and this additional source of capital coming into health care because of

additional third-party reimbursements for the elderly through Medicare and the medically and financially indigent through the Medicaid program.

So I'm reading this, and I knew I was going to go into business, and I was always struck by leadership and management. I'm thinking, 'This is it. I want to be a leader and I can focus on a particular industry.' All my family works in oil and gas, even to this day. So I go home and I say, 'Hey, Mom and Dad! I want to be a hospital administrator when I grow up.' They look at me and go, 'What's that?' And my mom says, 'He wants to be a doctor.' And I said, 'No Mom, let me tell you what hospital CEOs do.' And they just kind of shook their heads like, 'Eh, he'll grow out of it and forget about it.'

Q And exactly 20 years later, you walked through the door at 36?

A Yes. Oct. 4, 1989 was my first day. I had already been in the Texas Medical Center for 12 years. So from Oklahoma Baptist University, I went on to Washington University in St. Louis and got my MHA. Then I did my administrative fellowship at The Methodist Hospital beginning in '77. I started under the tutelage of Ted Bowen, President and CEO at the time, and Larry Mathis. At the age of 24, they promoted me to assistant vice president, at 26 to vice president, and at 30 to senior vice president with responsibility for hospital operations. I look back on that now and I wonder what in the world they were thinking.

Methodist had Dr. Michael DeBakey, who was still in his prime, along with other phenomenal cardiovascular surgeons, like E. Stanley Crawford, Jimmy Howell, George Noon, George Morris, Charlie McCollum—the list went on and on. In 1977, Houston was the heart capital of the world. At Methodist, you had Dr. DeBakey, and at St. Luke's and

Leadership can't be compartmentalized. If you're really a good leader, you want to lead every day, every moment.



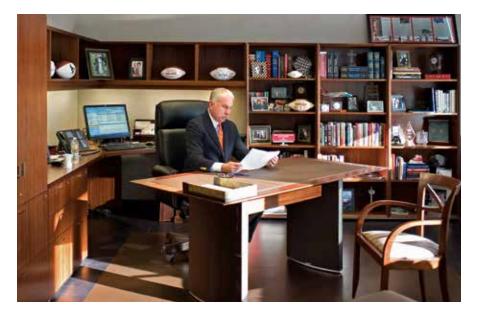
Dr. Ralph Feigin, left, and Mark Wallace (Credit: Texas Children's Hospital)

the Texas Heart Institute you had Dr. Denton Cooley. So truly we were the Mecca of cardiovascular medicine for the entire world.

It was a tremendous growth period for Methodist at that time. They were the adult teaching hospital for Baylor College of Medicine. In addition to being the world-class renowned surgeon that he was, Dr. DeBakey was chairman of the department of surgery at Baylor, and he was also the President and CEO of Baylor. He truly was an individual who had a tremendous impact on my career—getting to know him at the age of 24, spending a lot of time with him, watching him, and observing him lead growth and manage growth, and being one of the most prominent surgeons of the century.

Q Do you believe that the great leaders always have it in them to be natural-born leaders or do you see it as a skill learned over time?

A I think it's a little bit of both. I think the great leaders do have some inherent natural talents. You see that throughout medicine. You see it in sports and in business, as well. I think these great leaders, titans, captains of industry become so through leadership development. They work very hard at becoming a better leader. So they take their natural God-given ability and accentuate that by focusing on leadership development and thinking about their definition of leadership and how they can apply various characteristics towards becoming a better leader.





Q Was that curiosity or enthusiasm?

A I'm going to give my parents a lot of credit for that. My mom is 85, she is alive and well. She lives by herself and since it's Friday, she is probably eating Mexican food right now. Mom is smart, talented, a good musician. My dad worked for Cameron Iron Works. He was the district manager for Oklahoma and the Texas panhandle for 35 years.

I grew up at the dinner table hearing all these stories about Jim Abercrombie, who founded Cameron Iron Works and who was also the founding father of Texas Children's. Over the years, I learned of numerous other CEOs of Cameron who also had ties to Houston and the Texas Medical Center. There was Herbert Allen, who was also chairman of the Rice University board, and when I was 21 I heard about someone named Philip Burguieres who was the new president of Cameron. Philip is now a close personal friend of mine and a trustee at Baylor. And so the overlap between growing up in Oklahoma, Dad working for Cameron—the founder being Jim Abercrombie—and then my coming to work at Texas Children's Hospital in 1989 is pretty amazing.

Growing up, we would frequently come to Houston, driving from Oklahoma City. We would stay out on the old Katy Road across from the Cameron Iron Works plant at that time—where Ikea is now. Dad would work and go to conferences, meetings and seminars, and we would stay at a Howard Johnson Motel. We thought we were really living it up. But little did I know, at that age, that I would

be working here in the Texas Medical Center. So there is this incredible sense of irony—the overlap between Cameron and Texas Children's, and Jim Abercrombie founding both institutions, knowing so much about Houston and who Abercrombie was. Josephine Abercrombie, his daughter, is still an emeritus trustee on our board. She is wonderful and often sends notes to me, 'Mark I just heard this about Texas Children's. Mom and Dad would be so proud.' So this was a destination for me, a place where God wanted me to end up.

Another similar irony is that I came out of Washington University and started working at The Methodist Hospital in 1977. That same year, departing St. Louis and Washington University, was a person named Ralph Feigin. Dr. Ralph Feigin was leaving Washington University St. Louis Children's Hospital as the chief of infectious disease, and was coming to serve as chairman of the department of pediatrics at Baylor and physician-in-chief at Texas Children's. So we both came to Houston in 1977. I was 24, he was 39, and we didn't know one another. But we got here, quickly met and got to know each other. We became friends, even though I was at Methodist and he was at Texas Children's. He also served as chief of pediatrics at Methodist, so I used to see him at medical staff meetings. Even then, at a very young age, I was struck by Dr. Feigin and his capacity, work ethic and intellect. In 1989, I was 36 when Dr. Feigin and the board called me and

said, 'Mark, would you consider coming over and being the President and CEO of Texas Children's Hospital?' That's also another really important aspect of my career that a lot of people don't realize. Ralph and I led Texas Children's together for 21 years until his unfortunate and untimely death. A lot of people don't know we both came from Washington University in St. Louis in 1977. We connected in 1989. That's very important to me because I loved Dr. Feigin. He and I became great partners in leading Texas Children's.

Q How has Texas Children's grown over the last 25 years?

A It was 331 beds then and 650 today. We had 1,100 employees then and 10,200 employees today, 300,000 square feet then and over eight million square feet today. And that doesn't include what we will be adding in the next few years.

What I love is when people come to Texas Children's today and they see the West Tower, Feigin Center, Pavilion for Women, Jan and Dan Duncan Neurological Research Institute and Texas Children's Hospital West Campus. Texas Children's Pediatrics is the largest primary pediatric care network in the United States, with 49 locations, 1.2 million patient encounters, 200+ physicians. Texas Children's Health Plan is the largest pediatric provider-based HMO in the nation. Everyone thinks this is the way it's always been at Texas Children's for the last 40 or 50 years. No. It has grown up, at a very accelerated pace, to become

this in a very short period of time. It's been two and half decades during which the board, our medical staff, employees, volunteers and the community have worked to accomplish this. That's one of the things I'm most proud of—the pace, the acceleration and the consistency of the performance. The consistency of the quality of service, the safety, accessibility, financial performance, our capital campaigns. We've not had any major missteps. We've not squandered capital or funded a major product that didn't work. The leadership of the organization has been phenomenal. It's been a remarkable record of leading and managing growth. That's very important. Some organizations can lead growth, but they can't sustain it and manage it. That's one of the things we talk a lot about—leading and managing. We like to say that leaders lead people and managers manage an asset, process or thing. We need both. In your daily responsibilities, sometimes you're leading people and sometimes you're managing an asset, process or thing. That's one of my 10 leadership maxims.

Q | Can you tell us about your maxims?

A For the medical staff, board, employees, the volunteers, there's one word that best describes Texas Children's and leads to the culture we have here: passion. The passion for the mission of excellence in pediatrics and now ob-gyn and women's services. The passion for research, undergraduate medical education and graduate



(Credit: Texas Children's Hospital)

medical education. It is that passion for the mission and then for the patients and the families. Culture does begin at the top, there is no question about that. It has to be sustained as it cascades down vertically and then horizontally. I think the leadership maxims have been a big part in helping us establish and maintain the culture. Today, there is a cultural dividend that is being paid out throughout Texas Children's, because of our employees and medical staff and how passionate they are. All of that translates into other areas of the business model—a better balance sheet, a better profit and loss statement, a better bond rating and so on. The leadership maxims are a big part of Texas Children's. It's been a big part of my thinking about leadership, and hopefully in helping other people become better leaders. And not just people in formal leadership positions, because that's one of the maxims: everyone's a leader. We lead in our professional lives, but then we lead in our personal lives as well. There's not a more important leadership responsibility than that of being a parent, and especially a mom. That's the number one leadership job description on the planet. The second is being a great father. Then being a great wife and husband. We talk a lot about how everyone's a leader at Texas Children's. It's not just executives or people in the C Suite. It's front line employees, valet parkers, nurses—everyone has the opportunity to lead. Leadership can't be compartmentalized. If you're really a good leader, you want to lead every day, every moment.

These leadership maxims are real, and they work for everybody. They work at home and at work.

What about the challenges? What were some tough times that people don't know about?

A | Well, one of the scariest times I had was Tropical Storm Allison in 2001. It had been raining nonstop for five days, Houston was being consumed with water and flooding. We set up the command center Tuesday of that week. Unfortunately, other institutions in the Texas Medical Center did not get their flood logs up in time and the water got into the tunnels. Fortunately, 30 days before, we had installed our submarine vaulted doors, so we were able to seal off Texas Children's from the tunnels. But there was so much water, surging with such force that we were concerned the water was still going to flood through the tunnels and reach our West Tower. So it's Saturday morning and we're all in the command center. We're still afloat. Our emergency generators are on. Everyone else is evacuating. I can remember the water had begun to rise, flooding the tunnels from floor to ceiling. I was scared to death that we were that close to having to evacuate. The hospital was full, as we typically are.

It's one thing to evacuate adult patients. You have adult hospitals out in the community where you can triage them. We had no place to go. We were taking some of the adult patients from St. Luke's and Methodist. We even set up a surgical ICU for some of the

The thing that wakes me up in the morning, keeps me going, makes me want to continue to work on the next aspirational goal, is that I look down the street and around the corners as well [...] We have always tried to figure out the right thing to do and then execute that to our greatest ability. Texas Children's future has never been brighter.

transplant patients from St. Luke's and Methodist. I was scared to death. How are we going to get the children down from the patient floors? There were no elevators. We would have to go through the stairwells. How were we going to keep every child and baby that was on a ventilator, using ambu bags, alive until we could get them to wherever we were going to get them to? Fortunately, it quit raining early Saturday morning and the waters started to recede. It could have been a horrible situation for Texas Children's and our patients. We were the only major hospital that stayed open that entire time. We didn't have to evacuate one patient. We never lost emergency power.

Another challenge relates to Baylor College of Medicine, our academic partner. Much of Texas Children's success is due to our affiliation with a great medical school and how well that relationship has worked. Everyone in the medical center knows Baylor has had some real challenges in the last 10 years since they separated from Houston Methodist. I was worrying about our academic partner and how they were doing. I was concerned about whether or not they would be able to maintain their status as one of the preeminent medical schools, and if they weren't, what was going to be the impact on Texas Children's. So we spent years working on that as Baylor struggled not just financially but also culturally, including the turnover of leadership and retention of faculty. Today, under Dr. Paul Klotman's leadership, Baylor is strong, stable and on a positive

trajectory. And Baylor and Texas Children's have an ideal partnership.

| Those relationships that you mentioned are symbiotic. The greatness of Baylor College of Medicine is because of the greatness of Texas Children's and vice versa. How do you feel now that it has come full circle?

A It is one of the things I'm most proud of. I've spent 37 years working with Baylor—12 at Methodist and 25 here at Texas Children's. And that's been one of my greatest joys, working in academic medicine and building Texas Children's to what it is today. Working with full time faculty and becoming a research enterprise in pediatrics, surgery and ob-gyn has been immensely gratifying. Dr. Klotman informed me a month ago that at the next commencement, in May, Baylor is going to bestow upon me an honorary doctorate of humanities in medicine. Of all the honors I've received, that one is going to be at the top.

Q Any closing thoughts?

A | The thing that wakes me up in the morning, keeps me going, makes me want to continue to work on the next aspirational goal, is that I look down the street and around the corners as well. A lot of leaders look down the street, but not around the corners and anticipate what you can't see. We have always tried to figure out the right thing to do and then execute that to our greatest ability. Texas Children's future has never been brighter.

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, AlB Certified in Vestibular Rehabilitation, Rehabilitation Services The four clinicians featured here are representative of the whole team of specialists spanning our musculoskeletal services. niversity of Texas Medical Branch Texas Medical Center

Think muscles, joints and bones.

It's about getting your life back.

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.

Whether it's working in ortho, neuro, or any aspect of the musculoskeletal system, UTMB has gifted clinicians. These are the doctors and surgeons who teach others their art, using the very latest equipment, technology and techniques.

It's about getting your life back. *Your* life. Whether that means gardening, hiking, fishing, playing guitar, typing on a keyboard, extreme sports or just lifting your grandkids, our team is ready to return you to the things you love to do.

If something isn't right, do what Eleanor did. Take charge of your health and call us at 800-917-8906, or go to utmbhealth.com to work wonders for you.

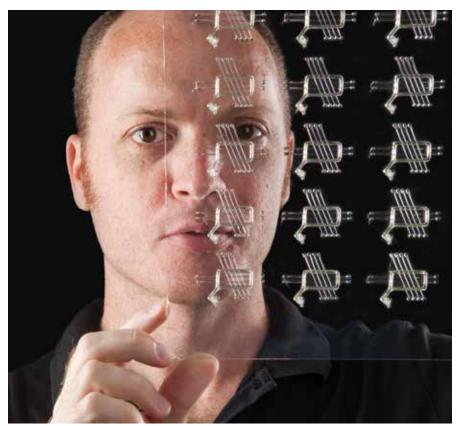


Working together to work wonders.™

One Layer at a Time

Inspired by cooking shows, one researcher is exploring how 3-D printing could be used to create dissolvable vascular structures

By Alex Orlando



Jordan Miller, pictured, with the printed 3-D sugar filament networks that he developed. The scaffolds combine with living cells to promote oxygen delivery to engineered tissue.

The hum of the 3-D printer, whirring rhythmically as it lays down different layers of crisscrossing filaments, is almost hypnotic. When the machine quiets down, what is left behind blurs the increasingly permeable membrane between science and science fiction—a dissolvable scaffold that can create hollows within printable organs, mimicking our own blood vessel networks. The inspiration behind this groundbreaking discovery? Something as simple, and sweet, as dessert.

"I watch a lot of cooking shows and I like dessert, so things like crème brulee or the sugar cages that chefs make at fancy restaurants really looked to me like the prints we had made and reminded me of blood vessel architecture," said Jordan Miller, Ph.D., an assistant professor of bioengineering at Rice University who is pioneering the use of 3-D printing to create vascular networks for research in tissue

engineering and regenerative medicine. "That's when it clicked that we should use sugar."

Three-D printing, the process that "prints" a three-dimensional object from a digital image by laying down consecutive layers of material, is sending ripples across the biomedical community with the eventual goal of creating customizable printed organs for transplant use. In the efforts to navigate the obstacles to printing a fully functional human organ—such as meeting the nutritional needs of cells deep within living tissue—Miller's approach may hold the key to successfully crafting more complex tissues.

"One of the traditional roadblocks in creating something as complex as organs is getting the blood vessel network in place," explained Miller. "It's similar to baking a loaf of bread, where you get a crust layer that forms all around the outside because the

Houston, having the largest medical center in the world, has huge potential to capitalize on some of the research going on in 3-D printing.

— JORDAN MILLER, PH.D.

Assistant Professor of Bioengineering at Rice University

dough is getting more oxygen on the outer surface. The same thing happens if you take a bunch of cells and try to put them together in 3-D—if you try to make something the size of a human organ composed of human cells, all of the cells in the center of that structure will die because they can't get access to the nutrients and the oxygen. The blood vessel network in your body is what feeds all of the cells deep within a tissue."

Miller, who joined Rice in July of 2013, crafted his technique for printable vascular structures at the University of Pennsylvania—where he conducted his postdoctoral research—in conjunction with other researchers and the guiding hand of members of the computer technology workshop, Hive76, Miller helped to found in Philadelphia in 2009. At the same time, the worldwide opensource consumer 3-D printer movement was just getting started, based largely on the RepRap project out of Bath University, U.K. Instead of printing plastic, Miller's heavily modified RepRap printer now constructs templates of blood vessel networks by building up layers of intersecting filaments, composed of sucrose, glucose and dextran for structural reinforcement. Once the sugar hardens, scientists surround the scaffold with a mixture of cells and gel to create soft tissues. When that process is finished, the scientists dissolve the sugar solution, leaving small hollows within the sample that can be used to deliver nutrition to the inner cells.

"Houston, having the largest medical center in the world, has huge potential to capitalize on some of the research going on in 3-D printing and apply it

for basic diagnostics, organ-generation technologies, and understanding the pathophysiology and etiology of disease," said Miller. "It's going to be a long time before we can make whole replacement organs that we've custom printed for someone, but maybe we can start by making much smaller types of tissues—something the size of your fingernail that has human liver cells embedded within—for pharmaceutical screening. There are even opportunities to test the toxicity of new drugs, using a patient's own cells. By creating patient-specific models in the lab, we hope to provide a very personal prediction of how drugs might react in a given patient."

Earlier this year, Miller marched his printer up the steps of Capitol Hill to show lawmakers and staffers the revolutionary potential of 3-D printing at 3D/DC, an event hosted by the consumer advocacy group Public Knowledge. Encouraging the upward trajectory of the technology and hoping to counter the emergence of restrictive intellectual property laws, 3D/DC provided the 3-D printing community an opportunity to educate policy makers and the public about the benefits of widespread access. "I love that [Jordan's] building processes on open source hardware, which means that as he moves forward, he is dragging everyone along with him," said Michael Weinberg, vice president of Public Knowledge. "He's pushing the limits of the technology in a very open, public way that says, 'If you want to push the limits, too, come along with me.""

THE LATEST ADVANCEMENT IN MEDICAL TECHNOLOGY IS



Discover the healing potential of your own stem cells.

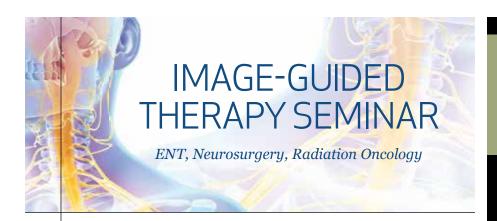
The stem cells contained within your own body have the power to do incredible things – and the world is starting to take notice.

In Texas alone, over one billion dollars is being spent on research to discover how stem cells can treat a range of conditions and improve your quality of life.

It's the future of medicine, and it's available today with Celltex Therapeutics. To learn more about adult stem cell therapy, call or go online.

celltexbank.com (866) 204-6831





Saturday, October 25, 2014

8:00 a.m. - 2:30 p.m.

Houston Methodist Research Institute 6670 Bertner Avenue Houston, TX 77030

Physicians: 5.25 AMA PRA Category 1 Credits™ ■ Nurses: 5.5 contact hours

For additional details, call 713.441.4971 or visit houstonmethodist.org/cme



Houston Methodist Hospital presents

5[™] ANNUAL CONFERENCE: DELIVERING EXCELLENCE IN CRITICAL CARE

Innovations for Clinical Practice 2014

REGISTER NOW!

houstonmethodist.org/icu-nursing-conference

Friday, Oct. 10, 2014

Houston Methodist Hospital Dunn Rio Grande Conference Room



Registration: 7:30 to 8 a.m. Conference: 8 a.m. to 4:30 p.m.

An Innovative Conference Offering Best Practices, Inspiration and Information to Meet the Needs of ICU Nurses.





HOUSTON IVF HELPS COUPLES BECOME FAMILIES.

At Houston IVF, we provide fertility solutions to couples who want help in building a family of their own. Houston IVF has consistently achieved high success rates through continuous refinements in clinical and laboratory techniques. With breakthrough technology and on-going research, Houston IVF has live birth rates higher compared to the national data. Call us today at 713-465-1211 or visit our web site **HoustonIVF.net**



All of the physicians at Houston IVF are Board Certified in Reproductive Endocrinology and Infertility by the American Board of Obstetrics and Gynecology.



713.465.1211 | HoustonIVF.net

Tailoring Treatment

Exciting additions to MD Anderson Cancer Center bring a history of pioneering innovations in breast cancer research and big plans for the future

By Shea Connelly



Debu Tripathy, M.D. (Credit: MD Anderson Cancer Center)

In this new age of molecular biology and a growing understanding of what actually drives breast cancer, we are very excited about applying this knowledge and developing a cutting-edge program that takes advantage of this information and is able to personalize and individualize therapies for breast cancer patients.

— DEBU TRIPATHY, M.D.

Chairman of the Breast Medical Oncology Department at The University of Texas MD Anderson Cancer Center

Pew people are more intimately acquainted with innovation in the field of breast cancer research and treatment than V. Craig Jordan, Ph.D. Numerous groundbreaking discoveries are credited to Jordan, but his most widely known achievement is turning a failed contraceptive into tamoxifen, the estrogen-blocking breast cancer drug responsible for saving countless lives. Now the man known as the "father of tamoxifen" is bringing his talents to The University of Texas MD Anderson Cancer Center.

Jordan's recruitment is one of several exciting new developments in MD Anderson's Breast Medical Oncology Department. The department also has a new chair, Debu Tripathy, M.D., who joined MD Anderson in late August with big plans for the future of breast cancer research and treatment at the hospital.

A key element of those plans includes moving the department in a more patient-focused direction that involves tailoring breast cancer treatments to each individual patient's specific needs.

"In this new age of molecular biology and a growing understanding of what actually drives breast cancer," said Tripathy, "we are very excited about applying this knowledge and developing a cutting-edge program that takes advantage of this information and is able to personalize and individualize therapies for breast cancer patients."

In decades past, researchers were looking for one miracle drug, the "magic bullet" that would cure cancer. These days, however, breast cancer treatment has evolved into something much more nuanced and individualized.

"We're recognizing that everybody's cancer is different—when you think about it, cancer is survival of the fittest," said Tripathy. "Cancer cells don't become cancer cells overnight, they slowly evolve over time. So by the time we actually detect a cancer that we can see on the screen or we can remove surgically, it already has a lot of genetic lesions that have given it an advantage to grow"

Understanding the differences unique to each individual patient and devising a treatment based on those differences is integral to the future of MD Anderson's Breast Medical Oncology Department.

"The field has really changed into developing drugs that are tailored for specific patients," Tripathy explained. "You're not only developing new drugs but you're also working on ways to find out how to match the right patient to the right drug."

According to Tripathy, this process of personalizing therapy, known as precision medicine, will be "the pathway forward" in cancer research. It will most likely depend on creating cocktails of multiple drugs customized to each individual patients' needs, very similar to the direction HIV and AIDS treatment has taken in recent years.

"What drives me is the ability to find and develop better outcomes for our patients with breast cancer, and the program that I develop is going to be very patient-focused," said Tripathy. "Everything I do is with that mission in mind."

Another goal for facilitating innovation at MD Anderson is to promote collaboration between researchers and clinical teams and a multidisciplinary approach to developing new treatments.

"Research, by definition, is a search for new treatments that will improve patient outcomes," said Tripathy, "but it has to go through a very rigorous process and it requires a laboratory team that works very closely with a clinical team."

Jordan is a new star player on that laboratory team. A professor in breast medical oncology and molecular and Where we were 40 years ago was basically non-specific therapies, combination chemotherapies that tended to hurt the patient more than the cancer. Combination chemotherapy was king, that was going to cure cancer...there was no place in the artillery for anything else.

- V. CRAIG JORDAN, PH.D.

Professor of Breast Medical Oncology and Molecular and Cellular Oncology at The University of Texas MD Anderson Cancer Center

cellular oncology, he will continue his work using hormonal therapy to both treat and prevent breast cancer.

"He's considered, by just about everyone in the field, to be the person who brought hormonal therapy to the forefront," said Tripathy. "Treating patients with hormonal therapy—therapy that targets the estrogen receptor pathway—remains our most potent tool in lowering the risk of recurrence and improving survival for women with breast cancer."

Jordan's contributions to the groundbreaking field of hormonal therapy date back to the tamoxifen discovery in the 1970s, though his interest in laboratory experimentation began even earlier.

"I was allowed by my mother to convert my bedroom to a chemistry laboratory in my teens, and there would always be something blowing up or being thrown out of the window, the curtains would be on fire," Jordan recalled of his childhood. "This passion for chemistry for the service of society by making medicines is something that was just was there...from being a teenager I've thought about nothing else."

When Jordan first conceived using hormonal therapy to target estrogen growth, he said the notion was laughable to many critics.

"Where we were 40 years ago was basically non-specific therapies, combination chemotherapies that tended to hurt the patient more than the cancer," said Jordan. "Combination chemotherapy was king. That was going to cure cancer...there was no place in the artillery for anything else."

At that time, shortly after Jordan finished his Ph.D., women diagnosed with breast cancer faced a bleak and uncertain future.

"When I started in the 1970s, if my mother had had the diagnosis of breast cancer, she would have died pretty quickly," he said. "There was no mammography, there was radical mastectomy, there was treatment in the last year of life. That was it."

Breast cancer treatment today looks vastly different, largely thanks to a stroke of imagination, a vision Jordan had to use a failed contraceptive to treat cancer. He admits the idea seemed "ridiculous" to many at the time, but the critics did not derail his determination. That failed contraceptive became tamoxifen.

"The drug wasn't my discovery, it's how you use it and that's the absolute key here. There are so many drugs that are thrown away because nobody could figure out how to use them," said Jordan. "It's being able to be the champion of something and building on your success."

Now Jordan will build on that success at MD Anderson, continuing his pioneering hormonal therapy work.

"His laboratory has made some very interesting observations about the biological pathways involved in estrogen that could be capitalized to develop newer and better treatments," said Tripathy. "We are very excited to have his brilliance here to continue our research trajectory."

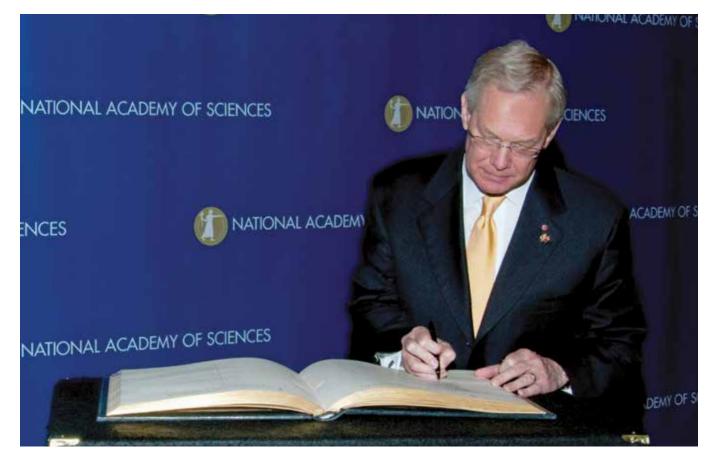
After over four decades of visionary discoveries in breast cancer research and treatment—from tamoxifen to the more recent raloxifene, a selective estrogen receptor modulator that prevents osteoporosis as well as breast cancer—Jordan's focus remains on future discoveries.

"Down in Texas we're going to absolutely spend the next five to ten years working on a hormone replacement therapy for women that will prevent breast cancer, will give them benefits, and will not cause cancer," said Jordan. As they spoke of a brighter future for breast cancer patients, both Jordan and Tripathy described MD Anderson, and the entire Texas Medical Center, as a hotbed of innovation in the field.

"I think the overall environment here is really an excellent one and one that will serve the people well," said Tripathy. "It's really all about making sure that we, little by little, eradicate cancer, and it's only going to come through coordinated effort."

Jordan echoed that sentiment, explaining the collaboration and powerful interactions between the laboratory, the clinic and the community at large drew him to MD Anderson.

"The secret for me was you have ideas, you prove you're successful, you have complete commitment and enthusiasm," he said. "This is the top place in the world where we can put the next range of ideas into action."



V. Craig Jordan, Ph.D., is inducted into the National Academy of Sciences.

ACCELERATING INNOVATION

By Amanda D. Stein



nnovation is at the center of what happens every day across the medical center—physicians problem-solve to treat rare diseases, researchers work on developing new drugs, and college students dream up devices to help young people with mobility issues.

During last year's strategic planning process, leaders from across the Texas Medical Center and Houston unanimously agreed that those great minds should have access to the resources and funding needed to help translate ideas into commercial products. Many exceptional inventors and entrepreneurs take their product ideas to the East or West Coast, where resources and funding are more readily available. And some great ideas never make it that far.

"While there have been great efforts to really help spur entrepreneurship in the city, very little money or resources have been dedicated to it in the same way as has been done in places like Boston, San Francisco, New York and Chicago," said Texas Medical Center Executive Vice President and Chief Operating Officer, William F. McKeon.

"Studies show the ratio of research dollars spent to commercial dollars

spent," he said. "The top areas of the country—like California or Boston—have a 6-to-1 ratio or 8-to-11 ratio, respectively. Texas has a 24-to-1 ratio. So while we're blessed by having this great campus with all these great assets, until now, we really had not dedicated the resources and time and money to coalesce that into one space."

Some of the most renowned life science clusters in the world are home to successful accelerators and incubators, added McKeon. In order for the Texas Medical Center to fulfill its charter, and also help retain and attract new talent to the city, it became clear that the community would need to collaboratively develop the space and resources to help great ideas reach the market.

"As part of the strategic planning process, there were five institutes that were identified as really straw proposals, the areas where we knew great research institutions around the world were really driving hard," said Texas Medical Center President and Chief Executive Officer Robert C. Robbins. "So we set out looking across these five institutes—genomics, health policy, innovation, regenerative medicine and

clinical research— and innovation was rated as the most important to member institution leadership."

The Innovation Institute design team was formed to help give shape to the vision.

"One of the recommendations that came from the strategic planning process was to create a space that would be a convening place for the bringing together of pharma with medical scientists and entrepreneurs," said George McLendon, Ph.D., the Howard R. Hughes Provost and Professor of Chemistry at Rice University.

McLendon served as co-chair of the Texas Medical Center's Innovation Institute design team.

"So the Innovation Institute space is the physical embodiment of that vision," he said. "As valuable as the space is, the people who create the innovation are the most important ingredient for success in building new companies that translate our basic research to sustainable clinical practice."

The October 9 launch of the accelerator—known as TMCx—marked the first of many programs and offerings for the Innovation Institute. Housed on the John P. McGovern campus (in the former Nabisco factory), the accelerator will offer young companies the resources and expertise they need to help mature their ideas.

Building on models proven successful by other accelerators around the country, TMCx features an open-concept workspace for those accepted into the program. There is also a staff of advisors available to help support with everything from business planning and development to conducting a market analysis and securing venture capital. There will also be a fund set up to help financially support strong proposals. Each team's unique needs will be identified upon their entry into the program.

"One thing that we've learned in an accelerator is that there is no such thing as a cookie cutter solution," said McKeon. "Some companies have management with great business expertise, other companies may have a scientist that has no business experience but understands their technology better than anyone.

"So the first phase of an accelerator is to objectively assess and understand each company's capabilities. Unlike almost all of the accelerators in the country, we do not take equity for the use of our space and resources. What we hope to see is that those companies who are successful with the help of TMCx will pay it forward. It's very much about creating a community-minded approach."

Texas Heart Institute Center for Technology and Innovation Director William Cohn, M.D., is well known for his work with heart assist and replacement devices, but many might be surprised to know that some of Cohn's best ideas have come to life in a workspace in his home garage. While Cohn has had great success with his work, there are many elements of commercialization that some innovators can never get past on their own—developing a business model, conducting a market analysis, finding investors, conducting clinical trials, filing for a patent. The demands can be daunting and time consuming, particularly for those whose innovations are side projects, worked on in their spare time.

"Even the greatest ideas can die in the minds of entrepreneurs who have never had the infrastructure or support We are doing this really for the best interest of Texas and going back to our founding charter, which was research, education and health in Texas. Those are the principles we were founded on, and we believe we are moving even closer to our mission by bringing these resource to Texas.

— ROBERT C. ROBBINS, M.D.

President and Chief Executive Officer of the Texas Medical Center

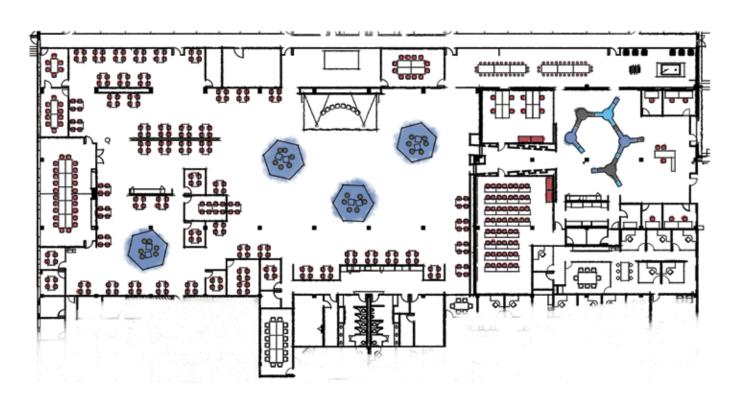
to help them along," said McKeon. "But on the other side of that, we see innovators here in the Texas Medical Center who have made remarkable strides with very limited resources.

"The fact that a great physician such as Dr. Billy Cohn is working out of his garage is emblematic of the problem. It means there are such great people who persevere to bring their ideas to market to benefit patients and their families that they will work out of their garages and out of their labs in places that are not really suitable to really do this in the best way possible," he added. "It shows you the entrepreneurship that needs to be unlocked here in the community."

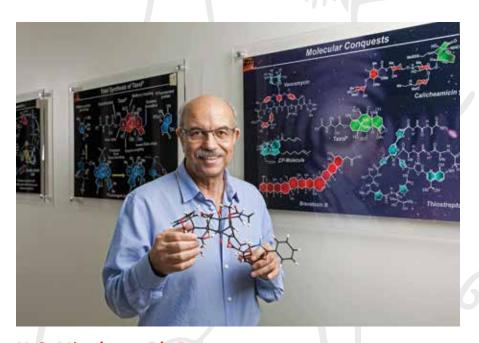
Beyond TMCx, there are other programs in the works for the Innovation Institute, including a robust curriculum, and a bio-design program designed to

target and address challenges faced by the medical community. The program will allow multidisciplinary teams to spend several months in hospitals within the medical center, identifying specific problems for which they can ultimately deliver tangible, real-world solutions—products, therapies or software. Similar programs are currently in place at Johns Hopkins University and Stanford University.

"We are doing this really for the best interest of Texas and going back to our founding charter, which was research, education and health in Texas," said Robbins. "Those are the principles we were founded on and we believe we are moving even closer to our mission by bringing these resource to Texas."



INNOVATORS IN THE TEXAS MEDICAL CENTER



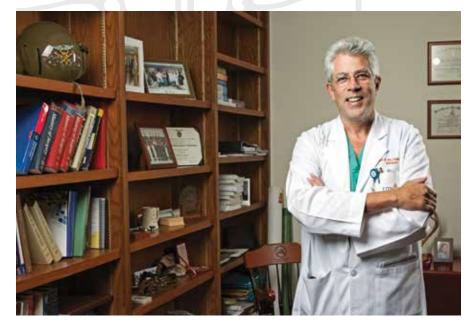
K.C. Nicolaou, Ph.D.

HARRY C. AND OLGA K. WIESS PROFESSOR OF CHEMISTRY AT RICE UNIVERSITY

Q | What resources were helpful to you when you were first starting out?

A | When I started my independent academic career as an assistant professor in 1976, my start-up package included \$20,000 for my research. My strongest resources were my students, the inspiration and support of my mentors, and my motivation to succeed. I spent my funds quickly without counting, despite the watchful eyes of the administration. Thankfully, it was not long before NIH rescued me through funding that increased steadily over the years until the recent de-investment in biomedical research. Those were the good old days when essentially all good science was funded. Unfortunately, nowadays it is much more difficult, especially for young faculty, to secure

the resources they need to establish their careers on the international scene. Indeed, the international leadership of the United States and the American dream are in danger of being eroded. I was one of those young students inspired by President Kennedy in the 1960s and one of those immigrants who benefited from the American dream. When I first came in 1972, America was on the move. We clearly need to reinvigorate education and science and create new opportunities for our young scientists to create and invent through visionary planning that includes significant increase in funding.



Col. John Holcomb, M.D.

VICE CHAIR, PROFESSOR AND CHIEF OF THE DIVISION OF ACUTE CARE SURGERY AT THE UNIVERSITY OF TEXAS HEALTH SCIENCE CENTER AT HOUSTON (UTHEALTH) MEDICAL SCHOOL

DIRECTOR OF THE MEMORIAL HERMANN TEXAS TRAUMA INSTITUTE

Q | What spurred your innovation?

A In 2003, the Surgeon General sent me to Iraq and asked me to figure out what was wrong and fix it. Turns out, his clinical systems were all disconnected. Helicopters weren't talking to the ground, this tent wasn't talking to that tent—there was a lack of coordination. We connected them into one Joint Trauma System that is now integrated. Linking clinical outcome data formed the backbone of our effort. It was a lot of work by a lot of people and we are pretty proud of it.

What spurred Decisio Health was really the angst of the electronic medical record (EMR). I wrote my first order on an EMR as a doctor in 1985. EMRs are good, but they slow things down. There is so much data generated, but we don't need all of it all of the time. EMRs aren't going away, so instead of whining about it, let's do something about it. Decisio Health displays the

actionable information on a 42-inch plasma screen above every patient. It becomes a good communication tool for the families to talk to the nurses and doctors and look up there and say, 'It's okay to be red; you were red yesterday. But, if it changes from green to red, then we want to know about that right away.'

Q | What advice would you give to other aspiring entrepreneurs or innovators?

A | For physician entrepreneurs, work on something that irritates you. If it irritates you as a clinician, then it's going to irritate other clinicians as well, and that means they will likely want to use it. Solve a problem, whether it is a clinical problem, a process problem or a device problem. Most of the time you are going to improve clinical outcomes

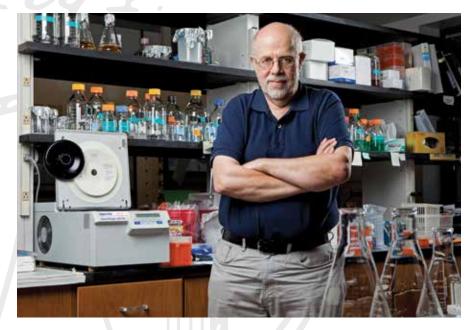
Q | What are the unique benefits of your innovation that make it a valuable solution?

A As I am approaching the translational process from an academician's point of view, I focus on discoveries that can have 'game-changing' effects and address needs that previously could not be practically solved. A potential example: collagen has a variety of biological effects and is often used in biomaterials and bioengineering. The protein is currently available as a slaughterhouse by-product, but its usefulness is limited by our inability to manipulate its properties. Our research team at the Texas A&M Health Science Center Institute for Biosciences and Technology made the discovery that bacteria can make collagen-like proteins. This represents a game-changer since the prevailing belief was that collagens could not be produced as a recombinant protein in bacteria. With our discovery,

recombinant 'designer collagens' can easily be made with specific biological properties and cues; and we are exploring using 'designer collagens' in a number of applications. This technology, which is currently in the innovation phase, serves as the bases for the start-up company ECM Technology.

Q | What advice would you give to other aspiring entrepreneurs or innovators?

A | The biggest piece of advice I would offer to aspiring innovators is to recognize that this is a team effort and that success depends upon the quality and compatibility of team members as much as the significance of the underlying discovery or innovation. The road from start to finish is long and winding and changes in direction and adjustments are needed throughout the journey.



Magnus Hook, Ph.D.

REGENTS AND DISTINGUISHED PROFESSOR AT THE TEXAS A&M HEALTH SCIENCE CENTER INSTITUTE FOR BIOSCIENCES AND TECHNOLOGY

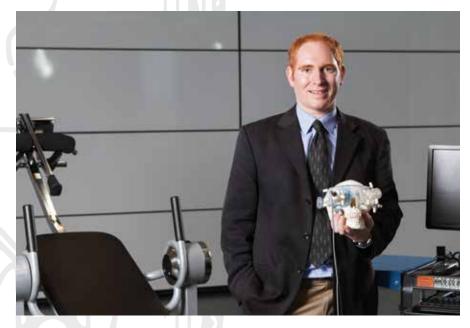
Q | What would you consider to be your most successful innovation?

A I am creating a bridge between multiple disciplines for clinical validation of novel biomedical technologies for space and earth medicine. Currently, I am helping to validate a new technology for measuring the intracranial pressure (pressure inside the skull) using non-invasive ultrasound energy.

Q | What spurred this innovation?

Recently, NASA scientists have determined that a majority of the astronauts on long-duration missions are developing visual changes that may be related to elevated pressure within the skull. Measurement of the intracranial pressure in outer space is crucial for understanding this condition, but currently the only way to measure the brain pressure is by placing an invasive catheter through

the skull. As a neurointensivist, I understand the importance of developing a non-invasive method for measuring the intracranial pressure not only for understanding the astronauts' condition, but also for many patients with neurological injuries on earth who may have traumatic brain injury, stroke or brain hemorrhage. After an extensive review of existing non-invasive ICP technologies, I identified the Vittamed ICP device as a promising technology that needed further evaluation. I then established an international collaboration with the Kaunas Institute of Technology, Kaunas, and also applied for grant funding from the National Space Biomedical Research Institute to clinically validate this device for possible use on the International Space Station.



Eric M. Bershad, M.D.

ASSISTANT PROFESSOR OF NEUROLOGY AND CENTER FOR SPACE MEDICINE AT BAYLOR COLLEGE OF MEDICINE / CHI ST. LUKE'S HEALTH-BAYLOR ST. LUKE'S MEDICAL CENTER



William E. Cohn, M.D.

PROFESSOR OF SURGERY AT BAYLOR COLLEGE OF MEDICINE

DIRECTOR OF CENTER FOR TECHNOLOGY AND INNOVATION AT TEXAS HEART INSTITUTE

CO-DIRECTOR OF CULLEN CARDIOVASCULAR RESEARCH LAB

STAFF CARDIAC SURGEON, DIVISION OF TRANSPLANT AND MECHANICAL CIRCULATORY ASSIST AT THE TEXAS HEART INSTITUTE

Q | What would you consider to be your most successful innovation?

A I've been fortunate to be involved in several impactful innovations. My four favorites are: 1) one of the first commercially available self-retaining coronary stabilizers for performing off-pump beating heart coronary artery bypass; 2) The SentreHeart LARIAT, a percutaneous system for excluding the left atrial appendage in patients with atrial fibrillation at risk for embolic stroke; 3) The TVA Medical percutaneous system for creating arterio-venous fistulas for hemodialysis access in renal failure patients; and 4) the granddaddy of all innovations, working closely with O. H. "Bud" Frazier on the first continuous flow total artificial heart. The artificial heart work has led to our current collaboration with the BiVACOR team to develop what we feel will ultimately be the first practical mechanical replacement for the failing human heart.

In each of these, I filed patents, created several iterations of prototype, performed extensive animal experiments and participated in first-in-man implementation. For the SentreHeart and TVA Medical projects, I hired a CEO, raised several rounds of venture capital, and created the companies.

Q | What advice would you give to other aspiring entrepreneurs or innovators?

A | The best advice I can give would be innovators or entrepreneurs is 'Drive it like you stole it.' There has to be a sense of urgency in your mission, and to achieve that you need passion. Passion takes energy to maintain, so surround yourself with brilliant, high-energy, like-minded people who believe in your mission. If you don't have that, you're better off selling shoes.



Jeffrey D. Frey

DIRECTOR OF DIGITAL EXPERIENCE AT THE UNIVERSITY OF TEXAS MD ANDERSON CANCER CENTER

Q | What would you consider to be your most successful innovation?

A Building a culture of innovation. Though I could answer with a new technology for building nuclear submarines, an alert system for notifying administrators of their at-risk student populations or devices to enable and monitor chronic disease prevention... my 'most successful innovation' is how I have been able to help build a culture of innovation in the organizations I've had the privilege to be a part of.

A culture of innovation, in my mind, is the best innovation anyone can engage in because it well outlives a single application or widget. Innovation slowly gets embedded into the non-communicated values and subconscious behaviors of employees. In information technology, this at first requires deliberate actions like adding 'innovation' as part of a strategic plan and creating processes to deal with

new ideas. It's not easy, but I've repeatedly enabled the integration of innovation into the cultures of several IT organizations, while in parallel, organizing and maintaining a structured and productive environment.

The benefit is obvious. The innovative mindset takes hold and unique ideas proactively come from all over. These ideas were always there, but now they surface and the organization is set up to accept and enable them. For example, we're currently innovating around our digital patient experience at MD Anderson. Once a broad overview of the vision was communicated, and a process for helping people articulate their ideas instituted, well thought out and executable concepts surfaced immediately...some of them I can genuinely say are new ways of thinking about how patients interact electronically with their cancer treatment.

Q | What would you consider to be your most successful innovation?

A | A class of anti-cancer compounds called phosphaplatins that has the potential to treat a variety of cancers, including metastatic cancers. I consider that class of compounds as the most successful innovation that came from my laboratory over the last 30 years or so.

Q | What spurred this innovation?

A It was kind of a grand vision when I started this project. I was trying to create a class of affordable and less toxic cancer drug that would have a broad impact in society. So that's the motivation. Failure after failure over many years taught me a lot about how to design a more effective cancer drug. In fact, my last approach for developing this kind of therapy really started when we began to understand the human

genes, the implications of the mutations, and what causes cancer and what stops cancer.

So the motivation, as you asked, came from different angles. The human suffering is number one, number two is the affordability of cancer drugs, and number three is reducing the toxicity of those cancer drugs so that people can really get a treatment without experiencing severe side effects.

Q | What drove your determination?

A | Mostly it is the human suffering. If you look at the distribution of cancer patients all over the world, 40 percent or more of cancer patients are in Asian countries. And their annual income isn't enough to even get a chemotherapy treatment for a month.



Rathindra N. Bose, Ph.D.

PROFESSOR OF BIOCHEMISTRY AND BIOLOGY

VICE CHANCELLOR FOR RESEARCH AND TECHNOLOGY TRANSFER FOR THE UNIVERSITY OF HOUSTON SYSTEM

VICE PRESIDENT FOR RESEARCH AND TECHNOLOGY TRANSFER AT THE UNIVERSITY OF HOUSTON

Q | What would you consider to be your most successful innovation?

A If the measure of success is the ability to help patients, then several projects qualify. Examples are a wheelchair modification project, a robotic assistive arm, a game-based rehabilitation device for children with cerebral palsy and an instrumented dexterity test.

Q | What spurred this innovation?

A | The impetus for all of my projects is the same—the desire to provide better care for my young patients, either in their medical evaluation and treatment, or simply in their daily life.

Q | What are the unique benefits of your innovation that make it a valuable solution?

A For the wheelchair project, it was the fact that the chair's manual propulsion system was completely customized to the patient's very specific—and very limited—range of motion.

Q | What resources were helpful to you when you were first starting out?

A The outstanding engineering professors, students and staff at the Oshman Engineering Design Kitchen at Rice University have always been integral to these projects.

Q | What advice would you give to other aspiring entrepreneurs or innovators?

A I have two bits of advice: one is to never accept the status quo. Just because something is considered 'good enough' or 'all there is' doesn't mean you can't make it better. Second, a team with complementary skills can accomplish more than a single individual, so develop multidisciplinary collaborations.



Gloria Gogola, M.D.

PEDIATRIC HAND SURGEON AT SHRINERS HOSPITALS FOR CHILDREN-HOUSTON



Audrius Brazdeikis, Ph.D.

RESEARCH ASSOCIATE PROFESSOR

HEAD OF THE BIOMEDICAL IMAGING GROUP AT THE TEXAS CENTER FOR SUPERCONDUCTIVITY AT THE UNIVERSITY OF HOUSTON

Q | What would you consider to be your most successful innovation?

A Perhaps the most widespread misconception is that innovation equals technology. Innovation is an ongoing process that identifies untapped opportunities to create value and impact. My most successful innovation brings together the academic, clinical and enterprise elements to solve health care challenges through novel application of nanotechnology and advanced magnetic sensors. The most rewarding aspect of this endeavor has been taking our original idea and seeing it through to market introduction, championed by UH spinoff, Endomagnetics Ltd.

This collaborative research project with UCL, which was originally funded by the Texas/United Kingdom Bioscience Initiative program, has resulted in developing a hand-held magnetic probe that can be used in conjunction with a magnetic nanoparticle tracer to quickly and easily locate the sentinel lymph node for biopsy in cancer patients.

Q | What are the unique benefits of your innovation that make it a valuable solution?

A | The current practice of using radioisotopes to stage cancers presents hospitals with an expensive logistical burden, requiring time and resources to be devoted to nuclear medicine in what is otherwise a routine procedure. Mandatory waste disposal regulations, training and licensing of surgical staff add to the overhead. Short half-life of the radioisotope presents additional challenges and limitations for surgery scheduling. Finally, the patients themselves are often anxious about nuclear medicine, along with the fact that the injection itself is painful.

Our innovation embodies a disruptive technology, which relies on a detection system based on magnetics rather than radiation. It completely removes radioisotopes from the operating room, but without changing clinical procedures or outcomes.



Rabih Darouiche, M.D.

VA DISTINGUISHED SERVICE PROFESSOR OF PHYSICAL MEDICINE & REHABILITATION, MEDICINE, AND SURGERY AT BAYLOR COLLEGE OF MEDICINE / MICHAEL E. DEBAKEY VETERANS AFFAIRS MEDICAL CENTER HOUSTON

Q | What are the unique benefits of your innovation that make it a valuable solution?

A Infection of cardiac implantable electric devices is associated with major morbidity, can result in death, and is very expensive to manage. The purpose of the Absorbable Antibacterial Envelope is to stabilize and prevent migration of the pacemaker/defibrillator as well as reduce the incidence of infection of the cardiac implantable electric devices. This is achieved by placing around the cardiac implantable electric device a resorbable mesh that is coated with a polymer, which contains antibiotics active against the vast majority of pathogens that could cause infection of the pocket that contains the implanted generator, cardiac valves, and bloodstream. The Absorbable Antibacterial Envelope is a resorbable mesh that is placed around cardiac implantable electric devices at the time of placement of pacemakers and defibrillators.

Q | What resources were helpful to you when you were first starting out?

A Taking into consideration that policy indicates that all of our inventions are assigned to the employer, we were fortunate to convince the Baylor Licensing Group to do due diligence for our first invention then have an external patent lawyer assess the invention and submit to the United States Patent Office. Establishing partnership with industry is very essential as long as preliminary data are very promising.

Q | What advice would you give to other aspiring entrepreneurs or innovators?

A I would humbly provide aspiring innovators the following advice: 1) It would be proper and more productive to assign the rights of potential patents to the employer; 2) Do not give up on a promising project; and 3) Discuss with and seek assistance from the very professional Baylor Licensing Group; 4) Don't give up if you get rejected. The first is the hardest!

Q | What spurred your innovation?

A It was a blind date. There's no joke in that. A mutual friend said to us, 'Bobby and Jan, you guys need to meet for coffee.' And we met for coffee and started talking. What made that blind date possible was a shared vision: bringing together technology and health care around this purpose. Jan has had that vision for a long time. That's why we hit it off so well on that initial date, because I had been thinking about it too.

My background of course, I was an astronaut for eight or nine years prior to returning to medical practice full time. One of the things that NASA did was use technology to take care of people in extreme environments, astronauts in particular. Many people give them credit for inventing telemedicine.

So that was a seed planted in my head when I was there. And I said, 'Wouldn't it be great to use this in a much broader sense and specifically in cancer care?' There's a lot of demand for that, especially nowadays.

With people surviving longer from cancer, it's just human nature to look for more convenience. That's part of the thing driving the demand. The other demand is that there are huge populations that are underserved, and with the Internet, they know that they are underserved. They know that they don't have access where they should have access to specialized care, like at MD Anderson. So this was a shared vision. We both arrived at the same point, coming from different sub specialties. That's what makes a marriage.



Robert (Bobby) L. Satcher Jr., M.D., Ph.D.

CO-DIRECTOR OF ELECTRONIC HEALTH RESEARCH INSTITUTE
FACULTY MEMBER IN THE DEPARTMENT OF ORTHOPEDIC ONCOLOGY
AT THE UNIVERSITY OF TEXAS MD ANDERSON CANCER CENTER

Q | What would you consider to be your most successful innovation?

A We developed several technologies that speed and improve DNA analysis. In recent years, the development of DNA capture technologies for isolation of human gene regions from whole DNA has had the largest impact.

Q | What spurred this innovation?

A | The need to have inexpensive but accurate DNA sequencing assays has driven our program for nearly three decades.

Q | What are the unique benefits of that innovation that make it a valuable solution?

A | With new technologies and lower costs for raw sequence data, we can envision a 'whole exome test' where we get sequence for all the gene regions

from a patient, for less than \$100. We are still some way off, but there is no reason this can't be achieved.

Q | What resources were helpful to you when you were first starting out?

A | The rich intellectual environment of the Texas Medical Center and the spirit of scientific entrepreneurialism!

Q | What advice would you give to other aspiring entrepreneurs or innovators?

A Work hard.



Richard Gibbs, Ph.D.

DIRECTOR OF THE HUMAN GENOME SEQUENCING CENTER AT BAYLOR COLLEGE OF MEDICINE

INDUSTRY SPOTLIGHT



PORT OF HOUSTON AUTHORITY **CHAIRMAN JANIECE LONGORIA** SAT DOWN WITH TEXAS MEDICAL CENTER EXECUTIVE VICE PRESIDENT AND CHIEF STRATEGY AND OPERATING OFFICER WILLIAM F. McKEON TO DISCUSS THE 100-YEAR-OLD FOUNDING VISION THAT LED TO THE 52-MILE CHANNEL, AND THE FUTURE PLANS THAT WILL CONTINUE TO DRIVE **GROWTH AND EXPANSION OF** THE GULF COAST'S TOP CONTAINER PORT.

Q | Can you tell us about your formative years?

A I was born in McAllen, Texas, and our home was in Pharr, a town in the Rio Grande Valley. When I was growing up there in the '50s and '60s, it was very different from how it appears now. It was mostly agrarian and there were citrus groves as far as the eye could see. The weather was quite different, as well. Thunderstorms would roll in during the summer from the Gulf of Mexico, and it was verdant and lush with cultivated farm land. Most of the businesses were locally owned. There was little concern for safety or crime. Much of the farmland is now gone, along with the citrus industry. Local-owned restaurants and businesses are now far and few, and the valley is a bustling region that looks as homogeneous as the rest of the state.

So as a young child did you know early on that you would follow in your father's footsteps and attend UT Law?

A I always knew I would attend The University of Texas. Both of my parents attended UT, and that is where they met, so everyone in my family is a Longhorn. When I was young, my father took me to the courthouse, so I was exposed the idea of being a lawyer from a young age. My mother was also a lawyer, so it is natural that I would choose that path. My father was a member of the state legislature for 27 years, and we were in Austin often. Coming from Pharr, Texas, I thought that Austin was the most beautiful and exciting city that could exist. I knew that I would attend The University of Texas in Austin, and after finishing undergraduate school, it was a natural progression to attend The University of Texas School of Law.

Q Are you more like your father or mother?

A My father was a talented politician and very engaging. He was a born public servant and worked tirelessly to help others and to improve conditions in the Rio Grande Valley. He and my mother were strong advocates for education, and worked on many initiatives to support education for the Rio Grande Valley. My mother was a very optimistic person, a great thinker, and the glue that held our family together. I inherited her steadfast nature, her love of learning, and her analytical skill. I inherited my father's love of public service, and his sense of humor. I hope that I reflect a blend of both of them.

What was UT law like before? I know you are very active as a regent. What was it like as you were first walking through those halls, compared to now?

A I was a regent for the University of Texas System, and rolled off the Board of Regents in February 2011. My time as a regent was one of the most rewarding chapters of my professional career.

I am grateful for the opportunity that I had to study at The University of Texas, and at The University of Texas School of Law, two first-class institutions of higher learning. I consider it the greatest honor of my professional career that I was honored by the Texas Exes as a Distinguished Alumnus in 2013. I am a founder of the Center for Women in Law, and the Kay Bailey Hutchison Center for Business and Energy, at The University of Texas School of Law. The difference between my time as a student and now is a span of time that feels like the blink of an eye.

What brought you to Houston?

A | A good decision. In-state opportunities for law school graduates were in Houston or Dallas. I wanted to practice litigation and my father suggested that I apply for a position at the Harris County District Attorney's Office as that would be the best way to get trial experience. I tried countless cases in both misdemeanor and felony courts. In representing the victims of crime, I never had any doubt about the importance of the mission.

I know you're passionate about leadership and mentoring women leaders. Can you share a little bit about your experience?

A When I'm speaking to groups of younger people, I remind them that they are the architects of their future, and that their future is theirs to create. I also suggest that they avoid any preconceived idea of what a mentor should look like. A mentor can be either gender, younger or older, and of any race or ethnicity. I have had many in my life, and still value the input that I get today from many people whose ideas I respect. You never know who might give a piece of advice that turns out to be helpful, so it pays to listen carefully to people that cross your path. That has happened throughout my life. There have been, and continue to be, generous people that have come into my life and helped me shape my future. I am very grateful.

What lead to you becoming the chair of the port?

A | It is a great privilege to be leading the Port of Houston Authority at this pivotal time in its history. The Houston Ship Channel opened on November 10, 1914, and we are celebrating its centennial this year. The Port of Houston, just like the Texas Medical Center, is a huge driver of our local, regional and state economies. I have often said that when you power a good idea with effective partnership, there is no limit to what can be accomplished. The Port of Houston is a prime example. The visionary civic and business

leaders that championed the dredging of a 52-mile deep-water channel from the Gulf of Mexico to the fledgling community of Houston a century ago understood the importance of having a marine link to the world, so that Texas' commodities could be traded throughout the world. But the realization of their bold idea to dredge the Houston Ship Channel has brought Houston, this region, Texas and the nation much more than those early visionaries could have imagined.

Because of that bold idea and an effective cost sharing partnership to dredge the channel, the Port of Houston hosts the largest petrochemical complex in the nation; Houston has grown to be the fourth largest city in the nation and the premier exporting metropolitan region; and Texas has been recognized as the leading export state for 13 years in a row. We will continue to grow the enterprise and our future opportunity in alignment with our significant strengths that include our strategic location on the Gulf Coast, the strength and continued growth of the industry along the Houston Ship Channel, regional population growth, our consumer reach, and the quality and scale of our infrastructure.

The story I heard was that a number of hurricanes that had wiped out Galveston led to the port in Houston. Is that true?

A | Certain events came together at the same time to make the dream of a deep-water port for Houston a reality. Early visionaries had been arguing in the mid-19th century for a deep-water port for Houston. There was agricultural export in the region that was barged on the Bayou from Houston to Galveston to be loaded onto ships for export. The early proponents of a deep-water channel could not get immediate traction for the idea of dredging a 52-mile channel from the Gulf of Mexico to Houston because of the expense of dredging a 52-mile channel, especially in light of the fact that Galveston was on the Gulf and a robust export port. Then came the storm of 1900 that killed thousands and virtually wiped out the Port of Galveston, making the argument for a protected inland port more attractive. Shortly after, in 1901, the discovery of oil at Spindletop created additional impetus for a deep-water channel because of the need to move prolific supplies of oil. So those two factors, along with increasing exports of cotton and lumber, created additional traction for the idea in Congress. However, there was still the thorny problem of how to fund such a project. Our local congressman, Tom Ball, for whom the town of Tomball is named, came up with a revolutionary funding concept. With the support of local citizens who agreed to fund half the cost of dredging the channel through the issuance of local bonds, he proposed to Congress the model of private citizens bearing half the cost of the new waterway. When Tom Ball proposed the idea to the other members of Congress, they were so impressed that the local citizens were willing to pay half the cost that they

immediately approved the concept. It was called the Houston Plan, and a local match for federal funding is still the model in place today for waterway projects.

U How deep is the channel? Is it consistently deep in all 52 miles?

A The channel is authorized to be 530 feet wide and 45 feet deep, but it is constantly silting from the drainage of rivers and bayous into the channel. Only six to ten percent of the channel is at its authorized depth of 45 feet at any given time. Maintenance dredging of the Houston Ship Channel is a challenge, and we work constantly to manage this. It costs approximately \$50 million per year to keep the channel properly maintained at its authorized depth of 45 feet. Approximately \$100 million in harbor maintenance tax is collected from users of the channel. That tax is put into the Harbor Maintenance Trust Fund, and re-appropriated by Congress for waterway maintenance and other general purposes. We receive approximately \$25-30 million per year in appropriations for our channel maintenance. So we are receiving a fraction of what is collected and a fraction of what we need to maintain the Houston Ship Channel. We constantly advocate for a federal solution for this issue. Certainly we make the case and our congressional delegation to a person is supportive of the Port of Houston and our maintenance dredging needs. We will continue to advocate that the law be modified to assure that Harbor Maintenance Tax funds are used for their intended purpose—the maintenance of our waterways and harbors.

| How long did it take them to dig the ship channel?

A It took approximately a decade to dredge the 52-mile Houston Ship Channel. The Channel was opened on November 10, 1914, and came into being the same year that another marvel of human ingenuity was accomplished: the Panama Canal. The Panama Canal celebrated its centennial in August of this year. It is appropriate that during this centennial year for both the Panama Canal and the Houston Ship Channel, that we are both expanding to move into the second century of opportunity.

What's your vision over the next five to 10 years?

A To set the context, yearly, 8,000 ships move through the Houston Ship Channel and there are 200,000 barge transits. We are strategically located on the central Gulf Coast as the gateway to the Heartland of America. We have a huge consumer base locally, and within 1,000 miles of our port, we can reach over 140 million consumers. We are blessed with the highest quality infrastructure, and local ingenuity and know how. We are blessed with a great labor pool that works cooperatively with industry. We are innovative and responsive.



So we continue to look for opportunities that are aligned with our significant strengths. As we look to the future, we are undergoing a petrochemical manufacturing renaissance along the Gulf Coast because of prolific quantities of shale gas for feedstock. Our petrochemical industry partners are investing \$35 billion in additional manufacturing infrastructure through 2015, and have advised us that they expect their exports of plastic resin and other petrochemical products will double or triple in the next two to five years.

So of course we are getting ready for that expanded opportunity for exports. We are dredging our facilities at both the Bayport and Barbour's Cut container terminals to meet the need to accommodate larger ships that can carry more containers. We are also investing \$700 million dollars at our older Barbour's Cut

Container Terminal to double the container handling capacity of the terminal in its existing footprint, and to purchase larger cranes for the handling of cargo on larger vessels. We also continue to build out Bayport to assure that we are ready to meet growing cargo demand—both export and import—through the Port of Houston Authority.

We are also actively promoting the growth of retail cargo through the Port of Houston. Because of a rapidly growing regional population, and our consumer reach, we believe that we are a very attractive port for additional retail cargo and retail distribution centers.

Another opportunity is to expand refrigerated cargo imports. The Port of Houston currently serves as a gateway port for containerized refrigerated cargo on a very small scale. When you consider the size and continuing growth of our consumer base, and our



strategic location, it is imperative that we expand this business line to get produce and refrigerated goods to our consumer base more efficiently. Again, additional refrigerated cargo growth will also spur distribution and warehousing opportunities and additional jobs for our region. For the Port of Houston to capture a larger share of this cargo, the port region needs more refrigerated warehouse space. To address this need, the Port Authority recently released an RFP for cold storage and warehousing at the Bayport Container Terminal and has received several proposals that are currently being evaluated.

We also work to balance business with environmental stewardship. I have been advocating the conversion of truck fleets in our region to the use of compressed or liquefied natural gas for two reasons First, it helps drive demand for a domestically produced resource, and as a cleaner burning alternative, it contributes to clean air initiatives for our region. To move this idea forward, the Port of Houston Authority has issued a Request for Proposals offering a parcel of land on Port Road near the Bayport Container Terminal for the construction of an LNG/CNG fueling station. Four thousand trucks per day call on our container terminals, and we hope that a natural gas fueling station on Port Road will help spur conversion.

We also stay at the forefront of innovation and technological enhancements to assure that we can meet rapidly growing needs. For example, the Port Authority installed optical character recognition (OCR) at our container terminal truck gates. OCR technology, along with our new gate system, facilitates automatic gate processing, ultimately reducing or eliminating truck wait time. The integration of gate, yard and vessel operations at the Port Authority has reduced truck turnaround times, improving efficiency for our customers and reducing emissions. In addition, we introduced a new mobile app that allows truck drivers to use their smart phone to check on the status of the container that they need to retrieve, improving efficiency and eliminating truck idling at the gate.

Q | Many people may not realize that the port extends 52 miles inland, and not far from downtown Houston. How does the word get out of all of the great things that you do here?

A | Scarcely seven miles from downtown Houston, lies the Port of Houston Turning Basin. The Port of Houston is the top break bulk port in the nation, the top port in the nation for foreign waterborne tonnage and the top container port on the Gulf Coast. And yet, it is not readily visible because of our topography. Centennial activities that will engage the public about the importance of the Port include a PBS documentary and television special, an educational

curriculum guide for high school students, the "Stories of a Workforce" exhibit at the Julia Ideson Building, and a centennial commemorative book. In addition, Promote HSC 2014 will host a re-dedication ceremony on November 10th to commemorate the historic date when President Woodrow Wilson fired a cannon via remote control from his office in Washington, D.C., to officially mark the opening of the Houston Ship Channel on November 10, 1914.

What does a typical day look like for you?

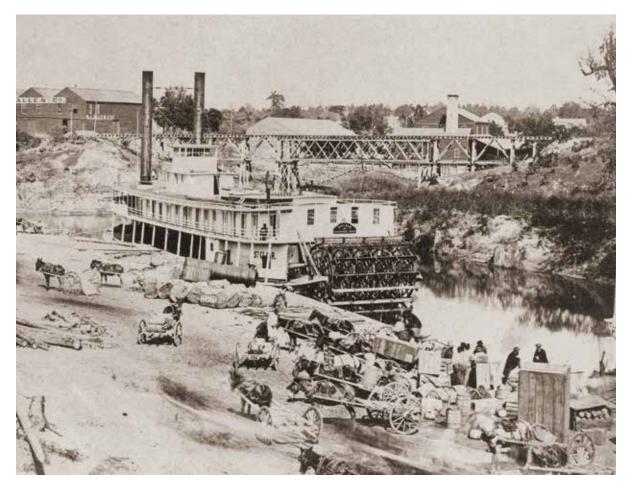
A | As chair, it is my role to lead the Commission, and together with the Commission to provide guidance to the Port of Houston Authority staff in their execution of strategic initiatives. I spend much of my day at the Port of Houston Authority offices working with our Executive Director Roger Guenther and other staff

members. I frequently present to chambers of commerce, businesses, industry conferences and many 501c3 organizations. I also work to build positive relationships with our elected officials, industry stakeholders, labor and community groups. I am available 24/7 since the Port of Houston never sleeps.

Q Any closing thoughts?

A | As we celebrate the centennial of the Houston Ship Channel it is appropriate to pause and give thanks, and to remember the great legacy that has been entrusted to us—a legacy that has fueled our economy for 100 years, and that will drive our expansion through the next century. Let's continue to work together to assure that the second century of the Houston Ship Channel and the Port of Houston is as remarkable as the first.

The visionary civic and business leaders that championed the dredging of a 52-mile deep-water channel from the Gulf of Mexico to the fledgling community of Houston a century ago understood the importance of having a marine link to the world, so that Texas' commodities could be traded throughout the world.



(Credit: The Port of Houston Authority)

Hearts of Gold

More than 300 guests gathered for an evening celebrating exceptional women in health and science

By Alex Orlando



Honoree Nancy W. Dickey, M.D., and Karen Tellepsen, co-chair of the Hearts of Gold Gala, share a moment on stage.

n award-winning researcher whose scope of involvement is as expansive as her ambition, encompassing everything from education to research to health policy. An educator and director, breaking through the barriers to interdisciplinary collaboration while synergizing efforts that had previously been fractured. Two trailblazers who sought to help physicians articulate their opinions with clarity and precision, launching a new discipline in the process. A neurologist whose lab is taking an integrative approach to the study of early developmental disorders, using patients' own cells to re-create human neurons outside of the body. A president of a renowned health science center and an instrumental figure in expanding its programs and services to the surrounding community, delving into previously uncharted waters.

The list could continue endlessly. It's no secret that the Texas Medical Center, and Houston in general, is brimming with talented and accomplished individuals, many of them pioneers in their respective fields. On September 19th, The Health Museum hosted the

Hearts of Gold Gala, honoring 23 women for their contributions to health and medical science. Held at Hotel ZaZa and emceed by local news anchor Gina Gaston, the gala featured an evening recognizing a few of the noteworthy and impactful women of the Greater Houston area.

"We started thinking about all of the women that we have in the medical center who have been huge contributors in improving science and medicine," said Elizabeth Torres, M.D., co-chair of the Hearts of Gold Gala and president of the Harris County Medical Society. "We saw that there was an extraordinary group of individuals who have been pretty much working quietly, accomplishing great works in different areas, and the idea was to honor these women and the strides that they've made in their respective arenas."

"The Health Museum prides itself on engaging the greater Houston community with health and science education," added Karen Tellepsen, co-chair of the Hearts of Gold Gala and chairman of The Health Museum Board of Directors. "Notable women like those being honored at this year's gala have made significant contributions in health and medicine and we are privileged to recognize their accomplishments."

According to Torres, distilling a list of notable honorees from the collective pool of talent in Houston was not an easy feat. "There are so many people who are deserving of recognition for what they've done, but we tried to select a group of people that provided a cross section of the work being done at various organizations in Houston and the medical center," she said. "There are so many different honorees, from basic science to advances in genomics, and our focus was to honor them while providing inspiration for young students, showcasing the wealth of possibilities in science

and medicine." Ultimately, honorees were chosen for their contributions to health through patient care and safety, research, teaching, leadership, publication and community service.

For honoree Nancy W. Dickey, M.D., president emeritus of the Texas A&M Health Science Center, navigating unexplored territory in leadership was just part of the ebb and flow of her career trajectory. "It was more of a serendipitous journey than a planned destination," she laughed. A family physician who delivered over 4,000 babies throughout the course of her career, Dickey's desire to impact medicine on a broader level than daily patient care led her to the American Medical Association (AMA). In 1997, after serving for a year as chair of the board of trustees, Dickey was elected the first female president of the AMA. One of her first recommendations, a proposed patient's bill of rights, is emblematic of her efforts to redefine and reshape medical care in the United States through the privileged perspective of a practicing physician.

"One of the joys and frustrations of family medicine is its very broad basethe perspective of looking not through a telescope, but at the entire breadth of issues, is a perspective that I have carried with me into academics," said Dickey, who assumed the role of president of the Texas A&M Health Science Center and vice chancellor for Health Affairs of the Texas A&M University System from 2002 to 2012. "The fact that I had spent the overwhelming majority of my career in private practice means that while I had to listen carefully to the academic perspective, which was new, I could bring a viewpoint that many lifelong academics had not experienced."

Nelda Wray, M.D., MPH, co-director of Houston Methodist's Center for Outcomes Research and a full member of the Houston Methodist Research

Institute, is another honoree with a career similarly characterized by her expansive ambition and sphere of influence. "I began my career educating medical residents, but at a certain point, I wanted to have more of an impact on the improvement of medical care than just training residents—I wanted to have a greater effect nationally on quality of care," she said. "There's a great joy in synthesizing teaching and implementation, but there's a greater joy in creating new information." After branching out into research, Wray served as the founding director of the Health Services Research and Development Center of Excellence at the Michael E. DeBakey VA Medical Center as well as the first section chief of Health Services Research at Baylor College of Medicine.

Throughout her career, Wray has filled a plethora of important policy roles, ranging from an appointment to the Texas Board on Aging, courtesy of Governor George W. Bush, to serving on the National Advisory Council for the U.S. Agency for Healthcare Research and Quality. "Once I went from education and training to research, it seemed that I needed to expand from research into policy to have the effect I wanted," she said. An award-winning researcher, Wray joined Houston Methodist Research Institute in 2008 after a long career at Baylor College of Medicine, where she served as professor of medicine and medical ethics.

Honoree Mary C. (Cindy) Farach-Carson, Ph.D., Ralph and Dorothy
Looney Professor of Biochemistry and
Cell Biology at Rice University and
scientific director of the BioScience
Research Collaborative (BRC), serves
as another testament to the benefits
of expanding the extent of your exposure. "When I was getting close
to being 50 years old, I had one of
those, 'Is this all there is?' crises.

I was an accomplished researcher and teacher, but I wanted the opportunity to do something totally different," she said. "I realized that, despite the fact that I'm the daughter of a physician and a nurse practitioner, I had never spent time in a medical institution, walking the walk of a clinician. How could I truly know the influence I was having?"

During her first full-time sabbatical, Farach-Carson, also vice provost for translational bioscience at Rice University, had the opportunity to spend some significant time at a county community hospital group in Delaware. When she returned, she was "bilingual"—a self-professed convert to translational research—a perspective that she incorporated into her work at the University of Delaware, where Farach-Carson founded the Center for Translational Cancer Research. When she came to Rice in 2009, she was spurred to provide scientific leadership and vision for the BRC, and energized to foster an atmosphere of interdisciplinary and translational research. "With our programs, it's about synergizing parallel efforts," said Farach-Carson. "We haven't tried to create so many new plants rather than feed and water the ones that are there, and put them in the same garden when they need to be. It's about tending all of those elements."

Weaving together different disciplines into the fabric of translational research is a major emphasis for honoree Mirjana Maletić-Savatić, M.D., Ph.D., neurologist in the Department of Pediatrics at Baylor College of Medicine and at the Jan and Dan Duncan Neurological Research Institute at Texas Children's Hospital. Leading an interdisciplinary team, composed of everyone from mathematicians to chemists, Maletić-Savatić is focused on developing an integrative approach to the study of early developmental disorders, such as autism.



66 I think that having women, and anyone who breaks the mold, historically, in leadership positions is an opportunity to sensitize colleagues at the senior levels that there are more similarities than differences. 99

— NANCY W. DICKEY, M.D.

President Emeritus, Texas A&M Health Science Center



TOP: Mary C. (Cindy) Farach-Carson, Ph.D., left, one of the 23 women being recognized for her contributions to health and medical science, catches up with a colleague.

BOTTOM: An informational booth courtesy of The Health Museum showcased the evening's emphasis on paving the way for younger generations. (Credit: OMP)

TO VIEW THE FULL LIST OF HONOREES FROM THE HEARTS OF GOLD GALA,

VISIT TMCNews.org





TOP: Elizabeth Torres, M.D., far left, served as co-chair for the Hearts of Gold Gala, an event that honored women in health and science. (Credit: OMP) BOTTOM: Mirjana Maletić-Savatić, M.D., Ph.D., right, was among the honorees.

66 There are so many different honorees, from basic science to advances in genomics, and our focus was to honor them while providing inspiration for young students, showcasing the wealth of possibilities in science and medicine.

> - ELIZABETH TORRES, M.D. Co-Chair of the Hearts of Gold Gala and President of the Harris County Medical Society

The team uses patients' own cells to recreate human neurons outside the body and learn ways to diagnose developmental disorders much earlier in a child's life. Maletić-Savatić and her team are especially interested in a phenomenon called neurogenesis the process of the formation of new neurons in the brain.

"No man is an island," she said, referring to the diversity of her lab's expertise. "We cannot know everything, and one of my mottos is that 'I can never know enough,' so I assume that everyone is smarter about something than I am. I always listen to everyone. People have different types of expertise and look at the same problem in sometimes surprisingly novel ways. I always try to emphasize how important it is to understand at least basic elements of different fields of science; joining expertise across the board is essential if you want to create reproducible and long-lasting results."

Communicating across different levels of expertise is a pursuit that would define the career of Lois DeBakey, Ph.D., professor of scientific communication at Baylor College of Medicine. Alongside her sister Selma, DeBakey launched an entirely new discipline, scientific biomedical communication, which encompassed critical reasoning, writing, editing, publishing, oral presentations, ethics and other related subjects. In the sixties, their courses at Tulane University School of Medicine represented the first curriculum-approved instruction in this field in any medical school—they have worked at Baylor College of Medicine since 1968.

"The purpose of medical writing and speaking is communication," said DeBakey. "Lucid, concise, readable

prose is easier to digest and interpret than ponderous logorrhea [excessive or stilted wordiness]. As Selma and I reviewed medical publications, replete with jargon, clichés and frozen forms, humorous images appeared in our minds of the literal depiction of the language used. We realized that was a useful didactic tool to relax our students and open their minds—it worked, and our classes were fun for both teachers and students. The courses became extremely popular, and we had more invitations nationally and internationally than we could accept.

"Genuine role models are always an asset if they motivate, stimulate, and inspire young people to think clearly, read critically, and adopt habits of honesty, integrity, compassion and altruism," she added, speaking to the potential of the Hearts of Gold Gala to incite enthusiasm for medicine and science, and learning in general, among younger generations of women. The success of the honorees in attendance helped pave the way for aspiring physicians and researchers.

"Somebody said to me once that being the first is less important than ensuring that there's a third and a fourth and a seventh and an eighth," reflected Dickey. "Being first, you are exclusively aware that if you don't perform satisfactorily, you will make it more difficult for someone else to come along. The opportunity to work side by side with someone of a different gender or race might painlessly address some preexisting biases. I think that having women, and anyone who breaks the mold, historically, in leadership positions is an opportunity to sensitize colleagues at the senior levels that there are more similarities than differences."

A Lasting Legacy

Renowned trauma surgeon and local icon "humbled beyond words" to have an elementary school named in his honor

By Alex Orlando

hroughout his career as a trauma surgeon for The University of Texas Health Science Center at Houston (UTHealth) Medical School, James "Red" Duke Jr., M.D., has repeatedly made his mark on history. An instrumental figure in establishing the Memorial Hermann-Texas Medical Center trauma program in 1972, Duke later played a pivotal role as founding director of Memorial Hermann Life Flight, the renowned air ambulance program for which he still serves as medical director. As a result of the nationally syndicated Texas Health Reports, which educated millions about topics ranging from kidney stones to injury prevention, he became one of the most recognized personalities in his field.

On September 7th, representatives from Alvin Independent School District (ISD), Memorial Hermann-TMC, UTHealth Medical School and the Pearland, Alvin and Manvel communities gathered to celebrate the official dedication ceremony of the Dr. James "Red" Duke Elementary school. The Alvin ISD Board of Trustees selected the name of the district's newest campus in honor of the distinguished surgeon.

"I'm such a fortunate man, I can't even try to put dimensions on it," said Duke, also professor of surgery and the John B. Holmes professor of clinical sciences at UTHealth Medical School. "I honestly don't know why I was ever picked for the privilege of having this school named after me; I'm humbled beyond words but I am grateful beyond words as well. The fact that the school is an elementary school is extra special—this is such a formative time in children's lives, when they begin to really perfect those things you learn about courtesy, respect and honesty. That's what it's all about."

Duke is known around the world for his extraordinary efforts to train medical students, residents and surgeons, improve outcomes for injured patients and educate the public about important health issues.

Approximately 500 people attended the 45-minute dedication ceremony, featuring a performance by Alvin ISD's cast from "Peter Pan, the Musical," two Duke Elementary students sang the National Anthem, the presentation of colors by Boy Scout Troop 414, and a brief video on the history of Memorial Hermann Life flight. A special video tribute to Duke from the students of Duke Elementary showcased their gratitude towards their school's namesake. The event also featured a "photo booth," where participants both young and old were invited to put on wire-rimmed glasses and red mustaches, a playful reference to Duke's iconic visage.

"For more than 50 years, Dr. Duke has saved lives and inspired others to do the same," said Craig Cordola, CEO The fact that the school is an elementary school is extra special—this is such a formative time in children's lives, when they begin to really perfect those things you learn about courtesy, respect and honesty. That's what it's all about.

— JAMES "RED" DUKE JR., M.D. Founding Director of Memorial Hermann Life Flight

of Memorial Hermann-TMC. "A colorful personality, he has lived a robust life of service and extraordinary accomplishments. In addition to his dedication to serving patients, he has always been passionate about teaching and now his legacy will be known to generations to come."

Duke Elementary is a two-story campus with a total enrollment of 852 students, as of September 5th.

Located in Manvel, Texas, the campus serves students in pre-kindergarten through fifth grade and includes areas for physical education, art, music, and special classes. The school has adopted a bulldog mascot and the official colors of maroon and white, in honor of Duke's alma mater, Texas A&M University.

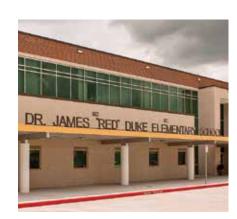
Duke Elementary opened its doors for the first time on August 25th, ushering in the first day of the 2014-2015 school year.

"This campus is named after a great man who has made a significant impact

on our community, and has definitely left his mark in history," said Fulvia Shaw, principal of Duke Elementary. "We will work to ensure that the students who come through the doors of our school will be inspired to be innovative, develop a passion for learning, and make a commitment to improving their community. They will be encouraged to reach their full potential, and have a clear understanding of the importance of Dr. Duke and all that he stands for. When they grow up, they will be equipped with the necessary skills and tools to be outstanding leaders."

"Our students will create a world where they belong," she added.
"They'll take ownership as empowered individuals, and they will leave a lasting impact."







In honor of James "Red" Duke Jr., M.D., pictured left, guests gathered to celebrate the dedication of the new Dr. James "Red" Duke Elementary School. Festivities included a photo booth where participants wore wire-rimmed glasses and red mustaches in a playful nod to Duke. (Credit: Memorial Hermann-TMC)







JOIN A GROWING FIELD

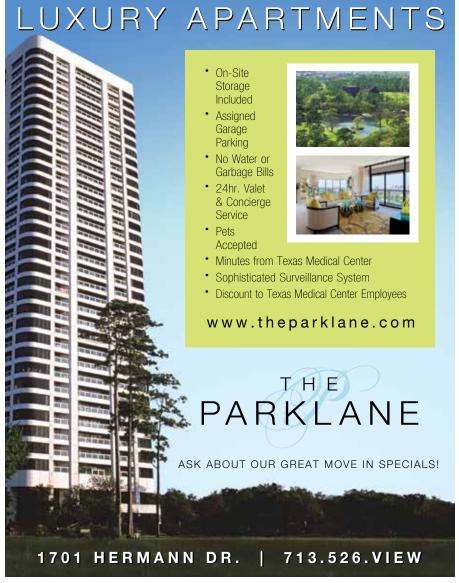
Earn a Master in Clinical Translation Management

Clinical translation is the ability to guide health-changing research discovery from the laboratory to its use in medical practice. The degree program, a collaboration between the University of St. Thomas and Houston Methodist Research Institute, teaches students to apply business principles to make this process more efficient and less expensive.

Apply by Oct 31.
Classes begin January 2015
Learn more at stthom.edu/mctm



MD Anderson



Biomedical Science: Houston Has Lift-Off

Buoyed by state funding, biomedical sciences are booming in the Texan city

By Paul Smaglik*

Texans pride themselves on their state's massive scale. So it is no surprise that Houston, the Lone Star State's most populous city and the fourth largest in the United States, boasts a biomedical infrastructure of impressive proportions.

What is surprising, however, is the sheer density of that infrastructure. The Texas Medical Center (TMC) is essentially a city of hospitals, clinics and medical-research labs—59 institutions and organizations in all—jammed into 544 hectares in southern Houston. Walking through what staff jokingly call "the world's largest parking garage" (parking fees help to pay for the operating costs) feels like strolling through any dense urban centre—except that every building is a hospital, clinic, university or research institution.

That size, plus a concentrated infrastructure, serves as a magnet for patients, funding and, increasingly, scientific recruitment. Houston's hospitals serve more than 6 million patients a year, and the University of Texas MD Anderson Cancer Center leads the nation in grant dollars won from the US National Cancer Institute in Bethesda, Maryland. The city claims US\$420 million from the \$3-billion Cancer Prevention Research Institute of Texas (CPRIT), which since its inception has awarded 36 grants worth \$124 million for recruiting scientists, labs and companies to the city.

"What's unique is we have such a high density of top-tier medical-research institutions in such a compact space," says Ronald DePinho, president of MD Anderson. The mix of hospitals and academic institutions at the TMC provides a platform for growth in clinical research—such studies require a patient base and interdisciplinary research, which flourishes when neighbouring institutions collaborate. Nearby Rice University and the University of Texas provide a basic-research yin to the TMC's clinical yang, and bolster the city's interdisciplinary bona fides.

DePinho, civic leaders and academics are proud of the city's vast educational and clinical assets—the life and health sciences are the city's second biggest industry after energy and oil—but they feel the lack of a major biotechnology and pharmaceutical presence in Houston. The region has had a robust history of technology transfer in the life sciences, but has generated mostly licences, which produce revenue, rather than biotechnology companies, which create jobs. Houston also needs to train young scientists to fill positions in biotech subfields such as technology transfer and intellectual property, or else recruit talent from outside the area.

The city is beginning to address those needs. First, MD Anderson created the Center for Professional Development and Entrepreneurship in 2012, giving young scientists training options beyond tenure-track careers. Then, last year, the University of Texas Health Science Center began changing the way it prepares graduate students for a changing work environment,

In addition, Robert Robbins, chief executive of the TMC, is leading a strategic plan to identify the region's 'connective tissue' in terms of cooperative interdisciplinary research. The plan currently focuses on five research themes: clinical research, genomics, health policy, innovation and regenerative medicine.

There are also tentative plans for a research facility that all TMC members could share, in the same way that the Broad Institute in Cambridge, Massachusetts, draws scientists from Harvard University and the Massachusetts Institute of Technology. "We need to pool our resources," Robbins says. If such a facility is built, it could mean hundreds of new positions, especially in the five key research themes.

TMC members have a history of sharing academic resources, says George Stancel, an executive vice-president at the University of Texas Houston. The 'Green Sheet'—a list of seminars and talks on the TMC campus—dates back to the 1970s, when the calendar was printed on green paper. "Any day of the week I can walk into a seminar or meeting at another medical school, cancer centre, hospital or academic centre and learn from those talks and presentations," Stancel says. This year the TMC added 'The Lead' (short for Leadership, Education and Career Development), which is a similar service for professional development that includes workshops and presentations about non-academic careers.

Houston's biomedical institutions also tend to share when recruiting talent. The current chair of neurosurgery at the Baylor College of Medicine is also chair of neurosurgery at MD Anderson and director of MD Anderson's brain-tumour centre. The two institutions recruit jointly for this and other roles, which makes recruitment easier, especially when it involves bringing in entire institutes. For example, in 2011 the vaccine-development programme of the Sabin Vaccine Institute moved from Washington DC to co-locate at Baylor and Texas Children's Hospital.

Access to funding has given Houston institutions an impressive track record in bringing world-class institutions to town. When Rice provost George McLendon went shopping for a computational centre that could simulate the inner workings of a cell, he identified the US National Science Foundation-funded Center for Theoretical Biological Physics at the University of California, San Diego. The centre moved to Rice in 2011 after being offered \$10 million in CPRIT funding.

The move sent a message: Texas will spend money to secure talent, and the \$3-billion CPRIT endowment

means that this is not just talk. "It is a huge difference to say to a top person that our state is interested in jump-starting careers like yours in this area," says McLendon. That message has made it easier for Rice to recruit 30 or so faculty members a year, half of whom are in science or engineering. Over the next five years, Rice will seek early-career scientists in bioengineering, computational sciences and physics.

Other Houston research institutions have had equal success in attracting talent. One of the latest recruits is David Sugarbaker, a cancer researcher and mesothelioma specialist from Harvard Medical School and Brigham and Women's Hospital in Boston, Massachusetts, who arrived at Baylor in March to build a comprehensive lung-disease centre. Between now and 2019 Baylor plans to recruit 150 faculty members, says Paul Klotman, Baylor president and chief executive.

The existence of CPRIT makes recruiting easiest in cancer-related fields. But if someone identifies a big fish in a field unrelated to cancer, other state money can be tapped. Jan-Åke Gustafsson, one of the world's foremost hormone researchers, was recruited in 2009 from Stockholm's Karolinska Institute with a \$5.5-million grant to the University of Houston through the Texas Emerging Technology Fund. His institute, the Center for Nuclear Receptors and Cell Signaling (CNRCS), is jointly supported by the university and Houston Methodist Hospital.

Moving the CNRCS meant hiring more staff, says Mary Ann Ottinger, associate vice-chancellor for research at the University of Houston—and in addition, in the next several years, the university plans to recruit 30 faculty members annually across all departments, buoyed by CPRIT and similar state funds.

Houston is also attracting and launching biotechnology companies using funds from CPRIT and others, says Robert Harvey, president of the Greater Houston Partnership, the city's economic-development arm. The organization helped the London-based biotechnology company Cell Medica to open a Houston office, partly with the help of CPRIT money, Harvey says. And even if a company is not directly linked to cancer treatment, the partnership can access other incentives to help close the deal, such as the Texas Entrepreneurial Fund.

Whether Houston buys life-science entrepreneurship or builds it, the momentum is growing. Like most things in Texas, it's likely to get bigger.

* This article was originally published in the journal Nature. Reprinted with permission.

Exploring the Depths of the Human Heart

 $Local\ artist\ reveals\ previously\ untold\ stories\ on\ the\ history\ of\ the\ human\ heart$

By Zoe Quezada







 $Dario\ Robleto's\ "The\ Boundary\ of\ Life\ is\ Quietly\ Crossed"\ seeks\ to\ unite\ the\ Houston\ medical,\ science\ and\ art\ communities.\ (Credit:\ Paul\ Hester)$

66 Robleto is doing something truly unique. The collision of art and science is something we're all interested in. [...] Robleto is not an artist responding to science. He's not making a beautiful picture representing his awe with the cosmos; he is participating in the creation of knowledge alongside the scientist and doctors he's working with.

> - MICHELLE WHITE Curator at the Menil Collection

rawing upon years of extensive research, local conceptual artist Dario Robleto has crafted a multilayered exhibition that uncovers many previously untold stories about a subject that has rattled the minds of mankind since the beginning of time: the mysteries of the human heart and how its history parallels with the human desire to understand the depths of the sea and the edge of the solar system.

Commissioned by the Menil Collection and the University of Houston's Cynthia Woods Mitchell Center for the Arts, Robleto's exhibition, "The Boundary of Life is Quietly Crossed," will be presented as both a site-specific installation at the Menil and a series of public programs which detail the artist's discovery process.

Leading up to the inception of this project, Robleto was most recently an artist-research fellow at the Smithsonian Institution in Washington, D.C. During his fellowship, Robleto focused his interests on the Liotta-Cooley heart, the first successful artificial heart that was implanted in Houston in 1969.

As he studied the revolutionary device, Robleto began digging up everything he could find on the history of the artificial heart and wondered what scientists had achieved since then. By chance, Robleto found his way into contact with the world famous cardiovascular surgeon O.H. "Bud" Frazier, M.D., who contributed greatly to the Liotta-Cooley heart and the improved models that succeeded it.

"It was a complete coincidence," said Robleto. "I had taken an image of the Liotta-Cooley heart and emailed the image to a local collector friend of mine whose wife happened to be good friends with Frazier. Frazier didn't know anything about me, but he wrote me a message saying, 'Did you realize I worked on that heart?' I knew he had worked under Cooley as a younger surgeon, so I was amazed. He said, 'Whenever you get back, if you're interested in seeing a heart transplant, let me know."

As soon as Robleto got back from the Smithsonian, he took Frazier up on his generous offer. As he looked on at Frazier performing the transplant surgery, Robleto said the experience was "breathtaking."

"The moment that stuck with me was seeing the emptiness in the man's chest," said Robleto. "As amazing as all the other steps were, when Frazier actually pulled it (the heart) out and set it on a cart, and there was that moment before the new one came in, there was this vacuum in the man's chest. As a sculptor

and someone sensitive to materials and space it was absent, empty and yet so full. The philosophical implications and meanings of that moment made it feel like the whole room was orbiting around that hole in his chest. It's a space that does not exist on the planet unless humans have made it happen."

Because of the profound impact that the experience had on Robleto, he wondered what Frazier, a man who has performed more than 1,200 heart transplants, felt in that moment.

"Not that it (heart transplantation) would ever get normal, but I still wonder what he thinks every time he sees that absence there," said Robleto. "The whole point I try to argue is that artists have to be involved in these moments because we're going to see something a little different and we should be talking to each other about what we're both seeing."

As he set out to have more conversations with experts who could help him in his research, Robleto was fortunate to meet Patrick Feaster, a sound historian who has been a driving force in recent breakthroughs in resurrecting early sound recordings from visual tracings, a technique used prior to the invention of playback technology in 1877.

Adding another dimension to his artwork, Feaster collaborated with Robleto in his research by converting old visual tracings of the earliest recordings of the human heartbeats into sound, marking the first time in history that these sounds have been made audible. In his installation Robleto incorporates detailed narratives to go along with the recordings.

"It's always a startling achievement when new pathways to the past are discovered," said Robleto. "These sounds have been lying dormant for over a century and this exhibition marks the first time that a 19th century heartbeat has ever been heard."

As Robleto continued his research and looked into the history of a more recent era, he was introduced to Ann Druyan, an author and producer who is best known for her work for the series "Cosmos," hosted by her late husband Carl Sagan.

Through their conversations, Robleto learned the story behind Druyan's contribution to the famed Golden Records that were put on board the Voyager 1 and 2 spacecraft. The records were created with the hope and intention that one day intelligent life would be able to find them and interpret them. In these records were recordings of greetings in multiple languages, natural sounds and music. There was also

a recording of something very unique and personal an EKG and EEG of Druyan were recorded just days after she and Sagan secretly became engaged.

"As an artist, I think that what she did was one of the most beautiful art acts," said Robleto. "What Ann did was as much art as it was science. For many years, I've had an interest in her story and have engaged with her EKG and EEG as a sound recording."

These conversations are just some of the many fascinating pieces featured in the exhibition. From conducting interviews with various doctors and patients at the Texas Heart Institute, to scoping out the rare collections of the Menil and Rice University archives, to meeting with scientists from NASA and the University of Houston, Robleto has a wealth of information to share and engage his audience with his public programs and installation.

"Robleto is doing something truly unique," said Michelle White, curator of the exhibit. "The collision of art and science is something we're all interested in. We're all talking about it and interested in this notion of interdisciplinary work. Robleto is not an artist responding to science. He's not making a beautiful picture representing his awe with the cosmos; he is participating in the creation of knowledge alongside the scientist and doctors he's working with."

"Talking about the heart is a really scary thing because I think it seems that everything has been said and what else could possibly be said without going down a road of clichés?" said Robleto. "As an artist, I like that challenge. If you can tap into a subject that seems impossible to say anything new about, then the reward is even more exciting when you do find something. I think as an artist I am continuously interested in asking questions, doing my homework to find the right people to ask these questions to and finding that they can't always provide answers to them all. That's why I think we need to have artists involved. I definitely want to keep those conversations going."

General Information: The Menil Collection 1533 Sul Ross St., Houston, TX 77006 www.menil.org | 713-525-9400

ACCOLADES



GEORGE S. BISSET III, M.D., has been named radiologist-in-chief at Texas Children's Hospital. Board-certified in pediatrics and pediatric cardiology by the American Board of Pediatrics, as well as a board-certified diplomat through the American Board of Radiology with additional subspecialty certification in pediatric radiology, Bisset also serves as the Edward B. Singleton Endowed Chair of Pediatric Radiology at Texas Children's and professor of radiology at Baylor College of Medicine. Bisset has authored or co-authored nearly 200 manuscripts and has a research focus primarily in cross-sectional imaging.



CHARLES A. LEMAISTRE, M.D., who served as the third president of The University of Texas MD Anderson Cancer Center, has been named as a chancellor emeritus by the System's Board of Regents. Prior to serving at MD Anderson's helm from 1978 to 1996, LeMaistre was chancellor of the UT System for seven years. The Board of Regents also named former UT System Chancellor Hans Mark, Ph.D., as chancellor emeritus. Only two other chancellors, Harry Huntt Ransom, Ph.D., and E. Don Walker, have been named chancellor emeritus.



RITA A. DELLO STRITTO, PH.D., RN, CNS, ENP, ACNP-BC, associate nursing professor at Texas Women's University, was recently selected as a Fellow of the American Association of Nurse Practitioners (AANP). Dello Stritto, who was one of 76 nurse practitioner leaders in the nation selected for the prestigious national Fellow program, was inducted during the AANP National Conference held in Nashville in June. The AANP established its Fellow program in 2000 to recognize nurse practitioner leaders who have made outstanding contributions to health care through clinical practice, research, education or policy.



WILLIAM MARGOLIN, PH.D., professor in the Department of Microbiology and Molecular Genetics at The University of Texas Health Science Center at Houston (UTHealth) Medical School, has been selected to serve as a distinguished lecturer for the American Society for Microbiology (ASM). Margolin's laboratory is working to further the understanding of how bacteria like Escherichia coli (E. coli) divide and multiply in the hopes of identifying better strategies to contain destructive strains. Margolin's duties as a distinguished lecturer extend through June of 2016 and include making presentations at regional meetings of the ASM.



ANGELO GIARDINO, M.D., PH.D., has been named senior vice president and chief quality officer of Texas Children's Health Plan. Giardino joined Texas Children's Health Plan as medical director in 2005 and was promoted to vice president and chief medical officer of the Health Plan in 2012. He has also served as the chief quality officer for medicine since July 2011 and chief of academic general pediatrics since April 2013. In addition, Giardino serves as a member of the Children's Hospital Association Quality Measurement & Standards subcommittee.



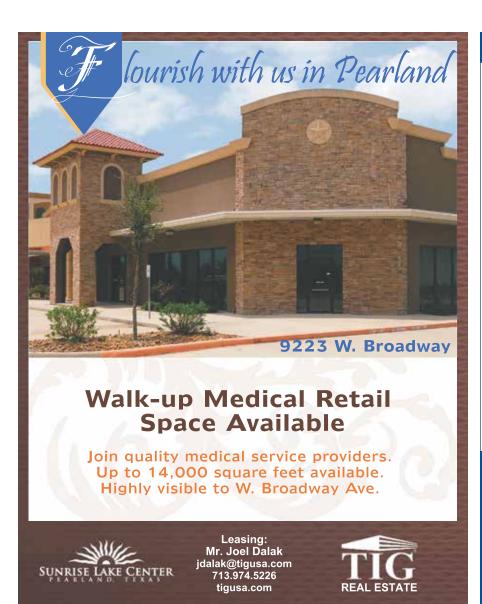
MARGO Y. MELCHOR, assistant clinical professor in the Department of Periodontics and Dental Hygiene and Director of Community Outreach at The University of Texas Health Science Center (UTHealth) School of Dentistry, has received the 2014 National Dental Association's Foundation / Colgate-Palmolive Faculty Recognition Award. The faculty awards program honors individuals who have demonstrated excellence in professional development and a willingness to support and to help others in their quest for knowledge and advancement.



DIMITRIOS KONTOYIANNIS, M.D., SC.D., Frances King Black Endowed Professor and Deputy Head-Research in the Division of Internal Medicine at The University of Texas MD Anderson Cancer Center, was awarded the lifetime achievement award, Drouhet Medal, by the European Confederation of Medical Mycology and EORTC Infectious Diseases Group. Kontoyiannis recently became the president-elect of the international Immunocompromised Host Society, a premiere 35-year-old multidisciplinary forum for scientific and clinical interchange to improve understanding and management of the immunocompromised host.



BRIAN ROE, previously managing director of tissue services, has been named managing director of tissue and donor resource operations at LifeGift, a nonprofit organization that offers hope to individuals needing transplants in 109 Texas counties in the Houston area, North Texas and West Texas. Roe will be expanding his responsibilities to lead LifeGift's Donor Resource Center (DRC). The DRC, a 24/7 lifeline for organ and tissue donation, works with more than 200 hospitals around the state to ensure families are offered the opportunity to donate and that organs and tissue are made available.



Motivate Challenge Inspire Connect







Come Experience the Difference!

Middle School Open House Sunday, Nov. 9, 1-3 pm Upper School Open House Tuesday, Nov. 11, 6:30-8:30 pm

ESW On O O O

(832) 204-5900 admissions@emeryweiner.org

Housing 100.com At Fully Furnished Apartments

- Move In Right Away
- Move Out with One Day Notice (only for TMC Patients)
- Affordable Short Term Corporate Housing
- Luxury Living Special Rates for TMC Patients
- Fully Furnished
- Minutes from TMC
- WiFi & Uverse TV Channels



OPEN 7 DAYS A WEEK 8:00 A.M.-8:00 P.M.
Call Now: 713-417-2682
Visit Us Online: www.Housing100.com

HOUSTON'S UNMATCHED AUTHORITY ON HEALTHCARE REAL ESTATE OUTSOURCING

When you're the leading provider of real estate services for medical facilities in Houston, you can see the big picture. With an average of 20% bottom-line savings for our health system clients and more than 3.5 million square feet of medical office space represented, we are the undisputed local authority on healthcare real estate.



CBRE

cbre.com/houston

Building a Global Network

The Consular Corps of Houston is an essential resource for the almost 20,000 international patients who seek medical treatment in the Texas Medical Center each year. We value our relationship with the Corps and look forward to assisting them for many years to come.

— ROBERT C. ROBBINS, M.D.

President and Chief Executive Officer of the Texas Medical Center

President and Chief Executive Officer of the Texas Medical Co







n September 17th, the Texas
Medical Center hosted a reception honoring the Consular Corps
of Houston. Held at the Museum of
Fine Arts, Houston, the event brought
together consular officials from
92 countries and representatives from
Texas Medical Center member institutions to discuss health care programs,
opportunities and academics.

"The Consular Corps of Houston is an essential resource for the almost 20,000 international patients who seek medical treatment in the Texas Medical Center each year," said Robert C. Robbins, M.D., president and chief executive officer of the Texas Medical Center. "We value our relationship with the Corps and look forward to assisting them for many years to come."

Houston has the third largest consular corps in the nation after New York and Los Angeles. There are approximately 92 consulates in Houston, from Albania to Vietnam. Consular officials develop economic, commercial, scientific and cultural relations between the countries they represent and the area in which they serve. An important function of a consulate is to help increase commerce—trade, technology transfer and investments—both ways. Consular officials provide a wealth of information on the economy, society, culture and tourism of the countries they represent.

Thousands of international patients visit the Texas Medical Center each year for patient care services, bolstered by the understanding that the quality of the care they receive and the collective scope of the health services provided are unsurpassed anywhere in the world. At the same time, the various member institutions in the Texas Medical Center provide services throughout the world as part of their collective missions—there are more than 200 separate and distinct international programs focused on patient care, education and research.

The importance of helping these patients navigate the overwhelming

network of institutions within the medical center, while simultaneously solidifying international efforts, spurred the mutual desire to develop a stronger relationship between the medical center and the Consular Corps of Houston.

"This relationship ultimately leads to the bottom line, which is education," said Louis A. Browne, Ph.D., honorary consul of Barbados and executive advisory committee member for the Consular Corps of Houston. "There's tremendous need for education in several of these countries. I make it a point to recommend that every visitor take a tour of the medical center—many Texas Medical Center institutions are looking for relationships with some of the countries that we represent, and it provides the administration with an opportunity to establish footholds for development.

"Our efforts involve education as well as the chance to develop business relationships with the medical center," added Browne. "Generally, I think it's about making it easier for the Corps and the countries that they represent to access and utilize the services of the medical center. It's about making it as easy and available as possible."

Browne is also a member of the Texas Medical Center's International Affairs Advisory Council (IAAC). Composed of representatives from the medical center and members of the Houston community, the IAAC works to strengthen the medical center's international position.

- Alex Orlando, Texas Medical Center

Pediatric Patient First in Houston to Receive Insertable Cardiac Monitor

Then he was just three months old, Parker Flax developed a fever, rash, conjunctivitis and cold-like symptoms that prompted his parents, Jessica and Daniel, to take him to the pediatrician. He was quickly diagnosed with measles, but after blood work ruled out the initial diagnosis, he was sent home. Parker then began developing extremely high fevers, which hovered around 106 degrees and would not subside with medication. Following a bigger spike in his temperature, his parents took him to a physician in nearby Kansas City who performed a spinal tap and diagnosed Parker with bacterial meningitis. He was admitted to the hospital and given antibiotics. Following further testing, meningitis was ruled out, but the physicians did not know what was causing Parker's symptoms.

The usually happy, carefree baby continued to have fevers and was oftentimes inconsolable. On PARKER WAS THE FIRST PEDIATRIC PATIENT IN HOUSTON, AND AMONG
THE FIRST IN TEXAS, TO RECEIVE THE DEVICE. THE DEVICE, RELEASED IN
FEBRUARY, IS SMALLER THAN A KEY AND WIRELESSLY MONITORS PARKER'S
HEART RHYTHM WITH SPECIFIC PARAMETERS SET BY DE LA UZ.

September 18, 2013, while at home with Parker and his brother, Jessica had to administer CPR on her young son who had collapsed and wasn't breathing. She knew in that instant that all of Parker's previous symptoms contributed to this frightening episode. He was admitted to the hospital and the family finally received a diagnosis-Parker had suffered a heart attack and had Kawasaki disease with 100 percent blockage of the right coronary artery as well as dilation of the left coronary artery. The physician told the family he had never seen a patient so young with this diagnosis, and sought advice from cardiologists around the country.

When he received 22 different answers from 22 different cardiologists, the Flax family knew they had to take matters into their own hands and find the best possible treatment for Parker. Jessica went online and found Texas Children's Heart Center.

On May 1, Texas Children's

Pediatric Cardiologist Caridad De la Uz,
M.D., implanted the 19-month-old with
the Reveal LINQ Insertable Cardiac
Monitor. Parker was the first pediatric
patient in Houston, and among the
first in Texas, to receive the device.
The device, released in February, is
smaller than a key and wirelessly
monitors Parker's heart rhythm with

specific parameters set by De la Uz. The monitoring device inside Parker's chest stores the information, which is wirelessly communicated to a device at his bedside. The device sends transmissions of any abnormal rhythms automatically to his care team here in Houston. The minimally-invasive procedure took less than ten minutes and allows Jessica and Daniel to sleep easier each night because they know Parker is being monitored by the Texas Children's Heart Center team 24 hours a day.

Lindsey Fox,Texas Children's Hospital

Rediscover The Commons



Because everyone likes options



















© 2014 CFA Properties, Inc. Chick-fil-A Stylized® is a registered trademarks of CFA Properties, Inc. SUBWAY® is a registered trademark of Doctor's Associates Inc. © Doctor's Associates Inc.

Texas A&M Dedicates National Pandemic Influenza Vaccine Manufacturing Facility

exas Governor Rick Perry, Texas A&M University System Chancellor John Sharp, Texas A&M Health Science Center CEO Brett Giroir, M.D., and officials from the U.S. Department of Health and Human Services (HHS), State of Texas and biopharmaceutical company GSK dedicated a national pandemic influenza vaccine manufacturing facility in Bryan, Texas, which when complete will serve as an anchor for the Texas A&M Biocorridor—a rapidly evolving hub of economic development and scientific discovery that is swiftly positioning Texas as the third coast in biotechnology.

Construction of the 100,000-squarefoot facility is on track for completion by the end of 2015, to be followed by start-up and validation phases that are expected to be complete by early 2017. When fully functional, the facility is expected to have the capacity to produce the bulk antigen needed for up to Texas A&M Health Science Center will continue to pioneer new pathways forward—this is the only way that unmet medical needs, locally and globally, will be addressed, and access to quality care can be achieved for all.

- BRETT GIROIR, M.D.

Chief Executive Officer of Texas A&M Health Science Center

50 million adjuvanted pandemic influenza vaccine doses within four months of a declared influenza pandemic and availability of acceptable virus seeds.

"This facility represents a huge step forward for the State of Texas, and an important milestone in the United States' battle against both contagious diseases and the specter of international bioterrorism," Gov. Perry said. "Our state has long been home to innovative minds willing to attempt giant leaps to great achievement, and this will serve as another instance where Texans are willing to lead the way to a safer and more prosperous future."

The Pandemic Influenza Vaccine

Facility and the adjacent Viral-based Vaccine Facility, which recently entered final design development, will form the cornerstone of the Texas A&M Center for Innovation in Advanced Development and Manufacturing (CIADM), one of three such national centers for innovation supported by the U.S. Department of Health and Human Services and the only one housed at an academic institution—Texas A&M Health Science Center.

"This center is important for our nation, but also evidences a new paradigm for how academic health science centers must transform health by forging novel partnerships with the federal government and leveraging the expertise of world-leading commercial partners, such as GSK," Giroir said. "Texas A&M Health Science Center will continue to pioneer new pathways forward—this is the only way that unmet medical needs, locally and globally, will be addressed, and access to quality care can be achieved for all."

Disease outbreaks, such as the H5N1 avian influenza, H1N1 influenza pandemic of 2009, and more recently the Ebola outbreak in West Africa, exposed the need for quick access to high-quality, life-saving vaccines and therapeutics, and the importance of reliable, U.S.-based vaccine development and manufacturing capabilities and expertise. After the President's Council of Advisors on Science and Technology report on reengineering the influenza vaccine manufacturing enterprise

and the U.S. Department of Health & Human Services' medical countermeasures review, HHS' Biomedical Advanced Research and Development Authority (BARDA) embarked on new approaches to bolster pandemic influenza preparedness and biodefense.

The Texas A&M Center for Innovation in Advanced Development and Manufacturing was founded on a \$285 million public-private partnership between HHS and collaborating academic, commercial and State of Texas stakeholders. Key objectives include performing advanced research and development, ensuring domestic manufacturing capacity, enabling FDA approval of products and mentoring the next generation of public health professionals through education, training and outreach.

With the Texas A&M CIADM's advancement of the Pandemic Influenza Vaccine Facility and the Viral-based Vaccine Facility—along with the recent retrofit completion of the Texas A&M National Center for Therapeutics Manufacturing, which offers flexible and adaptable biopharmaceutical development and manufacturing capabilities—the center is on track to meet its mission of bolstering the nation's preparedness and response to public health threats, whether in the form of a naturally occurring emerging infectious disease or a biological terrorist attack.

Angela Shubert,Texas A&M Health Science Center

Come check us out and see why our children and families are happy



Attentive and qualified staff.

Inviting classrooms where children have fun learning and exploring.

Engaging curriculum tailored to each child's development.

Monday-Friday 6:30am-6:00pm 5010 Caroline St. 713-521-1234

Accepting ages 6 weeks to 6 years.

Serving the medical center and downtown area

Only childcare center in Houston to incorporate S.T.E.A.M.

LEARNING WHILE PICKING UP S.T.E.A.M. (SCIENCE, TECHNOLOGY, ENGINEERING, ARTS & MATH)



As God has loved us, we will meet people on common ground and journey together to the higher ground of life in Christ Jesus our Lord.

Southwest Central Church of Christ

http://swcentral.org/



'Rowing' Wheelchair is a Moving Experience

Rice University students have built a unique wheelchair for a Houston teenager who will now be able to row his way forward.

Pedro, 15, a patient at Shriners Hospital for Children-Houston, has had arthrogryposis since birth. This congenital disorder causes severe limitation of movement in all of his joints.

But Pedro's path can be made easier. The Rice students are near completion of a four-year effort to make the wheelchair, which works with a paddling motion that does not require Pedro to turn the wheels of his manual wheelchair by hand.

Pedro's disability prevents him from pulling his arms in at the elbows though he can push out. In addition, his wrists are locked in a rotated position.

"He can't operate a normal wheelchair because it would require him to grip the wheels, which he can't do," said Michaela Dimoff, a Rice junior and bioengineering major, and part of the Wheelin' and Dealin' wheelchair team that designed the new device. "He would be able to push them out, but once he's there, he's stuck."

The new chair has push-forward paddles instead of armrests. Pedro places his hands inside fabric loops and pushes to move. The springloaded arms do the work when it's time to pull his arms back to complete the cycle. "He pushes out and then relaxes, and the paddles come back," said Dimoff, who spent much of her summer break working on the project.

Pedro has a motorized wheelchair he uses at school, but at home, when his family is not available to push him in a standard chair, he's wheel-less. "He moves around his house by commando crawling with his forearms," Dimoff said.

The chair was built at Rice's
Oshman Engineering Design Kitchen
(OEDK) by a team that includes
mechanical engineering majors Jared
Elinger and Christina Petlowany
and materials science and nanoengineering major David Smith, all
juniors, and senior art history major
Reed Thornburg. The parts were
fabricated and assembled there with

the exception of hub-mounted transmissions on each wheel that allow Pedro to go forward and backward and also give him a neutral gear.

Weeks after taking on the project, the team had its first meeting with Pedro to get specifics on his physical capabilities. "We spent a long time trying to figure out the scope of what he can do," Elinger said. "It quickly became clear that for propulsion, a rowing motion was our only option."

"For our initial prototypes, we used bicycle hubs," Petlowany said. "Once that didn't seem to work so well, we moved to bicycle hubs and chains.

And we could make it work, but it didn't meet our design criteria and clearly wasn't a long-term solution."

"Our industry mentor, Scott
Daigle, the co-founder and CEO of
Intelliwheels in Illinois, told us it
would take hundreds of thousand
of dollars and years to be able to
machine our own gears and get
them to work," Dimoff said.

"We didn't want Pedro to have to wait that long," Petlowany added.

The students found their solution at a California-based company, Innovations Health, which sold them wheelchair-specific, lever-operated Wijit wheels at wholesale and advised the students on how to incorporate them into their existing design. The teammates raised funds to buy them, with significant contributions coming from OEDK, the Rice Center for Engineering Leadership and the Shriners International chapter in Houston.

Pedro's input was critical at every step, Smith said. "We tested the chair with him six or eight times," he said. "We'd test brakes, forward motion, speed, comfort, and each time we'd make changes and come back and say, 'Hey, look at what we've done. What do you think of these things?' He's a great kid and doesn't like to complain, but we told him, 'If it's not perfect, we want you to tell us.' That really helped us in the design process."

The students expect to bring the chair back to Rice at the end of September for what they hope are final



(Credit: Brandon Martin)

Dr. Saterbak told us, 'You guys are it. You're the last hope," Dimoff recalled. "So there was no excuse. It didn't matter what we had to learn or what we had to do or how long it took because this boy needs a wheelchair, and we can't let him down.

— MICHAELA DIMOFF Rice University Bioengineering Student

touch-ups and are busy completing documentation so future engineering students can keep it in good repair.

Dimoff said doctors at Shriners have suggested the wheelchair design may be suitable for people with spina bifida, cerebral palsy and other disabilities. "It might even help a person with arthritis or someone who has really weak upper arms and doesn't want to do this (rolling motion) all day," she said. "Ergonomically, the way you move a standard wheelchair is terrible for your body. It's terrible for your shoulders. The rowing motion is really a lot better."

The students are proud of their success at accomplishing what seemed, for a time, impossible. The project began as one of the first offered by faculty adviser Ann Saterbak, a professor of bioengineering education and associate dean for undergraduate education, when she started her freshman design course four years ago. Other teams had tried and failed, she said.

"Dr. Saterbak told us, 'You guys are it. You're the last hope,'" Dimoff recalled. "So there was no excuse. It didn't matter what we had to learn or what we had to door how long it took because this boy needs a wheelchair, and we can't let him down."

- Mike Williams, Rice University

October 2014

○-1 ○ Symposia on Cancer Research 2014: Illuminating Genomic Dark Matter "ncRNA in Disease and Cancer"

Thursday & Friday, 8:15 a.m.-5:50 p.m.
MD Anderson
1515 Holcombe Blvd.
ctierney@mdanderson.org
713-745-0432

11 3rd Annual Baylor College of Medicine
Wellness 5k Race/Walk

Saturday, 8:00 a.m.
Baylor College of Medicine
One Baylor Plaza
kevin.shen@bcm.edu
713-798-4710

14 Educating and Utilizing Advanced
Practice Registered Nurses: A Conference on Collaborative Best Practices

Tuesday, 7:00 a.m.-5:30 p.m.

Memorial Hermann-TMC

Hermann Conference Center

shelley.vargo@memorialhermann.org
713-932-5770

16-17 Medical Oncology and Hematology 2014: Multidisciplinary Approaches that Improve Coordination of Care

Thursday & Friday, 8:00 a.m.-5:30 p.m.
MD Anderson
1515 Holcombe Blvd.
ambaring@mdanderson.org
713-563-7388

22nd Annual Nursing Conference Friday, 8:00 a.m.-3:30 p.m.

St. Paul's Methodist Church 5501 Main Street

jdoctor@ish-tmc.org 713-797-0600

25 Image-Guided Therapy Seminar

Saturday, 8:00 a.m.-2:00 p.m. Houston Methodist Research Institute 6670 Bertner Ave. cme@houstonmethodist.org

713-441-4971

Verna Marrs McLean Department of Biochemistry and Molecular Biology Seminar Series

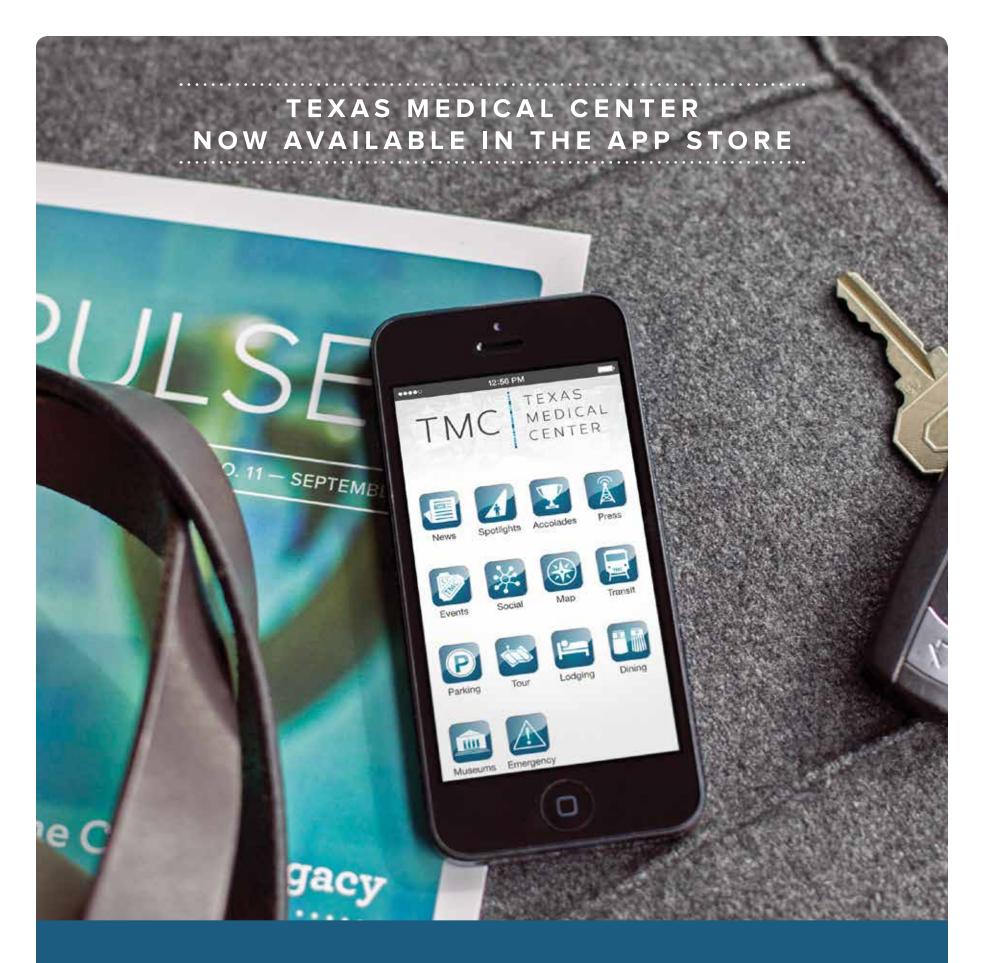
Thursday, 4:00 p.m.-5:00 p.m. Baylor College of Medicine One Baylor Plaza, Room N315 darrow@bcm.org 713-798-6989

31 WFAS Houston 2014 World
Acupuncture & Integrative
Medicine Conference

Presented by Dr. Michael Webb, HISD Friday-Sunday, 8:00 a.m.-6:00 p.m. 2222 West Loop South Houston, TX 77027 wfas2014@acaom.edu

713-780-9777

FOR MORE EVENTS, VISIT TMCNews.org



THE TEXAS MEDICAL CENTER MOBILE APP IS THE FIRST DIGITAL PLATFORM COMBINING ALL TMC COMMUNICATION. This free app allows our community of TMC employees, patients, and visitors to search news, events, social feeds, and maps across the Texas Medical Center campus.





Experiments with Truth: Gandhi and Images of Nonviolence Exhibition on view through February 1, 2015 menil.org