A Letter from
David A. Brenner, MD

In this magazine, you will read about how UC San Diego Health Sciences continues to make a difference, not only in San Diego, but across the globe. From efforts to unlock the secrets of autism to developing new ways to combat cancer, these stories illustrate some of the many ways in which our researchers and physicians are changing the face of medicine.

In 2011-2012, we continued to literally transform the landscape of health care in San Diego, with the opening of the UC San Diego Sulpizio Cardiovascular Center, the Medical Education and Telemedicine building, the Center for Advanced Laboratory Medicine, and the groundbreaking for UC San Diego Jacobs Medical Center, scheduled to open in 2016.

Jacobs Medical Center will fully leverage our cross-disciplinary partnerships. It will build upon the incredible care, research and education already underway at UC San Diego Health Sciences, and strengthen collaborations between researchers and clinicians so that new discoveries reach more patients faster.

With this magazine, we invite you to join us in the spirit of discovery that has always defined UC San Diego.

Sincerely,
David A. Brenner
Vice Chancellor, Health Sciences and Dean, School of Medicine
University of California, San Diego

UC San Diego is renowned for collaborative and cross-disciplinary research that transcends traditional boundaries in science, engineering and the humanities.

Our Location on Torrey Pines Mesa has long contributed to UC San Diego’s success as a model for innovative medical science. Our researchers have been able to collaborate with their colleagues across the La Jolla mesa — home to the Salk Institute, Sanford-Burnham and The Scripps Research Institute — along with dozens of local biotech companies.

When I was a fellow here in 1985, UC San Diego was already known as one of the world’s premier places to conduct biomedical research. But we sometimes found that patients with complex conditions chose to leave San Diego for their care.

That’s no longer the case. Today, UC San Diego Health System is a medical destination, drawing patients from around the world. Key thought leaders in clinical care and research are coming too, drawn by our focus on translational medicine, and the unique opportunity we offer to transform care.

This isn’t just about reputation — it’s about making a real difference.
Heart disease, cervical cancer and obesity are all described as silent killers. Yet one disease that affects more than 400 million people worldwide often goes unnoticed by both its carriers and the general public.

“A estimated two million people in the United States are living with hepatitis B and half are of Asian descent.” This is a growing public health issue that is not fully recognized in our country,” said Binh Tran, PharmD, co-founder and executive director of the Asian Pacific Health Foundation.

Tran arrived in the United States from Saigon in 1975 and currently serves as a volunteer faculty member at UC San Diego’s Skaggs School of Pharmacy and Pharmaceutical Sciences. Here, she helps students gain real-world experience in patient care while they learn to manage the legal and ethical dilemmas posed by insurers’ cost reduction efforts. It is from among these students that Tran recruits screeners for Hep B Free San Diego, a joint project between the Asian Pacific Health Foundation and UC San Diego to subdue this cancer-causing disease.

“That’s about 250,000 people who need to be screened. In a population that represents recent immigrants who are often non-vocal and disenfranchised, this is a real challenge.”

Nationwide, there is no systematic screening of individuals at risk for hepatitis B; most efforts are local and regional, with recent government mandates for screening just beginning to have an impact. The majority of people with chronic disease remain symptom-free and unaware they are infected, until they develop irreversible scarring or cancer of the liver. Treatment options range from expensive anti-viral drugs and liver cancer treatments to liver transplantation.

Wearing a silk áo dài tunic, Gish can be seen with his daughter at a local Tết Nguyên Đán festival, a celebration of the Vietnamese New Year. He greets passersby in their native language, which he learned while traveling in Vietnam and through continuous consumption of movies, radio, books, tapes and CDs.
“A common perception is that this life-threatening infection is transmitted most frequently through drug use or sexual contact. Not true. More than 90 percent of the time in developing countries, the virus is passed unknowingly from mother to infant or through reused medical equipment.”

Binh Tran, PharmD

“Learning Vietnamese is a passion of mine,” said Gish. “With my patients, the shared language is a form of bonding. It increases listening, comprehension and comfort.”

Gish’s fluency served him well as a founding member of the White Paper Team, a group of 30 physicians in the U.S. and Vietnam who have developed a bold five-year plan to improve screening, treatment and prevention of hepatitis B. He has brought lessons learned from Vietnam to California.

“In Vietnam, we were able to screen 3,000 people for hepatitis B with a portable test kit that delivered results in 20 minutes. This rapid test does not exist in the United States. Why?” asked Gish. “Think of how much better we could control this disease if we could diagnose on the spot.”

EXPANDED, SIMPLIFIED SCREENING

When Gish worked with a similar Hep B project in San Francisco, the estimated cost of screening was close to $200 per patient. If evaluations were offered to those most at risk for hepatitis B, the cost would be in the tens of millions. Such an approach is, in a word, unlikely — even though research has shown that these costs would be far less than therapies and surgery for liver failure and cancer.

“Right now we are looking at developing point-of-care testing that would cost $19 per kit or less,” said Gish. “There are other experimental kits, not developed in the U.S., that only cost $2. If we can get the cost of screening down, we can amplify our efforts.”

Tran and Gish combined forces in 2010. Their joint screening project is one of only 60 in the country. Gilead Foundation and Bristol-Myers Squibb recently awarded Gish grants of $50,000 and $100,000, respectively, to screen for hepatitis B and provide linkages to care, including vaccine and treatment if there is active liver disease. The next screening phase will evaluate a novel blood test achieved with a painless needle prick to the finger.

“Getting a tube of blood drawn, or even a finger stick test, is a barrier to care. Imagine what it would be like to have a saliva test,” said Gish, adding that it could be done. “In terms of barriers to care, mostly what we see is a lack of awareness. When people hear there is no cure, they give up. Historically, there has been no treatment, but now we have effective drugs and ways to control the disease. The world needs to get out.”

Tran added that there also needs to be a campaign for vaccinations. It takes three shots to achieve immunity, and only 30 to 40 percent of those who were screened were fully vaccinated.

So far Gish and Tran have screened more than 300 individuals, and about 6 percent of them tested positive for hepatitis B. This figure varies among test sites, dependent on the percentage of newly arrived individuals, at times reaching as high as 10 to 14 percent of those screened. With the participation of all San Diego area hospitals, the goal of Hep B Free San Diego is to screen 10,000 people by 2014.

“Hep B Free San Diego” is part of the San Diego Hepatitis Free Program, which has been extended to include screening for hepatitis C.

Hepatitis B is a condition that can go undetected and cause the liver to irreversibly scar or succumb to cancer. Without careful monitoring and proper treatment, 1 in 4 people with chronic hepatitis B will die from liver failure or cancer.

SANDY CHONG IS A SECOND-YEAR PHARMACY STUDENT at Slaggs School of Pharmacy and Pharmaceutical Sciences. She was born in Macau, 37 miles southwest of Hong Kong. Of the 400 million people affected worldwide by the hepatitis B virus, one third reside in China.

“Hepatitis B represents a global health issue,” said Chong. “What we can do locally, in California, is to better understand what promotes or prevents screening. This means being out in the community and engaging those who are most at risk.”

Chong and a team of pharmacy students recently surveyed attendees at Hep B Free San Diego events. Under the guidance of Tran and Gish, Chong collected data to evaluate personal demographics, knowledge of the virus, and perceived barriers to care, such as cost of screening, fear of needles, insurance status and language preferences.

“Lack of access to care was identified as the biggest barrier to screening and vaccination,” said Chong, who also serves as a translator at the screenings. “Income level and insurance status do not play a role.”

Overall, survey participants were aware of hepatitis, but did not know the virus is preventable. The majority expressed strong interest in learning more about the disease and gaining access to a blood test that provides rapid results.

Timing of immigration has also played a role in knowledge of the disease. In 1996, a law required immigrants or travelers to be screened for hepatitis B before coming to the U.S. Those arriving before this date were underinformed about the disease and its methods of transmission.

“What’s important for patients to monitor their own health and be mindful of their hepatitis B status, it’s important for doctors, pharmacists and nurses to proactively encourage screening,” said Chong.

“Education must come from multiple fronts and be timed in a meaningful way. This means involving health care providers as well as groups that may not immediately come to mind such as acupunctureists, tattoo artists and manicurists.”

Chong noted that the hepatitis project brings together diverse groups in fighting a preventable cancer regardless of a person’s language.

“I find this outreach deeply gratifying because every person I encounter is appreciative of the work,” said Chong. “Visitors to the health fairs can see that the pharmacy students and screeners really care about their health status. They can also see that the project is addressing a bigger need that will one day make an impact on themselves and their children.”
The Shape of Things to Come

Dr. Anne Wallace combines advanced therapies with reconstruction techniques for breast cancer patients.

Photograph by Nick Abadilla

“AS A YOUNG WOMAN, A REGISTERED NURSE AND A CANCER PATIENT, when I found out I had breast cancer, I specifically went out of my way to find a surgeon who could both remove the tumor and reconstruct my breast,” said Peggy Pico, a patient who chose surgeon Anne Wallace, MD, FACS, professor of clinical surgery and director of the Breast Cancer Unit, at UC San Diego Moores Cancer Center. Pico added that Wallace gave her a huge sense of peace: “I plan to live a long time,” said Pico. “My surgery was uniquely mine, and Dr. Wallace understood what I needed to feel whole again.”

A surgical oncologist, reconstructive surgeon and chief of the UC San Diego Health System’s Division of Plastic Surgery, Wallace is intimately involved with the entire experience of a woman with breast cancer. She not only removes the offending tumor, but also puts to use her advanced training at body contouring and cosmetic procedures for breast reconstruction.

“We can look beyond the cancer and then craft, with input from the patient, what is best for her future,” said Wallace. “The ability to see both sides is becoming more important as we tailor our response to the individual. We no longer fit every patient with everything we’ve got, hoping to kill all the cancer. We come up with an individualized plan, based on her specific needs — both physical and emotional.”

In the past, a woman with larger, low-grade tumors would have undergone chemotherapy treatment. Today, Wallace’s team would likely remove the tumor and conduct extensive genetic testing to see if there is a need for more therapy, avoiding the potentially unnecessary damage from invasive chemotherapy treatments. On the other hand, if a young woman comes to Wallace with triple-negative breast cancer, a type of cancer which typically has a significant recurrence rate, Wallace would likely recommend the most aggressive therapy available. She might also suggest the patient enroll in one of the advanced clinical trials offered at UC San Diego Moores Cancer Center, such as one called I-SPY2.

I-SPY2 uses genetic biomarkers from the individual patient’s tumor to screen promising new drugs, thus identifying which treatments are most effective in women with high-risk, fast-growing breast cancers. For these women, improving the speed of treatment could improve survival odds as well.

“Our approach at Moores Cancer Center is the epitome of knowing when to react and when not to,” said Wallace. “We are enrolling women in ATHENA who have calcifications on a mammogram that would likely have been biopsied in the past,” explained Wallace. “Now we know that with ductal carcinoma in situ (very early breast cancer), she needs to be watched, not overtreated.”

RESTORING WHOLESNESS

Wallace also hopes to shape the training provided to future breast cancer surgeons. She is an advocate for updating the current medical training protocol to include both a one-year rotation on removal of breast tumors and one year on plastic surgery procedures to reconstruct the breast. It’s a move that she knows may cause controversy in the surgical world, but a recommendation she backs up with the numbers.

“A startling number of women are not getting reconstructive surgery due to lack of access and education,” said Wallace. She points to a recent nationwide study with preliminary results showing that fewer than one in four women with invasive cancer have reconstruction immediately after a mastectomy, while 36 percent of those with early-stage cancers do. The study cited cost and access as among the contributing factors.

“The reconstruction rate among my patients at Moores Cancer Center is nearly double that, at 70 percent,” said Wallace. “Today, immediate reconstruction is the standard of care in most cases. Women need to know upfront that it’s an option for them. If access and cost are key contributors, then it is our duty to train more physicians to do both and improve access for all patients.”

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Wallace approaches these systemic changes motivated, as always, by the aim of what’s best for her patients: restoring them to wellness and a sense of wholeness.

To learn more about how you can help us improve breast cancer care, contact Health Sciences Development at 858-246-1568.
Unlocking the Secrets of Autism

Photographs by David Ahntholz

Eric Courchesne, PhD, and Karen Pierce, PhD, observe the brain function of young children in hopes of discovering why autism affects both the mechanics of language and social elements of communication.
Eric Courchesne has been driving around La Jolla for a couple of hours. In the backseat, a fussy infant is being gently lulled into quiet, then sleep, by the engine and the rhythmic slap, slap of the windshield wipers. Courchesne lifts her from the car and carries her into a building a few miles from the UC San Diego campus, home to the fMRI machines that are a fundamental part of his research.

It is now 8:30 p.m. and tests on the baby will just begin. If only she stays asleep…

“Autistic children have little interest in new experiences; they much prefer to experience the same thing over and over.”

Scientists at the UCSD Autism Center of Excellence aim to identify genetic and brain developmental factors that cause autism, allowing major advances in the implementation of novel early identification practices, more accurate diagnosis, and intervention for infants and young children with the disorder.

In one such study, Courchesne and colleagues have performed functional MRI (fMRI) scans on sleeping infants as part of a three-year study to observe the brain function of young children. They discovered abnormally low activity in the left temporal cortex of the brain in children with autism — an area long suspected of playing a part in the development disorder due to its critical role in learning language. The change in brain activity in toddlers with autism could help explain why autism affects both the mechanics of language and social elements of communication. His study — among four highlighted at last year’s International Meeting for Autism — represents a new paradigm in studying toddlers. The researchers’ hope is that, with earlier diagnosis through such non-invasive methods as fMRI scans, these children can start a treatment regimen at an earlier age.

A LIFE WITHOUT LIMITS

Courchesne was drawn to study autism for two fundamental reasons, one professional and one more personal. He was one of the last wave of children to contract polio in the 1950s before Salk’s breakthrough vaccine. He remembers his mother carrying him everywhere for the first few years, until he had surgery to strengthen his leg muscles, allowing him to stand and walk.

“My mum was phenomenal, and really put herself out to make my life as normal as possible, to overcome my disability,” said Courchesne. With his parents’ encouragement, he actively participated in sports, and later became a Western U.S. Champion in gymnastics on pommel horse and rings while a student at UC Berkeley.

“When I began my career and met young men with autism, I could see their potential. I wanted them to know they too could live a life without limits, and I thought maybe I could help.”

One revelatory moment about autism came to Courchesne when he was in the graduate neurosciences program at UC San Diego, studying part of the frontal cortex called “novelty P3,” which is activated when people hear or observe new information. He wondered how the brain brought new information to our attention and how such awareness is processed.

He mentioned his work to a colleague in psychology as they rode the elevator together after work one evening. She listened and, as she left, remarked that she noticed that the autistic children she worked with had little interest in new experiences; they much preferred to experience the same thing over and over.

“I wondered if patients with autism lacked this novelty brain response,” Courchesne said. He discovered that indeed there were key differences in the frontal cortex of those with autism, a finding which led to his first published paper and launched a career to discover the roots of this disturbing neurological disorder.

Eric Courchesne, PhD, at UC San Diego’s Radiology Imaging Laboratory.

Courchesne’s partner in research and in life, Pierce has been working in the field for nearly 20 years. She first became interested in the study of autism as an undergraduate at Stonybrook University in New York, where she had an internship teaching non-verbal communication skills to severely aggressive children with the disorder.

“One afternoon, I accompanied one of our teenagers with autism to go out for ice cream. Suddenly, without provocation, he punched me and pretty much knocked my lights out!” Pierce recalled. Her research colleague rushed to her side, frantically warning Pierce not to yell or cry, which might be construed as positive reinforcement of the hitting behavior.

“No one expected I’d show up for work the next day, but I did.” Armed with a subsequent graduate degree in clinical psychology from UC San Diego, Pierce understood the behavioral aspects of autism. But she felt that, in order to make big gains in the field, she would need to also understand the biology behind autism.

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Eric Courchesne (left) with Karen Pierce. "When I began my career and met young men with autism, I could see their potential. I wanted them to know they too could live a life without limits, and I thought maybe I could help!"
“But early behavioral paradigms remain close to my heart,” she says, having spent her first 10 years in the trenches, working with families. That background, combined with an additional five years of training in neurosciences, has informed her research and led to some breakthroughs of her own.

Pierce received worldwide media attention for her study in 2011 describing work with thousands of San Diego area pediatricians who had parents fill out a simple questionnaire at their child’s “one-year Healthy Baby” check-up. The study, which screened more than 10,000 infants, shows promise as a simple way for physicians to detect cases of autism spectrum disorder, language or developmental delays in babies at an early age. Following the screening, all toddlers diagnosed with ASD or developmental delay, and 89 percent of those with language delay, were referred for behavioral therapy and, on average, these children began receiving treatment at the age of 19 months. This program could be adopted by any pediatric office, at virtually no cost, to aid in identifying children with developmental delays and getting them therapy at a much earlier age than before.

“When we started giving parents the survey, I found that they listened more carefully to what I had to share with them and paid more attention to their child’s development,” said pediatrician Chrystal E. de Freitas, MD, FAAP, who participated in the study. “In addition to giving me the opportunity to do a more thorough evaluation, it allowed parents time to process the information that their child might have a developmental delay or autism — a message no parent wants to hear. But, by addressing these concerns early, the child can begin therapy that much sooner.”

In 2010, Pierce published yet another important study to identify at-risk behavior in young infants. Using eye-tracking methods, she and colleagues showed that toddlers with autism spend significantly more time visually examining dynamic geometric patterns than they do looking at social images — a viewing pattern not found in either typical or developmentally delayed toddlers. The results of the study suggest that a preference for geometric patterns early in life may be a signature behavior in infants who are at-risk for autism.

Together and separately, Pierce and Courchesne are contributing to medical sciences’ understanding of autism, providing glimpses into the minds of children with the disease.

**Tools for early diagnosis**

The Autism Center of Excellence is dedicated to discovering the causes of autism and paving the way for more effective autism treatment. The program focuses on research that will help identify what autism looks like in babies as young as 12 months, when the potential for effective interventions is greatest.

**Sleep fMRI** methods seek to discover a functional brain signature of infants at risk for autism.

**Eye Tracking** methods identify eye gaze patterns that may demonstrate elevated risk for autism in young infants.

**“One-Year Healthy Baby Check-Up” has screened thousands of babies in the general population for risk symptoms of autism at visits to their pediatrician around the child’s first birthday.**

**Research breakthroughs**

In a monumental breakthrough in the field of autism in 2003, Courchesne discovered that small head circumference at birth, followed by a sudden and excessive increase in head circumference during the first year of life, was linked to development of autism. Published in the Journal of the American Medical Association (JAMA), the study identified the first neurobiological, early-warning signs of autism during a child’s first year of life, offering the potential for earlier diagnosis, intervention and improved clinical outcomes for autistic children. In addition, this dramatic brain overgrowth has become a major focus of ongoing autism genetics research.

“Brain imaging studies of young children with autism have shown overgrowth and dysfunction in the prefrontal cortex, as well as other brain regions,” said Courchesne. “But the underlying cause at the level of brain cells has remained a mystery. The best guess was that overgrowth of prefrontal cortex might be due to an abnormal excess of brain cells, but this had never been tested.”

A study by Courchesne in late 2011 showed that brain overgrowth in boys with autism involves an abnormal, excess number of neurons in areas of the brain associated with social, communication and cognitive development. He discovered a 67 percent excess of cortical cells — a type of brain cell only made before birth — in children with autism. The findings suggest that the disorder may arise from prenatal processes gone awry.

“An excess of brain cells was found in each child with autism that we studied,” said Courchesne. “While we think that ultimately not every child with an autism disorder will show this, our study does suggest that an abnormal excess of cells may be quite common among children with autism.”

“This is an exciting finding because, if future research can pinpoint why an excessive number of brain cells are there in the first place, it will have a large impact on understanding autism, and perhaps developing new treatments.”

Even with their offices directly across the hall from one another, Courchesne and Pierce often go an entire work day without speaking to one another. Both note the nighttime hours spent with babies in the MRI suite, when they can talk one-on-one with the parents, as among the best times of the day. But they take turns working nights, so one of them can stay at home with their two young children.

Courchesne notes his other favorite time of the day, in the morning after he drops his children off at school, when he sits in a rocking chair at home writing on his laptop. “I love the process of quiet thinking and writing. I love to know that we are making discoveries that will really make a difference for kids with autism.”
When Heads Collide

Photographs by David Ahnholz

When heads collide, the impact isn’t always obvious. The standard signs of concussion — a sharp jolting of the brain that can result in a temporary loss of consciousness and symptoms ranging from headache, confusion, slurred speech and nausea to memory and concentration problems, irritability or even personality changes — can last from a few days to several months. Concussion symptoms and cognitive problems can persist for many years and may increase an individual’s chance of developing major depressive disorders, and even dementia, over time.

70 percent of traumatic brain injuries aren’t detected by an MRI.

THE USUAL RECURSIVE FOR SUSPECTED TRAUMATIC BRAIN INJURY

A magnetic resonance imaging (MRI) or computerized tomography (CT) imaging, both of which look for tell-tale blood clotting caused by concussive damage to neural tissues.

“Most people with concussions don’t actually have blood clots in their head, so their scans look normal,” says Roland Lee, MD, professor in the UC San Diego Department of Radiology. “Just because a CT or MRI scan looks normal doesn’t mean the brain is normal. Concussions cause injuries and abnormalities that don’t appear on MRIs and CT scans.”

SEARCHING FOR UNSEEN EVIDENCE

Magnetoencephalography (MEG) maps brain activity by measuring magnetic fields produced by the neurons that comprise synchronized circuits in the brain. It takes about 50,000 neurons working together to produce a signal. The brain has approximately 100 billion neurons making an estimated 100 trillion connections or synapses.

Lee and his Department of Radiology colleague, Mingxiong Huang, PhD, represent a vanguard using new imaging technologies to search for unseen evidence of head injury. Their work is supported by diverse agencies, among them the U.S. Department of Defense and the Veterans Administration, which treats thousands of soldiers suffering traumatic brain injuries, and the National Football League (NFL), where the rate and severity of on-field concussions appear to be increasing.

MEG can identify and localize brain activity in real time, pinpointing where neurons may not be functioning normally due to concussive injury that does not cause bleeding, such as torn or shredded “axonal injuries” — damage to the long, slender fibers that carry signals between brain cells. The technology is leading edge — UC San Diego has one of only three working MEG scanners in California — but its applications are already deep and broad.

MEG is used to localize epileptic discharges in the brains of patients with seizures, aiding treatment. Neurosurgeons can use MEG to pinpoint functional centers controlling movement, sensation and language before operations to remove nearby tumors. It’s also a powerful research tool for better understanding brain function and dysfunction in neurological disorders such as epilepsy, schizophrenia, stroke, dementia, post-traumatic stress disorder and autism. It has even been used to help determine how babies process language. Importantly, Lee and Huang are using MEG to differentiate between traumatic brain injury and post-traumatic stress disorder in military personnel, a determination that can significantly affect treatment in returning war veterans.

As advanced as the technologies are, Huang said the ultimate goal is to integrate them into the arsenal of imaging tools used to see the unseen. “We want MEG to become a routine clinical tool used by other centers and hospitals. We think it provides a new and improved way to look inside the living brain.”

Photographs by David Ahnholz

LEFT: MEG Imaging Unit.
RIGHT: Roland Lee, MD, (right) along with Mingxiong Huang, PhD, both professors in the UCSD Department of Radiology, are looking at injured brains in a different way at UCSD’s Magnetoencephalography Laboratory.
Bodies of Work
The Institute of Engineering in Medicine

THE HUMAN CARDIOVASCULAR SYSTEM CONSISTS OF AN ENDLESSLY BEATING HEART
pumping uncountable trillions of blood vessels through 60,000 miles of arteries, capillaries and veins.

This incredibly complex system has been the focus of much of Shu Chien’s long and storied career. Bringing to bear his training in both physiology and engineering, Chien — who holds a medical degree from National Taiwan University and a PhD degree from Columbia University — has helped to fundamentally explain how and why the cardiovascular system works and to develop new treatments and repairs for when it doesn’t.

Chien’s research has led to several patented inventions for UC San Diego, including a recent patent for gene therapy to prevent arteries from re-clogging after balloon angioplasty and bypass surgery. His achievements were honored last year with a National Medal of Honor, bestowed by President Barack Obama.

Chien is director of UC San Diego’s Institute of Engineering in Medicine (IeM), which he helped establish in 2008. Like the human cardiovascular system and Chien himself, the IeM combines many distinct entities into a working whole. Its mission is to better understand the human condition and develop remedies for what ails it by tapping into the diverse talents of faculty in UC San Diego’s Jacobs School of Engineering, the School of Medicine, the Skaggs School of Pharmacy and Pharmaceutical Sciences, and numerous other interdisciplinary departments and research units at the University.

“We want to create opportunities for faculty to meet and discuss research projects of common interest from various perspectives and use different, but complementary, approaches,” said Chien.

These efforts extend far beyond UC San Diego’s campus. The IeM partners with most of the large research institutions in the region; dozens of pharmaceutical companies; funding agencies such as the National Institutes of Health and California Institute for Regenerative Medicine; and major academic institutions, including Peking University, the National University of Singapore, Oxford University, the University System of Taiwan and the University of Gothenburg in Sweden.

In just four years, IeM doctors, scientists and engineers have done more than just learn how to talk each other’s talk, says David Cheresh, PhD, UC San Diego professor of pathology, noted cancer researcher and an associate director of the IeM.

“One notable achievement has to do with new approaches for identifying and surgically resecting tumors. By using tumor-targeting probes, it’s now possible to fluorescently tag tumors, which allows surgeons to more precisely remove the tumor with cleaner margins, leading to less residual disease after surgery.” The work, pioneered by IeM member and 2008 Nobel Laureate Roger Tsien, PhD, illuminates the real-world benefits of scientific cross-talk.

“One can imagine this dialogue has helped engineers better understand various disease processes so that they can begin to design devices and tools to address unmet medical needs,” said Cheresh.

“From a clinical perspective, disease-imaging approaches, drug-delivery vehicles and surgical tools are becoming available to the physician-scientist. It has clearly changed the way we and others do research. There’s a new path forward for tackling medical problems.”

THE INSTITUTE FOR ENGINEERING IN MEDICINE is one of the few places in the United States to combine the strengths of two major research and teaching enterprises — medicine and engineering — at one university to advance human health.

Not surprisingly, the IeM is structured a bit like the human body. At its metaphorical heart is the Cardiac Biomedical Science and Engineering Center, whose research mission extends from better understanding cardiac development, to developing new treatments for a variety of heart conditions and diseases.

Adding muscle is the Center for Musculoskeletal Research, focusing on diseases and therapies related to muscle, bone, cartilage and connective tissues. These include joint injuries, cerebral palsy, muscular dystrophy and osteoarthritis.

Topping this biological hierarchy is the Center for Advanced Neurological Engineering, where scientists use novel approaches for measuring and modeling the human brain to not just parse its extraordinary complexity, but also create new treatments for much-dreaded neurological conditions such as Alzheimer’s disease and Lou Gehrig’s disease.

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Shu Chien, MD, PhD, Director, IeM

“We want to create opportunities for faculty to meet and discuss research projects of common interest from various perspectives and use different, but complementary, approaches.”

Working nearby are researchers at the Retinal Engineering Center, who combine engineering and medical expertise to develop new approaches for restoring lost vision, including implants based upon nanotechnology.

The work at these centers is advanced by three other enterprises under the IeM umbrella: the Center for Medical Device and Instrumentation, specializing in the conception and development of 21st-century medical tools, from personalized biodevices to surgical robots; the Whitaker Center for Biomedical Engineering, which promotes collaboration and interactivity among the myriad departments at UC San Diego, with a focus on training students in biomedical engineering; and the William J. von Liebig Center of Entrepreneurism and Technology Advancement, the first facility of its kind in the United States. Established with a $10 million gift from the von Liebig Foundation, the Center promotes the commercialization and dissemination of innovative research and discovery at UC San Diego.
Since 1971, Elizabeth Barrett-Connor, MD, has overseen the Rancho Bernardo Heart and Chronic Disease study, tracking health data from more than 5,000 patients over a 40-year span.

“In January 1970, Barrett-Connor began teaching epidemiology courses at UC San Diego. She had earned her medical degree and had worked for 10 years, and the young assistant professor had the requisite research portfolio. Fast forward four decades: Barrett-Connor has now published more than 1,000 journal articles and is the founder and director of the Rancho Bernardo Heart and Chronic Disease Study, one of the longest-running longitudinal studies in the United States.

“I had no idea what I was getting myself into,” admits Barrett-Connor, reflecting on when she agreed in 1971 to serve as the epidemiologist for the UC San Diego School of Medicine site in a 12-site study funded by the National Institutes of Health (NIH) on the role of lipids in heart disease.
Barrett-Connor’s first task was to recruit participants for the study. She chose Rancho Bernardo, a relatively new suburb north of San Diego, for a number of reasons. It was the right size (10,000), with people moving there from all over the country. The population was fairly homogeneous — older, white, healthy, upper-middle-class and, above all, well-educated; assumed to be more likely to be altruistic and motivated to participate in research. Barrett-Connor’s team went door to door in Rancho Bernardo. They eventually recruited 2,508 men and 2,940 women — 82 percent of the age-eligible residents.

A study spanning four decades

“We studied how everyday characteristics like body size and fat distribution, good and bad cholesterol, blood pressure, physical activity, alcohol intake, cigarette smoking, diet and family medical history were related to common chronic diseases,” Barrett-Connor said. “We studied the reasons for gender differences in heart disease and diabetes — our first questions — plus chronic arthritis, headaches, lung disease, liver disease, kidney disease, cancer, and cognitive, mental and functional health.”

What makes much of this data especially valuable is that it was collected in the 70s and 80s — before participants started changing their health and lifestyle patterns, and taking medications to lower cholesterol and blood pressure. “Lipids and cholesterol were not household words then,” she said. Rancho Bernardo was the only one of the 12 sites not to close down after the initial research was completed. With continued funding from the NIH, Barrett-Connor’s team has conducted clinical research visits with participants every four years for four decades, gathering a phenomenal amount of data on diverse behaviors and biomarkers. In all, more than 400 scientific papers based on the Rancho Bernardo data have already been published.

“Genius of the study,” explains Barrett-Connor, “is that we have gathered enough data to publish at least another 100 papers.” She also has frozen blood samples dating back 30 years, and she and fellow researchers are applying for grants for new studies. Some of the future studies will require participants to come in for additional tests, such as bone density tests or brain scans. But, if the past is any indication, the Rancho Bernardo cohort will be more than willing. There is a certain urgency, however, as many of the participants are now in their 80s or older, and the last years of life may be extremely informative about healthy aging.

In recognition of her impressive body of work, Barrett-Connor won the American Heart Association’s 2011 Population Research Prize.

Forty years after they were recruited, more than 1,800 unpaid participants — 70 percent of the surviving cohort — are still answering health questions.

The Next Chapter: Preventive Care

Bess Marcus, PhD, chair of UC San Diego’s Department of Family and Preventive Medicine, is passionate about physical activity behavior. “While I was a graduate student,” she recounts, “I was struck by the fact that much of what ails people — like cancer, heart disease and diabetes — could be prevented if we could help them adopt healthy behaviors.”

This awareness has led Marcus to spend the last 25 years conducting research on physical activity behavior, and sparked her interest in developing programs to help people change poor health habits.

“The Rancho Bernardo Study has allowed us to learn much about the process of disease,” said Marcus. “Going forward, we will harness this knowledge to guide our department’s work in health promotion and disease prevention.” She adds that more population-based approaches are needed to address the many environmental, behavioral and systemic factors that influence preventive care.

As for her passion for physical activity, “I do practice what I preach,” she acknowledges. “No matter how busy my day is with administrative, teaching, research and family responsibilities, I always find a way to fit in at least 30 minutes of physical activity!”

“The Rancho Bernardo Heart and Chronic Disease Study is one of the most significant epidemiologic databases in the country, allowing research on a multitude of issues in healthy aging and women’s health, as well as specific disease-focused investigation. The breadth of Dr. Barrett-Connor’s scientific legacy is extraordinary.”

Bess Marcus, PhD
Chair, UC San Diego’s Department of Family and Preventive Medicine

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A Dramatic Remedy

UC San Diego Health System’s PTE Program

For most of what ails us, we can seek similar treatments with similar results in multiple places. Chronic thromboembolic pulmonary hypertension (CTEPH) is a severe, life-threatening condition that robs patients of their ability to breathe. For these patients, there is really just one place to go — the pulmonary thromboendarterectomy (PTE) program at UC San Diego Health System.

SINCE THE 1970s, DOCTORS AND RESEARCHERS AT UC SAN DIEGO have helped pioneer and perfect PTE, a radical surgery that removes chronic clots and scar tissue obstructing blood vessels in the lungs. Patients with CTEPH characteristically struggle to breathe, especially when exerting themselves. Their hearts must increasingly labor to generate sufficient blood flow, boosting the risk of cardiovascular disease and heart failure.

“We’ve had a rich and glorious history of outstanding surgeons, each surgical group seeming to build and improve upon their predecessors,” said William Auger, MD, professor of medicine and medical director of UC San Diego Health System’s PTE program. “Just as important, we have a wonderful team of collaborators — pulmonologists, cardiologists, anesthesiologists, nurses, technicians and support staff — who are talented, well-trained and experienced. We’re also leaders in making the diagnosis of chronic thromboembolic disease, which is just as important as doing the actual procedure.”

Early-stage patients are sometimes asymptomatic or may be misdiagnosed with ailments such as asthma, allergies, coronary artery disease or primary pulmonary hypertension. CTEPH is often incorrectly identified until the patient reaches the point where he or she struggles to simply walk and breathe at the same time.

“Many doctors aren’t familiar with the disease,” said Stuart Jamieson, MB, FRCS. “It’s not on their short list of conditions to look for, so it’s probably not considered until things become more obvious. Even then, a lot of people aren’t aware that the condition can be cured. I would estimate that at least 100,000 people in the United States could benefit from PTE, but there are only about 250 operations in this country each year.”

A PERMANENT CURE

The remedy is dramatic, both in operation and in result. PTE is an 8- to 15-hour procedure that involves attaching the patient to a heart-lung bypass machine, then cooling the body to roughly 68 degrees Fahrenheit, which reduces its oxygen needs by 95 percent. The patient’s chest is opened and surgeons temporarily turn off the heart-lung machine, stopping circulation for as long as 20 minutes. During this time, they can bloodlessly open lung arteries to remove clots and scar tissue. Relief is almost immediate. Breathing capacity is instantly boosted, and the heart’s workload is eased.

While lung transplants may still be performed elsewhere in the world for patients with thromboembolic disease, in the hands of the right surgeon, PTE is generally deemed safer and more effective. It is also considered a permanent cure. Few patients return for a repeat procedure.

UC San Diego Health System stands out as the best place in the world to go for PTE, but Jamieson, Auger and colleagues have worked hard to promote the procedure and train others to do it. Jamieson has helped establish PTE programs in England, Germany, Italy, Holland, Denmark, Australia, China, Canada and Japan, and our PTE program regularly hosts visits from foreign doctors and institutions.

“Our PTE program is probably the only clinical program that is indisputably the world’s leader.”

Stuart Jamieson, MB, FRCS
Distinguished Professor of Surgery and Chief of the Division of Cardiothoracic Surgery at UC San Diego Health System
GEORGE HIGHTOWER LIKES TO GET LOST. Sometimes, that means rolling through southern Mexico on a local bus, not knowing exactly where the driver is going. More often, it means mentally meandering through the DNA sequence of the human immunodeficiency virus (HIV), which causes AIDS. In so doing, he hopes to discover how HIV can attack the human brain, ravaging concentration, memory and judgment.

Hightower, a student at UC San Diego School of Medicine, is midway through a nine-year program to earn a combined MD/PhD degree. He aims to become an infectious disease expert who treats and studies viruses and bacteria. Already, his work has revealed that some concentration, memory and judgment.

Hightower was enrolled in an immunology class. Although he loved learning about the body’s numerous defenses against bacterial and viral invasion, he admits that memorizing a long list of immune cell types was less than thrilling. Listening in on the seasoned scientists one day in the lab, he noticed that they weren’t talking about that textbook list. They were debating whether certain cell types existed at all and what they might do if they were real. These scientists were planning experiments that would fill future textbooks.

Hightower felt that exhilarating rush of being lost amid the unknown — and the challenge of finding his way.

“Science isn’t something you can look up in a book and find what’s right or wrong.”

GEORGE HIGHTOWER, MD/PhD student at UC San Diego

HIV’s genome is diabolically simple. It contains only nine genes. Worldwide, more than a hundred laboratories are studying those genes in an effort to understand and combat AIDS. But the battle does not end there. Like other viruses, HIV frequently mutates, or changes at the genetic level. On average, every new virus particle — called a virion — has one mutation. Some of these mutations might allow the virion to evade anti-HIV drugs.

The quick mutation rate of HIV also means that a person doesn’t just have one version of the virus. Davey Smith, MD, an infectious disease physician and virologist who works with Hightower at UC San Diego, says a single person can host a “swarm of variants” numbering in the thousands. Each of these variants might differ by just a single DNA letter.

Hightower is looking for the genetic mutations that affect HIV’s ability to infect the brain. Identifying these will help scientists understand why some people have cognitive effects and others don’t. He is collaborating with Sanjay Mehta, MD, an infectious disease specialist at UC San Diego. Mehta estimates that about a third of people with HIV have cognitive problems. Of those, only a third have severe symptoms.

Hightower and Mehta are working with scientists at UCSD’s HIV Neurobehavioral Research Center who provide them with raw materials for the research — blood samples from HIV-positive people and test results that evaluate the people’s ability to think and remember.

Since this story was written in Spring 2011, Hightower successfully defended his PhD thesis work and returned to the clinical portion of the MD/PhD program. Currently, he’s engrossed in patient care, training at UC San Diego Health System and affiliated teaching hospitals and clinics. In June 2013, Hightower will complete his fourth and final year of medical school and graduate from UCSD’s Medical Scientist Training Program. His interests include pediatrics and dermatology, and he plans to continue on a career path that combines a passion for research and clinical care.

HIV on the Brain

By Amber Dance
Reprinted in part, with permission from the National Institutes of Health
Photographs by Nick Abadilla
Ajit Varki, MD, Ph.D., is a Professor of Medicine and Cellular and Molecular Medicine at UC San Diego School of Medicine. He belongs to that increasingly rare breed of physician-scientists: a medical doctor who not only learned how to treat disease, but also seeks to understand why diseases exist — even when their origins date back millions of years.

Born into a distinguished Indian family, Varki knew from an early age that he wanted to be both a doctor and a scientist. He excelled at some of his country’s finest schools, but ultimately realized he could not fulfill his ambitions in India. “In those days, there were no research-based academic medical institutions. For that, I needed to go to the United States.” And so he did, arriving in 1975 with a suitcase, six dollars in his pocket and grand aspirations. “But I couldn’t get any interviews. Back then, being an Indian doctor meant one was less qualified. So even though I was the top graduate from the top Indian school, nobody would talk to me.”

In St. Louis, Varki worked with Stuart Kornfeld, a physician-scientist interested in the structure and biology of sugar chains or glycans. It was an emerging field whose name — glycobiology — would not be coined for another few years. Glycans were enormously difficult to study. Most molecular biologists sought easier subjects, but Varki became intrigued.

“these glycans are found in large amounts on the surfaces of all cells, but no one really knew what they did,” said Varki. “I was lucky to find the first clear-cut example of function. I was hooked.”

In 1982, he joined the faculty at UCSD School of Medicine, where he continues his own glycan research and regularly teaches medicine and glycobiology, both locally and abroad.

In 1984, he observed a patient being treated with horse serum. The patient experienced an immune reaction, called “serum sickness.” Some attributed the response to glycans called sialic acids. Varki was perplexed. Why would sialic acids, which are ubiquitous on every mammalian cell, provoke such a reaction? In 1998, he published the answer: humans are missing a form of sialic acid that horses and other mammals have; in fact, we are different from all other primates. The difference isn’t much — a single oxygen atom — but it’s enough to provoke a complex and sometimes adverse immune response.

**Sugar Coded**

Ajit Varki is not afraid to ask big questions or do what’s required to answer them, even if that means experimenting on himself.

**AJIT VARKI, MD, PHD, IS A PROFESSOR OF MEDICINE AND CELLULAR AND MOLECULAR MEDICINE AT UC SAN DIEGO SCHOOL OF MEDICINE.**

**HOOKED ON AN EMERGING NEW FIELD**

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**Glycans are complex sugar chains found on the surface of all cells, but how are they linked to disease?**
THE EVOLUTION OF DISEASE

Humans produce a sialic acid known as N-acetylneuraminic acid, or Neu5Ac for short. Other mammals also make a form called Neu5Gc. All humans have antibodies against Neu5Gc, which Varki deduced must be the result of eating foods containing Neu5Gc, particularly red meat. To prove it, he proposed ingesting large amounts of Neu5Gc and to see where it went. Varki presented his plan to an institutional review board for approval, but was initially rebuffed. Self-experimentation is frowned upon, the board declared. But when Varki asked them to volunteer, board members said to go ahead.

So Varki drank 150 milligrams of Neu5Gc dissolved in water (which he later described as tasting “slightly sweet and sour”) and no more dangerous than eating 14 pork steaks, then scrupulously analyzed his urine, saliva and hair samples over the next week. All showed increased levels of Neu5Gc.

The work was not strictly academic. Varki and others contend that inflammation due to meat-associated diseases, such as cancers and heart attacks. Glycans fascinate Varki because they are so poorly understood. “Most scientists probably can’t tell you much about them,” he says. “But most diseases have a glycan component.”

As Varki discovered more about glycan evolution, he also uncovered other questions to fuel his curiosity. Chimpanzees, for example, are near-genetic duplicates of humans, but do not share the same diseases. They don’t get most human cancers. They don’t have the same kinds of heart attacks. They rarely suffer from conditions like bronchial asthma or rheumatoid arthritis.

Varki has evidence that uniquely human changes in sialic acids and sialic-recognizing proteins called siglecs (which he discovered and named) contain at least part of the answer. Siglecs are among the most rapidly evolving part of the human genome. The larger mystery is what prompted the changes? With colleague Pascal Gagneux, PhD, an associate professor of cellular and molecular medicine, Varki has found answers involving factors as diverse as malaria and anti-sperm antibodies. “These aren’t just subjects for evolutionary biologists,” he says. “They’re important to medical doctors too.”

“Doctors care for a single species, but learn nothing about the origin of that species,” Varki said. “But evolutionary knowledge has practical implications. It affects how you treat specific diseases. Some say they don’t need to know where a machine came from to fix it, they just need the blueprint. I think it’s important to know how the machine came to be built the way it is.”

Where do we come from? How did we get here?

Wanting to fully explore how humans became human, in 1998, Varki created the Project for Explaining the Origin of Humans, which involved private gatherings of invited academics from around the world, supported by the Mathers Foundation of New York. A decade later, the effort was expanded into the Center for Academic Research and Training in Anthropogenesis (CARTA), with co-directors Fred Gage, PhD, a Salk Institute neuroscientist, Margaret Schoeninger, PhD, a professor of anthropology at UC San Diego, and associate director Gagneux. Among other activities, CARTA conducts wide-ranging public symposia featuring internationally renowned speakers, discussing everything from the molecular basis of speech to how humans run upright, and is training a new generation of transdisciplinary “anthropogenists.”

For information and a list of CARTA events, go to carta.anthropogeny.org.

Treating Cancer from the Inside Out

It has been known for more than a century that heat is toxic to cancer cells. Heat makes cancer cells more sensitive to the chemotherapy itself, and some cancer cells are sensitive to the heat alone.

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Building Better Doctors
UC San Diego School of Medicine

When second-year medical student Viridiana J. Tapia first enrolled at UC San Diego’s School of Medicine, she dreamed of serving her community as a general practitioner. After reading about the work of a plastic surgeon doing reconstructive surgery in Mexico last summer and doing research on the topic, her goals shifted.

“Now I am thinking that plastic surgery may be the best way for me to serve my community, and I am so glad that I have a community of advisors here that will support me in that pursuit,” Tapia said.

This kind of academic growth, where hands-on experience informs education and career goals, is exactly what Maria C. Savoia, MD, dean of medical education, hopes for all of her students. In this pursuit, Savoia and the rest of the leadership at the school worked to help create the Medical Education and Telemedicine building, which opened in fall 2011.

Medical students, residents and practicing physicians now learn in a space equipped with the latest technologies, a design that encourages collaborative learning and a comfortable environment that invites students to stay after classes are through.

The facility has a large, state-of-the-art lecture hall, break-out study rooms, advanced medical and surgical simulation centers, lounges, meeting rooms and the flexibility to evolve as educational needs change.

“When we designed this building, we hoped it would invite interaction among different levels, from medical school students to practicing physicians,” Savoia said. “We created a space that feels welcoming, which will help build a sense of community.”

Second-year medical school student Tanya Gupta said housing all of her educational needs under one roof saves her time and encourages her to collaborate with students in her class, her professors and others. She regularly studies with friends in the break-out rooms equipped with large, flat-screen televisions that allow teleconferencing.

Features of the new building advance the goals of the new curriculum that started last year, which emphasizes collaboration and real-world practice. Simulation technologies — from mock operating rooms to video cameras to electronic mannequins — give students a chance to hone their medical and surgical skills.

“The technology is amazing,” said Katie Blair, a second-year medical student. “Another great aspect of the building is that all of our needs are in one place. My advisor’s office is just steps away from where I study. I can meet with her any time she is in her office.”

The student lounge is a large and sun-filled space, a hub of activity complete with a kitchen, piano, foosball table and a large television. “I meet students from different years and different cohorts in the lounge,” Blair said. “It allows me to build a relationship with more students, and these relationships will serve me throughout my career.”

In coming years, Savoia said the building can be reconfigured based on educational needs. For example, she hopes to create a three-dimensional, virtual-reality learning environment that would allow students and doctors to immerse themselves into worlds as small as nanoparticles and as complex as the human body.

“This new facility, in combination with our revised curriculum, helps us serve the continuum of medical education better than anywhere else in the country,” Savoia said. “Another great aspect of the building is that all of our needs are in one place. My advisor’s office is just steps away from where I study. I can meet with her any time she is in her office.”

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Maria C. Savoia, MD
Dean of Medical Education

To learn more about supporting students at the School of Medicine, contact Health Sciences Development at 858-246-1568.
2012 Highlights

THE NEW FOUR-STORY SANFORD CONSORTIUM FOR REGENERATIVE MEDICINE BUILDING — entirely dedicated to advancing and fulfilling the therapeutic promise of stem cells — celebrated its grand opening on UC San Diego’s campus in November 2011. Here, stem cell researchers from five distinct local institutions — UC San Diego, the Sanford-Burnham Medical Research Institute, The Scripps Research Institute, the Salk Institute for Biological Studies and the La Jolla Institute for Allergy & Immunology — work together under one roof. The consortium building is the ninth facility erected under the auspices of the California Institute for Regenerative Medicine (CIRM), a state agency established in 2004 with the passage of Proposition 71 and charged with overseeing $3 billion in tax-supported funding for stem cell research at California universities and research institutions. UC San Diego research alone has received more than $100 million in CIRM funding since 2005.

PAUL S. VIVIANO ACCEPTED THE POSITION AS THE NEW CEO OF UC SAN DIEGO HEALTH SYSTEM AND ASSOCIATE VICE CHANCELLOR FOR HEALTH SCIENCES, commencing June 1, 2012. Viviano brings to this critical position a background of exceptional leadership and strategic vision with a community hospital system, an academic health center and in medical business providing health care services nationally. He was most recently the Chairman of the Board and CEO of Alliance Healthcare Services — the nation’s largest provider of advanced outpatient diagnostic imaging services and a leader in the delivery of radiation oncology services. His prior positions include President and CEO of USC University Hospital and USC Norris Cancer Hospital.

ROBERT N. WEINREB, MD, A CLINICIAN, SURGEON AND SCIENTIST WHO IS INTERNATIONALLY RENOWNED FOR HIS WORK WITH GLAUCOMA, was selected as the new chair of the Department of Ophthalmology and director of the Shiley Eye Center in 2011. Weinreb is Distinguished Professor of Ophthalmology and holds the Morris Gleich, MD, Chair of Glaucoma at UC San Diego. He replaced outgoing chair Stuart I. Brown, MD, who stepped down as Shiley Eye Center director after 28 years at the helm. Weinreb has been at UC San Diego School of Medicine since 1984, and has been the director of the Hamilton Glaucoma Center since 2003.

ALMOST EXACTLY TWO YEARS AFTER ANNOUNCING A PLEDGE OF $75 MILLION FROM JOAN AND IRWIN JACOBS to name the new facility, on April 9, 2012, UC San Diego celebrated the official start of construction for Jacobs Medical Center. This 10-story, multi-specialty medical center will be the largest component of UC San Diego Health System in La Jolla, and is scheduled to open in 2016. The new facility will house the Hospital for Advanced Surgery, the Hospital for Cancer Care and the Hospital for Women and Infants. In addition to increasing the speed at which medical breakthroughs are translated into clinical practice, the Jacobs Medical Center promises to serve as an educational space for the next generation of physicians, pharmacists and scientists. Philanthropist Carol Vassiliadis has pledged support of a surgical floor at Jacobs Medical Center’s Hospital for Cancer Care.

A $1 MILLION PLEDGE BY TED AND MICHELLE GURNEE, matched by a university-endowed fund established by the Department of Emergency Medicine, has led to the establishment of the Ted and Michelle Gurnee Chair in Hyperbaric Medicine. This endowed chair will help UC San Diego establish a top-tier research program in hyperbaric-related sciences.

THE UC SAN DIEGO SCHOOL OF MEDICINE UNVEILED THE CENTER FOR THE FUTURE OF SURGERY IN FALL 2011 — one of the largest facilities in the nation dedicated to catalyzing novel surgical technologies, techniques and teaching methods. Directed by professor of surgery Santiago Horgan, MD, the Center has more than 20 surgical training stations located within 11,440 square feet of space, and is an integral part of the new 100,000-square-foot Medical Education and Telemedicine building, designed to provide a progressive, high-tech environment for the training of students and physicians.

WOLFGANG DILLMANN, MD, WAS SELECTED AS CHAIR OF THE DEPARTMENT OF MEDICINE and named the Helen M. Ranney Endowed Chair in late 2011. Dillman, an internationally recognized physician-scientist, came to UC San Diego in 1979, and is the fifth chair in the Department’s 43-year history. With nearly 470 full-time faculty members and over 100 academic researchers, the Department of Medicine is the largest of the departments at UC San Diego School of Medicine, as well as one of its inaugural departments. The department is engaged in nearly 380 different biomedical research programs, with funding awards totaling $113.6 million in fiscal year 2011.

UC SAN DIEGO MEDICAL CENTER WAS NAMED ONE OF THE NATION’S 100 TOP HOSPITALS® by Thomson Reuters in April 2012. Ranked among the country’s major teaching hospitals, the Medical Center was also one of 12 hospitals to receive the Everest Award. This award honors hospitals that have achieved both the highest current performance and the fastest long-term improvement over a five-year period in Reuter’s national benchmarking study.

SCOTT M. LIPPMAN, MD, FORMER CHAIR OF THORACIC/HEAD AND NECK MEDICAL ONCOLOGY AT MD ANDERSON CANCER CENTER, was named director of UC San Diego Moores Cancer Center, beginning May 1, 2012. His major fields of research are translational/molecular studies of cancer risk, molecular-targeted drug development and personalized therapy, and he has more than 25 years of experience heading translational research involving investigator-initiated clinical trials. He is triple board-certified in internal medicine, hematology and medical oncology.

IN APRIL 2012, UC SAN DIEGO OFFICIALLY OPENED ITS NEW CENTER FOR ADVANCED LABORATORY MEDICINE (CALM). The 90,000-square-foot, state-of-the-art facility brings together under one roof most of the clinical laboratories in UC San Diego Health System, along with many diagnostic services of the School of Medicine’s Department of Pathology. The CALM will also act as a referral center and resource for doctors and institutions throughout San Diego County and beyond, emphasizing development and use of leading-edge technologies of health science.
UC San Diego Health Sciences comprises one of the nation’s top research-intensive schools of medicine; the Skaggs School of Pharmacy and Pharmaceutical Sciences; and UC San Diego Health System, the region’s only academic health system.

David A. Brenner, MD
Vice Chancellor, Health Sciences and Dean, School of Medicine

Paul S. Viviano
CEO, UC San Diego Health System

Kim Kennedy
Executive Director, Marketing and Communications

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