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**UCLA** Health System

# UCLA NEUROSURGERY

## INVENTING A BOLD NEW FUTURE

VISION. PHILANTHROPY. NEXT-GENERATION MEDICINE THAT SAVES LIVES.

*Shown above and on the cover: Colored light micrograph of a section through the cerebellum of the brain. The cerebellum controls balance, posture, and muscle coordination.*



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## **INSIGHT. ANALYSIS. WISDOM. KNOWLEDGE.**

The human brain is both miracle and mystery, transforming our capacity to shape the world around us. With a remarkable power to understand nuance and master complexity, our brain is an asset of incalculable worth – and neurosurgeons at UCLA are helping us leverage its true potential. Their cutting-edge research yields critical scientific breakthroughs and innovative surgical techniques; their unparalleled clinical care sets the global standard in treatment and recovery. Working to redefine the future of brain-related medicine, these physicians are accelerating the pace of discovery and inspiring new hope in our community and beyond.



Dr. Neil Martin is passionate about maximizing neurological health. As chairman of the UCLA Department of Neurosurgery, he sees firsthand how devastating illnesses of the brain can be – and how critical it is to bring every possible resource to bear in fighting them. “Neurological disorders – from stroke and brain injury to Alzheimer’s disease, brain tumors, epilepsy, and others – represent a major challenge in global healthcare,” he says. Meeting that challenge requires a close collaboration among physicians, patients, and the larger community. “By working together,” he continues, “we are able to offer a truly world-class level of treatment for the entire spectrum of disorders of the brain and spinal cord.”

The human brain is the most complex thing in the known universe. It is, more than any geographical marker, a true frontier – a boundary beyond which lies exciting, uncharted territory. Exploring that landscape takes extraordinary neurosurgeons capable of finding new ways to navigate difficult terrain, and at UCLA we have the very best.



Often taking place within the most critical circumstances, the work of a neurosurgeon is frequently described as “medical miracle.” Behind that mystique at UCLA are the dedication, talent, and training of what I consider to be the greatest team of biomedical scientists, innovators, and surgeons assembled anywhere. Recognized among the top 10 such programs around the globe, the UCLA Department of Neurosurgery is known not just for the expertise of our physicians, the breadth of our research, or the scope of our scholarship, but also for our indefatigable commitment to our patients and to the full restoration of their neurological health.

Millions of Americans face disorders of the brain and spine each year. As the human population lives longer and advancements in technology lead to increases in diagnosis, there is an urgent and increasing need to develop cutting-edge neurosurgical excellence. The road to curing brain cancer, reversing strokes, repairing traumatic injuries, and re-engineering the central nervous system presents a formidable challenge. Yet, as the only medical professionals with direct access to the brain and spinal cord, neurosurgeons are uniquely qualified to blaze the trail – and none more so than here at UCLA. The peerless philanthropic partners who sustain our journey with moral and financial support accelerate our impact exponentially.

The UCLA Stroke Center works at the forefront of research, education, and treatment in cerebral vascular diseases. Funded by a prestigious National Institutes of Health (NIH) Specialized Programs of Translational Research in Acute Stroke grant, UCLA houses one of only eight such centers in existence around the country, and services the entire Southern California region with its TeleStroke unit. The Brain Injury Research Center, bolstered by private, support ranks among the top three of its kind nationwide. The Center takes a rigorous approach to understanding the biology of traumatic brain injury, developing real-world treatments for soldiers on the battlefield and children on the playground.

The UCLA Brain Tumor Program encompasses a broad range of specialties from genetics to immunology to pathology, translating research discoveries into groundbreaking clinical advancements. It is the only program in existence that has developed a truly personalized brain cancer vaccine. And, the UCLA Epilepsy Program, founded more than 30 years ago, was the first to offer a comprehensive program for patients suffering from intractable seizure disorders; it still serves as a primary beacon of hope today.

As we enter the next era of medical technology and innovation, UCLA neurosurgeons aim to combat illnesses never before conceived of for surgical treatment such as autism, dementia, and severe depression, providing an entirely new spectrum of possibilities for our patients’ recovery. Major philanthropic investment will anchor core medical research programs in brain trauma, neurovascular disorders, brain tumors, and spine disorders – programs that aim for nothing less than permanent cures for these debilitating illnesses. With private support, new facilities will deploy the latest advancements in telecommunications and telemedicine, creating a Global Neurosurgery Institute where patients will have the greatest minds in neurosurgery at their service, regardless of location.

Your contributions and involvement are crucial to realizing our vision. I invite you to join us on this journey as, together, we invent the future of neurological repair, restoring the lives of our patients and loved ones for generations.

Sincerely,

Neil A. Martin, M.D.

Chairman and W. Eugene Stern Professor in Neurosurgery  
UCLA Department of Neurosurgery

## IMPOSSIBLE ODDS. MIRACULOUS MEDICINE.

For many patients, each day is a miracle. For Jennifer Sugioka, that describes every day, and just waking up inspires reflection and gratitude. Eleven years ago, she was diagnosed with the most aggressive form of brain cancer: glioblastoma multiforme. Now, defying impossible odds, she continues to thrive. The story is one of courage, innovation, and triumph – and Jennifer is living proof of how the right medical team can mean the difference between life and death.

It was during her first year at Loyola Law School that Jennifer, a 23-year-old Los Angeles native, first started noticing the headaches. Just before final exams, she was walking downstairs to her car when her

developed through fellowship funding from the Sidney Kimmel Foundation. “I was lucky,” Jennifer points out, “because there was no guarantee that my tumor was the type that would respond to

**“Without Dr. Martin, Dr. Liau and the support of my family, I wouldn’t be here today. Now I cherish each moment, each day.”**

legs gave out. Fortunately, a friend was there to catch her and to convince her it was time to see a doctor. “They gave me an MRI,” Jennifer recalls. “Two hours later, I received the most difficult call of my life. I was told I had a brain tumor.”

The diagnosis – glioblastoma multiforme, the deadliest kind of brain cancer – was devastating, and the outlook was grim: Jennifer was told that, in all likelihood, she had between nine and 12 months to live. The doctor put her on a powerful anti-seizure medication called Dilantin and suggested they operate right away to remove the entire tumor. In the meantime, her symptoms were getting worse, with frequent fainting spells and rashes that were breaking out all over her body.

Jennifer decided to seek a second opinion and, through a close friend, was referred to Dr. Neil Martin, a prominent neurosurgeon at UCLA. Seeing Dr. Martin turned out to be the right decision. “Almost immediately, Dr. Martin realized that a lot of my ‘symptoms’ were actually the result of an allergic reaction to the medication the previous doctor put me on,” she says. “He could also see that the tumor was wrapped around an artery near the speech center in my brain, and that taking it out entirely would be the worst thing to do.” After extensive brain mapping (at the time, part of a cutting-edge clinical trial at UCLA Neurosurgery; today, a cornerstone of precision brain surgery to minimize damage to healthy areas that control key functions), Dr. Martin safely removed the largest possible portion of the tumor – and Jennifer’s ability to speak remained intact.

After a successful surgery, Jennifer was offered the option to enroll in Dr. Linda Liau’s brain cancer vaccine clinical trial, which was

the therapy. Fortunately, after testing some of the cells from my tumor that were removed during surgery, Dr. Liau saw I was eligible for the trial.”

She underwent the traditional treatments for cancer: radiation and chemotherapy. At the same time, surgeon-scientists at UCLA began preparing her personalized vaccine. Tumor cells that were removed during Jennifer’s surgery were put into culture and grown in the lab. She then underwent a process called leukapheresis, the extraction of white blood cells capable of generating dendritic cells – the generals of the immune system’s army. Next, these dendritic cells were combined with peptides from her cultured tumor cells and, when injected, activated Jennifer’s immune system to seek out any remaining cancer in her body. Two months post surgery, she received her custom brain cancer vaccine shots – much like a flu vaccine – over the course of two weeks.

Amazingly, that was more than a decade ago, and Jennifer has the distinction of being among the rare group of people who are long-term brain cancer survivors today. And, though her road to recovery continues as she dedicates each day to maintaining her health, she is grateful: “Without Dr. Martin, Dr. Liau and the support of my family, I wouldn’t be here to tell my story. Now I cherish each moment, each day.” Dr. Liau is quick to return the compliment. “We are all so proud of Jennifer and how dedicated she is to being well and living her life,” she says. “It’s my dream some day to see all of our patients survive – and thrive – as Jennifer has.”



# THE ART AND SCIENCE OF NEUROSURGERY

Neurosurgeons have a unique role in the management of the brain. While some neurological disorders may be addressed with medications or noninvasive therapies, others require a more direct approach. Uniquely able to pinpoint access to the deepest reaches of the most vital organ, neurosurgeons attack diseases of the brain with a targeted surgical strike.

By offering precise and focused surgical intervention, neurosurgeons maximize the benefit of treatment and minimize the damage to surrounding healthy tissue. It's a delicate balance of science and art – and, at UCLA Neurosurgery, we are among the world's leaders in achieving that equilibrium, raising the bar on excellence that our patients have come to expect.

At the heart of our work is a dual emphasis on research and results: conducting hands-on investigations that change the way of looking at neurological illnesses and translate to new lines of treatments, producing never-before-seen improvements in clinical care. We concentrate our efforts in the following four key areas.

## BRAIN TUMORS

At UCLA, we offer comprehensive treatment of all types, including benign tumors, malignant primary tumors, gliomas, meningiomas, and metastatic tumors. We also specialize in pituitary tumors and those involving the highly delicate skull-base anatomy. Surgery is commonly one of the most effective treatments, and our team of preeminent neurosurgeons – whose expertise ranges from neurosurgery and molecular biology to neuro-oncology and neuropathology – can safely operate on even the most challenging cases.

research center, looking at a molecule that shows promise as an agent that inhibits the growth of medulloblastomas, or working to activate and engineer super T-cells that can recognize and attack brain tumor cells, our neurosurgeons are revolutionizing scientific knowledge and extending patients' lives.

## NEUROVASCULAR DISORDERS

UCLA's Neurovascular Surgery Program is widely regarded as one of the premier research centers for the diagnosis, treatment, and management of vascular diseases of the brain and spinal cord. Our neurovascular surgeons specialize in addressing complex central nervous system disorders including aneurysms, stroke, arteriovenous malformations, cavernous angiomas, and carotid and intracerebral arterial stenosis.

Our team has partnered with colleagues in diagnostic neuroradiology, interventional neuroradiology, stroke neurology, neurological critical care, stereotactic radiosurgery, and neurological rehabilitation, treating more than 15,000 patients each year. Our clinicians and researchers collaborate closely with the UCLA Stroke Center, designated as the first in Los Angeles County to earn accreditation as a Primary Stroke Center.

With focus and vision, our surgeons have developed game-changing, state-of-the-art therapies for neurovascular patients. The Guglielmi detachable coils (GDCs), which have transformed the treatment of intracranial aneurysms, were invented at UCLA, as was the MERCI clot retrieval device, which recently won Food and Drug Administration (FDA) approval for the restoration of blood flow following a cerebrovascular event.

Our advanced diagnostic and treatment options include deploying telemedicine in the field to improve pre-hospital stroke care, extracranial-intracranial bypass surgery for giant aneurysms, bypass techniques for Moyamoya disease, the use

of intra-operative brain mapping, transcranial Doppler (TCD) and cerebral blood flow monitoring for vasospasm, and intracranial angioplasty and stenting. These therapeutic techniques are vital to the survival and recovery of patients here and abroad.

## SPINAL DISORDERS

Working in concert with multiple specialists at the UCLA Spine Center, neurosurgeons at UCLA are at the forefront of technologies and techniques that are dramatically strengthening outcomes. With the assistance of robotic technology, we are navigating complex spinal surgeries with greater precision and ease, helping patients afflicted with spinal tumors, degenerative diseases, and trauma or inflammatory conditions at the skull base and upper cervical spine. Through outpatient

“Looking ahead, diseases never before approached through a surgical lens – such as Alzheimer's, severe depression, obsessive-compulsive disorder, and autism – will be treated, and cured, with groundbreaking solutions.”

stereotactic radiosurgery, we are increasingly able to deliver high-focal radiation to lesions without damaging essential areas of the spine.

Using small endoscopes and high-resolution video cameras, UCLA is also a leader in neuroendoscopy – microsurgeries of the brain and spine. These minimally invasive procedures require only a small incision and involve very little trauma, resulting in a shorter hospital stay for patients and a quicker return to normal activities. Our neurosurgeons leverage their expertise in neuroendoscopy to treat disorders such as spinal cord tumors, degenerative disc disease, and injury.

We are one of the few spine centers in the country to have NIH funding, supporting a robust research program. Our spine surgeons are lead investigators in a number of cutting-edge studies, blazing a trail to translational medicine that will benefit patients everywhere. Advanced MRI techniques allow us to be proactive rather than reactive, providing the tools necessary to identify and treat spinal cord damage at the earliest detectable point in time. Molecular therapies in development are enabling us to repair degenerated and arthritic discs. And, we are creating novel methods to regenerate usage of the arms and legs in paralytic patients with traumatic spinal cord injury.

## BRAIN INJURY

The number-one cause of death and disability in people under 45, traumatic brain injury (TBI) is a significant focus of our work at UCLA Neurosurgery. Approximately one and a half million

Americans – including soldiers, athletes, the elderly, and children – sustain a head injury each year. Nearly 50 percent will be hospitalized in an emergency room or intensive care unit (ICU).

A Level 1 trauma facility, Ronald Reagan UCLA Medical Center has been designated as one of six Public Health Service and Research Centers for providing acute trauma care and extensive clinical research. UCLA Neurosurgery's clinical Brain Injury Program is a cornerstone of this effort, offering emergency evaluation and surgery, as well as long-term therapy and care for TBI.

Our neurosurgical/neurological ICU is a 24-bed, state-of-the-art facility that provides minute-to-minute critical care. The ICU is staffed by an elite team of physicians and residents, neuroscience nurses, respiratory technologists, electroencephalography (EEG) technologists, and nurse

managers. The team monitors patients' nervous systems using EEG, evoked potentials (EP), TCD, cerebral blood flow, intracranial pressure monitoring, cerebral microdialysis, and positron emission tomography (PET).

Our Brain Injury Research Center (BIRC) is an innovator in translating laboratory research into effective therapies for head-injured patients. Internationally renowned for its contributions, BIRC is one of this country's preeminent programs. Its scholars have played key roles in advising the U.S. Joint Chiefs of Staff on the establishment of mandatory protocols to help the nation's service members recover after suffering TBIs on the front lines. In addition, UCLA's physician-scientists have set national guidelines for pediatric brain injury protocols, protecting countless children involved in trauma from severe accidents to regular sports activities.

The advances made by UCLA's BIRC literally save lives every day, illustrating the university's commitment to turn research into treatments – and, in the process, to improve outcomes everywhere.

## LOOKING AHEAD

As we continue to build on the success of these programs, we will carry our history of innovation forward. Diseases never before approached through a surgical lens – such as Alzheimer's, severe depression, obsessive-compulsive disorder (OCD), and autism – will be treated, and cured, with groundbreaking solutions. Looking ahead, UCLA Neurosurgery will seek to remain at the forefront of neuroscience medicine and research; to deliver personalized neurosurgical care and novel treatments; to train the next generation of neurosurgical pioneers; and to be recognized as the worldwide leader in inventing the future of the field.

# A TRULY GLOBAL ACADEMY

As medicine is expanding, the world is becoming smaller. Communications and collaborations that even a decade ago would have been unthinkable are, today, an unremarkable aspect of everyday life.

By taking full advantage of these new and emerging tools and opportunities, UCLA Neurosurgery is paving the way to an exciting new era in the field. Continuing to foster a culture of innovation that

is virtually unmatched, we are building a Global Neurosurgery Institute that will eliminate domestic and international barriers to transformational science and patient care. The facility will expedite patient-doctor interactions, improve care in the nation and around the world, and train more neurosurgeons globally to address some of the most challenging neurological diseases such as Parkinson's, Alzheimer's, stroke, and brain tumors.

We will be able to forge closer, deeper, and faster partnerships with elite institutions internationally in ways that will have a profound impact on patients and the care they receive both in Los Angeles and abroad. Here at home, patients treated by the UCLA Health System will have access to the best doctors in the world with the unique expertise for their particular case. Populations beyond UCLA with a need for specialized care but

limited local access will be able to tap into the resources of our preeminent neurosurgery program.

With the establishment of the Global Neurosurgery Institute, UCLA is ushering in a future of unequalled opportunity for clinicians, researchers, and patients on every continent.



# ONE CAMPUS. ENDLESS POSSIBILITIES.

Currently under construction, the Edie and Lew Wasserman Building is changing the face of neurosurgery at UCLA. In 2014, the top two floors of the state-of-the-art facility will house the Department of Neurosurgery, bringing physicians and researchers together under one roof for the first time in the Department's history. This new structure will include the most technologically advanced patient clinic, telemedicine center, training pavilion, and faculty center, creating a comprehensive neurosurgery campus unlike any other in existence.

## NEUROSURGERY SCHOLARS PAVILION

### BREADTH OF INQUIRY. DEPTH OF DISCOVERY.

Historically, world-renowned leaders have time to gather only once a year, if at all, at global conferences and colloquia to share insights into surgical methods, patient therapies, and research breakthroughs. This limited interaction also offers little, if any, opportunity for doctors and researchers in far-flung locations to exchange ideas and information that could advance neurosurgical knowledge and lead to breakthrough treatments.

The top floor of our headquarters will be fully dedicated to the Neurosurgery Scholars Pavilion. We will partner directly with an international network of leading academic medical centers in the United States, Latin America, Europe, Africa, and Asia, opening up a world of possibilities for research, collaboration, and clinical trials.



## CLINICAL PAVILION

### SUPERIOR OUTCOMES. EXCEPTIONAL CARE.

In recent years, the disjointed approach to acute care in the United States has grown more pronounced. With physicians and scientists scattered across vast areas within a single medical enterprise, patients are forced to ferry between primary-care doctors, specialists, and labs, among other locations.

The new Clinical Pavilion will empower UCLA Neurosurgery to set a new standard in coordinated team care. It will include experts from neurosurgery, neurology, psychology, brain mapping, cardiology, and diet and nutrition from UCLA and around the world. Regardless of their location, these specialists will identify approaches and confounding factors and weigh risks in an enhanced interactive atmosphere that emphasizes problem solving and patient results.



## NEUROSURGERY TRAINING PAVILION

### CUTTING-EDGE SKILLS. UNBRIDLED SUCCESS.

UCLA neurosurgeons are sought for their expertise in treating conditions that can afflict hundreds of thousands, if not millions, of people. For many of these patients, finding appropriate and timely medical care is unlikely or impossible. Producing experts with UCLA-caliber training who are capable of addressing these conditions is absolutely vital; otherwise, countless individuals will continue to lack access to lifesaving care.

With the establishment of our new Neurosurgery Training Pavilion, the next generation of top neurosurgeon-scientists will be trained in their craft. It will provide a space to enhance the skills not only of our residents, but also of our seasoned surgeons, taking the entire professional surgical staff from great to greatest. The Pavilion will offer image-guidance systems in mock surgical practice. Through high-definition video and telecommunications technologies, our surgeons will observe procedures in top medical facilities, and international surgeons-in-training will have access to UCLA's expertise. Neurosurgical masters will mentor our residents and attending physicians, ensuring that patients benefit from the ultimate in knowledge and experience.



## GLOBAL CONFERENCE PAVILION

### EMERGING TECHNOLOGY. CONVERGING EXPERTISE.

Capitalizing on the latest advances in communications technology, the Global Conference Pavilion will create an expanded academy of scholars. From Los Angeles to London and from Barcelona to Beijing, millions of patients will benefit from seeing physicians, in their own neighborhoods and beyond, best-equipped to treat rare injuries, tumors, and diseases that require a high degree of specialization. Similarly, those same physicians will gain critical knowledge and insight by having the opportunity to consult with colleagues around the globe.

With the development of a 70-seat conference center and a technically advanced, internationally connected boardroom, the Pavilion will provide collaborative opportunities for doctors and patients across borders and time zones. The potential outcomes are dramatic: Patient and doctor consultations will be expedited, physicians will have more time for local cases, doctors the world over will have direct access to the expert in their field in order to better care for their patients, and generations of new physicians will be trained to treat varied and complex cases effectively.



Edie  
Lew Wasserman  
Center

In 2002, Dr. Jorge Lazareff, the Geri and Richard Brawerman Professor in Pediatric Neurosurgery, made international headlines by separating one-year-old Guatemalan twins Maria Teresa and Maria de Jesus Quiej Alvarez, who were born joined at the head and later flown to UCLA for treatment. As he began a grueling 23-hour surgery to unwind the extensive, tangled venous network that connected their two brains, Dr. Lazareff was simultaneously linking himself to their lives as a member of their extended network of caring. Now 10 years old and residing with families in Los Angeles, the twins are living examples of the power of progress in neurosurgical medicine.



## EXCEPTIONAL TALENT. EXTRAORDINARY HEALING.

UCLA is dedicated to attracting top talent that will be game-changers in the field. Dr. Jorge Lazareff is just one example. When it comes to strengthening outcomes in neurosurgical medicine, he goes beyond the borders of a single city – or even a single continent. Dr. Lazareff works toward the fulfillment of a visionary goal: advancing neurosurgical possibilities for children in developing nations across the globe.

Dr. Lazareff sees a clear path to making this vision a reality. “The incidence of most neurosurgical diseases,” he says, “is similar in rich and poor countries. But the treatments available and the outcomes achieved vary wildly.” And while every low- and middle-income country faces a distinct set of challenges, Dr. Lazareff has identified a common – and elegant – solution: training local physicians and building an international network of specialists who leverage emerging technologies to share their expertise. He is able to meet this challenge through support provided by the Geri and Richard Brawerman Chair in Pediatric Neurosurgery.

Since arriving at UCLA in 1993, the Argentina native has perfected a model of international clinical care training that goes beyond medical tourism. Physicians traveling abroad to perform pro bono surgeries, says Dr. Lazareff, are doing an admirable service, but there is still an opportunity to do more. “Years ago, I was traveling frequently to Guatemala to lend a hand,” he recalls. “And it struck me how much more effective the trips would be if I could use them to teach the doctors who lived there, so they could take the lead in treating their own people.” Rather than returning to the same location year after year, he realized, he would be able to go new places and multiply his impact exponentially.

That impact has been wide and far-reaching. In less than a decade, Dr. Lazareff and his team have traveled 14 times to diverse locations throughout Central and South America, Eastern Europe, and Asia, honing local neurosurgeons’ skills and helping scores of children born with congenital diseases and disorders of the brain and spinal cord. The benefit of these trips, he observes, runs both ways. “The physicians we meet have things to teach us that are different from and complementary to what we know,” Dr. Lazareff says. Through an interchange of ideas and experiences with international colleagues, UCLA neurosurgeons are able to gain fresh insights that help their own patients here at home.

They are also able to establish ongoing, collaborative relationships worldwide – and to lay the foundation for frequent, and affordable, transnational communications. Dr. Lazareff cites one prominent example: “We are developing web-based platforms that allow neurosurgeons to interact with their colleagues from countries of all income levels,” he says. “We have currently built an Internet network that virtually brings together 17 neurosurgeons from Latin America, China, and Africa to focus on combating tethered spinal cord syndrome.” His goal is to set up similar networks for each of the pathologies treated by UCLA Neurosurgery. One in every 1,000 children born in the developing world is afflicted with congenital diseases of the central nervous system, and the care they receive can be enhanced through partnership with UCLA. The potential impact will be enormous, and, says Dr. Lazareff, “We’re just getting started.”

### PHILANTHROPY AT WORK

The work of Dr. Lazareff and his UCLA colleagues is vital and innovative, bringing us one step closer to the future of neurosurgery every day. Building the infrastructure necessary for their progress requires discipline, commitment, and a willingness to invest in top-tier talent capable of evolving the field. Endowments are one essential way to offer both moral and financial support.

Geri and Richard Brawerman are among a distinguished number of visionary philanthropists whose generous endowed contributions yield tangible advancements in neurosurgical knowledge and expertise. With funds established through the Geri and Richard Brawerman Chair in Pediatric Neurosurgery, Dr. Lazareff is tackling the inequity of neurosurgical care for children in developing nations head on. The partnership among the Brawermans, Dr. Lazareff, and UCLA has attracted the notice and active participation of neurosurgeons in the United States and worldwide.

Named chairs do more than just recognize a scholar’s dedication to scientific discoveries. As importantly, they provide critical funds to attract and retain top talent, allowing the most innovative approaches to medicine to flourish. Endowed chairs have a meaningful impact on patients – and the donor’s legacy – for generations to come.

## SEEKING ANSWERS. FINDING CURES.

Experts in UCLA's Department of Neurosurgery are focused on practical results: advancing knowledge to develop groundbreaking treatments and cures. Through unique collaborations and innovative approaches, we nurture a deeper understanding of the human brain that allows us to change – and save – patients' lives.

The UCLA BIRC is at the forefront of this effort, developing effective therapies for patients who have experienced traumatic brain injury (TBI) as a result of varied circumstances: from car accidents to sports and military service. Fundamental to innovation are technological advances in imaging, neurophysiology, molecular biology, modeling, and behavioral neuroscience, creating critical new tools for the study of TBI and earning the BIRC acclaim as one of the top three centers of its kind across the country.

Faculty members affiliated with the BIRC pursue research in both clinical and basic neuroscience. This dual emphasis is incredibly advantageous, as it enables us to confirm laboratory findings in a real-world environment and to take clinical problems to our basic-science laboratories to discover much-needed solutions. Studies of metabolism, neuroplasticity, imaging, developmental neuroscience, and drug therapies are all key components, as are robust programs in brain imaging, cerebral blood flow, metabolism, and neuro-intensive care. All areas of our investigations at the bench translate to the bedside.

Among the BIRC's most important discoveries is that, after an acute period following injury, the brain enters a state of metabolic depression. Going forward, we are working to develop metabolic therapies capable of combating this depression and enhancing cellular and functional recovery – an approach that may lead to fundamental changes in the future of TBI patient management.

Just as the BIRC is transforming the way we look at TBI, so too is UCLA's Brain Tumor Program redefining treatments for brain cancer. Led by Dr. Linda Liao, the program has yielded research resulting in a custom-made vaccine, currently in a Phase II clinical trial, that manipulates a patient's own cells to jumpstart the body's immune system. Once invigorated, the immune system creates a host of "killer" T-cells that strike the tumor dead on the spot. In conjunction with surgery, radiation, and chemotherapy, Dr. Liao's vaccine may help cure brain cancer once and for all.

UCLA scientists are continually pushing the boundaries of knowledge and discovery. From isolating the link between TBI and Parkinson's disease to documenting how humans regulate the activity of specific neurons in the brain and from analyzing data showing the benefits of surgery in treating catastrophic pediatric epilepsy to achieving breakthroughs that offer promise in reversing paralysis, our research has an impact that reverberates worldwide.

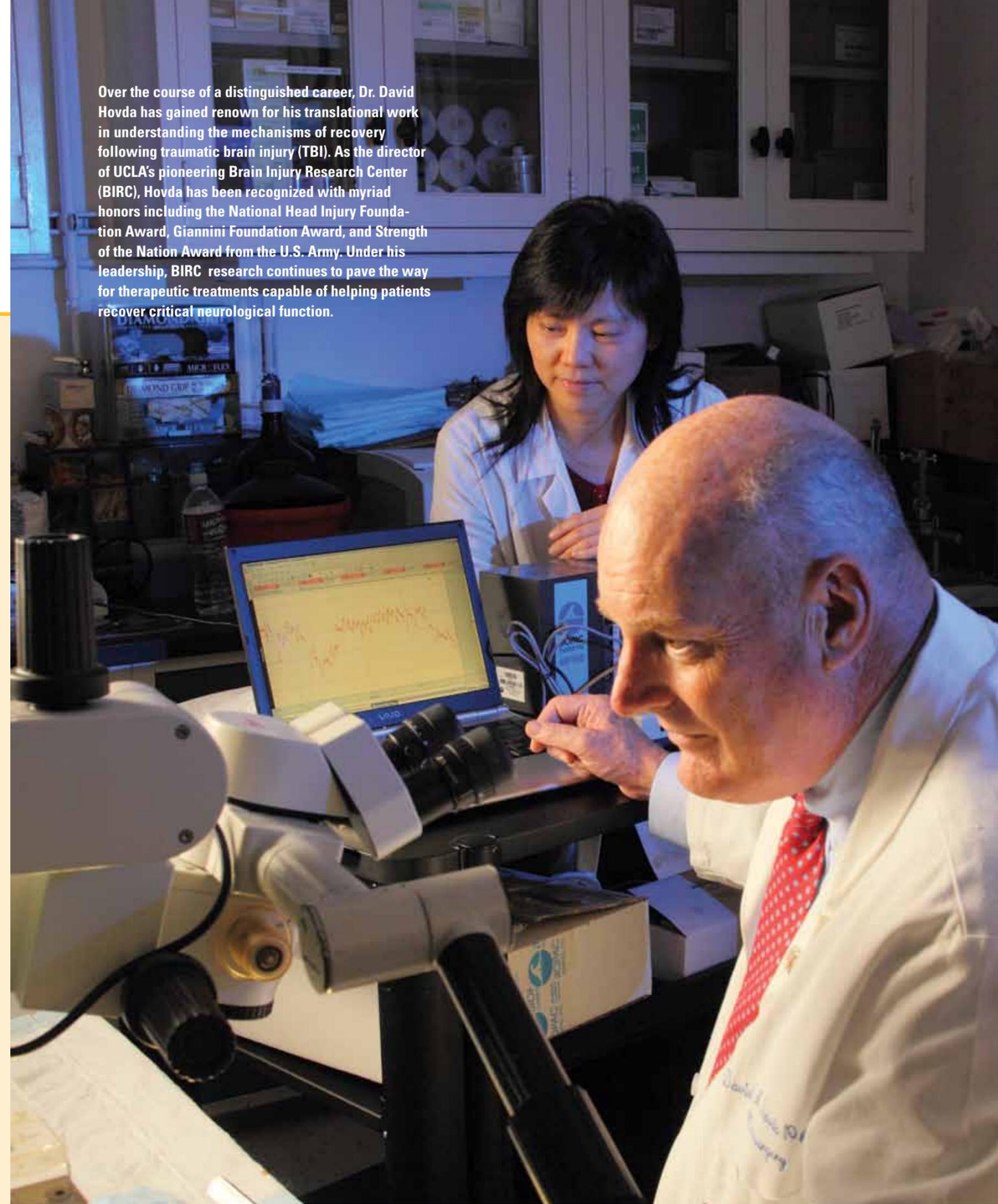
### FROM RESOURCES TO RESULTS

At UCLA Neurosurgery, we have a distinguished record of accomplishment. And, though we are proud of where we have been, we continue to set our sights on perfecting the future.

We envision a time when the most sophisticated technology, consummate skill, and advanced techniques can enhance, recover, and restore brain function for every patient, in every instance, and on every level. Getting there will require that we establish multi-million-dollar centers that can further the remarkable work already started: creating the Center for Brain Tumor Research, Center for Neurovascular Health, and Center for Spinal Cord Disorders Research; catapulting the Brain Injury Research Center to the next level; and launching the Center for Neurobionics and Neuromodulation.

The reason is simple: Resources bring results. Through robust and dedicated funding, our programs are capable of extraordinary advances that can completely reshape the landscape of neurological care. Working with philanthropic partners, we can test hypotheses, engineer revolutionary treatments, and enable our patients and their families to live better. It is an ambitious undertaking, but our progress is already well underway – and UCLA Neurosurgery stands ready to be recognized as the unmatched model in this arena.

Over the course of a distinguished career, Dr. David Hovda has gained renown for his translational work in understanding the mechanisms of recovery following traumatic brain injury (TBI). As the director of UCLA's pioneering Brain Injury Research Center (BIRC), Hovda has been recognized with myriad honors including the National Head Injury Foundation Award, Giannini Foundation Award, and Strength of the Nation Award from the U.S. Army. Under his leadership, BIRC research continues to pave the way for therapeutic treatments capable of helping patients recover critical neurological function.



## WE DON'T ANTICIPATE THE FUTURE. WE *INVENT* IT.

UCLA Neurosurgery is not only one of the nation's most prominent providers of neurosurgical care as it exists today – we are also world-renowned leaders in pursuing the science of tomorrow. Our philanthropic partners play a critical role in the development of incredible innovations that help patients recover and thrive.

Through the power of visionary seed funding, fresh ideas and inspiration spark important advances in neurosurgical care. In 2003, Dr. Linda Liau, Vice-Chair and Director of the UCLA Brain Tumor Program, received a fellowship through the Sidney Kimmel Foundation for Cancer Research. She used these funds to pursue

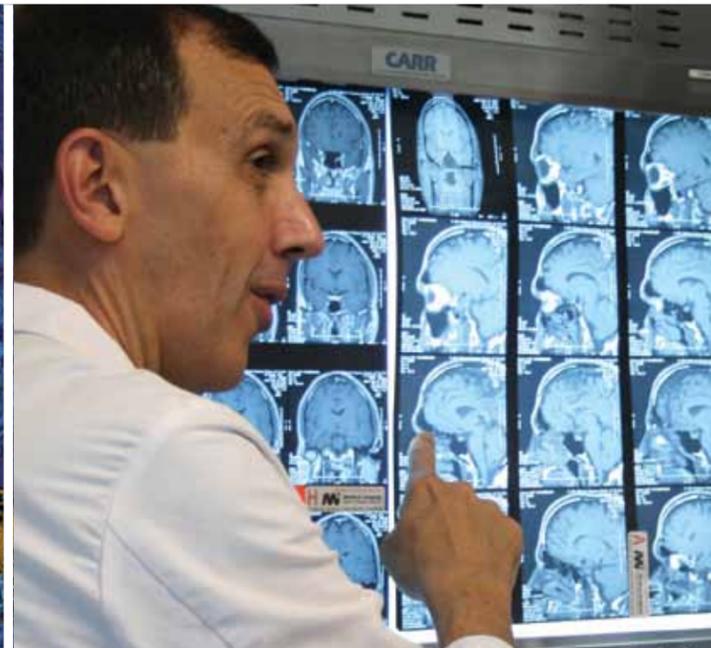
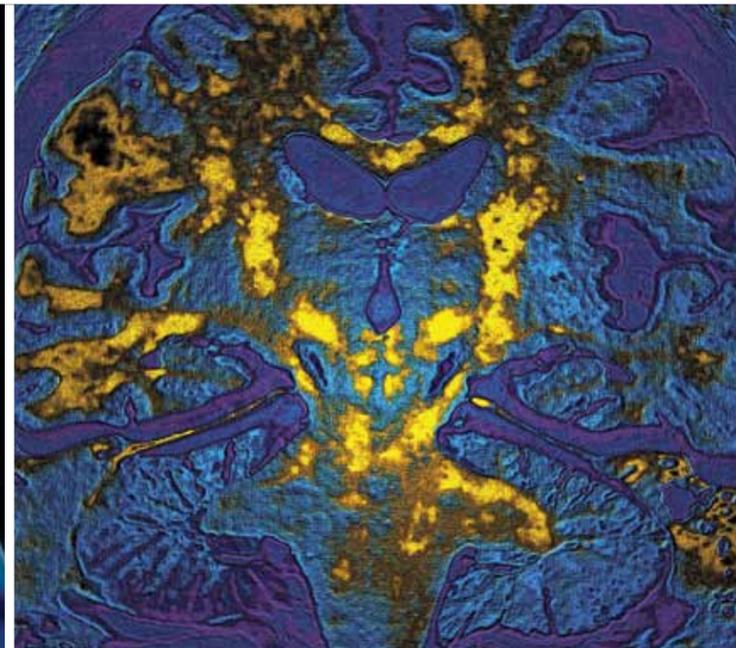
technologies put powerful and flexible resources directly into the hands of healthcare providers to help them make faster, more informed patient-care decisions. Integrating hospital, clinical, and radiological data, the software sends patient information directly to the medical provider via handheld devices or desktop computers.

published in the New England Journal of Medicine – could lead to a new method for enhancing memory in patients with early Alzheimer's disease, which afflicts six million Americans and 30 million people worldwide each year.

With the assistance of community benefactors, UCLA Neurosurgery faculty members Drs. Marvin Bergsneider and Xiao Hu are developing ShuntSense®, the first “smart shunt” system for the treatment and management of hydrocephalus. For the first time, patients with this disease – which costs Americans up to \$1 billion each year – will have advanced technology available that allows implantable devices to be monitored by their physicians around the clock, seven days a week. This new system will help neurosurgeons at UCLA eliminate multiple surgeries that, in the past, were required to

were previously compromised. No other team in the country has mastered this technique, and the results of this seminal research are being published in the prestigious Journal of Neurosurgery. We aim to serve as a model for others in this arena, helping them to make a difference for the more than one million patients who suffer from stroke each year.

Through our commitment to discovering new frontiers, Drs. V. Reggie Edgerton and Daniel Lu are learning to harness next-generation neurobionics and neuromodulation (the controlled stimulation of currents in the central nervous system to restore key brain/body function). This surgeon-scientist team at UCLA is developing interventions that may enable patients with severe paralysis due to spinal-cord trauma and stroke to stand, step, and regain voluntary



research into the development of a brain-cancer vaccine. Less than a decade later, that vaccine is a reality, currently in Phase II of a multi-million-dollar, national clinical trial on the road to FDA approval as the next standard brain tumor treatment. The result: Due in part to Dr. Liau's revolutionary work, brain-cancer patients at UCLA Neurosurgery live longer than those treated in any other hospital.

In collaboration with private supporters, UCLA Neurosurgery Chairman Dr. Neil Martin and his colleagues built a suite of medical software tools they call Global Care Quest (GCQ). Its

GCQ enables doctors and others to access comprehensive real-time patient data at the point of care and anywhere there is cellular or Wi-Fi network coverage. Currently being distributed to more than 25 hospitals nationwide, this new system is eliminating the barriers of time and distance in the delivery of high-quality medical care to the most critically ill patients.

Propelled by vital research funding, UCLA scientists have demonstrated an ability to boost human memory by stimulating a key site in the brain: the entorhinal cortex. Led by Dr. Itzhak Fried, a professor in the Department of Neurosurgery, this landmark study –

correct malfunctioning shunts. Consequently, it also will reduce the associated risks of these surgeries, such as infection and radiation exposure from repeat imaging. It's a winning economic argument: cutting costs for patients, while strengthening their health and improving their quality of life.

As a result of our emphasis on fostering innovation, UCLA's Dr. Nestor Gonzalez developed new surgical techniques for the most difficult cases of chronic stroke. By “borrowing” blood vessels from the scalp and implanting them in the cranium, our surgeons can now provide vital oxygen and nutrients to areas of the brain that

muscle control once lost to injury. New combinations of drugs and electrical stimulation are being developed to awaken dormant circuitries within the spinal cord – enabling purposeful leg control, even after the injury has completely disconnected the spinal cord from the brain.

These innovations are just the beginning. Every day, we engage in the relentless pursuit of discovery as we continue to invent the future of neurosurgery. At UCLA, philanthropy creates undreamed of opportunities – an incalculable return on investment.

## ACCELERATING IMPACT

“Supporting UCLA’s achievements in neurosurgery strengthens the fabric of our own community as it improves the health of the population globally. There are few things more rewarding than the knowledge that your partnership is helping people live better, and longer.”

— Mr. Jim Z. Donor ”

“Our work at UCLA is about people: enabling patients to set a goal of returning to full health, and then creating a roadmap to take them there. By pushing the boundaries of scientific possibility, we make breakthrough discoveries that advance neurosurgery and transform patients’ lives.”

— Dr. Neil A. Martin, Chairman, UCLA Neurosurgery

“Every patient should have access to the brilliant, skilled, and forward-thinking neurosurgeons at UCLA. At each step of the way, they showed me that my treatment was their top priority. It was so reassuring to know that I was in the hands of world-class experts who were literally writing the book on fresh approaches and new techniques. That I’m here to tell the story demonstrates what it means to have a team of the very best.”

— Edie Baskin Bronson

A microscopic image of brain tissue, showing a complex network of yellow and brown structures. A white text box is overlaid on the right side of the image.

You can play a vital role in restoring neurological health to thousands of patients in our community and beyond.

To learn more about giving opportunities to support the UCLA Neurosurgery vision, please contact:

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