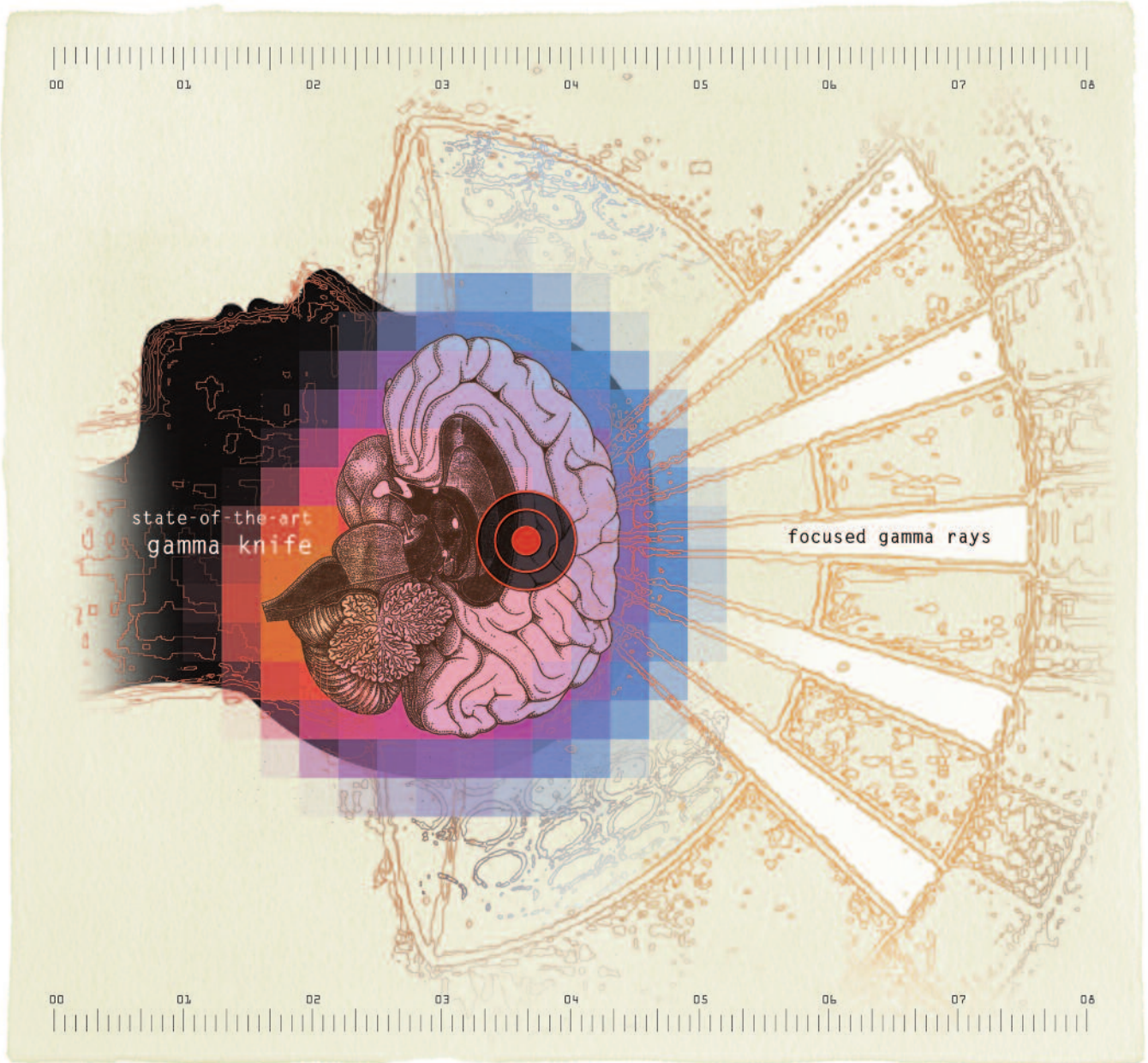


MEMORIAL HERMANN
 MISCHER NEUROSCIENCE INSTITUTE
 JOURNAL
 TEXAS MEDICAL CENTER



 The University of Texas
 Medical School at Houston

UT★PHYSICIANS

Mischer
 Neuroscience Institute

MEMORIAL
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WEBSITE

Please visit us at our new website: www.mhmni.com

NEW INSIGHTS INTO NEUROLOGIC DISEASE

IN THIS ISSUE of the Mischer Neuroscience Institute Journal, we celebrate the accomplishments of the Vivian L. Smith Center for Neurologic Research, made possible by the generous support of the Vivian L. Smith Foundation for Neurologic Research. Under the outstanding leadership of its founding director, Guy L. Clifton, M.D., the Vivian L. Smith Center has been a world leader in testing new treatments for patients with brain injuries resulting from hemorrhage, trauma and stroke.

We're also grateful to Mr. Gregg Tangeman for sharing the story of his diagnosis of and treatment for chronic inflammatory demyelinating polyneuropathy (CIDP). Like countless other patients with neuromuscular disorders, he benefited from the clinical and diagnostic expertise of physicians and staff at our Neuromuscular Disorders Center, which was recently designated by the GBS/CIDP Foundation International as a center of excellence for the treatment of Guillain-Barré syndrome, CIDP and other inflammatory peripheral neuropathies.

MNI now encompasses several other centers of excellence, including the Brain Tumor Center, Cerebrovascular Center, Texas Comprehensive Epilepsy Program, Multiple Sclerosis Center, Spine Center, Neurorehabilitation Program, Movement Disorders Center and the Dementia Center. Toward our mission of being the best locally, nationally and internationally, we remain committed to establishing new clinical and academic programs, recruiting nationally recognized faculty and expanding our reach across Houston and beyond.

**TOWARD OUR MISSION OF BEING THE BEST LOCALLY,
NATIONALLY AND INTERNATIONALLY, WE REMAIN COMMITTED TO
ESTABLISHING NEW CLINICAL AND ACADEMIC PROGRAMS,
RECRUITING NATIONALLY RECOGNIZED FACULTY AND EXPANDING
OUR REACH ACROSS HOUSTON AND BEYOND.**

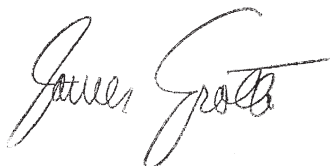
With best wishes,



Dong H. Kim, M.D.

DIRECTOR, MISCHER NEUROSCIENCE
INSTITUTE AT MEMORIAL HERMANN

PROFESSOR AND CHAIR,
DEPARTMENT OF NEUROSURGERY,
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THE VIVIAN L. SMITH CENTER FOR NEUROLOGIC RESEARCH

ADVANCING SCIENCE AND NEW THERAPIES TO IMPROVE
QUALITY OF LIFE FOR NEUROLOGIC PATIENTS.

In four more years, approximately 5,000 patients will have become part of the Neuroscience Research Repository (NRR), a prospective database and tissue sample bank that will improve knowledge of neurological illness and injury, and ultimately change the way care is delivered. A collaborative project of Memorial Hermann and the Vivian L. Smith Center for Neurologic Research at The University of Texas Medical School at Houston, the NRR will

that are now funded by outside sources.”

Under the decade-long leadership of founding director Guy L. Clifton, M.D., the Vivian L. Smith Center achieved international renown for leading-edge research in brain injury. During its first 10 years, funding from the Vivian L. Smith Center supported the development of several laboratories dedicated to research in neurological injuries and fostered extensive collaborations with local investigators affiliated with insti-

says. “I also wanted to establish a major new resource at the Vivian L. Smith Center – a tissue repository for work in neurological injury similar to the large tumor repositories that support cancer researchers and serve as the foundation for basic and clinical studies. There was no such bio-bank of human samples from patients suffering brain injuries from trauma, stroke or hemorrhage. We envisioned the NRR as a resource for investigators already in the field and a tool that would stimulate others to enter the field.”

An early beneficiary of the NRR is a laboratory study investigating the genetic basis of cerebral aneurysms, which was funded by the National Institutes of Health from 2002 to 2007 and is currently supported by the American Heart Association/Bugher Foundation Center for Stroke Prevention and the Vivian L. Smith Center. “Our long-term goals for the study are to identify causative mutations in intracranial aneurysms and altered molecular pathways that lead to disease,” says Teresa Santiago-Sim, Ph.D., principal investigator of the study. Dr. Santiago-Sim is a research scientist and assistant professor of neurosurgery recruited to the Center from Harvard University.

Using DNA samples stored in the NRR, Dr. Santiago-Sim utilized linkage analysis of a large family with a history of hereditary intracranial aneurysms to identify a novel region in the genome. “In the process of characterizing the gene, we think we may have identified a possible mutation,” she says.

The NRR figures prominently in Dr. Santiago-Sim’s work. “The repository is a major research resource at the Vivian L. Smith Center,” she says. “Standardized electronic health data and samples are collected in a uniform manner, which makes the information in the database very consistent. The information is also very extensive, describing the type and shape of the aneurysm, whether it was ruptured or remained intact at the time of

“THE VIVIAN L. SMITH CENTER FOR NEUROLOGIC RESEARCH PLAYS AN INTEGRAL ROLE IN RESEARCH WITHIN THE DEPARTMENT OF NEUROSURGERY AT UT, ALLOWING NEW PROJECTS TO FLOURISH.”

collect samples from consenting patients for clinical, genomic and proteomic analysis. The repository is just one of many Memorial Hermann/UT research projects benefiting from the support of the Vivian L. Smith Foundation for Neurologic Research, which has funded research in the UT Medical School’s department of Neurosurgery since 1996.

“The Vivian L. Smith Center for Neurologic Research plays an integral role in research within the department of Neurosurgery, allowing new projects to flourish,” says Dong H. Kim, M.D., director of the Mischer Neuroscience Institute (MNI), professor and chair of the department of Neurosurgery at the UT Medical School and director of the Center. “Startup support from the Vivian L. Smith Foundation for Neurologic Research has laid the groundwork for numerous faculty-led research projects

tutions like TIRR Memorial Hermann, Mission Connect and Baylor College of Medicine. With seed money from the Foundation, scientific investigators at the Vivian L. Smith Center/Department of Neurosurgery have gone on to obtain more than \$26 million in grants since 1996. Grant providers include the National Institutes of Health, United States Department of Defense, Mission Connect, Christopher and Dana Reeve Foundation and others. The work has resulted in more than 100 peer-reviewed publications that acknowledge the support of the Vivian L. Smith Foundation.

In 2008, when Dr. Kim assumed the role of director of the Vivian L. Smith Center, he wanted to build on past successes and move in new directions. “As with Dr. Clifton before me, I wanted to continue the recruitment of outstanding scientists to the Center and Houston,” he

diagnosis, and whether the patient has a positive or negative family history for aneurysms and other possible related inherited diseases such as polycystic kidney disease or stroke. This information will help us identify genotype and phenotype correlations that will ultimately improve the way we manage patient care.”

Other recent outstanding recruits to the Vivian L. Smith Center include Qilin Cao, M.D., an associate professor of neurosurgery and an international leader in the use of stem cells to treat spinal cord injury (SCI). With substantial funding also from Mission Connect, Dr. Cao is exploring the therapeutic utility of oligodendrocyte-restricted precursor cells, a type of stem cell, to treat patients with SCI. He is also investigating ways to enhance remyelination as a mechanism for spinal cord repair, a study funded by National Center for Research Resources (NCRR), and optimal combinatory strategies to promote remyelination and functional recovery after SCI, funded by

the National Institute of Neurological Disorders and Stroke (NINDS).

Ying Xia, M.D., Ph.D., and his team joined the Vivian L. Smith Center/Department of Neurosurgery in May from Yale University School of Medicine, where he was known for his work on stroke and other neurological injury. Dr. Xia’s research includes investigations of brain protection from ischemia, hypoxic dysfunction of neurons and inhibition of epileptic hyperexcitability. His team hopes to provide new clues for better solutions for stroke, hypoxia encephalopathy and specific neurodegenerative disorders.

The Vivian L. Smith Center is a large operation, with 19 faculty currently involved, including nine research scientists and five clinician-investigators, along with nine staff members. Since 2008, the Center has attracted an additional \$7.4 million in external funding. It also provides a major new resource, the NRR, that will help local investigators and, over time, other researchers

working on brain injury studies around the world.

“Advances in biomedical research technology like the NRR present a range of new opportunities for a greater understanding of neurological illness and injury and the development of novel therapies,” Dr. Kim says. “The beauty of the NRR is that it integrates reliable clinical data with biologic information from patient tissue specimens, providing us with insight into a broad spectrum of health issues related to injury and disease of the brain, spine and central nervous system,” he says. Already, the following projects are under way because of the NRR:

Therapeutic utility of stem cells to treat spinal cord injury (Qilin Cao, M.D.)

Use of statin drugs following traumatic brain injury (Bryan Oh, M.D., and Imo Aisiku, M.D.)

Coding variants associated with cerebral aneurysm pathogenesis (Dong Kim, M.D., and Teresa Santiago-Sim, Ph.D.)



Thoracic aortic aneurysms and dissections (Hariyadarshi Pannu, Ph.D.)

Changes in microRNA expression following brain injury, spinal cord injury, or stroke (Meredith Moore, Ph.D.)

Clinical interventions to increase organ procurement after brain death (Gigi Hergenroeder, M.H.A., R.N., and David Powner, M.D.)

Proteomics of brain trauma-associated elevations of intracranial pressure (David Powner, M.D., Pramod Dash, Ph.D., and Gigi Hergenroeder, M.H.A., R.N.)

Biomarkers for TBI-associated elevated intracranial pressure (David Powner, M.D., Pramod Dash, Ph.D., and Gigi Hergenroeder, M.H.A., R.N.)

Comparison of NT-proBNP concentrations in blood samples from jugular bulb and arterial sites after traumatic brain injury in adults (David Powner, M.D.)

Mechanism-based therapeutic strategies for prevention and treatment of oxidative stress-related human diseases (Rong Yu, Ph.D.)

Patient data for the Neuroscience Research Repository is gathered through a clinical documentation and communication program called Neurocore and electronically transferred to the NRR database for analysis. Developed by Clearpath Solutions with funding from Memorial Hermann, the Neurocore system has the capability to collect patient data in a standardized manner, enabling researchers like Dr. Santiago-Sim to search for patterns in medical histories and track outcomes. All data and samples are de-identified according to HIPAA and Institutional Review Board regulations.

“The vision for medicine across the country is to transition as quickly as possible to electronic medical records,” says Gigi Hergenroeder, M.H.A., R.N., director of the Neuroscience Research Repository and an assistant professor in



The Mischer Neuroscience Institute medical staff uses Neurocore to chart patients' medical treatments during rounds.

the department of Neurosurgery at the UT Medical School. “Dr. Kim has worked with Memorial Hermann-Texas Medical Center to put the main source of the patient data for the NRR into place through the development of Neurocore. Because of Dr. Kim’s vision and the support of the Vivian L. Smith Foundation we now have a priceless resource combining clinical data, which provides an overall picture of the patient’s condition, with tissue samples researchers can analyze on the scientific level. The result is a much more complete picture than most databases provide.”

The system also offers clinical decision support through imbedded protocols for the treatment of specific conditions. “Neurocore has the capability to analyze information with a narrow and deep focus, making it particularly useful in specialties like neuroscience,” Dr. Kim says. “It facilitates research and evidence-based medicine and supports our mission as a medical school and teaching hospital to educate future leaders in neuroscience by helping our residents advance their knowledge and practice. It also offers us the opportunity to monitor

adherence to and departure from protocols, as well as change existing protocols and introduce new ones.”

Researchers began enrolling patients in the NRR at Memorial Hermann-TMC in the spring of 2009. As the repository’s inventory expands, the availability of tissue samples will quicken the pace of research. “If our residents want to study, for example, a brain tumor population or an aneurysm population, our tissue and serum stores will catapult their research by eliminating the time spent collecting data and samples,” Hergenroeder says. “By speeding the creation of new knowledge, the Vivian L. Smith Center is making a huge contribution to neurological science and practice.”

“Our aim is to build on the foundation Dr. Clifton laid by continuing to provide startup support for promising investigators and by pushing the envelope in neurological and neurosurgical care in ways that are appropriate for the patients we treat,” Dr. Kim says. “We’ve set our sights high. Our mission is to be the best locally, nationally and internationally and lead the world in advancing the art and science of neurosurgery.”

DIAGNOSING AND TREATING CIDP

SMALL VICTORIES ADD UP FOR GREGG TANGEMAN

The course of chronic inflammatory demyelinating polyneuropathy (CIDP) varies widely among those who have it. For Gregg Tangeman it began with loss of sensation in the tips of his toes that soon spread to the balls of his feet. Thinking that pressure on his sciatic nerve could be causing the numbness, Tangeman saw a chiropractor. Within the same month, November 2008, after a weeklong bout of gastroenteritis, the numbness had spread to his ankles, fingertips, face, lips and tongue. He began to have trouble typing and operating a calculator.

Tangeman's general practitioner in El

BY THE TIME TANGEMAN SAW DR. SHEIKH IN LATE JANUARY 2009, HE COULD NO LONGER RUN OR NEGOTIATE STAIRS AND HAD DIFFICULTY WALKING LONG DISTANCES. HE USED A CANE TO COMPENSATE FOR IMBALANCE, AND IF HE CLOSED HIS EYES, HE WOULD FALL. HE WAS 55.

Campo, Texas, referred him to a neurologist in nearby Wharton. "By that time - I think it was the last week in December 2008 - the numbness had moved up my ankles and into my calves," he says. "The neurologist referred me to the University of Texas Medical School at Houston, where I met Dr. Sheikh."

Kazim Sheikh, M.D., is a professor of neurology at the UT Medical School and director of the Neuromuscular Disorders Center at the Mischer Neuroscience Institute (MNI) at Memorial Hermann-Texas Medical Center. An established physician-scientist, Dr. Sheikh is renowned for his work in the area of autoimmune and inflammatory neu-

ropathies. He has served as principal or co-principal investigator in studies funded by the National Institutes of Health, the GBS/CIDP Foundation International, MDA, the National Institute of Environmental Health Sciences, Johns Hopkins University and the National Multiple Sclerosis Society. When he joined the medical staff at MNI, he brought with him to Memorial Hermann research grants totaling more than \$1.5 million, focused in several areas related to neuromuscular diseases, autoimmune neuropathies and peripheral nerve regeneration.

By the time Tangeman saw Dr. Sheikh in late January 2009, he had severe muscle weakness, numbness, tingling, double vision and imbalance. He could no longer run or negotiate stairs and had difficulty walking long distances. He used a cane to compensate for imbalance, and if he closed his eyes, he would fall. He was 55.

"It was a frightening experience," he says. "My wife and I didn't know what was happening to me, where it would lead or if it would stop."

Based on his initial workup and the relatively rapid progression of Tangeman's disease, Dr. Sheikh considered CIDP as a possible diagnosis. An autoimmune neurological disorder characterized by progressive weakness and impaired sensory function in the legs and arms, CIDP is caused by damage to the myelin sheath of the peripheral nerves. The disorder can occur in both genders at any age, but CIDP is most common in young adults and in men. It is closely related to Guillain-Barré syndrome (GBS), which presents acutely, and is considered the syndrome's chronic manifestation. At 1.5 to 7 cases per 100,000, the prevalence of CIDP may be underestimated.

Although supportive studies are done to rule out other disorders when CIDP is suspected, diagnosis is based on clinical and electrodiagnostic criteria. In addition to blood work, MRI and CT scans and a lumbar puncture, Tangeman underwent



Gregg Tangeman enjoys riding his motorcycle again, thanks to CIDP treatment he has received from the Neuromuscular Disorders Center at the Mischer Neuroscience Institute and The University of Texas Medical School at Houston.

a nerve conduction test in MNI's Electromyography (EMG) Laboratory. Under the direction of Parveen Athar, M.D., an assistant professor of neurology at the UT Medical School, a small, thin needle was inserted into several muscles to measure electrical activity at rest and during contraction.

The last and most conclusive study Tangeman underwent was a muscle and

nerve biopsy. Working in MNI's Muscle and Nerve Laboratory, Suur Biliciler, M.D., an assistant professor of neurology, injected a local anesthetic between the ankle and Achilles tendon and extracted a piece of sural nerve. She also removed four small muscle samples from the thigh through a small incision under local anesthesia. The biopsies were interpreted by Dr. Sheikh and Dr. Biliciler, both of whom are experts in interpreting nerve and muscle pathology.

"Nerve and muscle biopsies can help confirm the diagnosis of CIDP and exclude conditions that can mimic the disorder," Dr. Sheikh says. "A secure diagnosis is important for long-term management of the disease, because it allows physicians to choose therapies that may have significant side effects with the knowledge that they are making the correct decision."

Treatment of CIDP includes corticosteroids, which may be prescribed alone or in combination with immunosuppressant drugs. For many patients, plasmapheresis and intravenous immunoglobulin (IVIg) are effective, and IVIg is often used as a first-line therapy.

"After we discussed the options, I decided I wanted to try IVIg right away," Tangeman says. "We did five infusions in five consecutive days but were disappointed with the results. We tried it again about a month later and, once more, saw no improvement. So we switched to prednisone."

Tangeman felt an improvement immediately. "I'd lost 50 pounds in just over two months and was down to 155," he says. "It was really frightening. I had lost my appetite because nothing tasted good. Almost as soon as I went on prednisone I started having small victories and the numbness began to retreat. Now, I'm on the downhill side of prednisone."

Originally on a high daily dose of prednisone, Tangeman was down to just 5 milligrams at the time of publication. To wean him off prednisone without a return of symptoms, Dr. Sheikh recommended

administration of azathioprine, a corticosteroid-sparing immunosuppressant.

“Our goal in the treatment of CIDP is remission,” he says. “We’re hoping Mr. Tangeman will maintain his improvement either with no medication or just a small amount of medication. There are no well-defined, consensus- or evidence-based recommendations for the long-term treatment of CIDP at this point in time. Recent clinical trials suggest that we may have been treating patients longer than necessary, so close monitoring of the condition and regular follow-up are important.”

Tangeman is pleased with his improvement. “Dr. Sheikh had trouble getting a reflex in my knee, and one day recently at work I accidentally hit my knee and my leg jumped,” he says. “My feet are still pretty numb and my fingertips tingle but I have good strength in my fingers now. I can’t run yet, but I’ve started to jog a little now. I can mow the lawn, which I couldn’t do two months ago, and I can ride my motorcycle. I’m not 100 percent yet, but I can live with this.”

In June 2010, the GBS/CIDP Foundation International designated the Neuromuscular Disorders Center at Mischer Neuroscience Institute and The University of Texas Medical School at Houston as a center of excellence for the diagnosis and treatment of Guillain-Barré syndrome, CIDP and other inflammatory peripheral neuropathies. In addition to Kazim Sheikh, M.D., the MNI adult neuromuscular disorders team includes Parveen Athar, M.D., assistant professor of neurology and director of the MNI Electromyography Laboratory, and Suur Biliciler, M.D., assistant professor of neurology.

MUSCLE AND NERVE TISSUE IN THE DIAGNOSIS OF NEUROMUSCULAR DISEASE

In some conditions, abnormalities at a microscopic level can be found even when there is a scarcity of clinical neuromuscular findings. “Muscle and nerve pathology is an important component of patient assessment,” says Kazim Sheikh, M.D., a professor of neurology at The University of Texas Medical School at Houston and director of the Neuromuscular Disorders Center at the Mischer Neuroscience Institute (MNI) at Memorial Hermann-Texas Medical Center.

In the Muscle and Nerve Laboratory at MNI, muscle, nerve and skin biopsies are performed by neuromuscular specialists and further processed by highly experienced staff. Dr. Sheikh and Suur Biliciler, M.D., an assistant professor of neurology at the UT Medical School, both of whom are experts in neuromuscular pathology, interpret the specimens.

“Our preferred technique for nerve and muscle biopsies is open biopsy under local anesthesia, which reduces the likelihood of missing abnormalities in cases of patchy involvement, such as in inflammatory myopathies,” says Dr. Sheikh, who is also director of the Muscle and Nerve Laboratory. “This also prevents undesired consequences of general anesthesia such as respiratory compromise, which can occur in patients with neuromuscular disorders.”

The laboratory accepts surgical specimens obtained elsewhere for processing and interpretation. For nerve and muscle biopsies, preliminary reports are prepared within three working days of specimen submission. Skin biopsy reports are available within two weeks. For more information, call the clinical coordinator at 832.325.7084.

MNI’S ELECTROMYOGRAPHY LABORATORY

An invaluable diagnostic tool, electromyography (EMG) provides evidence in support of diagnoses of peripheral neuropathies; motor neuron diseases such as amyotrophic lateral sclerosis and spinal muscular atrophy; muscle disorders such as myopathy and muscular dystrophy; neuromuscular junction disorders such as myasthenia gravis; entrapment neuropathies such as carpal tunnel syndrome, ulnar and peroneal neuropathies; and traumatic nerve injury, including evaluation of the brachial plexus and facial neuropathy.

Mischer Neuroscience Institute’s state-of-the-art Electromyography Laboratory at The University of Texas Medical School at Houston provides comprehensive nerve conduction studies and EMG evaluations performed by staff with expertise in neurodiagnostic testing. Because electrodiagnostic evaluation is an extension of clinical findings, the lab’s medical specialists perform a focused neuromuscular examination, including history and physical, before conducting the electrical test. Both Parveen Athar, M.D., and Suur Biliciler, M.D., perform EMG studies.

In addition to nerve conduction and EMG, electrodiagnostic studies available at the EMG Lab include repetitive nerve stimulation, blink reflexes, cranial nerve studies, single-fiber electromyography and facial/trigeminal neuropathy. Referring physicians receive timely reports that include recommendations for further management. For more information or to refer a patient, call 832.325.7084.

MISCHER NEUROSCIENCE INSTITUTE RAISES THE BAR IN PATIENT CARE, EDUCATION AND RESEARCH

Neuroscience services at the Memorial Hermann-Texas Medical Center Campus came together to form the Mischer Neuroscience Institute (MNI) in 2006, and both Memorial Hermann and The University of Texas Medical School at Houston have invested a tremendous amount of resources leading to significant growth. World-renowned Harvard researcher and neurosurgeon Dong H.

hospitals as primary stroke centers.

At the Memorial Hermann-TMC Campus, MNI now encompasses several centers of excellence, including the Brain Tumor Center, Cerebrovascular Center, Texas Comprehensive Epilepsy Program, Multiple Sclerosis Center, Spine Center, Neurorehabilitation Program, Neuromuscular Disorders Center, Movement Disorders Center, Dementia Center, Neurotrauma/Critical Care, and the Children's Neuroscience Center. The centers are supported by the Institute's new \$13.5 million Neuro Intensive Care Unit, designed with input from physicians, nurses, patients and family members. Thirty-two private rooms are arranged in a 34,500-square-foot space built for efficiency of flow for both staff and equipment.

The new unit houses critical diagnostic and support equipment - including a mobile CT, ventilators, blood gas analyzer and PACS radiographic viewing rooms - within the unit to ensure faster test results and improved patient care. All rooms are designed with breakaway glass doors and virtual 360-degree views from the floor to ensure ease of patient monitoring. Consultation rooms allow for private conferences with family members and consulting physicians.

"By investing in a truly state-of-the-art neuroscience ICU, Memorial Hermann is making a strong statement about the level of care we want for southeast Texas and the surrounding regions," Dr. Kim says. "The Neuro ICU is designed to support the needs of our patients during the most acute phase of their hospitalization, accommodate the needs of our teams of surgeons, intensivists, fellows and residents, and integrate teaching and research space in support of our combined academic and clinical missions."

NEUROSURGERY RESIDENCY PROGRAM

The Institute broadened its commitment

SINCE SEPTEMBER 2008, RESEARCHERS AT THE MNI AND UT HAVE RECEIVED MORE THAN \$8.7 MILLION IN GRANTS FOR CLINICAL TRIALS AND LABORATORY RESEARCH IN NEUROLOGY AND MORE THAN \$2 MILLION IN GRANTS FOR STUDIES RELATED TO NEUROSURGERY. THE DEPARTMENT OF NEUROSURGERY IS CURRENTLY LISTED AS NO. 7 IN THE COUNTRY IN NATIONAL INSTITUTES OF HEALTH RESEARCH AWARDS.

Kim, M.D., director of MNI and chair of the department of Neurosurgery at UT Medical School, joined prominent stroke expert James Grotta, M.D., co-director of MNI and professor and chair of the department of Neurology at UT Medical School, in 2007 to lead the Institute. Under their direction, new clinical and academic programs have been established and more than 25 nationally recognized subspecialists have been recruited to the MNI medical staff. The Institute's reach has also expanded across the Memorial Hermann system through Mischer Neurosurgical Associates and the designation of five Memorial Hermann



to teaching last summer with the launch of the UT Medical School's Neurosurgery Residency Program. "There's a dire shortage of neurosurgeons throughout the country," Dr. Kim says. "We have the expert faculty in place to support a residency, and we're the market leader in Houston in cranial neurosurgery."

According to a study published in the February 2005 issue of the *Journal of Neurology*, the United States has experienced "a severe decline in the number of active neurosurgeons and a static supply of residents." Only about 60 board-certified or board-eligible neurosurgeons serve Harris County's nearly 4 million

residents, according to the Harris County Medical Society and the American Association of Neurological Surgeons.

The six new neurosurgery residents began their seven-year residency on July 1, 2008, training at Memorial Hermann-TMC and Children's Memorial Hermann Hospital. The new program is one of 58 UT Houston residencies and fellowships accredited by the Accreditation Council for Graduate Medical Education. Arthur L. Day, M.D., assumed the position as director of clinical education in July of this year. *(See related article.)*

"The residency program is good news for neurology, neurosurgery and all other

The Neuro ICU medical team uses critical diagnostic and support equipment to treat patients in private rooms.

clinical departments at the medical school," says James C. Grotta, M.D., co-director of MNI and professor and chair of the department of Neurology at the UT Medical School.

"The neurosurgery residency reinforces the strength of our program at the Mischer Neuroscience Institute and will lead to even more research. With its addition, we now have a residency in every field," Dr. Kim says.

NEUROSCIENCE CENTERS OF EXCELLENCE IN THE COMMUNITY

MNI’s infrastructure expansion has allowed the Institute to extend its neuroscience expertise and capabilities outside the Texas Medical Center and into the community through the development of neuroscience centers of excellence at our Memorial Hermann Community campuses: Memorial Hermann Memorial City Medical Center, Memorial Hermann Southwest Hospital, Memorial Hermann Northeast Hospital and Memorial Hermann The Woodlands Hospital.

Mischer Neurosurgical Associates recruited its first two neurosurgeons in 2008 - Paul Boone, M.D., and Scott Shepard, M.D. - to lead these efforts at Memorial City and Memorial Hermann Southwest. Juan Ortega-Barnett, M.D., was recruited in 2009 to extend neuro-

surgical expertise to The Woodlands, and Albert Fenoy, M.D., and Bryan Oh, M.D., also joined to expand neurosurgical services at Memorial Hermann Northeast. Jay Zhu, M.D., is another addition to the Mischer Neurosurgical Associates team and provides neuro-oncology support to patients in the Texas Medical Center, Memorial City and The Woodlands. On the neurology side, Anita Madan, M.D., is partnering with Dr. Fenoy to support community neurologists in medical and surgical interventions for patients with movement disorders. And Anitha Abraham, M.D., who serves as a hospitalist at Memorial Hermann Southwest, provides specialized care for stroke patients, facilitates the transfer of patients who can benefit from advanced treatment or research protocols available only at the TMC Campus and collaborates in research protocols run at the Southwest hospital by the TMC stroke team.

“These eight physicians bring distinctive skill sets to the community and when combined with the specialized skills of neurosurgeons and neurologists at MNI, they offer patients in the suburbs comprehensive consultation, evaluation and treatment for a range of disorders, including stroke, brain tumors, spine injuries and spine tumors,” Dr. Kim says.

- MEMORIAL HERMANN HOSPITALS
- PRIMARY STROKE CENTER
- HOSPITAL WITH TELEMEDICINE
- MNA NEUROSURGEONS



A UNITED STATES LEADER IN STROKE TREATMENT

The MNI neurosurgery program is complemented by an equally strong neurology program, which boasts the first Stroke Center in Houston, one of the first dedicated stroke programs in the world and the first Joint Commission-accredited primary stroke center in the region. Led by Dr. James Grotta, the Center was the first in Houston and one of the first in the United States to test tPA for acute stroke, and it remains the

nation's leader in the number of acute stroke patients treated with tPA.

In 2009, that track record helped lead to the designation of five Memorial Hermann hospitals as primary stroke centers by the Texas Department of State Health Services: Memorial Hermann-Texas Medical Center, Memorial Hermann Memorial City Medical Center, Memorial Hermann Southwest Hospital, Memorial Hermann Katy Hospital, and Memorial Hermann The Woodlands Hospital. Hospitals selected for the designation are known for their efforts to ensure that patients receive the fastest and most appropriate care following a stroke.

"Much can be done for stroke patients in community hospitals, especially if the Emergency Center is set up for telemedicine," Dr. Grotta says. "New remote presence technology is improving care for patients across the city and playing a vital role in Memorial Hermann's systemwide neuroscience strategic plan."

As hospitals around the Memorial Hermann system move toward Joint Commission certification as primary stroke centers, Memorial Hermann-TMC's RP-7™ Remote Presence System, a robotic teleconferencing technology, is enhancing the system's existing telemedicine program, which extends expertise to community hospitals throughout the state of Texas. Pioneered by InTouch Health, the Remote Presence System allows physicians at MNI to consult with emergency specialists at outlying Memorial Hermann hospitals to treat stroke patients. Currently, Memorial Hermann Southwest, Memorial Hermann Sugar Land and Memorial Hermann Baptist Hospital in Beaumont are linked electronically to MNI's Stroke Center, providing real-time visual interaction between the stroke team and patients, and allowing neurologists to review CT scans and advise local physicians on treatment options.

"We've further expanded our telemed-

icine program throughout the state of Texas and soon to Louisiana, working in conjunction with Specialists on Call, a service that provides highly trained specialists around the clock to hospitals equipped for videoconferencing," Dr. Grotta says. "With our new remote presence technology and expanded telemedicine capabilities, we expect to report more positive outcomes in stroke treatment."

ADVANCES IN RESEARCH

The Stroke Center at MNI and UT Medical School was the first in Texas to test and use tPA for stroke patients within three hours of onset. Today, the Center is extending the window for stroke treatment to up to three days through a variety of clinical trials.

"Our Center is the only one in the region conducting a large number of research trials with two important goals – amplifying what we can accomplish using tPA and treating patients with tPA beyond the 3- to 4.5-hour window now established as safe and implemented as a protocol at most major stroke centers," Dr. Grotta says. "We're investigating how to improve the benefit of tPA by adding other agents and procedures to the treatment regimen, including argatroban, ultrasound, mechanical clot extraction and brain cooling. We're also the only center in Houston doing research focused on the treatment of hemorrhagic stroke and exploring the use of stem cells."

Since September 2008, researchers at the MNI and UT Medical School have received more than \$8.7 million in grants for clinical trials and laboratory research in neurology and more than \$2 million in grants for studies related to neurosurgery. The department of Neurosurgery at Memorial Hermann-TMC and the UT Medical School is currently listed as No. 3 in the country in National Institutes of

Health research awards.

The neurology awards fund research focused on topics that include clinical treatment for intracerebral hemorrhage and acute ischemic stroke, multiple sclerosis, nerve repair in preclinical models of autoimmune neuropathy, improving ambulation post stroke with robotic training, epilepsy, neuromuscular disease, movement disorders, dementia, neurodegeneration in prion diseases, Alzheimer's disease, pain in spinal cord injury patients, stroke prevention and novel neuro-protection approaches and restorative therapy for spinal cord injury.

To enhance the delivery of care, Dr. Kim, Dr. Grotta and the MNI team will continue to focus on key growth initiatives that include recruitment of subspecialty physicians at Memorial Hermann-TMC and systemwide. "Quality and safety are core strategies that underlie our promise to provide the best possible outcomes and exceptional patient care," Dr. Kim says. "We keep this top of mind as we continue to develop new programs and services in the greater Houston area, strengthen awareness and preference for MNI, and expand our support of research and innovation."

ARTHUR L. DAY, M.D., NAMED DIRECTOR OF CLINICAL EDUCATION



Arthur L. Day, M.D., has joined the medical staff of Mischer Neuroscience Institute (MNI), concomitant with his appointment as professor of neurosurgery at The University of Texas Medical School at Houston, effective July 1. He will also serve as vice chair of the department of Neurosurgery at UT Medical School and director of clinical education at MNI.

An accomplished clinician and researcher, Dr. Day comes to MNI from the department of Neurosurgery at Harvard Medical School and Brigham and Women's Hospital in Boston, where he served as a professor and program

**HE HAS BEEN CONSISTENTLY NAMED AMONG THE BEST
DOCTORS IN AMERICA, AMERICA'S TOP DOCTORS, BEST DOCTORS
AND AMERICA'S TOP DOCTORS FOR CANCER.**

director of neurosurgery since 2002, and chair of the department from 2007 to 2009. He received his medical degree at Louisiana State University in New Orleans in 1972, followed by a neurological residency and a neuropathology fellowship in brain tumor immunology at the University of Florida (UF) at Gainesville. After completing his training, he joined the UF faculty and rose to the rank of professor, program director, and co-chair of the department.

Dr. Day's clinical interests include surgical treatment of intracranial aneurysms and other vascular lesions; skull base exposures to complex vascu-

lar lesions and tumors; general neurosurgical procedures, including minimally invasive spine surgery; and the management of athletic injuries to the nervous system. His clinical research focuses on new and safer surgical approaches to complex tumors and vascular lesions of the skull base, especially those affecting the visual system. In the lab, his research includes neuroprotection with estrogens in ischemic and hemorrhagic stroke and biomarkers of neural injury.

A fellow of the American Surgical Association and American College of Surgeons, Dr. Day served as vice president of the World Congress of Neurological Surgery in 2009. He is a past president of the Congress of Neurological Surgeons and past chair of the American Board of Neurological Surgery, and is currently a member of the Residency Review Committee for Neurosurgery and the president-elect of the Society of Neurological Surgeons. He has served on the editorial board of numerous journals, and has been consistently named among the Best Doctors in America, America's Top Doctors, Best Doctors and America's Top Doctors for Cancer. He has published widely, including authoring or coauthoring more than 150 original articles and book chapters. He has been invited as a visiting professor at prominent universities throughout the United States and the world.

MISCHER NEUROSCIENCE INSTITUTE AND UT MEDICAL SCHOOL WELCOME NEW RECRUITS

A NEUROSURGICAL RESEARCHER AND THREE NEUROLOGISTS HAVE JOINED THE STAFF OF THE MISCHER NEUROSCIENCE INSTITUTE (MNI) AND THE FACULTY OF THE UNIVERSITY OF TEXAS MEDICAL SCHOOL AT HOUSTON.



Ying Xia, M.D., Ph.D., joined the department of Neurosurgery at MNI and the UT Medical School as professor and vice chair for research in May. He comes to Memorial Hermann-Texas Medical Center and UT Medical School from the Yale University School of Medicine, where he and his research team used molecular, transgenic and electrophysical techniques to study cellular and molecular neuroscience. Dr. Xia's research interests include mechanisms for hypoxic disruption of ionic homeostasis and neuroprotection from hypoxic/ischemic injury. He also collaborates internationally in studies on complementary and alternative medicine such as the effects of electroacupuncture on stroke, epilepsy and chronic hypoxic encephalopathy. He recently initiated new explorations on protective strategies against Parkinson's disease and the relationship between hypoxic/ischemic injury and Alzheimer's disease. His current research is supported by the National Institutes of Health, National Institute of Child Health and Human Development, National Center for Complementary and

Alternative Medicine and the American Heart Association.

Dr. Xia received his medical degree at Suzhou Medical College and Ph.D. at Shanghai Medical University in Shanghai, China. After his postdoctoral fellowship at Yale University School of Medicine, he became a faculty member in 1993 and was promoted to associate professor at Yale. He has authored or coauthored more than 80 articles published in prominent journals. He brings with him to MNI and UT Medical School his research team and two NIH R01 grants.



Paul E. Schulz, M.D., comes to MNI and the UT Medical School from Baylor College of Medicine (BCM) in Houston, where he was an associate professor of neurology, neuroscience and translational biology, vice chair for education in the department of Neurology, director of the Cognitive Disorders Clinics and director of the Neuropsychiatry and Behavioral Neurology Fellowship. He also serves as the elected deputy chair of The Methodist Hospital Neurology Service.

After receiving his medical degree from Boston University School of Medicine in 1984, he completed a residency in neurology at BCM, followed by a fellowship in cellular neurophysiology at the same institution in 1993. He is the recipient of numerous awards and honors, including the National Research Service Award, National Institutes of Health (NIH) Physician-Scientist Award, NIH First Award and several awards for outstanding teaching at Baylor. He was named a *Texas Monthly* "Super Doc" in 2008 and 2009, was among the Doctor's Choice listing in *Health and Fitness* magazine in 2009 and

was selected one of Houston's Top Doctors by *H Texas* magazine in 2009 and 2010.

Dr. Schulz practices neuropsychiatry and behavioral neurology. His clinical interests are focused on the diagnosis and treatment of neuropsychiatric disorders such as Alzheimer, frontotemporal and Lewy body dementias; memory loss; cognitive and behavioral changes associated with neurologic disorders such as stroke, ALS and epilepsy and with psychiatric disorders such as schizophrenia; and distinguishing symptoms caused by neurologic disorders, such as dementia, from those caused by psychiatric disorders, such as schizophrenia, bipolar disorder and major depressive disorder. At MNI, he will direct the Dementia and Memory Disorders Program.

Dr. Schulz's research interests focus on the frontotemporal dementias (FTD), including genetic mutations associated with them, their association with Lou Gehrig disease (ALS), medical and environmental risk factors for FTD and their treatments. His group also studies several psychiatric disorders, including the neurologic and medical disorders associated with post-traumatic stress disorder (PTSD) and cognitive impairment associated with schizophrenia and bipolar disorder. Their investigations also focus on risk factors for dementia, such as diabetes, hypertension and increased weight, and how modifying them reduces the risk of developing dementia; the treatment and evaluation of dementia across practice settings; and the diagnosis, risk factors and treatment of several dementia-associated symptoms, such as anxiety and aggression.

Dr. Schulz's research has been funded by the National Institutes of Health, DeGeorge Foundation, Alzheimer's Foundation, Kozmetsky Foundation, Hamill Foundation, American Heart Association and American Epilepsy Society. He has authored or coauthored more than 75 articles in national and international publications and numerous

book chapters, books and online publications. He is a journal reviewer for *Neurology*, *Journal of Neuropsychiatry and Clinical Neuroscience*, *PNAS*, *Learning and Memory*, *Synapse*, *Archives of Physical Medicine and Rehabilitation*, *Journal of Medical Case Reports*, and *Dementia and Geriatric Cognitive Disorders*.



Neurologist and assistant professor **Anita Madan, M.D.**, joins the medical staff at MNI and the faculty at the UT Medical School after completing her residency in neurology and a fellowship in movement disorders there. She was chief neurology resident during the 2007-2008 academic year.

Dr. Madan received her medical degree from Saba University School of Medicine in Saba, Netherlands Antilles, in 2004. Her clinical expertise includes comprehensive training and certification in botulinum toxin injection, certification in patient selection and programming of intrathecal baclofen pumps, experience in intraoperative recording for deep brain stimulation electrode placement and extensive experience in DBS programming. She has served as co-investigator on several studies with principal investigator Mya Schiess, M.D., professor and vice chair of the department of Neurology. Dr. Schiess holds the Adriana Blood Endowed Chair at the UT Medical School and is director of UT MOVE, a program focused on clinical care, education and basic science research on the neurological conditions of motor systems disruption.

Dr. Madan's clinical and research

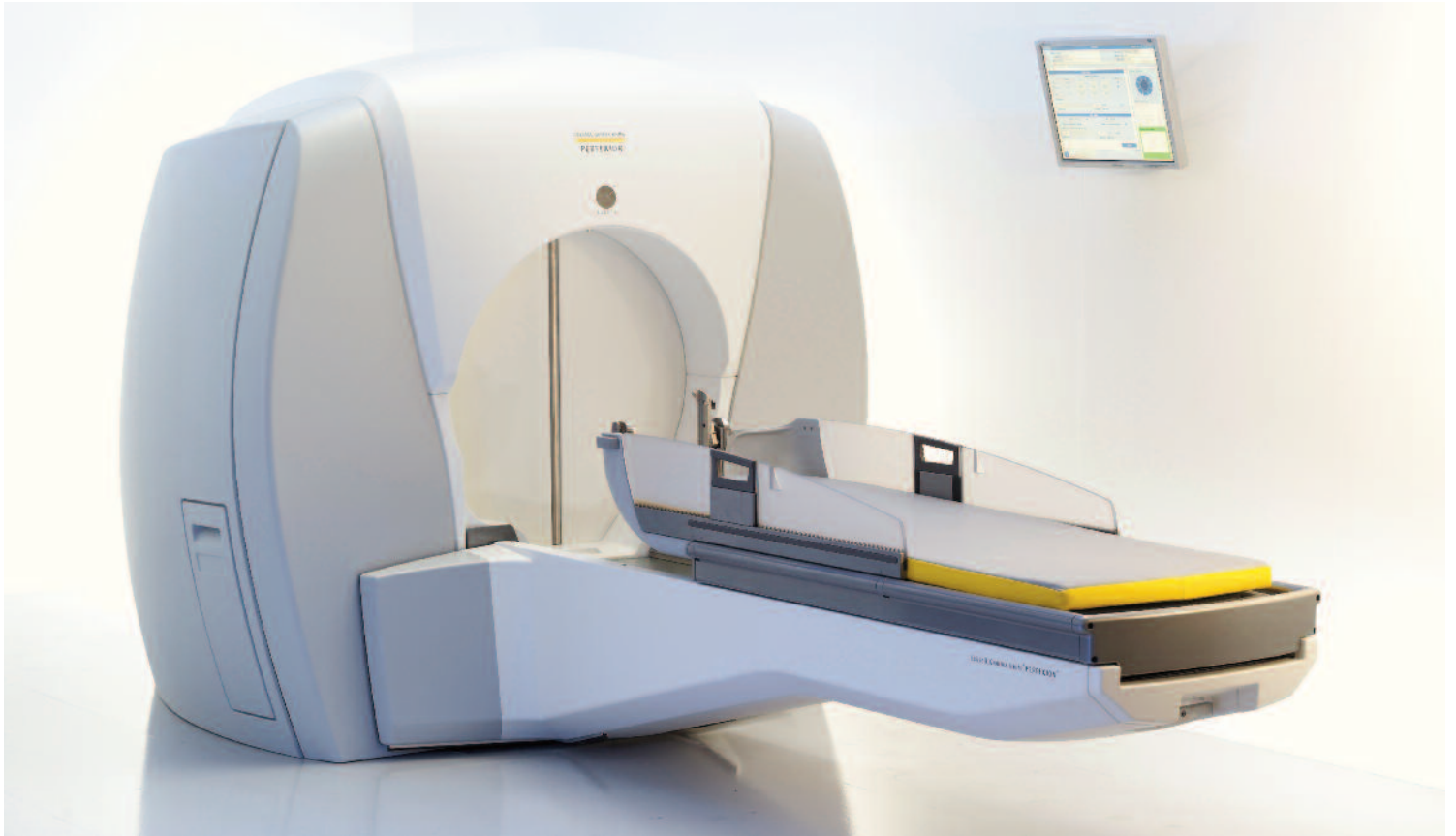
interests include Parkinson's disease, deep brain stimulation, multiple system atrophy and REM behavior sleep disorder. She is a member of the Texas Neurological Society and the Movement Disorders Society.



Vascular neurologist **Vivek Misra, M.D.**, a clinical instructor at the UT Medical School, comes to MNI following completion of a vascular neurology fellowship at the UT Medical School in 2010. He received his medical degree in 1999 from Kasturba Medical College in Manipal, India, and completed his neurology residency at Louisiana State University Health Sciences Center at Shreveport in 2008.

Dr. Misra's clinical and research interests include thrombolytic therapies in acute stroke, intracranial stenosis and regenerative therapy in ischemic stroke. He has coauthored studies published in the *American Journal of Neuroradiology*, *Neurology*, *Stroke*, *Neurological Research*, *Journal of Neuroimaging*, *Journal of Stroke and Cerebrovascular Diseases*, *International Review of Neurobiology* and *Acta Myologica*. He is a member of the American Academy of Neurology, the American Heart Association and the Neurocritical Care Society.

MNI IMPROVES CARE WITH NEW STATE-OF-THE-ART GAMMA KNIFE AND BIPLANE



Mischer Neuroscience Institute has added two new pieces of equipment to its arsenal against neurological disease: the state-of-the-art Leksell Gamma Knife® Perfexion™ and a Siemens Artis™ zee biplane system. Both expand MNI's treatment capability and allow physicians to accommodate increases in patient volume.

The Leksell Gamma Knife Perfexion broadens the range of treatable anatomical structures beyond earlier Gamma Knife models, offering virtually unlimited cranial reach. The new instrument also optimizes workflow and significantly reduces treatment time.

The Siemens Artis zee biplane system can be used for both cerebral and spinal

angiography, minimally invasive neuro-endovascular therapy and combined open microsurgery and intra-operative endovascular intervention, allowing for treatment of some of the most complex brain and spine vascular diseases. "With two large 30x40 detectors, the biplane provides excellent coverage and flexibility for a broad spectrum of applications, including brain, spine and abdominal vascular imaging," says P. Roc Chen, M.D., director of the Cerebrovascular/Endovascular Program at MNI and an assistant professor in the department of Neurosurgery at The University of Texas Medical School at Houston. "It also enables improved visualization of therapeutic devices, as well as a range of advanced 3-D applications that allow us to provide care with greater speed

The innovative Leksell Gamma Knife Perfexion dramatically expands the technology's reach to a broader scope of treatment and range of anatomical structures.

and precision."

"With the addition of the Siemens Artis zee, we will meet projected increases in patient volume," says Dr. Chen, who specializes in cerebrovascular neurosurgery, endovascular neurosurgery and skull base procedures. "We provide the most advanced management for the full spectrum of cerebrovascular and spinal vascular diseases, including brain aneurysm, arteriovenous malformation, intracranial and extracranial occlusive diseases and spinal arteriovenous malformation."

ACCOLADES

JAMES GROTTA, M.D., NAMED "HEALTH CARE HEROES" FINALIST



James C. Grotta, M.D., chief of neurology at Memorial Hermann-Texas Medical Center, co-director of the Mischer Neuroscience

Institute (MNI) and professor and chair of the department of Neurology at The University of Texas Medical School at Houston, was selected as a 2010 "Health Care Heroes" finalist by the *Houston Business Journal*. The Health Care Heroes Awards are presented annually to honor "those who serve, innovate and save lives."

Dr. Grotta, who holds the Roy M. and Phyllis Gough Huffington Distinguished Chair, has played a leadership role in many clinical research studies of both thrombolytic drugs and cytoprotective agents following stroke, and has been funded by the National Institutes of

Health (NIH) for laboratory studies on the biology of brain injury and recovery in animal stroke models. He is currently funded by the NIH for a program project to carry out a series of novel pilot studies aimed at amplifying the existing benefits of intravenous tPA and achieving clinically meaningful neuroprotection using hypothermia.

In 1988, Dr. Grotta was instrumental in founding MNI's Stroke Center, one of the first dedicated stroke programs in the world and the first Joint Commission-accredited primary stroke center in the region. Under his leadership, Memorial Hermann-TMC was the first hospital in Houston and one of the first in the United States to test tPA for acute stroke.

Dr. Grotta orchestrated the development of a highly successful collaborative network between the MNI Stroke Center, Memorial Hermann-TMC, Houston Fire Department Emergency Medical Services and other regional stroke centers to increase the delivery of appropriate therapy to a large number of acute stroke patients in Houston. As a result, the Stroke Center remains

the nation's leader in number of acute stroke patients treated with tPA, with an administration track record of 10 times the national average. He has extended these efforts to rural areas through regional educational programs and, more recently, telemedicine.

Dr. Grotta also directs an NIH-funded and Accreditation Council for Graduate Medical Education-accredited stroke training program with a strong emphasis on basic and clinical research. He has assembled a multidisciplinary stroke faculty that has graduated more than 40 clinician scientists specializing in stroke research.

He has been an editor of the *Annals of Neurology*, *Stroke* and many other peer-reviewed journals, and has been a member of several NIH and FDA review panels. He was a recipient of the Feinberg Award for Excellence in Clinical Stroke from the American Heart Association in 1999, the AHA Physician of the Year Award for 2006 and awards for teaching excellence at the UT Medical School for 14 years. He has authored or coauthored more than 200 articles in peer-reviewed journals.

NEUROMUSCULAR DISORDERS CENTER DESIGNATED GBS/CIDP CENTER OF EXCELLENCE

The GBS/CIDP Foundation International has designated the Neuromuscular Disorders Center at Mischer Neuroscience

Institute (MNI) and The University of Texas Medical School at Houston department of Neurology as a center of excellence for the diagnosis and treatment of Guillain-Barré syndrome, chronic inflammatory demyelinating polyneuropathy (CIDP) and other inflammatory peripheral neuropathies. The designation was awarded in recognition of the high standards main-



Dr. Sheikh



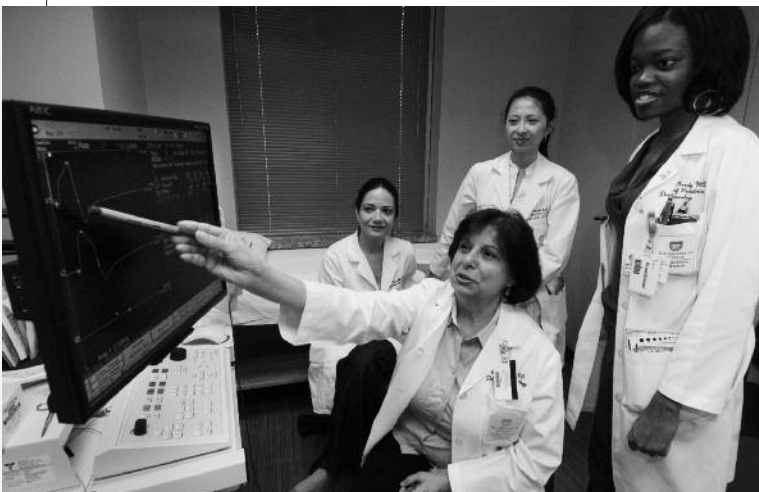
Dr. Athar



Dr. Biliciler

tained and quality of patient care provided at the Center, which is one of only six such centers of excellence in the United States.

The MNI neuromuscular disorders team includes **Kazim Sheikh, M.D.**, professor of neurology at the UT Medical School, director of the MNI Neuromuscular Disorders Center and director of the Muscle and Nerve Laboratory at Memorial Hermann-Texas Medical Center; **Parveen Athar, M.D.**, assistant professor of neurology and director of the MNI Electromyography



Comprehensive nerve conduction studies and EMG evaluations are provided by medical specialists in the state-of-the-art Electromyography Laboratory.

Laboratory; and **Suur Biliciler, M.D.**, assistant professor of neurology, all of whom provide adult care.



Pedro Mancias, M.D., a member of the medical staff at Children's Memorial Hermann Hospital and an associate professor of pediatric neurology, provides pediatric care.

Dr. Mancias

TO REFER A PATIENT TO THE NEUROMUSCULAR DISORDERS CENTER, CALL 832.325.7080 (ADULT) OR 832.325.7151 (PEDIATRIC). FOR MORE INFORMATION ABOUT THE CENTER, CONTACT DR. SHEIKH AT KAZIM.SHEIKH@UTH.TMC.EDU.

NEUROSURGERY CHIEF RESIDENT RECOGNIZED AGAIN BY THE GOLD FOUNDATION

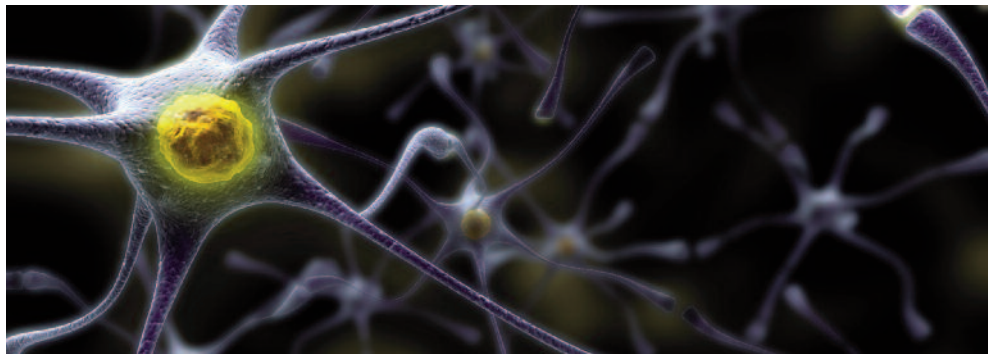


Neurosurgery chief resident **Bart MacDonald, M.D.**, has received the Arnold P. Gold Foundation's Humanism and Excellence in Teaching Award for the second consecutive year. Nominated by fourth-year medical students, he was recognized for his demonstrated commitment to teaching and compassionate treatment of patients and families, students and colleagues.

Dr. MacDonald received his medical degree from the Medical College of Georgia in Augusta in 2000, followed by an internship in general surgery at the University of Florida in Gainesville. He completed his first year of neurosurgical residency at the University of North Carolina in Chapel Hill in 2001, followed by four years at Brigham and Women's Hospital and Children's Hospital in Boston, where he also conducted research in hydrocephalus. His clinical and research interests include complex spine and vascular neurosurgery.

The Arnold P. Gold Foundation advances humanism in medicine, perpetuating the tradition of the caring doctor.

RESEARCH UPDATE



SAFETY AND PHARMACOKINETICS OF RILUZOLE IN PATIENTS WITH TRAUMATIC ACUTE SPINAL CORD INJURY

Researchers at the Mischer Neuroscience Institute (MNI) and The University of Texas Medical School at Houston have begun enrolling patients in a Phase II clinical trial of a drug that may ultimately improve outcomes in patients with traumatic acute spinal cord injury (SCI).

The drug is riluzole, a benzothiazole anticonvulsant sodium channel blocker approved by the Food and Drug Administration for the treatment of amyotrophic lateral sclerosis (ALS). "As neurosurgeons, we can realign bones after spinal cord injury, but there is no medication currently available to lessen the secondary effects of SCI," says Michele M. Johnson, M.D., an assistant professor of neurosurgery at the UT Medical School and principal investigator at the MNI/UT study site. "Riluzole has been shown in two randomized controlled trials to promote increased survival and slow the progression of neurological dysfunction in patients with ALS, a disease characterized by progressive degeneration of neurons similar to the secondary injuries that occur following traumatic SCI. We're also encouraged by the results of a number of studies in animal models conducted at independent labs, which have shown riluzole to be neuroprotective and pro-

mote neuro-recovery following ischemic and traumatic injury to the brain and spinal cord. We're hoping the drug will function in a similar way to minimize the damage caused by secondary events in SCI patients."

While the primary aim of the national multicenter trial is to evaluate the safety and preliminary efficacy of riluzole in cases of acute SCI, the researchers expect the results to set the stage for a Phase III randomized controlled trial. Enrollment at the MNI/UT site began on June 7, with a goal of recruiting four to eight participants out of the 36 who will be enrolled at all eight American study sites, which include The Methodist Hospital in Houston, sponsor of the study. Participants must be age 18 to 70; have no other life-threatening injury; have SCI at the neurologic level from C4 to T12; been rated A, B or C on the ASIA Impairment Scale; have no cognitive impairment that would preclude an informed consent; and be enrolled less than 12 hours following injury.

Funded by the Christopher and Dana Reeve Foundation and the United States Department of Defense, the study is being carried out by the North American Clinical Trials Network (NACTN) for the Treatment of Spinal Cord Injury. NACTN was organized in 2004 to conduct clinical trials of new therapies for spinal cord injury in an effective manner, ensuring enrollment of sufficient numbers of patients and adherence to

standard protocols and delivery of care by skilled healthcare professionals. The estimated study completion date is August 2012.

FOR MORE INFORMATION ABOUT THE STUDY, CONTACT MICHELLE EDELBROCK, R.N., AT 713.500.6141 OR MICHELLE.EDELBROCK@UTH.TMC.EDU OR MARTHA POWNER, R.N., AT 713.500.6936 OR MARTHA.POWNER@UTH.TMC.EDU.

MNI AND UT MEDICAL SCHOOL PARTICIPATE IN MAJOR NIH STUDY ON BRAIN COOLING AND STROKE

Researchers at the Mischer Neuroscience Institute and The University of Texas Medical School at Houston are part of the largest clinical trial to date of hypothermia for stroke. The \$1.1-million study is funded by the National Institute of Neurological Disorders and Stroke (NINDS) of the National Institutes of Health (NIH).

James C. Grotta, M.D., the Roy M. and Phyllis Gough Huffington Distinguished Chair in Neurology at UT Medical School at Houston and co-director of the Mischer Neuroscience Institute at Memorial Hermann, is principal investigator for eight sites including Memorial Hermann-Texas Medical Center. Patrick D. Lyden, M.D., professor and chair of the depart-

ment of Neurology at Cedars-Sinai in Los Angeles, and Thomas Hemmen, M.D., at the University of California, San Diego School of Medicine, are co-principal investigators along with Dr. Grotta. Vascular neurologist and neurointensivist George A. Lopez, M.D., Ph.D., an associate professor in the department of Neurology and director of systemwide neurocritical care, will assist Dr. Grotta with the trial locally.

Hypothermia has been shown to decrease brain swelling and reduce loss of neurological function after an acute stroke. It has also been proven highly effective in saving lives and preventing neurological damage after cardiac arrest and after oxygen deprivation in newborns. The trial, called the ICTuS 2 study (Intravascular Cooling for Acute Stroke), will look specifically at whether hypothermia can be used safely in elderly stroke patients.

“Stroke is more prevalent in the elderly and this type of treatment is important in trying to minimize neurological damage and possible disability,” says Dr. Grotta, who is chief of neurology at Memorial Hermann-TMC. “We think this particular form of hypothermia using a catheter inserted into the vein will cool patients faster and more comfortably, as these patients are awake, versus the externally cooled patients who are typically comatose.”

In the ICTuS 2 trial, investigators will

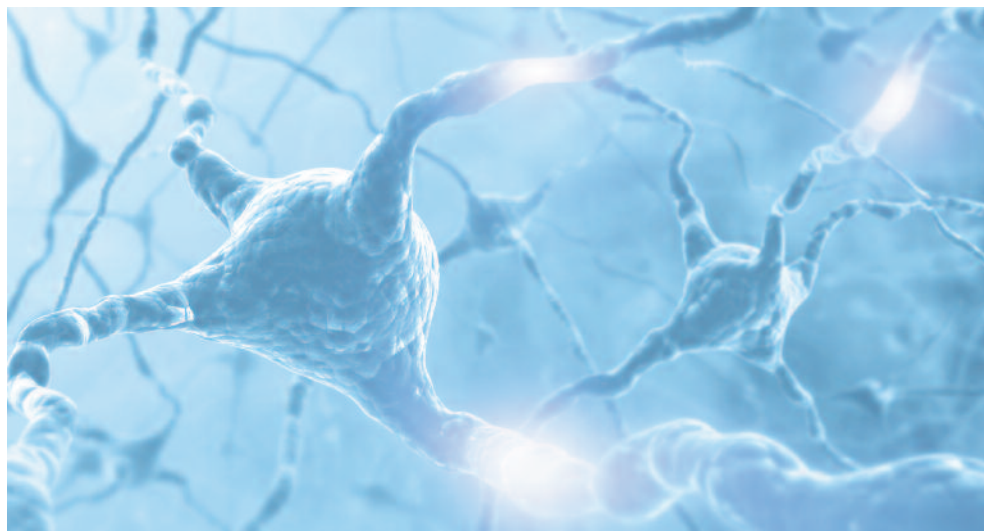
use an endovascular temperature modulation system from Philips Healthcare. Endovascular cooling provides rapid heat exchange and very fast cooling toward target temperature; in awake patients, endovascular cooling is generally superior to cooling blankets or ice packs in maintaining tight temperature control around the target temperature.

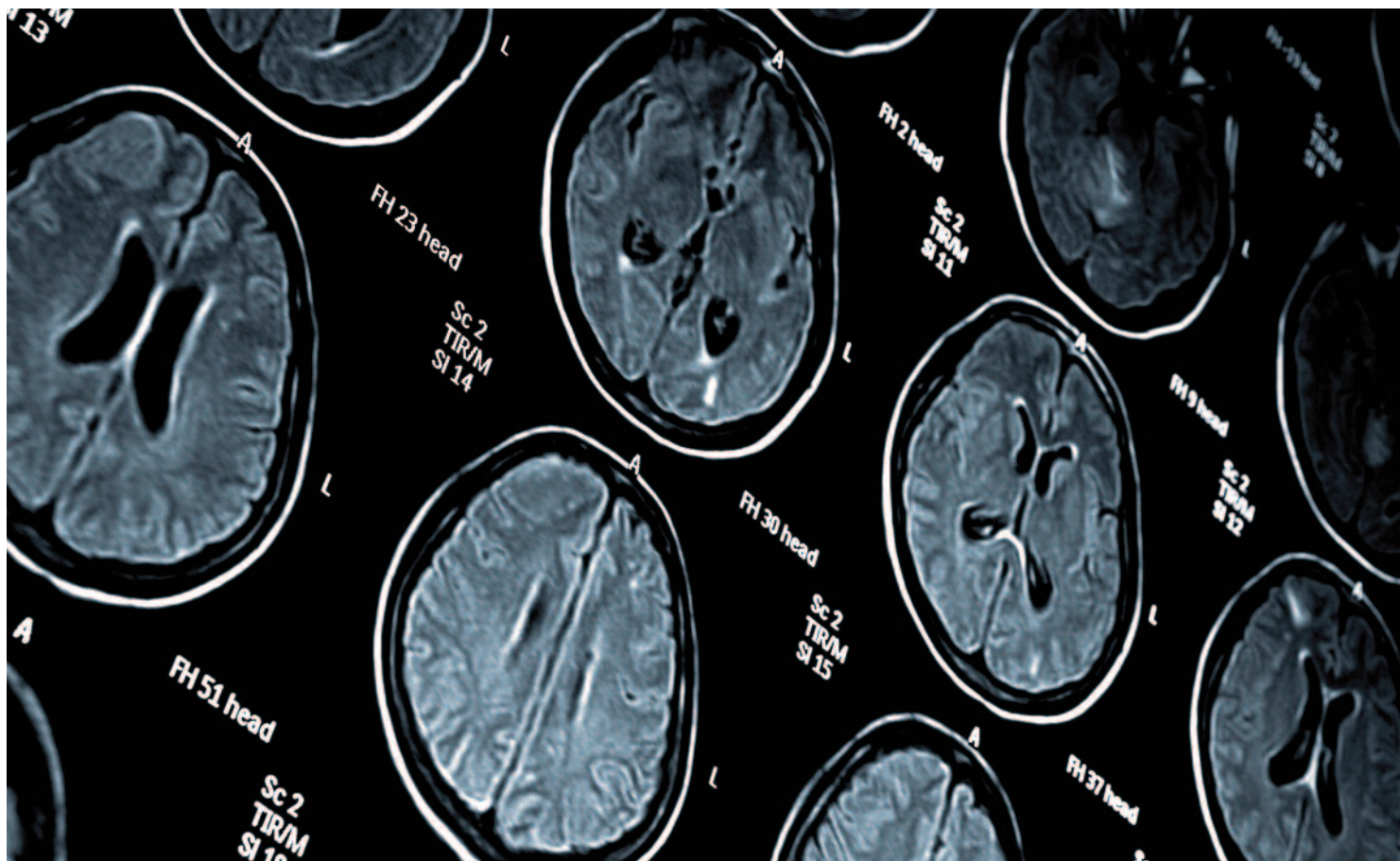
Cooling is achieved by inserting a special catheter into the inferior vena cava—the body’s largest vein. No fluid enters the patient; instead, an internal circulation within the catheter transfers heat out. Study participants are covered with a warming blanket to “trick” the body into feeling warm, and temperature sensors in the skin and a mild sedative help suppress shivering. In this study, body temperature will be cooled to 33 degrees Celsius and maintained at that level for 24 hours. At the conclusion of the cooling period, participants will be re-warmed over 12 hours.

Beginning in July, the three-and-a-half-year study will enroll 400 patients. ICTuS 2 is a single-blind, randomized trial. To be included, patients must meet certain age and medical criteria, treatment must begin within three hours of stroke onset, and patients must receive intravenous injection of tissue plasminogen activator (tPA), a “clot-busting” medication.

“In animal models, cooling within the three-hour window has shown to be most effective, and you have to be able to get the artery open, which is why we try to cool patients who have received tPA,” Dr. Grotta says.

Stroke is the third-leading cause of death behind heart disease and cancer. According to the American Stroke Association, nearly 800,000 Americans suffer a stroke each year – one every 40 seconds. On average, someone dies of stroke every three to four minutes. “The major symptoms of stroke are weakness of the face, arm or leg on one side and difficulty talking,” Dr. Grotta says. “If such symptoms occur, don’t wait. Call





911 immediately and ask to be taken to the nearest and largest stroke center. Memorial Hermann-TMC is the only hospital participating in this study in the Houston area.”

**MNI/UT MEDICAL SCHOOL
RESEARCHERS AWARDED GRANT TO
STUDY POSSIBLE VENOUS
INSUFFICIENCY ROLE IN
MULTIPLE SCLEROSIS**

The University of Texas Medical School at Houston is one of three institutions in the United States to receive an initial grant to study chronic cerebrospinal venous insufficiency (CCSVI) in multiple sclerosis (MS). The grant is part of a more than \$2.3-million joint commitment from the National MS Society and the MS Society of Canada.

According to the National MS Society, the new studies will carry out significant steps needed to confirm the phenome-

non originally described by Paolo Zamboni, M.D., and resolve the questions he and others raised about whether CCSVI is a cause of MS or related to MS in another manner. The studies’ goals are to resolve conflicting data from previous research, such as how frequently CCSVI occurs in MS and how often it occurs in people who do not have MS. If CCSVI is found in study subjects, the society said in a news release, the findings will speed the way to determining whether therapeutic trials to correct blockages will be helpful in improving or altering the MS disease process.



Jerry Wolinsky, M.D., the Bartels Family and Opal C. Rankin Professor of Neurology at the UT Medical School, is principal investigator of a study that will attempt to reproduce the ultrasound approach used by Dr. Zamboni to investigate the association of CCSVI with major clinical types of MS and in non-MS control groups. The MNI/UT

Medical School research team will also test whether other imaging methods, such as magnetic resonance imaging (MRI), can confirm the ultrasound findings while identifying the most reliable technique to screen for CCSVI.

“Our team of accomplished investigators is interdisciplinary and dedicated to understanding the uniqueness and importance of this observation for patients with multiple sclerosis,” says Dr. Wolinsky, who is director of the MS Research Group at the UT Medical School. “We are humbled by the support shown by the National MS Society and their belief that we will be able to help unravel the significance of CCSVI in understanding the disease.”

The two other U.S. institutions receiving two-year grants beginning July 1 are the Cleveland Clinic and the University of Wisconsin-Madison. Four institutions in Canada have also been awarded research grants. To learn more about all funded grants and about CCSVI, visit www.nationalmssociety.org/CCSVI.

TRANSPLANTATION OF CILIARY NEUROTROPHIC FACTOR-EXPRESSING ADULT OLIGODENDROCYTE PRECURSOR CELLS

PROMOTES REMYELINATION AND FUNCTIONAL RECOVERY AFTER SPINAL CORD INJURY

Qilin Cao,^{1,2,4} Qian He,^{1,2,4} Yaping Wang,^{1,2,6} Xiaoxin Cheng,^{1,2,4} Russell M. Howard,^{1,2} Yiping Zhang,^{1,2} William H. DeVries,^{1,2} Christopher B. Shields,^{1,2,3} David S. K. Magnuson,^{1,2,3} Xiao-Ming Xu,^{1,2,3,5} Dong H. Kim⁴ and Scott R. Whittemore^{1,2,3}

ABSTRACT

Demyelination contributes to the dysfunction after traumatic spinal cord injury (SCI). We explored whether the combination of neurotrophic factors and transplantation of adult rat spinal cord oligodendrocyte precursor cells (OPCs) could enhance remyelination and functional recovery after SCI. Ciliary neurotrophic factor (CNTF) was the most effective neurotrophic factor to promote oligodendrocyte (OL) differentiation and survival of OPCs in vitro. OPCs were infected with retroviruses expressing enhanced green fluorescent protein (EGFP) or CNTF and transplanted into the contused adult thoracic spinal cord 9 d after injury. Seven weeks after transplantation, the grafted OPCs survived and integrated into the injured spinal cord. The survival of grafted CNTF-OPCs increased fourfold compared with EGFP-OPCs. The grafted OPCs differentiated into adenomatus polyposis coli (APC+) OLs, and CNTF significantly increased the percentage of APC+ OLs from grafted OPCs. Immunofluorescent and immunoelectron microscopic analyses showed that the grafted OPCs formed central myelin sheaths around the axons in the injured spinal cord. The number of OL-remyelinated axons in ventrolateral funiculus (VLF) or lateral funiculus (LF) at the injured epicenter was significantly increased in animals that received CNTF-OPC grafts compared with all other groups. Importantly, 75 percent of rats receiving CNTF-OPC grafts recovered transcranial magnetic motor-evoked potential and magnetic interenlargement reflex responses, indicating that conduction through the demyelinated axons in VLF or LF, respectively, was partially restored. More importantly, recovery of hindlimb locomotor function was significantly enhanced in animals receiving grafts of CNTF-OPCs. Thus, combined treatment with OPC grafts expressing CNTF can enhance remyelination and facilitate functional recovery after traumatic SCI.

This work was supported by National Institutes of Health Grants NS061975 (Q.C.), NS054708 (S.R.W., D.S.K.M.), and RR15576 (Q.C., S.R.W., D.S.K.M.); The Institute for Rehabilitation and Research Foundation through Mission Connect (Q.C.); the Kentucky Spinal Cord and Head Injury Research Trust (Q.C., S.R.W.); and the Commonwealth of Kentucky Research Challenge for Excellence Trust Fund (S.R.W.).

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NONINVASIVE IMAGING OF NERVE REGENERATION

Kazim A. Sheikh

Department of Neurology, University of Texas Health Science Center at Houston

ABSTRACT

The need for non-invasive imaging of peripheral nerves that can reliably assess extent of nerve fiber degeneration and regeneration is increasingly realized. Availability of such a technology has several immediate clinical and preclinical applications. Diffusion tensor imaging (DTI) is an emerging magnetic resonance based technology that is particularly suited for imaging nerve fiber tracts. This review highlights immediate clinical and pre-clinical uses of non-invasive imaging of peripheral nerve regeneration and DTI as a potential technology that can fulfill these clinical and research needs.

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