**Stem cell therapy aids paralyzed man**

By Meg Aldrich

On March 6, just shy of his 21st birthday, Kristopher (Kris) Boesen of Bakersfield suffered a traumatic injury to his cervical spine when his car fishtailed on a wet road, hit a tree and slammed into a telephone pole.

His parents were warned there was a good chance their son would be permanently paralyzed from the neck down. However, they also learned that he could possibly qualify for a clinical study that might help.

Enter the Keck Medical Center of USC, which announced that a team of doctors became the first in California to inject its patient with an experimental treatment made from stem cells, AST-OPC1, as part of a multi-center clinical trial.

Charles Liu, MD, PhD, director of the USC Neurorestoration Center, led the surgical team, working in collaboration with the Rancho Los Amigos National Rehabilitation Center and Keck Medicine of USC, that injected an experimental dose of 10 million AST-OPC1 cells directly into Boesen’s cervical spinal cord in early April.

“Typically, spinal cord injury patients undergo surgery that stabilizes the spine but generally does very little to restore motor or sensory function,” explained Liu, a professor of clinical neurological surgery at the Keck School of Medicine of USC. “With this study, we are testing a procedure that may improve neurological function, which could mean the difference between being permanently paralyzed and being able to use one’s arms and hands. Restoring that level of function could significantly improve the daily lives of patients with severe spinal injuries.”

Two weeks after surgery, Boesen began to show signs of improvement. Three months later, he’s able to feed himself, use his wheelchair and hug his friends and family. Improved sensation and movement in both arms and hands also makes it easier for him to care for himself, and to envision a life lived more independently.

“As of 90 days post-treatment, Kris has gained significant improvement in his motor function, up to two spinal cord levels,” Liu said. “In Kris’ case, two spinal cord levels mean the difference between using your hands to brush your teeth, operate a computer or do other things you wouldn’t otherwise be able to do. Other things you wouldn’t otherwise be able to do.”

**$6 million NIH grant to fund study of asthma, obesity**

Keck School of Medicine of USC researchers have received a two-year, $6 million National Institutes of Health grant to examine health issues related to asthma and obesity.

Part of the funding will go toward the USC Children’s Health Study, the nation’s longest study on air pollution and kids’ health. The new research program, “Life Course Approach to Developmental Repercussions of Environmental Agents on Metabolic and Respiratory Health,” or LA DREAMERS, will be led by Carrie Breton, ScD, assistant professor of preventive medicine, and Frank Gilliland, MD, PhD, professor of preventive medicine.

“Frank Gilliland and Carrie Breton have been instrumental in leading the Keck School’s extraordinary environmental health research with the groundbreaking USC Children’s Health Study and the MADRES Center,” said Rohit Varma, MD, professor of preventive medicine.

**Little library brings books to community**

By L. Alexis Young

The USC Department of Public Safety (DPS) is hoping to build a relationship with children and youth in the Boyle Heights community one book at a time.

DPS and Keck Medicine of USC, collaborating to bring a Little Free Library to Hazard Park Recreation Center, which sits across the street from the USC Health Sciences Campus. The Literacy Club is an organization that partners with law enforcement and community leaders to create custom-built miniature libraries in inner-city communities. The program’s mission is to cultivate community and knowledge through reading and education.

On Aug. 19, Keck Medicine executive leadership, DPS and officers from the Los Angeles Police Department Hollenbeck Division gathered to unveil the new Little Free Library at Hazard Park, the sixth library DPS has helped bring to communities surrounding the USC University Park and Health Sciences campuses. “We’re putting books in people’s hands,” DPS Chief Steve Gabbert said.

**Anesthesiology chair named**

By Holly A. Muir

The Keck School of Medicine of USC has named Holly A. Muir, MD, as the new chair of the Department of Anesthesiology, effective Jan. 1.

Muir specializes in obstetric anesthesia, with expertise in the effects of interventions on obstetric outcome, both maternal and neonatal. She has published extensively on the management of childbirth pain and is investigating ethnic and cultural influences on pain expression. Her secondary research emphasis is on genetic and molecular aspects of pain perception. Muir recently completed studies in Ghana in the Department of Clinical Neurobiology at the University of California, Berkeley.

**Flu vaccine available**

Flu vaccines will be available to all faculty, nurses and Keck Medicine of USC staff starting Sept. 12 at Employee Health Services, Monday through Friday from 7:45 a.m. to 4 p.m. and the Evaluation & Treatment Clinic, Monday through Friday from 4 p.m. to 7:45 a.m., weekends and holidays.

Preservative-free and egg-free vaccines are available on request. Flu season begins Nov. 1 and stretches to March 31.
Students share global lessons

By Larissa Puro

“S... Cabo next break?” jokes a global medicine student in the elevator. His classmates laugh and roll their eyes. Later spring break they donned scrubs, not bathing suits, while taking a course in a remote area of Panama only reachable by boat.

The students reunited Aug. 23 in Anes Myofo A Maksim Plikus, PhD, University of British Columbia. 

Professor Asselin, the program’s director. “In the process they become global citizens and contrasted their experiences and reinforced their understanding of what constitutes a fiscally sound department, “said Dr. Tom Foreman, Keck School of USC Research Center for Liver Diseases. “We are indebted for his tremendous leadership of the Department at all its sites, his continued commitment to faculty development and his stewardship to maintain a truly visible the health needs of the most vulnerable — and in this case, also non-English speaking — populations.”

The DK fellows’ projects examined different aspects of health systems across the world, including attitudes towards secondhand smoke in China, health services in rural Nigeria, prenatal care in Panama and oncology in Haiti.

In Fiji, fellow Rasa Raithel analyzed children’s sugar consumption. She led activities and interviewed students in primary and secondary schools to assess their dietary habits, diets and understanding of nutrition.

“I chose to focus my research on the pediatric population because, as we learned in many of our global medicine classes, in any emergency situation, children are always the most vulnerable — and in this case, also forgotten,” she said.

By participating in educational trips and research, global medicine students witness firsthand the health needs of individuals and communities worldwide.

In the process they become global citizens who value cross-cultural understanding and building connections across diverse societies, according to Elahe Nekzami, PhD, the program’s director.

“They see the problems of the world, you will never be able to understand and say, ‘I’m not going to do anything,’” said Nekzami, an associate professor of clinical preventive medicine (health behavior scholar) and associate dean for graduate programs. “That’s why the students in her program travel thousands of miles away from home each year to learn, she explained. “It is a responsibility for anyone in health care to learn about the world, to give back to the world.”

For more information about the Master of Science in Global Medicine and its opportunities abroad, visit http://keckmed.usc.edu/mgmn/

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Calendar of Events

Friday, Sept. 23

2-3 p.m. USC Institute of Urology Calendar of Events

“Live Surgery Symposium: A To Z Robotic Radical Cystectomy,” Brad Adams, PhD, UCLA School of Medicine. Hastings Auditorium.

Info and RSVP: Dolores Mendoza, (323) 442-1283, dmmendoz@usc.edu. 

Saturday, Sept. 24

7 a.m.-4 p.m. Calhoun Center for Liver Disease

Symposium: 2016 State of the Art,” Kamyar Nezami, an associate professor of clinical preventive medicine (health behavior scholar) and associate dean for graduate programs. “That’s why the students in her program travel thousands of miles away from home each year to learn, she explained. “It is a responsibility for anyone in health care to learn about the world, to give back to the world.”

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\begin{itemize}
  \item \textbf{Friday, Sept. 23}
  \item \textbf{9 a.m.-10 a.m.} USC Institute of Urology Symposium. Fabio Rossi, MD, PhD, University of British Columbia.
  \item \textbf{11:45 a.m.-1 p.m.} Office of Research Workshop: “Writing Winning Proposals,” Bonnie Lund, professional grant writer. CUB 329, University Park Campus.
  \item \textbf{5-6 p.m.} Office of Research Workshop: “Optimizing NIH R01 Grant Funding Success,” Lynn Carol Miller, professor, Annenberg School of Communication. Saban Research Building, First Floor Auditorium, (323) 740-6709, usccer@usc.edu, http://research.usc.edu/optimizing-nih-r01-grant-funding-succes
  \item \textbf{Thursday, Sept. 29}
  \item \textbf{10 a.m.-11 a.m.} Office of Research Workshop: “Writing Winning Proposals,” Bonnie Lund, professional grant writer. CUB 329, University Park Campus.
  \item \textbf{11 a.m.-12 p.m.} Office of Research Workshop: “Optimizing NIH R01 Grant Funding Success,” Lynn Carol Miller, professor, Annenberg School of Communication. Saban Research Building, First Floor Auditorium, (323) 740-6709, usccer@usc.edu, http://research.usc.edu/optimizing-nih-r01-grant-funding-succes
  \item \textbf{Friday, Oct. 7}
  \item \textbf{9 a.m.-10 a.m.} USC Institute of Urology Symposium. Fabio Rossi, MD, PhD, University of British Columbia.
  \item \textbf{11 a.m.-12 p.m.} Office of Research Workshop: “Writing Winning Proposals,” Bonnie Lund, professional grant writer. CUB 329, University Park Campus.
  \item \textbf{12 p.m.-1 p.m.} Office of Research Workshop: “Optimizing NIH R01 Grant Funding Success,” Lynn Carol Miller, professor, Annenberg School of Communication. Saban Research Building, First Floor Auditorium, (323) 740-6709, usccer@usc.edu, http://research.usc.edu/optimizing-nih-r01-grant-funding-succes
  \item \textbf{12:30 p.m.-1:30 p.m.} Department of Medicine, division of pulmonary, critical care and sleep medicine, USC Office of Continu-
  \item \textbf{1:30 p.m.-2:30 p.m.} USC Stem Cell Seminar. “Sony SS800 Live Cell Imaging Platform,” Michael Toppell, PhD, Aresty Auditorium. Info: Anika Bobb, (323) 442-2547, RSVP: Chelsea Michel, (323) 442-2555, usccer@usc.edu, http://research.usc.edu/uscstemcellseminar
  \item \textbf{3 p.m.-4 p.m.} Office of Research Workshop: “Optimizing NIH R01 Grant Funding Success,” Lynn Carol Miller, professor, Annenberg School of Communication. Saban Research Building, First Floor Auditorium, (323) 740-6709, usccer@usc.edu, http://research.usc.edu/optimizing-nih-r01-grant-funding-succes


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STEM CELL: Boesen happy with ‘fighting chance’

Continued from page 1

do so, having this level of functional independence cannot be overstated.”

Doctors are careful not to predict Boesen’s future progress.

“All I’ve wanted from the beginning was a fighting chance,” said Boesen, who has a passion for repairing and driving cars, and was studying to become a life insurance broker at the time of the accident. “But if there’s a chance for me to walk again, then heck yeah! I want to do anything possible to do that.”

In early April, a surgical team from Keck Hospital of USC carefully injected 10 million AST-OPC1 cells directly into Boesen’s cervical spine. Nearly six weeks later, he was discharged and returned to Bakersfield to continue his rehabilitation.

Doctors reviewed his progress at seven days, 30 days, 60 days and 90 days post-injury. AST-OPC1 cells are made from embryonic stem cells by converting them to oligodendrocyte progenitor cells (OPCs), which are cells found in the brain and spinal cord that support the healthy functioning of nerve cells. In previous laboratory studies, AST-OPC1 was shown to produce neurotrophic factors, stimulate vascularization and induce remyelination of demyelinated axons. All are critical factors in the survival, regrowth and conduction of nerve impulses through axons at the injury site, according to Edward Wirth III, chief medical director of Asterias and lead investigator of the study, dubbed “SCiStar.”

At the 10 million cell level, we’re now in a dose range that is the human equivalent of what we were when we saw efficacy in pre-clinical studies,” Wirth said. “While we continue to evaluate safety first and foremost, we are also now looking at how well treatment might help restore movement in these patients.

To qualify for the clinical trial, enrollees must be between the age of 18 and 69, and their condition must be stable enough to receive an injection of AST-OPC1 between the 14th and 30th days following injury.

Keck Medical Center is one of six sites in the United States that is authorized to enroll subjects and administer the clinical trial dosage.
Laughter is the best medicine

By Gabrielle Forte

T
to many, the term “clowning” may not invoke more than an image of childhood birthday party entertainment. However, recent studies show that there is more to clowning than what initially meets the eye. Over the past three decades, a new form of drama that brings joy to people in difficult situations has gained momentum. This form of therapy, known as therapeutic medical clowning, has been shown to provide significant benefits to patients and their families. One of the leading programs in this field is the USC Norris Cancer Hospital and Los Angeles County + USC Medical Center’s Medical Clowning Program.

In the past few months, Zachary Steel, an assistant professor at the USC School of Medicine and a medical clown, has been showcasing the healing power of laughter at the hospital. “I believe that laughter is a powerful tool in helping patients cope with their illnesses,” he said.

Study: Stroke-induced long-term disability can be reversed

PERMANENT BRAIN DAMAGE FROM A STROKE may be reversible thanks to a developing therapeutic technique, a new study has found. The novel approach combines transplanted human stem cells with proteins that the U.S. Food and Drug Administration already approved for clinical studies in new stroke patients. Berislav Zlokovic, MD, PhD, senior investigator on the Aug. 22 Nature Medicine study, and his colleagues identified a protein that spurs neural stem cells to become functional neurons: 3K3A-APC, a variant of the human protein “activated protein C.” Researchers in a National Institutes of Health-funded Phase II clinical trial administered 3K3A-APC to patients who have very recently suffered an ischemic stroke. However, Zlokovic, director of the Zilkha Neurogenetic Institute at the Keck School of Medicine of USC, said he and his colleagues are the first to use 3K3A-APC to generate neurons from human stem cells grafted into the stroke-damaged mouse brain.

By Claire Norman

Family Medicine Interest Group awarded for excellence

On June 29, the FAMILY MEDICINE INTEREST GROUP (FMIG) at the Keck School of Medicine of USC received a Program of Excellence Award based on their commitment to engaging students interested in pursuing family medicine. One of only 10 schools to be awarded for overall excellence nationally, the Keck School of Medicine of USC’s FMIG was also the only one from California honored at the American Academy of Family Physicians National Conference of Family Medicine Residents and Medical Students in Kansas City. Students who participate in the FMIG at the Keck School are involved in numerous activities that allow them to participate in diverse health care experiences with patients of all ages. — Claire Norman

By Zen Vuong

In the future, Steel hopes to expand the newly released program into an emphasis for School of Dramatic Arts undergraduates and ultimately create a progressive degree track. “A corridor of this article appeared in the Trojan Health Connection.

LIBRARY
Continued from page 1

Functional human liver made from stem, progenitor cells

A RESEARCH TEAM LED BY INVESTIGATORS at The Saban Research Institute of Children’s Hospital Los Angeles has generated functional human and mouse tissue engineered liver from adult stem and progenitor cells. Tissue-engineered Liver (TELI) was found to contain normal structural components such as hepatocytes, bile ducts and blood vessels. The study has been published online in the journal Stem Cells Translational Medicine. “Based on the success in our lab generating tissue-engineered intestine and other cell types, we hypothesized that by modifying the protocol used to generate intestine, we would be able to develop liver organoid cultures that could generate functional tissue-engineered liver when transplanted,” said Tracy C. Grikscheit, MD, a pediatric surgeon and researcher at The Saban Research Institute of CHLA and co-principal investigator on the study. Grikscheit is also a tenured associate professor of surgery at the Keck School of Medicine of USC. — Ellin Kavanagh

By Virginia Baca

Laughter is the best medicine

To many, the term “clowning” may not invoke more than an image of childhood birthday party entertainment. However, recent studies show that there is more to clowning than what initially meets the eye. Over the past three decades, a new form of therapy called Medical Clowning has risen in children’s hospitals around the globe. Programs like Doutores da Alegria in Brazil and Dream Doctors in Israel kickedstart the rapid rise of Clown Care in 1991 and 2002, respectively.

Zachary Steel, professor at the USC School of Dramatic Arts and former teacher at The Clown School in Los Angeles, witnessed the healing powers of laughter firsthand when studying medical clowning in Israel. “There is no way to know how to which a clown can be effective in a hospital setting beyond an entertainment factor,” Steel said. “It’s a form of empowerment, an avenue for a patient to escape the isolation of post-trauma.”

For the past few years, Steel has been spending weekly shifts in full gear as a “medical clown practitioner” at USC Norris Cancer Hospital and Los Angeles County + USC Medical Center, entertaining patients and providing vital support to hospital staff. He recalled an incident when he and assistant Caitlyn Conlin sang with a 9-year-old girl, distracting her while hospital staff provided treatment. “It is a nice reminder that amid all the horror and all the wicked problems of the world, that there is still so much love and magic,” he said.

In light of the practice’s newfound popularity, Steel and David Bridel, dean of the USC School of Dramatic Arts, set out on a quest to bring medical clowning to the USC community by co-creating an undergraduate program in the School of Dramatic Arts designed to train individuals in therapeutic medical clowning, thanks to a generous seed gift from the Albert & Bessie Warner Fund.

The School of Dramatic Arts program will be segmented into three classes. The first class, Medical Clowning, opened to all USC undergraduates in the fall of 2016 and focuses on basic clowning techniques. “Advanced Medical Clowning” will delve into the intricacies of patient-clown interaction and after completing the two courses, successful students can intern at select hospitals during the summer.

In the future, Steel hopes to expand the newly released program into an emphasis for School of Dramatic Arts undergraduates and ultimately create a progressive degree track. "A corridor of this article appeared in the Trojan Health Connection."