USC Stem Cell Symposium creates scientific synergy

By Cristy Lytal

The inaugural USC Stem Cell Symposium convened with a straightforward truth about the future of regenerative medicine: “It will take a dedicated community of scholars across the disciplines to have maximum impact,” said Interim Provost Michael Quick, PhD.

The Jan. 16 symposium brought together precisely such a community, with speakers from USC’s schools of medicine, dentistry, gerontology and engineering, as well as the Saban Research Institute of Children’s Hospital Los Angeles (CHLA).

“An important part of the future is how USC Stem Cell is going to engage other schools — in business, in public policy, in law — as this area of medicine becomes increasingly more involved,” said Andy McMahon, PhD, FRS, chair of the USC Stem Cell executive committee.

He shared his vision of engaging even more scholars from beyond the scientific realm. “So I’m looking forward to a future that embraces many more schools than are currently represented.”

McMahon also unveiled two new opportunities for young scientists to engage in collaborative and creative research projects:

- The new USC Stem Cell Heart Fellowship will support exceptional young scientists to engage in collaborative and creative research projects.
- The study indicates that it may be possible to use brain scans to detect changes in blood vessels in the hippo-

Neuroscientists detect changes in blood vessels tied to Alzheimer’s

By Allison Trinidad

USC neuroscientists have identified another piece to the puzzle of Alzheimer’s disease. Researchers at Keck Medicine of USC used high-resolution imaging of the living human brain to show for the first time that the brain’s protective blood barrier becomes leaky with age, starting at the hippocampus, a critical learning and memory center that is damaged by Alzheimer’s disease.

The findings have broad implications related to conditions that are expected to affect 16 million Americans over age 65 by 2050, according to the latest figures from the Alzheimer’s Association. The research appears in the Jan. 11 edition of the peer-reviewed scientific journal Neuron.

“Life is a significant step forward in understanding how the vascular system affects the health of our brains,” said Thomas Jackiewicz, senior vice president and CEO of Keck Medicine of USC, who will serve as interim CEO of Keck Medical Center of USC

Keck Medicine is first in Southern California to perform robotic endovascular surgery

By Leslie Ridgeway

Keck Medicine of USC and vascular surgeons are the only surgeons in Southern California using a new robotic system with the potential to reduce procedure times, decrease radiation, shorten hospital stays, enhance safety and put patients back on their feet again faster.

Whittier, CA, resident Paul Toft, 59, was one of the first Keck Medicine patients to benefit from the new system being used by surgeons at the USC CardioVascular Thoracic Institute. Sung Wan Han, MD, director of the Endovascular Robotic Program and his team, including Fred Weaver, MD, MMM, chief of vascular surgery and endovascular therapy, and Sungku Han, MD, assistant professor of surgery at Keck Medicine of USC, performed the surgery in September.

Toft, a high school mathematics teacher who had been in good health all of his life, began suffering last summer from blockage of the left superficial femoral artery. The blockage cut off oxygen to his lower left leg, causing severe leg cramps and endangering the leg.

“As a teacher, I’m constantly moving, but I couldn’t walk a city block without needing rests,” he said. “My general practitioner told me I needed to get help or I was likely to lose my lower leg.”

Toft’s surgery was performed with the Magellan Robotic System by Hansen Medical Inc., a robotic endovascular system used to treat peripheral vascular disease (PVD) more efficiently and safely.

Enterprise CEO will serve as interim CEO of Keck Medical Center of USC

Thomas Jackiewicz, senior vice president and CEO of Keck Medicine of USC, will serve as interim CEO of Keck Medical Center of USC upon the departure of Scott Evans, PharmD, MHA, who is leaving to become senior vice president and chief executive officer for Sharp Grossmont Hospital in San Diego. Evans’ last day is Feb. 13.

Evans has been dedicated to the Keck Medicine enterprise for 16 years, having begun his career at USC in 1999 as a pharmacist and climbing the ranks to CEO in 2012.

“Scott led these two hospitals at a transformative time for our academic medical enterprise, leading many achievements in quality outcomes, patient safety, performance improvement and fiscal stewardship,” Jackiewicz said. “During his tenure, Scott helped grow revenue, opened several major ambulatory centers across the community, revitalized the employee workforce through an organization-wide cultural redesign, led efforts to enhance efficiency and quality care, and helped integrate clinical services.”

Jackiewicz will ensure important continuity and ongoing successful collaboration between the hospitals’ administrative team and Keck Medicine of USC’s executive leadership team as interim CEO.

“Health care today is an ever-changing, complex industry with so many factors and players influencing our every step,” Jackiewicz said. “Change is the only constant, and we must remain poised for success. With so many exciting initiatives underway, we continue to be focused on our quest to become the most elite academic health system in Southern California.”
Keck-led consortium finds gene changes that affect brain size

By Alison Trinidad

A national, collaborative study of the brain led by researchers from the Keck School of Medicine of USC found eight common genetic mutations that seem to age the brain an average of three years — and result in smaller brains.

“Any change in those genes appears to alter your mental bank account or brain reserve by 2 or 3 percent,” said Paul Thompson, PhD, who is a professor in the Keck School of Medicine of USC and principal investigator of the Enhancing Neuro Imaging Genetics Through Meta Analysis network, or ENIGMA.

The team of about 300 scientists at 190 global institutions pooled brain scans and genetic data from people in 33 countries.

“This crowdsourcing and sheer wealth of data gives us the power to crack the brain’s genetic code,” Thompson said. The work could lead to targeted therapies and interventions for Alzheimer’s disease, autism and other neurological conditions.

The research — the first high-profile study since the National Institutes of Health launched its Big Data to Knowledge Centers of Excellence last year — was published Jan. 21 in the journal Nature.

Using MRI’s of more than 30,000 people, the researchers looked for genetic differences affecting the size of key parts of the brain that coordinate movement, learning, memory and motivation.

The group found eight gene variants associated with reduced brain size, several in one fifth-of-the-world’s population. Some of the genes are implicated in cancer and mental illness.

The next step is to investigate whether the genes, besides influencing brain size, also cause disease or reduced mental function.

In October, the NIH invested nearly $32 million in its Big Data initiative, creating 12 research hubs across the United States to improve the utility and accessibility of medical data. USC’s two Big Data to Knowledge Centers of Excellence, including ENIGMA, were awarded $23 million over four years.

“The ENIGMA Center’s work uses vast data sets as engines of biological discovery; it shows how each individual’s genetic blueprint shapes the human brain,” said Philip Bourne, NIH associate director for data science.

USC co-authors included other researchers at Keck School of Medicine of USC: Provost Professor Arthur W. Toga and Assistant Professor of Health Sciences Public Relations and Marketing Neda Jahanshad. ENIGMA was supported in part by a consortium grant from the NIH’s Initiative and by public and private agencies worldwide.

Angel of concierge services is Keck’s Employee of the Year

By Douglas Morino

Sandy Pfirrmann, Keck Medical Center of USC’s inaugural Employee of the Year, arrives to work each day 45 minutes early — and has done so for nearly six years. This gives her time to gather herself, have a cup of coffee and relax before the day begins.

“I tell myself, ‘Today is going to be a great day, no matter what,’” the mother of three daughters said. “I’m going to put everything aside for the patients and their families.”

Pfirrmann was selected as the 2014 Employee of the Year from among the year’s monthly winners. The honor includes a $2,500 payment. The Employee of the Month program rewards excellence and goes to employees who demonstrate Keck Service Culture standards. Staff members are nominated by their peers. Pfirrmann works in concierge services, checking inpatients and families.

Patients and families have sent in many letters commending Pfirrmann’s work.

“They say she’s an angel,” Molyneaux said.

New option benefits patients who need a bone marrow transplant

By Hope Hamashige

Keck Medical Center of USC is offering a new option for patients who need bone marrow (also called stem cell) transplants, but have not found a match.

Haploidentical transplants allow patients who can only find partially matched donors to receive potentially life-saving transplants.

“This greatly expands the donor pool. More patients will be helped,” said Preet Chaudhary, MD, PhD, chief of the Jane Anne Nohl Division of Hematology and Center for the Study of Blood Diseases at the Keck School of Medicine of USC and director of the USC Norris Cancer Center’s blood and marrow transplant program. Chaudhary added that some 10 percent of patients needing bone marrow transplants can find a perfect match. Those figures are higher for Caucasians and lower for some ethnic minorities.

Because finding a perfect match can take months, explained Chaudhary, there have been efforts to find a method to use less-closely matched tissue. Recent advances in drug therapy that prevent the patient from rejecting the donated marrow have finally made haploidentical bone marrow transplants possible.

Chaudhary said the outcomes associated with haploidentical transplants have reached the point they are nearly the same as transplants from closely matched donors, though there may be a higher risk of infection. There are also benefits, such as the fact that haploidentical transplants are less time-consuming and less costly.

Most importantly, they offer the chance for a cure to many people who thought they did not have one, such as the first patient at Keck Medical Center of USC to receive a haploidentical transplant. That patient had been diagnosed with Hodgkin lymphoma and did not find a donor who was a perfect match. Instead, the team at Keck Medical Center of USC decided to move forward with their first attempt at a haploidentical transplant in May.

“So far, we believe this patient has a full recovery,” said Chaudhary, who added that they have performed many additional haploidentical transplants since May with good results.

By Les Dunseith

Contributors: Sharon Brock, Tania Chatilla, Hope Hamashige, Crissy Lytal, Carol Mathieu, Douglas Morino, Sara Reive, Leslie Ridgeway, Talar Shahinian, Sherri Snelling and Alison Trinidad

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ALZHEIMER’S: Researchers focus on blood-brain barrier

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Bernd Zikovic, MD, PhD, director of the Zilkha Neuro-genetic Institute at the Keck School of Medicine of USC, holds a Mary H away and Selim Zilkha chair for Alzheimer’s Disease research and the study’s principal investigator. Alzheimer’s is the most common type of dementia, a general term for loss of memory and other mental abilities. Postmortem studies of brains affected by Alzheimer’s show damage to the blood-brain barrier, a cellular layer that regulates entry of blood and pathogens into the brain. Why and when this damage occurs remains unclear, however.

In the Neurology study, Zikovic’s research team examined contrast-enhanced brain images from 64 human subjects of various ages and found that early vascular leakage in the aging human brain occurs in the hippocampus, which normally shows the highest barrier properties compared to other brain regions. When controlled for age, the blood-brain barrier also showed more damage in the hippocampal area among people with dementia.

The researchers also looked at the subjects’ cerebrospinal fluid (CSF), which flows through the brain and spinal cord. Individuals who showed signs of mild dementia had 30 percent more albumin, a blood protein, in their CSF than age-matched control subjects, further indicating a leaky blood-brain barrier. The cerebrospinal fluid of individuals with dementia also showed a 115 percent increase of a protein related to pericyte injury. Pericytes are cells that surround blood vessels and help maintain the blood brain barrier; previous research has linked pericytes to dementia and aging.

Study participants were recruited through the USC Alzheimer’s Disease Research Center and Huntington Medical Research Institutes. Other USC co-authors include Axel Montagne, Melanie Sweeney, Matthew Halliday, Abhay Suresh, Zhen Zhao, Arthur Toga, Colleen Liu, Lylanya Amezcua, Helena Chui and Meng Law.

A sampling of research shared at the symposium:

David Warburton, MD, of CHLA and the Keck School of Medicine addressed lung development and disease, and infant mortality in Uganda, Mongolia, which has some of the world’s worst air pollution.

Paula Cannon, PhD, of the Keck School of Medicine talked about genetically modifying blood stem cells to cure HIV/AIDS.

Rong Lu, PhD, of USC’s stem cell research center discussed “barcoding” blood stem cells using a genetic label. This allows her to observe individual cells’ contributions to disease progression — determining potential strategies for better blood transfusions or bone marrow transplants.

Tracy Grikechiel, MD, of CHLA, the Keck School and the USC Viterbi School of Engineering explained how to help babies with injured or diseased intestine. She’s using discarded intestine from the operating room to regrow new intestine, which surgeons may someday reconnect to patient digestive tracts.

Senta Georgia, PhD, of CHLA and the Keck School shared a possible diabetes treatment: inducing intestinal stem cells to make insulin by “turning on” key genes.

Valter Longo, PhD, of the USC Davis School of Gerontology discussed clinical trials exploring fast improving chemotherapy outcomes in cancer patients and stimulate organ system regeneration in healthy patients.

Min Yu, MD, PhD, of USC’s stem cell research center and USC Norris spoke about using breast cancer cells from patients’ blood to identify mutated cancer strains and the right drugs to target them.

Alan S. Wayne, MD, of CHLA and the Keck School introduced immunotherapy for children with acute lymphoblastic leukemia. In A clinical trial, two-thirds of children experienced complete remission.

Michael Bonaguidi, PhD, of USC’s stem cell research center described how adult human stem cells can generate either stem cells or neurons, offering a possible avenue for treating Alzheimer’s or other brain diseases.

Justin Ichida, PhD, of USC’s stem cell research center presented drugs on neurons formed by reprogramming skin cells from patients with Lou Gehrig’s disease. He’s found drugs that keep neurons alive in petri dishes.

Ruchir Raja, PhD, of the Ostrow School of Dentistry and the Keck School addressed why neural tube and craniofacial birth defects occur together in a genetic disorder called CHARGE syndrome.

David Cubrikink, MD, PhD, of CHLA and the Keck School discussed a childhood eye tumor called retinoblastoma, which he studies by creating retinal tissue from stem cells.

Megan McCain, PhD, of the Viterbi School of Engineering and the Keck School introduced the “heart on a chip.” To overcome the limitations of using laboratory animals or human cells in petri dishes to study disease, McCain engineers dynamic micro-scale mimics of human tissue.

Cheng-Ming Chuong, PhD, of the Keck School addressed how feather stem cells enabled the evolution of birds and how hair stem cells might enable the “extinction” of male pattern baldness.

Yang Chai, DDS, PhD, director of the Center for Craniofacial Molecular Biology at the Ostrow School of Dentistry explored stem cells that can maintain tooth growth and other stem cells that might help babies with fused skulls that can’t grow normally.

SYMPOSIUM: USC experts meet to share knowledge

Continued from page 1

junior postdoctoral fellow discussing stem cell research at USC. The USC Stem Cell Student/Postdoc Collaborative Challenge Grant Program will provide $10,000 to one-year research projects bringing together students or postdocs in two or more labs.

McMahon said, “Particularly, we’re interested in interdisciplinary projects that bring people together across different areas of research that tend to have boundaries. The idea is to stimulate new interdisciplinary research and to enhance the student’s or postdoc’s ability to be a creative and independent scientist.”

Collaboration underway among USC-affiliated faculty members is recognized by the USC Stem Cell Regenerative Medicine Initiative (RMI) Awards, which support multi-investigator research efforts. Three winning teams presented their progress in developing stem cell-based strategies to treat certain forms of deafness, bone defects and pediatric leukemia.

One of the day’s highlights was the keynote address by Fred H. Gage, PhD, who is the Vi and John Adler chair and faculty member.

and family waiting areas.

After a delay because of obtaining permits, construction began in November and continues on a six-level, 1,200 square parking structure on San Pablo Street, near Valley Boulevard. The structure is expected to open in late 2015, according to Elvis Evans, manager of hospital parking and transportation services.

Construction of the O’Neall Lot on the corner of Soto and Alcazar streets has been delayed until the new parking structure is completed. The lot is expected to be finished in July 2016 and will create 300 spaces.

The finished six-story parking structure will eventually sit next to a new extended-stay 200-bed hotel on the northeast corner of the San Pablo and Alcazar intersection. The hotel development will include 19,000 square feet of retail space, including a sit-down restaurant and 14,000 square feet of conference space, said Laurie Stone, associate senior vice president for real estate and asset management.

A new student housing building is under construction and will have 177 units with about 450 beds. The building is expected to be completed by fall 2016.

HSO expansion is underway

By Douglas Morino

The ground is moving.

The rumble of construction trucks signals that work is underway on a series of projects across the Health Science Campus aimed at increasing parking and expanding medical services.

Construction began last week on the USC Norris Healthcare Center (HC3) near deans of Alcazar and San Pablo streets. The building will house clinics dedicated to cancer treatment and will be an ambulatory surgery center and a women’s cancer program. There will also be a retail pharmacy, along with patient and family waiting areas.

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### Calendar of Events

**Monday, Feb. 2**
- 11:30 a.m. USC Institute for Global Health lecture. “Bending the Arc to Health Equity: Social Justice and the People’s Health,” Nancy Krieger, Harvard School of Public Health. VSB 1116, followed by an afternoon tea reception at University Club, UPC. Info: global.health@usc.edu RSVP: http://globalhealth.usc.edu/Bending-the-Arc

**Tuesday, Feb. 3**
- 5:30 p.m. OphthalmoLOGY grand rounds. Kelly Rie, MD, USC. Heilbron Conference Room. Info: Tyanya Christopher, (323) 409-5253, tyanya@usc.edu

**Thursday, Feb. 5**
- Noon. Family Medicine lecture. “Health Promotion and Care in Patients with Learning Disabilities,” David Stad, PhD, Tulane University. FSA, Bldg A-4, 4th Floor, Large Conference Room. Info and RSVP: Elizabeth O’Toole, (626) 457-4203, ets@usc.edu

**Saturday, Feb. 7**
- 10 a.m. — 3 p.m. Medical Humanities Interest Group (MHIG) Workshop. “Styloid Process Writing Workshop.” Dr. Simi Ballard, (323) 442-3400, ellisbal@usc.edu

**Thursday, Feb. 12**
- Noon. Southern California Research Center for ALDP and Car- nioske Lecture. “EngineeringVault Nanoparticles as a ‘Smart Vaccine’ for Chlamydial Trachomatis.” Kathleen A. Kells, PhD, UCLA. McKibben Lecture Hall 156. Info: Julie Lee, (323) 442-4644, julie.lee@med.usc.edu

**Tuesday, Feb. 10**
- Noon. USC Institute for Global Health, USC. translational and Clinical Sciences Seminar. “Chemical Probes for the Functional Analysis of N-glycan Modifications in Cancer,” Matthew Pratt, PhD, USC. NRT LG-503/504. Info: Julie Lee, (323) 442-4844. julee.lee@med.usc.edu

**Friday, Feb. 13**

**Tuesday, Feb. 17**

**Wednesday, Feb. 18**
- 7:30 a.m. — 6 p.m. USC Diabetes & Obesity Research Institute (Diabetes and Obesity Research Institute) Symposium. “The Guns and Beans Behind the Diabetes and Obesity Epidemics!” Celebrity Audition. Info: Christina Ayala, (323) 442-2500, USCdiabetesandobesity@usc.edu. RSVP: http://usc.edu/events. EPP code: Diabetes and Obesity Research Institute 2015

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### Gift establishes fellowship for global medicine

Atul Dhablania, Associate Dean Elahe Nezami and Incha Kim join Dean Carmen A. Puliafito for presentation of gift to Keck School of Medicine. The funding will help the Keck School advance its educational mission, Nezami said, and it places USC “squarely at the forefront of global health education.”

**Art exhibit —** At the Hoyt Gallery, Nily Haral, a USC research lab specialist, talks with Michelle MacVeigh, a USC research specialist. An exhibit featuring photographs taken by Haral and other art by Keck School of Medicine faculty, staff and students will be on display on the basement level of KAM through spring 2015.

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Call the Emergency Information Phone: (213) 740-9233 The emergency telephone system can handle 1,400 simultaneous calls. It also has a backup system on the East Coast.

Visit the USC Web: http://emergency.usc.edu This page will be activated in case of an emergency. Backup Web servers on the East Coast will function if the USC servers are incapacitated.

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**Notice:** Calendar submissions must be received at least 10 days before an issue’s publication date to be considered. Please note that timely submission does not guarantee an item will be printed. Entries must include day, date, time, title, first and last name of speaker, affiliation of speaker, location and a phone number or email address for information.

Submit calendar items at tinryn.com/calendar-hsc.