By Cristy Lytal

When Andy McMahon, head of USC Stem Cell, wanted a three-dimensional image of a kidney, he used to ship the organ to Australia. Now he can just send down the hall to the university’s new specialized microscope — built by the undergraduates from the USC Viterbi School of Engineering for ENGR 499 Microscope Design and Construction.

Called an optical projection tomography (OPT) microscope, the instrument produces 3-D images of pea-sized biological samples such as organs and embryos. This provides a valuable tool that enables McMahon and other biologists to study how organs develop and how they maintain and repair themselves.

“To acquire an OPT image, light is either projected through the specimen or the specimen is illuminated for fluorescent imaging. Then a camera captures images at 1,000 different angles all the way around the specimen,” said Seth Ruffins, PhD, who taught the course and directs the Microscopy Core Facility at the Eli and Edythe Broad Center for Regenerative Medicine and Stem Cell Research at USC. “And through a mathematical process called a back plane projection you can then construct those images from all these different angles into a three-dimensional shape.”

With funding secured by McMahon and input from USC Viterbi Professor Andrea Armani, PhD, and Provost Professor Scott E. Fraser, PhD, the undergraduates built and assembled the microscope hardware in ENGR 499 during the fall 2014 semester. They started to troubleshoot the instrument and design the microscope at the start of the following spring.

The microscope began capturing its first state-of-the-art images, including a detailed three-dimensional rendering of kidneys and lungs.

By Douglas Morino

Incoming Keck Medical School of USC students recite the Hippocratic Oath on Aug. 14.

Students recite the Hippocratic Oath before the ceremony at which they receive their white coats at the start of medical school, promising to practice medicine with honor, loyalty and professionalism. Then they are assigned to compose their own personal oaths in the Professionalism and Commitment to Benefit Patients’ Lives course, which is considered among the most sacred binding documents in history.

An anthologization of student work reflects Hippocratic Oath

“Medical students into physicians that have achieved their white coats, symbolizing entrance into the medical profession.”

They were part of a ritual that is both celebratory and serious, 187 new students at the Keck School of Medicine of USC received their white coats, symbolizing entrance into the medical profession.

For the first time, students were asked to compose their own personal oaths interpreting the original Hippocratic oath as both celebratory and serious, as part of the ceremonial recitation of the Hippocratic Oath.

By Hope Hamashige

“Medicine is a science and an art,” said Reilly, an associate professor of clinical family medicine and associate director of the Introduction to Clinical Medicine Program. “This anthology reflects the art of medicine. The oaths represent creatively the themes that students are struggling with and celebrating as they begin their journey in the medical profession.”

The oaths vary in form — photo collages, musical scores, poems, personal essays — and are based on the Hippocratic Oath, a rite of passage signaling the transition of medical students into physicians that is considered among the most sacred binding documents in history.

Named after Hippocrates, the oath lays a foundation for the practice of ethical medicine by touching on themes of knowledge, compassion, empathy and fortitude in the face of adversity.

Students recite the Hippocratic Oath before the ceremony at which they receive their white coats at the start of medical school, promising to practice medicine with honor, loyalty and professionalism. Then they are assigned to compose their own personal oaths in the Professionalism and Commitment to Benefit Patients’ Lives course, which is considered among the most sacred binding documents in history.

“Students haven’t had any tests or hard work yet, so it’s an honest and thoughtful opportunity to reflect on what it means for their life,” Reilly said. “The oaths become something they refer back to and keep. It’s very positive for them.”

Students at the Keck School have been crafting their own personal oaths for about seven years, and Reilly shares her own oath with them at the start of each semester. The assignment stemmed from Reilly’s personal journey as a practicing physician.

“I had been in practice for about...
Merkin Family Foundation provides regenerative medicine faculty posts
By Cristy Lytal

It is the past two years, USC’s Department of Stem Cell Biology and Regenerative Medicine has welcomed six new assistant professors — and, thanks to a gift from the Merkin Family Foundation, their postdocs are on the horizon.

The young faculty members are recipients of the Richard N. Merkin Assistant Professorships in Regenerative Medicine, funded through the Richard N. Merkin, MD, Fund for Professorships in Regenerative Medicine. The gift enables USC to retain outstanding young faculty members and provide them with career-shaping resources to support their efforts to obtain external funding and tenure-track success as they transition into the next phase of their careers.

This gift supports USC’s program of cultivating one of the most dynamic teams of research scientists in the field of regenerative medicine,” said Andy McMahon, Ph.D., FRS, chair of the Department of Stem Cell Biology and Regenerative Medicine. “I am confident that these faculty will make transformational contributions to human health in the years to come.”

In addition to the recognition as assistant professors, each awardee will receive up to three years of support and training. They also receive access to a unique fund dedicated to promoting collaborations with clinicians in order to propel laboratory research into the patient-care setting.

“I’m delighted to establish the Merkin Fund for Professorships in Regenerative Medicine at the Keck School of Medicine of USC to further support research and discoveries that can unlock debilitating chronic diseases and develop new therapies,” said Richard N. Merkin, president and CEO of the Heritage Provider Network and the Merkin Family Foundation.

Family Overview: Merkin is a member of the Board of Overseers of the Keck School of Medicine of USC. The Heritage Provider Network and its affiliates operate in California, New York and Arizona, providing high-quality, cost-effective interventional health care to more than 700,000 individuals.

Merkin added, “Successful research can play an integral role in overcom- ing barriers for millions of Americans suffering from nerve disease and diabetes, and perhaps in solving some of the mysteries surrounding Alzheimer’s disease as well.”

The Merkin Family Foundation provides regenerative medicine faculty posts

MICROSCOPE: Interdisciplinary effort pays off
Continued from page 1

“This is probably only the fourth or fifth microscope of this design built in the United States,” said Ruf- fins. “This particular design comes from a group in Toronto. It was built as an open source project.”

Even with those designs in hand, the process of building the OPT microscope presented unexpected challenges.

“It wasn’t a step-by-step blueprint at all, so we had to fill in the gaps and a lot of blanks there,” said Stephanie Fong, a biomedical engineering major with a French minor. “In most of our classes, we don’t really get the chance to build a machine, especially something as complex as this from the ground up, so it’s been a really cool experience.”

Welbourn, the director of the Eli and Edythe Broad Center for Regenerative Medicine and Stem Cell Research at USC, will continue to cultivate collaborative and interdisciplinary thinking through the university-wide USC Stem Cell initiative, which con- nects almost 100 researchers.

“I look forward to continuing to work with students and colleagues at USC Viterbi and across the university,” said Welbourn. “The fact that this undergradu- ate course produced a working OPT microscope, which will be tremendously useful to stem cell research- ers including myself, underscores the synergy that results when we reach across disciplines.”

Foundation funds trial of drug to treat bone cancer
By Hope Hamaslidge

The USC Norris Comprehensive Cancer Center recently received the US$100,000 grant to fund a clinical trial of a new drug for the treatment of sarcoma, with an emphasis on osteosarcoma. The gift comes from a foundation established in memory of David Andrew Merkin. Merkin had osteosarcoma before his death in 2008. During this time, Madden told his parents he wanted to establish a non-profit organiza- tion to assist other young adult cancer patients.

To fulfill his dream, his friends and family established the David Andrew “Pooch” Madden Foundation, which also is the home of the David “Pooch” Madden Bone Cancer Fund, which provides grants to young adult cancer patients struggling with the cost of living expenses during their treatments.

“This is the first clinical trial we have funded, and we are elated about this extremely promising clinical trial because of its emphasis on osteosarcoma,” explained David Madden’s mother, Anna Madden, a member of the board of directors.

Osteosarcoma grows in connective tissue — cells that connect or support other kinds of tissue in the body. Osteosarcoma occurs in children and teens, but they can occur at any age, according to the American Cancer Society.

This trial in the drug that targets cancer is a novel fashion — introducing a protein that appears to halt the ability of tumor cells to grow the blood vessels they need to spread cancer.

James S. Hu, MD, medical director of the Sarcoma Program of USC and assistant professor of clinical medicine at the Keck School of Medicine, will use the funds to enroll 10 to 12 patients in a Phase I/Phase II clinical trial.

“It is really hard to get funding for research on sarcoma, and this is espe- cially true of osteosarcoma,” said Hu, noting that there are 15,000 new sarcoma cases a year, a relatively small number that makes it more difficult to attract attention and research dollars. “Because this type of research is so underfunded, this grant can make a huge difference.”

The drug has already gone through two years of testing on a variety of other cancers. That research demonstrated that the treatment might also be effective for osteosar- coma and other sarcomas.

DAM-CANCER has given more than 200 grants to cancer patients between the ages of 18 and 35, the most financially vulnerable age group of cancer patients.

“Sometimes young adult cancer patients do not complete their treatments because they do not have enough money for basic living expenses, such as food, housing and transportation costs to medical treatments,” said Anna Madden. “This support can help young adult cancer patients have not worked long enough to have accumu- lated sufficient savings and disability insurance and that some cannot rely on their parents to assist with the financial disaster of cancer treatment survi- vors. As Grand children and older patients have edge up in recent years, the survival rate of young adult cancer patients has been slow improving.

Families of cancer patients and others interested in the foundation’s efforts can find more information online at http://www.dam-cancer.org.

Calendar of Events
Tuesday, Sept. 1
1 p.m. USC Stem Cell Seminar. Marko Grkovic, Oregon Health and Science University, Portland. Info: Cristy Lytal, (323) 442-2172, lytal@med.usc.edu.


Tyshela Christopher@med.usc.edu

Wednesday, Sept. 2
Neon, Neon Science Seminar. "NK Cell Therapy for Pediatric Cancers," Dean A. Lee, MD, PhD, University of Texas Southwestern Medical Center. Info: Cristy Lytal, (323) 442-2172, lytal@med.usc.edu.

5:30 p.m. Ophthalmology Grand Rounds. Steve Moore, University of Texas Southwestern Medical Center. Info: Cristy Lytal, (323) 442-2172, lytal@med.usc.edu.

Thursday, Sept. 10
10 a.m. Stem Cell Seminar. "Recent Advances in Use of USC Stroke Support Group Meeting, "Depression and Stroke," Max Kim-Tenser, MD, USC, Keck Medical Center, 1901 Zonal Dr., Room D360A. Parking validated and snacks provided. Info: Oxnard, (805) 442-0499, oba- wurst@med.usc.edu.


Saturday, Sept. 12
10 a.m. USC Campus Department of Otolaryngology-Head and Neck Surgery. "Laryngectomy Support Group," Silver Conference Room. Group to meet on second Saturday of each month in the same location. Info: Brenda Villegas, (323) 442-5790, Brenda.Villegas@med.usc.edu.

Monday, Sept. 14

Tuesday, Sept. 15
11 a.m. USC Stem Cell Seminar. Adam Eng- lehart, University of Rochester Medical Center. Info: Cristy Lytal, (323) 442-2172, lytal@med.usc.edu.

Thursday, Sept. 17
7 a.m. Division of Vascular Surgery and Reconstructive Therapy, with the USC Office of Continuing Medical Education. "19th Annual Max R. Graper Symposium on Contemporary Management of Challenging Vascular Conditions," Fred A. Weaver, MD, USC, 1001 W. 120th St., Los Angeles. Info: Teresa Ball, (323) 442-2533, usccme@usc.edu.

Notice: Calendar items are due at least 10 days before publication date. Timely submission does not guarantee publication in print. See more calendar entries atuscnews.usc.edu/calendar-of-events. Submit items atuscnews.usc.edu/calendar-hsc. Include date, day, time, title of talk, first and last name of speaker, affiliation of speaker, location and a phone number/email address.
Summer stem cell program benefits high school students

By Marie Rippen

Enthusiastic is the word that best describes the 10 students from this year’s USC Early Investigator High School (EiHS) Stem Cell Research Program, who graduated July 31 from the summer laboratory immersion program at the Eli and Edythe Broad Center for Regenerative Medicine and Stem Cell Research at USC.

Since 2012, the program has enabled more than 50 students from local high schools to work in stem cell laboratories and take hands-on courses at the USC facility. This year’s students hailed from Cupertino High School, Harvard-Westlake School, Lifeline Education Charter School, Milken Community Schools, Palos Verdes Peninsula High School and San Marino High School. The program was opened this year for students from any high school, said Kanomi Sasaki-Capela, the training coordinator at the USC Stem Cell Core Facility.

For the first hour of the graduation ceremony, students exhibited posters that summarized their research for family, friends and peers. Topics included gene editing, neural stem cells and heart regeneration.

To begin the formal graduation ceremony, members of the USC Stem Cell and EiHS communities spoke, thanking parents, professors, USC Stem Cell Core Facility members and students themselves. As the students’ names were called, they crossed to the front of the room to shake hands with Core Program Director Victoria Fox, PhD, and receive plaques commemorating their accomplishments. Many laboratory mentors attended to support and brag about the students they had advised.

“Jonathan was very responsible,” said postdoctoral researcher Susanna Cavallo, who mentored Jonathan Kay of San Marino High School. “He was a pleasure to have in the lab — plus, most of his experiments worked.”

The students had positive things to say about their experiences with EiHS.

“I enjoyed the weekly forums with Dr. Fox,” said Sharon Chow, a student from Harvard-Westlake School. “She asked each of us what we were working on so we all could hear about each other’s projects.”

Esmeralda Lorenzana, a student from Lifeline Education Charter School, added, “It was also interesting to hear from professionals in different science-related careers.”

Will these students pursue careers in science? The response was an enthusiastic “yes.”

OATH: Book collects students’ pledges

Continued from page 1

10 years, “she said. “It gets busy and it gets crazy. You think, ‘Why am I doing all this?’ You can get in an overwhelmed state. You have to sit down and remember why you started.”

The oaths were submitted by 76 authors. Many of the oaths are done by former students who have gone on to become practicing physicians.

“What we read were very inspirational and positive, in a way that may not be so positive for us these days,” Allan Lichtman said. “We felt that these oaths should be published to reveal the dedication and inspiration that our first year students demonstrated.”

The anthology was made possible by grants from the Arnold P. Gold Foundation and the USC Levon Institute for Humanities and Ethics. After being published in May, the anthology was distributed to all new graduates and to those who submitted oaths that were published.

“We hope to share the value of professionalism in medicine, and we believe this project will continue to remind and inspire students to keep humanity in patient care at the core of their practice of medicine,” Yu said. “As my classmates and I move through the clinical years of medical school into residency and beyond, I hope this anthology will continue to be an encouraging and motivational reminder of our reasons for pursuing a career in medicine.”

The personal oaths are aimed at inspiring everyone from prospective medical students to those who have long completed medical school and are now practicing medicine.

“For me, reading these oaths continues to be an affirmation of hope,” Reilly McMillan said. “As you get out and practice, you see a lot of things and your work can be challenging. These oaths remind you of why you started, who you are and where you have been. They inspire students and let them know this is a great career and a wonderful profession of service. From the days of Hippocrates it was, and it still is now.”

Hippocrates Revisited: A Collection of Personal Student Oaths can be purchased at the USC Bookstore on the Health Sciences Campus and at amazon.com. The book is also available at the U.C. Medical Humanities Press.

CEREMONY: Ritual honors incoming class

Continued from page 1

a difficult diagnosis or create the best treatment plan, but that doesn’t mean they can’t help their patients. “Your presence, your sensitivity, your caring attitude, your willingness to listen to them may have profound effects on their emotional well-being,” Ford said. “Yes, you can make a difference even now.”

This year’s keynote speaker was Peter Cookes, MD, associate professor of surgery and recipient of the 2015 Leonard Tow Humanism in Medicine Award. Cookes echoed the theme, emphasizing that top medical practitioners combine sophistication in science with a genuine concern for others.

“Students’ time in medical school will focus on learning about scientific discoveries and technological advances, Cookes said, adding that it is just as important to remember the human side of medicine.

“Don’t lose the human aspect of reaching out to people in distress,” he said. Cheers erupted as Pulitano and Ford clapped the students in their coats — names emblazoned on the front — as each person was introduced to the crowd. Then the students recited the Hippocratic oath for the first time, swearing an allegiance to practice medicine with utmost integrity and with respect for the people they treat.
HSC Newsmakers

A roundup of news items related to Keck Medicine of USC, which may include philanthropic donations, research grants, publication in academic journals and mentions in the news media.

Walk with USC colleagues Sept. 26

Keck Medicine of USC is a sponsor of this year’s American Heart Association Heart Walk at the Rose Bowl on Sept. 26. The Heart Walk is the American Heart Association’s premier fund-raising event to save lives and fund research to fight No. 1 and No. 5 medical killers in the United States — heart disease and stroke. Walking teams are forming now. Sign up a team or register to walk by contacting Anne McGlyer at anne.mcglyer@med.usc.

New research program studies gut bacteria related to human disease

USC has funded a new intercampus research program to study the human microbiome and its impact on disease, the first such program at the university. The human body contains more than 100 trillion microbes known collectively as the microbiome. While the microbiome’s importance in health has been noted — think probiotics and stool transplants — the role that these bacteria play in disease is still not well understood. Led by William DePaolo, PhD, associate director of USC’s Programs in Biomedical and Biological Sciences (PIBBS), the Committee on Microbiome-Human Interactions in Disease (CMHID) aims to leverage existing technology at USC to drive bench-to-bedside research on the microbiome. The focus is on diseases such as inflammatory bowel disease, vaginal and gastrointestinal cancers, and metabolic disease. In 2015, the research program has had more than 50 members from across the Keck School of Medicine, the Roski School of Fine Arts and the School of Cinematic Arts, the committee was established by a three-year USC Research Collaboration Fund. For more, go to http://www.cmhid.org. — Alison Trinidad

White House honors IGM Gallery

Members of the advisory council for the USC Institute for Genetic Medicine Art Gallery and community leaders recently received a National Medal of Arts, an award for volunteerism presented by the White House to IGM Gallery Director Lynn Crandall. The award and a letter supporting it were presented by President Barack Obama to Crandall by Jennifer Morgan, president of the United Nations Association, Beverly Hills, in recognition of the mission of the IGM Art Gallery and its public, private, nonprofit, faith-based, academic and media partners to develop economic self-sufficiency and social justice on both USC campuses and in the surrounding communities. The event also launched an exhibition by New Delhi artist Nikki Anand, who flew in for the reception and discussions. The exhibition will run through Nov. 17. The event also launched an exhibition by New Delhi artist Nikki Anand, who flew in for the reception and discussions. The exhibition will run through Nov. 17.

Research shows teens who use e-cigarettes may go on to tobacco

A MULTI-UNIVERSITY TEAM led by Keck Medicine of USC researchers has found, for the first time, that using electronic cigarettes, or “vaping,” is associated with a propensity to start smoking cigarettes or use other tobacco products. Based on a survey of 2,530 14-year-olds at 10 public and private schools in Los Angeles, the researchers found that teens who use e-cigarettes were more likely to transition to smokeable tobacco products. The findings were published Aug. 18 in the Journal of the American Medical Association (JAMA). E-cigarettes may be drawing a new generation of teens into recreational nicotine use because they are high-tech, cool, fun and relatively easy to smoke, and even more so, come in enticing flavors and have a perception that “they’re not harmful,” said Adam Leventhal, PhD, associate professor and director of the USC Health, Emotion and Addiction Laboratory at the Keck School of Medicine. The research is among the first to be released under an NHI-funded program established in 2013 at the Department of Preventive Medicine.

Cancer program at USC Norris honors Ronnie Lippin

By Hope Hamashigsie

I t is experience with the diagnosis and treatment of his wife’s breast cancer that has inspired Ronnie Lippin to establish the Ronnie Lippin Cancer Prevention and Navigation Program at the USC Norris Comprehensive Cancer Center.

Beginning this fall, the program will help people living with cancer at the USC Health Sciences Campus to maximize their chances of surviving cancer, and connect them to the right doctors. It will also help them in understanding treatment options, clarifying insurance coverage, and finding additional resources. Before Ronnie Lippin developed a rare form of breast cancer, the couple had high-flying careers in the entertainment industry. Ronnie Lippin represented top name talent such as Eric Clapton, Prince, Brian Wilson and the Bee Gees. Dick Lippin represented Hollywood companies as clients of his public relations firm, Lippin Group.

Despite their success in business, dealing with Ronnie Lippin’s cancer made Dick Lippin feel “like a baby in the woods.” “I was so whipsawed by decisions I made in business, but when it came to complex medical information, I felt like I didn’t know what I was doing,” Dick Lippin said. “I remember thinking that if I was going through all this, I couldn’t imagine what people who couldn’t afford great care were going through.”

After Ronnie’s death, Dick Lippin partnered with Tower Cancer Research Foundation. He explained that the type of program he envisioned to honor his wife’s memory and they secured him toward a $300,000 donation to establish the program at USC Norris. Linda David, executive director of Tower Cancer Research Foundation, explained that the organization works with its donors to find the right institution in Southern California for the kind of donation they want to make. “He was passionate about getting help for people who don’t have access to the best care or the understanding of the system to get the help they need,” David said.

Lippin came to her unsure how his money would do the most good. She believes that Keck Medicine physicians do free cancer screenings in the communities around the campus, where there are high instances of late-stage cancer diagnoses, and she saw a fit. “A lot of those people who get a cancer diagnosis will benefit from someone stepping in to help them navigate their next steps,” she said.

Zul Sunati, executive director of HSC Community Partnerships, explained that USC Norris had identified a need to bridge the gap between the free cancer screenings in the neighborhoods and ensuring those people get the help they need.

“We don’t want the people we screen and who need follow-up services to fall through the cracks,” Sunati said. “We are so grateful for this gift because it not only brings in funds, but when it is we will us our mission of promoting better health for the communities we serve.”

Global study of Type 1 diabetes receives funds

By Hope Hamashighsie

Two USC research leaders recently received funding to participate in a global effort to find new ways to prevent the onset of Type 1 diabetes (T1D). David Agus, MD, professor of medicine, and Dan Ruderman, PhD, assistant professor of research medicine, were awarded $169,806 by the Leona M. and Harry B. Helmsley Charitable Trust. The project, dubbed the T1D Prevention Initiative, involves ongoing and new research at five institutions — Helmholtz Zentrum Munchen in Germany, the University of Cambridge in Great Britain, JDRF in Australia, and the Keck School of Medicine of USC and the University of South Florida in the United States.

The $169,806 total investment of over $8.7 million will help these institutions further and continue observation of hundreds of thousands of newborns and children across the United States, Europe and Australia, as well as funding analysis of the data to chart the history and progression of Type 1 diabetes. Clinical trials seeking to halt the development of T1D are also expected.

In Type 1 diabetes, the body does not produce insulin. It is usually diagnosed in children and young adults, according to the American Diabetes Association. Agus and his team are reviewing the reliability and quality of existing clinical data from T1D trials and from individuals with other autoimmune diseases. Their research will determine whether sufficient data exists to design an interventional prevention trial and use data analytic techniques to better understand T1D and other childhood diseases.

“My team and I are excited to dive into the clinical trial data and try to learn about the onset of diabetes,” said Agus, who is also a professor in the USC Viterbi School of Engineering. “Through the remarkable patients who donated their data, we will hopefully develop a new understanding to better prevent and treat T1D. This is the beginning of a long and fruitful collaboration with the Helmsley Trust to understand T1D and design clinical trials to make a difference in T1D and other diseases.”

The Helmsley Charitable Trust supports research in the field of T1D understanding and prevention.

HSC News

HSC News is published for the faculty, staff, students, volunteers and visitors of the University of Southern California’s Health Sciences Campus community. It is produced by the Health Sciences Public Relations and Marketing staff. Permission to reprint articles is available upon request. No artwork may be reproduced without the creator’s consent.

Editor: Les Dunshef

Director, Internal Communications: Virginia Ibarra

Contact: Andrea Aldiana, Hope Hamashige, Cristy Lytle, Carol Matthieu, Douglas Morino, Sara Reeve, Leslie Ridgeway and Alison Trinidad

Phone: (213) 442-4320
Fax: (213) 442-2832
Email: hscnews@usc.edu
Web: hscnews.usc.edu/keckmed.usc

Next issue: Sept. 11