HSC News

USC University of Southern California

FEBRUARY 13 • 2015 PUBLISHED FOR THE USC HEALTH SCIENCES CAMPUS COMMUNITY VOLUME 2 • NUMBER 3

Photos by **Ellen Gruber**

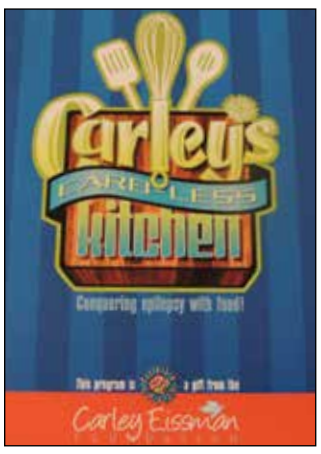
Tom Clark, far left, and Carl Eissman, in black apron on right, prepare food in Carley's Carb-less Kitchen during a recent class for families learning to use dietary therapy to treat epilepsy.

Eissman Foundation teaches food as medicine in Carley's Carb-less Kitchen

By Ellen Gruber

When Carley Eissman started dietary therapy to manage epileptic seizures, her goal was simple — play basketball. She did not know that it would change her life or the lives of the many people who now receive dietary support and education in Carley's memory.

After Carley's 2011 death at age 19 in an accident related to an epileptic seizure, her family founded the Carley Eissman Foundation to benefit families who were beginning to use dietary



therapy to treat epilepsy.

As a teacher, Carley's mother was not satisfied with simply raising and donating funds. "A good teacher gets on the carpet with the kids," Lori Eissman said. "So I took that approach to my idea for a kitchen."

Today, Lori and Carl Eissman and other family members can be found cooking for a growing audience of families affected by epilepsy in Carley's Carb-less Kitchen, which offers monthly cooking classes in cooperation with the dietary clinic at LAC+USC Medical Center.

"One of the things we keep talking about is that

See **KITCHEN**, page 3

Keck stem cell researchers garner $4.3 million in funding

By Cristy Lytal

Three scientists from Keck Medicine of USC have won grants exceeding $4.3 million from the California Institute for Regenerative Medicine (CIRM) for research that includes creating a temporary liver for transplant patients, finding novel ways to treat immune disorders and blood diseases, and developing a new animal model for exploring diseases such as heart failure, diabetes and neurodegenerative diseases.

The grants were received by USC Stem Cell Principal Investigators Paula Cannon, PhD; Toshio Miki, MD, PhD; and Qi-Long Ying, PhD. The funds are part of the CIRM Tools and Technologies initiative, which supports projects addressing the challenges of translating stem cell discoveries into cures. The winners were chosen from 212 proposals to create, design and test the key technologies needed to usher in the era of regenerative medicine.

"Sometimes even the most promising therapy can be derailed by a tiny problem," said Jonathan Thomas, JD, PhD, chair of CIRM's governing board. "These awards are designed to help find ways to overcome those problems, to bridge the gaps in our knowledge and to ensure that the best research is able to keep progressing and move out of the lab and into clinical trials in patients."

Cristy Lytal

Toshio Miki holds device used in his work with human liver cells.

Miki's team at the Eli and Edythe Broad Center for Regenerative Medicine and Stem Cell Research at USC plans to develop what he calls an "extracorporeal liver support system (ELS)" for patients with liver failure. The ELS will house a collection of human liver cells, produced from stem cells, in a device outside of the patient's body but connected

See **CIRM**, page 3

Douglas Morino

PRESIDENTIAL ADDRESS — USC President C.L. Max Nikias delivered his 5th annual address to Keck School of Medicine faculty on Feb. 10 in Aresty Auditorium. "Faculty and students determine our success," Nikias told about 250 faculty members. "Your accomplishments define us and will continue to distinguish us."

USC donation brings upgrades to neighborhood park

By Teresa Lara

More than 200 community members gathered to celebrate a $1 million gift from USC that will fund improvements to the Hazard Recreation Center near the university's Health Sciences Campus.

Martha Escutia, JD, vice president for USC Government Relations, presented a ceremonial check on Jan. 31 to the Los Angeles Parks Foundation on behalf of USC President C. L. Max Nikias, PhD, the Board of Trustees, senior management and HSC employees.

Among the proposed improvements announced at the celebration are a new jogging path, exercise equipment and upgrades to the tennis and basketball courts.

Los Angeles City Councilmember José Huizar, whose 14th District includes the Health Sciences Campus, commended the university for listening to the comments of community members and taking action.

David Sprague

Pausing for a moment are Kevin Regan of the L.A. Department of Parks and Recreation; Councilman José Huizar; Martha Escutia, USC vice president; and Judith Kieffer of the Los Angeles Parks Foundation.

"I'm so proud to work with the city and the USC Government Relations and Civic Engagement teams who welcomed community dialogue," he said. "I'm also proud to serve communities who welcomed the help to improve the lives of all who work, live, study or receive medical help around the neighborhood."

Recognition was also given to the Hazard Park Preservation Committee and the city Department of Parks and Recreation for the upgrades.

KSOM catapults into Top 10 in NIH funding of otolaryngology research

By Alison Trinidad

The Keck School of Medicine of USC climbed 30 spots in two years to join the country's 10 highest funded medical schools by the National Institutes of Health (NIH) for 2014 otolaryngology research, according to an independent analysis by the non-profit Blue Ridge Institute for Medical Research.

In 2014, the Department of Otolaryngology – Head and Neck Surgery received $3.25 million of $85 million in NIH awards targeted to clinical otolaryngology departments across the country, vaulting to No. 10 of NIH-funded programs and surpassing the likes of Harvard University, New York University and UC San Francisco. An additional $2.8 million in NIH funding was transferred to the department in 2014 from other institutions' existing research programs now at USC.

John K. Niparko

The achievement aligns with USC President C. L. Max Nikias' charge to become Southern California's most elite health system, with global prominence in medicine, biological sciences, translational research, biotechnology and patient care.

"The vibrant academic community of scientists interested in the communication sciences at USC enabled us to attract top-notch research programs from the House Research Institute, the University of Michigan and Johns Hopkins University over the last two years, providing a critical mass of investigators dedicated to the communication sciences and placing us among the world's elite clinical otolaryngology departments," said John K. Niparko, MD, professor and chair of otolaryngology at the Keck School of Medicine of USC. "This talented team has found important synergies at USC, and their research promises to directly affect clinical assessment and care in the immediate future."

Niparko, an internationally renowned otoneurologic surgeon and researcher, came to USC from Johns Hopkins in February 2013, bringing with him more than $2.5 million in NIH and foundation grants that year alone. The department has grown since, adding 16 full-time faculty clinician-scientists and basic scientists, including seven who serve as principal investigators on NIH-supported studies.

NIH-funded hearing research programs at USC include the study of genetic predispositions to age-related hearing loss, exploring stem cell therapy for restoring hearing loss and evaluating the effectiveness of cochlear implantation and auditory brainstem implants in deaf children. USC's otolaryngology department came in at No. 16 in 2013 and at No. 40 in 2012.

Otolaryngologists are physicians who diagnose and manage diseases of the ear, nose, sinuses, voice box, mouth and throat, as well as structures in the neck and face. The NIH is the largest source of funding for medical research in the world.

The Blue Ridge Institute for Medical Research used the Research Portfolio Online Reporting Tool from the NIH to compile its analysis. In 2014, USC also ranked in the Top 10 NIH-funded programs in public health and preventive medicine (No. 1) and ophthalmology (No. 3).

Patient's family gives $1.5 million for Parkinson's research

By Hope Hamashige

One of her father's many fine qualities was that he had a great eye for people, explained Bertha Gonzalez. And although he chose Giselle Petzinger, MD, to be his physician because of her top reputation, he came to admire her professionalism with patients and respect the contributions she hoped to make to the understanding of Parkinson's disease.

For this reason, Roberto Gonzalez's family chose to honor his memory by establishing the USC Roberto Gonzalez Parkinson's Research Fund. A $1.5 million contribution will further Petzinger's research on the effect of exercise on patients with Parkinson's. Petzinger, an assistant professor of research in the Department of Neurology at the Keck School of Medicine of USC, has been studying which types of exercise are most efficient for keeping the symptoms of Parkinson's disease at bay.

Roberto Gonzalez

Petzinger said she was thrilled to receive the gift from the Gonzalez family because it will further her research, and because it came from a patient with whom she had a special bond. "He was a big believer in leading a healthy lifestyle," said Petzinger. "We shared a common bond in wanting a deeper understanding of the connection between health and lifestyle."

Gonzalez understood that her research project is both costly and detailed, Petzinger added. It involves basic science and human trials, including putting more than 150 people through an exercise protocol designed for Parkinson's patients. Ultimately, Petzinger and her team hope their research will lead to new therapeutics for Parkinson's patients.

Once the research is complete, Petzinger will share the findings with colleagues in Mexico — a condition requested by the family because Gonzalez wanted to ensure Parkinson's patients in Mexico were updated with the most current research findings and treatments available to help them combat this debilitating disorder. Petzinger noted that Gonzalez is widely known and much-loved throughout Mexico because of his philanthropic work, which will continue through the family foundation.

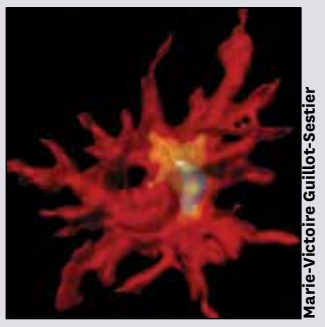
"It was something he spoke about before he died," said Bertha Gonzalez, "and it is something we agree needs to be addressed in Mexico."

Neurogeneticists harness immune cells to clear Alzheimer's-related plaques

By Alison Trinidad

New research from scientists at the Keck School of Medicine of USC shows that the body's immune system may be able to clear the brain of the toxic plaque buildup that is a hallmark of Alzheimer's disease, reversing memory loss and brain cell damage.

The study, which appears in the Feb. 4 edition of the peer-reviewed scientific journal *Neuron*, identifies a promising avenue for treating a disease that affected an estimated 5.2 million Americans in 2014, according to the Alzheimer's Association.



Marie-Victoire Guillot-Sestier

A 3-D reconstruction shows an immune cell containing beta-amyloid within an intracellular degradation compartment.

"Alzheimer's disease is the public health crisis of our time, and effective treatment does not yet exist," said Terrence Town, PhD, professor of physiology and biophysics at the Keck School of Medicine of USC and the study's senior author. "Our study shows that 'rebalancing' the immune response to wipe away toxic plaques from the brain may bring new hope for a safe and effective treatment for this devastating illness of the mind."

Alzheimer's disease is an irreversible, progressive brain disease that causes problems with memory, thinking and behavior. It is the most common type of dementia, a general term for loss of memory and other mental abilities. Brains with Alzheimer's disease show build-up of a sticky plaque — made of a protein called beta-amyloid — that induces memory loss. When afflicted with Alzheimer's, the immune system, which typically rids the body of toxic substances, becomes imbalanced and inefficient at clearing those plaques.

In the *Neuron* study, Town and his team used genetically modified mice to show that blocking a substance called interleukin-10 activates an immune response to clear the brain of the beta-amyloid plaques to restore memory loss and brain cell damage. Alzheimer's-afflicted mice in which the immune cells were activated behaved more like mice without the disease in various learning and memory tests. Future studies will test the effectiveness of drugs that target interleukin-10 in rats that the scientists have genetically modified to develop Alzheimer's disease.

USC co-authors include Marie-Victoire Guillot-Sestier, Kevin R. Doty, David Gate, Javier Rodriguez Jr. and Brian P. Leung. The study was supported in part by the National Institutes of Health, American Federation of Aging Research/Ellis Medical Foundation and Zilkha Neurogenetic Institute.

HSC News **Next Issue: Feb. 27**

HSC News is published for the faculty, staff, students, volunteers and visitors in the University of Southern California's Health Sciences Campus community. It is written and 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 artist's consent

Editor: Les Dunseith

Contributors: Sharon Brock, Tania Chatila, Hope Hamashige, Cristy Lytal, Carol Matthieu, Douglas Morino, Sara Reeve, Leslie Ridgeway, Talar Shahinian, Sherri Snelling and Alison Trinidad

Director, Internal Communications: Virginia Baca

Executive Director, Creative Services: Tom DeSanto

Associate Vice President, Health Sciences Public Relations and Marketing: Deborah S. Fullerton

Phone: (323) 442-2830 Fax: (323) 442-2832
Email: hscnews@usc.edu Web: hscnews.usc.edu

Lung cancer screening is now covered by Medicare

By Leslie Ridgeway

Keck Medicine of USC applauds the Centers for Medicare and Medicaid (CMS) decision to provide coverage of annual low-dose computed tomography (CT) screening for patients ages 55 to 77 years with at least a 30 pack-year smoking history.

"Today signals a new day where lung cancer transitions from the No. 1 cancer killer to a treatable, curable disease. With thousands of preventable deaths every year due to lung cancer, this important decision has the potential to make a significant difference for our patients," said Christopher Lee, MD, assistant professor of radiology, Keck School of Medicine of USC. "Lung cancer is one of the most difficult diseases to detect early, and this gives patients a fighting chance. Here at Keck Medicine of USC, we commit to those at risk to provide high-quality screening and follow-up care."

The Medicare ruling specifies that patients must also be asymptomatic, be a current smoker or one who has quit smoking within the last 15 years, and the scan must be ordered by a physician. The Keck Medicine of USC Multidisciplinary Lung Cancer program can assist with coordinating a physician consultation. To schedule a low-dose CT scan, call (323) 680-3534 or email lungcancer@med.usc.edu.

This ruling finalizes a draft decision issued in November 2014 that brings the benefit of lung cancer screening to approximately 5 million American seniors, the most at-risk group for the disease. This represents close to half of the entire at-risk public who would qualify for screening.

KITCHEN: Families coping with epilepsy learn dietary therapy in LAC+USC classes

Continued from page 1

food really cuts across cultures and languages, and it is a really nice vehicle for effective human communication," said Arthur Partikian, MD, director of child neurology at LAC+USC Medical Center and a specialist in epilepsy. "So it was a really unique idea to have a kitchen cooking class to introduce the concept of food as medicine."

Ellen Gruber

Carley's mother, Lori Eissman, at left in orange, helps conduct a recent cooking class that included Kesli Gazsi, Carley's best friend, at right.

Epilepsy is a neurological condition that affects the nervous system and causes recurring seizures over time. More than 2 million Americans have epilepsy, according to the U.S. Centers for Disease Control. It is estimated that one in 26 people will develop epilepsy at some point in their lives.

Despite epilepsy's widespread impact, the Eissmans and others have noted that it receives little attention outside of hospitals and academic research centers.

"Epilepsy has a very negative stigma about it because you don't see it … until you have a seizure, and then it's gone again." Lori Eissman said. "There are so many people who never saw that Carley had seizures. They never understood it."

The Eissmans are doing what they can to end the stigma. "People need to talk about epilepsy like they talk about cancer or diabetes," Lori Eissman said.

Treatments for the illness range from oral medication to brain stimulation and surgery. These treatments are often successful in controlling or even curing epilepsy, but one third of epilepsy patients live with uncontrollable seizures because no treatments work for them.

Carley Eissman was such a patient.

Carley Eissman

Laura Kalayjian, MD, chief of neurology and director of the EEG Lab at LAC+USC Medical Center, was the last of many physicians who treated Carley — but the first to suggest dietary therapy. Within a few months of strict adherence to a modified Atkins diet (MAD), Carley's seizures had almost disappeared.

"These patients — many of them are determining whether or not to do brain surgery," said Kalayjian, who is also an assistant professor of neurology at Keck School of Medicine of USC. "Sometimes dietary therapy is looked at as a last resort, and it shouldn't be."

Potential benefits to managing epilepsy through diet include weight loss and fewer negative side effects than surgery. But distinct challenges exist.

"Epilepsy is a socially isolating condition. Patients don't have a lot of people to talk to," said Jessica Lowe, a dietitian in the Department of Neurology who runs the dietary therapy classes. "When you put someone on this therapy, it changes their entire lifestyle, and then there are even fewer people to talk to. It's much easier to go through it with others than to go through it by yourself."

The teamwork aspect is important at Carley's Carbless Kitchen, which has seen classes double in size in just six months of operation, leading to a move to a larger location in the Wellness Center at LAC+USC Medical Center.

"It's not like a normal cooking class where you walk away with just a recipe," observed Lori Eissman. "It is a teaching class where families can come together for education about MAD, eat an amazing meal and walk away with a sense of community."

Ultimately, Carley's Carbless Kitchen seeks to equip families with tools to master epilepsy through food. Students quickly become the masters, taking on roles as sous-chefs, bloggers and ambassadors for the modified Atkins diet.

The Eissmans started the foundation to honor their daughter and to give back to others dealing with epilepsy. But the effort is already transforming itself.

"I'm so impressed by USC and what we've started and how it's grown," Lori Eissman said.

"I know Carley would be really proud of this."

CIRM: Funding will further USC's efforts in regenerative medicine

Continued from page 1

to the patient's circulation. The ELS will therefore be able to function as a temporary liver: removing toxins, preventing irreversible brain damage, and giving the patient's own liver a chance to recover and regenerate.

If successful, the device will allow patients to recuperate without undergoing liver transplantation.

Miki, an assistant professor of research in the Department of Biochemistry and Molecular Biology at the Keck School of Medicine of USC, received the award for his proposal "Development of a clinical-grade extracorporeal liver support system using human induced pluripotent stem cell-derived hepatic cells." The project is an international collaboration with Katrin Zeilinger, DVM, at Charité University, Berlin, and Frank Shubert at Stem Cell Systems GmbH, with additional support from Germany's Federal Ministry for Education and Research (BMBF).

Don Milici

Paula Cannon

Cannon plans to improve the precision and safety of "targeted nucleases," which she describes as "scissors" used to edit specific genes in hematopoietic or blood-forming stem cells. Cannon hopes to develop the next generation of targeted nucleases to treat severe immune deficiencies and blood diseases, such as sickle cell disease.

Cannon and her colleagues have already developed a targeted nuclease that could potentially cure HIV/AIDS by introducing a mutation in a gene called CCR5 that confers natural immunity to HIV. Heading into clinical trials, the approach is inspired by the "Berlin patient," a man cured of both HIV and leukemia through a bone marrow transplant from a donor with a CCR5 mutation.

Cannon — a principal investigator with USC Stem Cell and associate professor of molecular microbiology and immunology, pediatrics, and biochemistry and molecular biology at the Keck School of Medicine of USC — received the award for her proposal "Site specific gene editing in hematopoietic stem cells as an anti-HIV therapy."

Cristy Lytal

Qi-Long Ying

Ying, who is also at the Eli and Edythe Broad Center for Regenerative Medicine and Stem Cell Research at USC, plans to use stem cell-based technology to create genetically modified laboratory rats for research into new therapies for heart failure, diabetes and neurodegenerative diseases.

Transgenic rats will provide an even more powerful tool than transgenic mice, which for nearly 25 years have allowed scientists to study and model a wide range of diseases that also occur in humans. The rat is widely accepted as more similar to the human in its physiology, which is essential for cardiac, metabolic and neurological studies.

An associate professor of stem cell biology and regenerative medicine at the Keck School of Medicine of USC, Ying received the award for his proposal "Embryonic stem cell-based generation of small animal models for assessing human cellular therapies." He is collaborating with USC colleagues Justin Ichida, PhD; Bangyan L. Stiles, PhD; and Ching-Ling (Ellen) Lien, PhD, who is also affiliated with The Saban Research Institute of Keck Medicine of USC-affiliated Children's Hospital Los Angeles.

"At USC, we are committed to developing the critical tools and technologies for the broader scientific community to translate stem cell discoveries into patient cures," said Andy McMahon, PhD, director of the Eli and Edythe Broad Center for Regenerative Medicine and Stem Cell Research at USC, and chair of the department and university-wide initiative in stem cell research. "We are grateful for this ongoing support invested in CIRM by the voters in California. Their investment is accelerating the progress of scientists at USC and other world-class universities within the state toward the future of regenerative medicine."

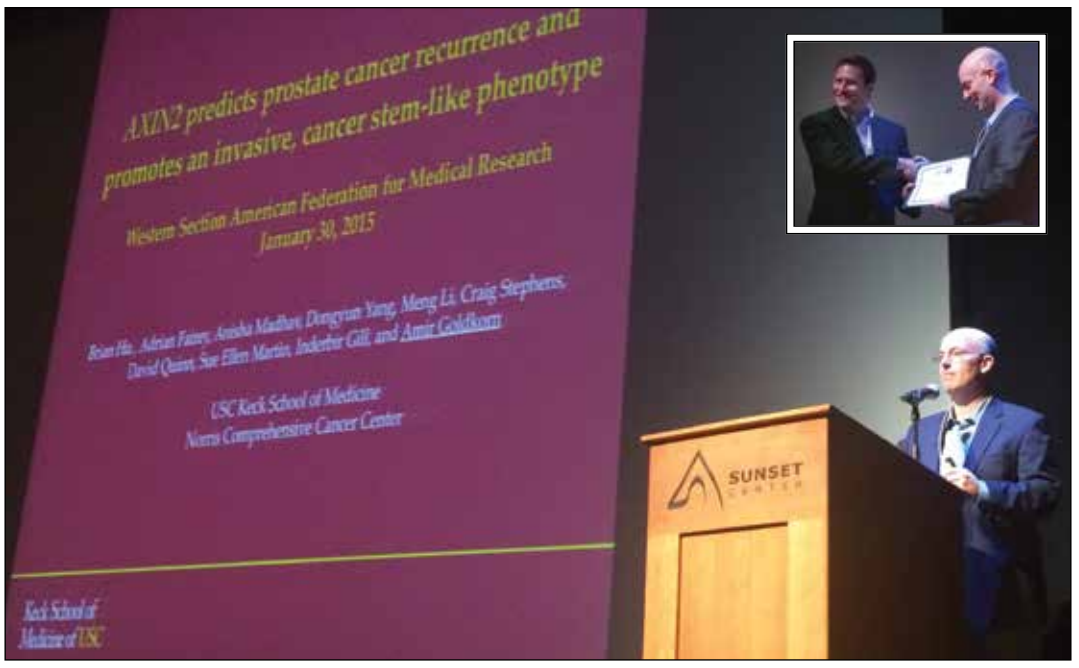
Calendar of Events

Sunday, Nov. 6

8:30 a.m. USC Institute for Urology and USC Norris Cancer Hospital 2nd Annual LA Prostate Cancer 5K. All proceeds and donations will be dedicated to prostate cancer research at USC. UPC: By Tommy Trojan. To register: visit uscurology.com/prostate-5k. Info: (323) 865-3731

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 of talk, first and last name of speaker, affiliation of speaker, location and a phone number or email address for information.

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



AWARD WINNER — Amir Goldkorn, MD, speaks about his research into biomarkers related to prostate cancer during the Western Regional meeting of the American Federation for Medical Research (AFMR). Goldkorn, an assistant professor of medicine in genitourinary oncology at the Keck School of Medicine of USC, was honored with the Outstanding Investigator Award during the annual conference Jan. 29-31 in Carmel, CA. He was presented with the award by WAFMR chairman Michael Schivo, inset.

Segil uses stem cells to seek treatments for hearing loss

By Cristy Lytal

During most of his 20s, Neil Segil, PhD, couldn't imagine pursuing a career in science and being a professor. Now he's doing both — as a principal investigator with USC Stem Cell and a professor of research at the Keck School of Medicine of USC in two departments: Stem Cell Biology and Regenerative Medicine, and Otolaryngology-Head and Neck Surgery.

"I enjoyed doing experiments and working in the lab, but wasn't very eager to run one," he explained.

After growing up mostly in Marblehead, MA., Segil studied philosophy and psychology at Hampshire College. He made his first foray into stem cell science with his senior thesis — a study about lens regeneration in newts published in the journal *Developmental Biology*.

He then traveled and worked as needed. He did a nine-month stint in a Harvard Medical School lab run by David Hubel, MD, and Torsten N. Wiesel, MD, who shared the 1981 Nobel Prize in Physiology or Medicine for explaining how the brain forms images using information from the retina.

Inspired, he enrolled in graduate school at the University of Washington to study retinal development but dropped out to move to New York City and work with a friend in an independent publishing company. They started a magazine, *Europa*, that published

Cristy Lytal

Neil Segil

articles on East European political science and cultural affairs.

To support himself, he worked as a technician at New York University and realized that he missed the lab. So he enrolled in the PhD program at Columbia University, where he studied biochemistry. He did postdoctoral research at Rockefeller University before accepting a job at the House Research Institute, a nonprofit that specialized in the science of hearing.

In 2013, his lab relocated to the Eli and Edythe Broad CIRM Center for Regenerative Medicine and Stem Cell Research at USC.

Segil's lab explores the development of the inner ear's sensory cells, which don't naturally regenerate in humans when damaged, even though they do in non-mammals such as birds.

Segil is also collaborating with USC Stem Cell researchers Justin Ichida, PhD, and Takahiro Ohyama, PhD, to reprogram skin cells into inner ear cells.

They will put these reprogrammed cells into a robotic screening machine, which will allow them to test thousands of drugs to find ones that protect against or reverse hearing damage, and stimulate regeneration.

USC Health Sciences
Public Relations and Marketing
2011 N Soto Street - SST-2830
Los Angeles, CA 90032

Non-Profit Organization
U.S. POSTAGE PAID
Industry CA
Permit 4029

In case of an emergency...

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.