Health effects eyed in Porter Ranch leak

By Zen Vuong

A massive methane leak in a Los Angeles County community will have long-term health consequences that USC researchers say they intend to study.

More than 87,500 metric tons of methane have leaked from a natural gas storage facility near Porter Ranch, according to the Environmental Defense Fund. Ed Avol, MS, professor of clinical medicine in the Department of Preventive Medicine of the Keck School of Medicine of USC, is an expert on respiratory health and the public health impacts of air pollution. Avol said he and his colleagues will study the long-term health effects of the natural gas leak in Aliso Canyon.

Question: Gas leaks happen often. Why is this one unusual?

Avol: Methane gas has been spewing out at several thousand pounds per square inch since late October. It is coming out at a very high pressure, and this exhaustion is expected to continue for another month or two. In terms of climate change and global warming, I have seen estimates claiming that it has increased California’s methane emissions by 25 percent.

In some ways, the Aliso Canyon gas leak parallels the Deepwater Horizon oil spill in the Gulf of Mexico back in 2010. A blowout of a well is exuding toxic compounds, including some of the other contaminants methane can react in the open-air environment and create other gases and chemicals, such as hydrogen sulfide, benzene, toluene, ethylbenzene and xylene also have been associated with the explosion and are thought to be part of the oily residues in the well and on the walls of the storage facility.

Researchers at USC are interested in investigating these chemical constituents and the long-term effects that might result from breathing in these chemicals.

Stroke program hosts Armenian neurologist

By Amanda Busick

When Yakarina Hovhannisyan, MD, arrived in Los Angeles from Yerevan, Armenia, last year, she was prepared for an intensive learning experience at the Keck School of Medicine of USC.

Hovhannisyan, a neurologist and junior faculty member at the Yerevan State Medical University, was at the USC Comprehensive Stroke and Cerebrovascular Center as part of an ongoing project between neurologists of Armenian descent from the US and Canada to improve stroke patient outcomes in that part of the world.

Q: What causes the nausea, headaches, eye irritation, nosebleeds and other symptoms Porter Ranch residents are reporting?

A: Methane makes up about 90 percent of natural gas. Methane and other chemicals emitted in natural gas can react in the open-air environment and create other gases and chemicals, such as hydrogen sulfide. Benzene, toluene, ethylbenzene and xylene also have been associated with the explosion and are thought to be part of the oily residues in the well and on the walls of the storage facility.

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Study: Too much screen time raising rate of childhood myopia

By Meg Aldrich

The largest study of childhood eye diseases ever undertaken in the U.S. confirms that the incidence of childhood myopia among American children has more than doubled over the last 50 years. The findings echo a troubling trend among adults and children in Asia, where 90 percent or more of the population have been diagnosed with myopia, up to 10 to 20 percent 60 years ago.

The Multi-Ethnic Pediatric Eye Disease Study (MPIEDS), conducted by researchers and clinicians from the USC Eye Institute at Keck Medicine of USC in collaboration with the National Institutes of Health (NIH), adds to a growing body of research into the incidence and potential causes of myopia, or near-sightedness, in children and adults.

The possible culprit? Too much “screen time” and not enough sunlight, according to Rohit Varma, MD, MPH and director of the USC Eye Institute.

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The importance of diversity to college campuses has been in the media spotlight recently, but the Keck School of Medicine of USC has been a leader in this arena for more than forty years.

Founded in 1968, the Office of Diversity at the Keck School of Medicine has developed numerous programs to strengthen the climate of the Keck School for underrepresented students, faculty and staff.

In an effort to continue this momentum, Dean Carmen A. Puliafito, MD, MBA recently announced the formation of the Keck School of Medicine Dean’s Diversity Cabinet. This cabinet, comprising six members of the Keck School faculty, will focus on enhancing recruitment and retention of students, faculty, residents and staff, and on creating a supportive and culturally sensitive campus environment.

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**AWARD WINNERS TACKLING HEART DISEASE, ALS**

By Cristy Lytal

TWO collaborative teams within USC Stem Cell are developing new approaches that could eventually help patients with heart disease, frontotemporal dementia (FTD), and amyotrophic lateral sclerosis (ALS).

The teams are the winners of the Audrey E. Striedean Regenerative Medicine Initiative Awards, supported by a generous bequest by the Audrey E. Striedean to the Department of Stem Cell Biology and Regenerative Medicine at the Keck School of Medicine of USC. Totaling $140,000 each, the awards support USC-affiliated faculty members pursuing multidisciplinary research collaborations with the goal of curing diseases using stem cells as tools.

One winning proposal combines the complementary expertise of researchers Justin Ichida, PhD, and Paula Cannon, PhD, two faculty members with appointments in the Department of Stem Cell Biology and Regenerative Medicine. The team aims to develop a technique for correcting a gene mutation responsible for 10 percent of all cases of FTD and ALS, two fatal diseases in which nerve cells degenerate.

A leading expert in reprogramming stem cells into neurons, Ichida has already demonstrated that correcting “or editing” mutations in a gene called C9ORF72 can rescue neurons in a petri dish. In order to move beyond the petri dish, he will team up with Cannon, who develops cutting-edge technologies for delivering gene editing technology to cells in living organisms.

In this case, Cannon and Ichida will deliver their gene editing technology by putting it inside of an adeno-associated virus (AAV), which can naturally enter cells.

They hope that these experiments will demonstrate the effectiveness of their approach in mice, and lay the foundation for a clinical trial to treat patients with these devastating neurodegenerative diseases.

The other winning proposal brings together basic scientist Jian Xu, PhD, and cardiologist-surgeon Ram Kumar Subramanyan, MD, PhD, in an effort to find new strategies for healing damaged hearts.

Damage occurs when clumped arteries block blood flow to the heart, starving it of oxygen, and injuring and scarring its muscle. This can eventually lead to heart failure.

In an attempt to reverse this process, the researchers are studying a gene called p53, which sends signals to cells known as fibroblasts, instructing them to transform themselves into cells that line new blood vessels, thereby promoting the growth of new arteries. This improves blood flow to injured hearts, which can in turn improve healing.

As Andy McMahon, PhD, chair of the executive committee of USC Stem Cell, explained, “These collaborative projects aim a ambitious goal: to move basic research into the clinic. By enabling scientists and clinicians to work together, these awards lay the groundwork for the regenerative therapies of tomorrow.”

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**STROKE: Visit continues new learning exchange**

Continued from page 1

“Amyotrophic neurologists are really good. Their level of expertise is very high but they have to treat patients without the same resources that we have,” he said. “The intelligence and the care that they give here, it’s the system that doesn’t support patient care. We are working to change that.”

Sanossian’s group is optimistic about future changes. Recently, they introduced the use of tissue plasminogen activator (t-PA), a drug that breaks down clots, to stroke patients in two hospitals in Armenia.

This drug is commonly used in the US but had only been administered in Armenia once before the implementation of this program.

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stimulating environment, the Keck School of Medicine recognizes the need to support, encourage, and facilitate diversity and inclusion in all aspects of academic life,” Puliafito stated in a memo to faculty, staff and students. “This includes training medical and graduate students, improving the working environment for staff, enriching the research environment and, finally, recruiting top residents and faculty.”

The cabinet will be led by Henri Food, MD, MHA, vice-dean of medical education. “Diversity has always been part of the intrinsic fabric of the Keck School of Medicine of USC; it is a vital core of our DNA and that of the entire Trojan family,” he said. “The Dean’s Diversity Cabinet is designed to embrace, promote and champion diversity throughout the Health Sciences Campus.”

Joyce Richey, PhD, chief diversity officer and assistant dean of educational affairs, has been instrumental in the establishment of many diversity programs at the Keck School. According to Richey, keeping the lines of communication open between administration and faculty, staff and students is a top priority.

“We are being very proactive and taking these matters quite seriously,” she said. “We want to make sure that our students, faculty and staff are well informed, and that they feel comfortable engaging in necessary and important discussions about diversity with peers and others. We want everyone to feel valued and respected here — attaining these goals will ensure a campus environment that welcomes and embraces diversity and inclusivity.”

Other members of the cabinet include: Ine Lainlat-Offringa, PhD, associate dean of graduate affairs; Larry Oppy, MD, associate dean of graduate medical education; Jeffrey Upperman, MD, associate dean of faculty diversity; and Suzanne Palmer, MD, president of the Keck Faculty Council.

The Keck School has a long-established reputation for providing students and staff with support and resources to explore race, gender, sexual orientation and gender identity. Programs such as Bridging the Gap, MED-COR and the Latino Medical Student Association all encourage undergraduate—represented college and high school students to avenues into the school and flourish once they arrive.
ENIGMA leaders travel to Moscow Science Week

K eck School of Medicine of USC researchers traveled to Russia recently to participate in Moscow Science Week as part of an effort to increase participation in ENIGMA, an international, collaborative study of the brain.

Paul Thompson, PhD, Keck School of Medicine of USC professor and principal investigator and co-founder of the Enhancing Neuro Imaging Genetics Through Meta-Analysis (ENIGMA) network, joined Vladimir Zelentsov, MD, PhD, and co-founder of the Russia and professor and co-chair of the Department of Anesthesiology, for a week of ENIGMA-related events in Russia.

“We see a great surge of interest in ENIGMA, which is widely known across Russia,” Zelentsov told Rosavya 24, a national news channel of the Russian Federation. In a series of interviews on Russian national television, Zelentsov noted the vibrant partnerships in ENIGMA across Russia that now are producing groundbreaking discoveries about the human brain. The Russian Deputy Minister for Education and Science, Lyudmila Ogorodova, attended ENIGMA meetings and noted her strong support for ENIGMA and its established and extensive partnerships with other Russian science initiatives, such as Co-Brain, and NeuronET.

In two days of highly animated sessions of the Russian National Academy of Sciences, of which Zelentsov is a member, a series of workshops and symposia hailed ENIGMA’s work bringing scientists together as part of Moscow Science Week. Thompson thanked senior members of the Russian Academy, including its president, noted physicist Vladimir Fortov, PhD, for supporting ENIGMA and promoting its ongoing projects to their colleagues. Karkhevich Institute Director of Information Technology, academician Al-exander Kuleshov said that he is sending three mathematicians to the ENIGMA Center in Los Angeles to boost the ongoing machine-learning efforts to discover genomic markers of brain disease.

Interviewed by V. Mir-Maksid, a Russian-language publication of Scientific American, Thompson pointed to developments being accelerated by ENIGMA’s Russian scientists in the fields of genomics, machine learning, and analysis of brain connectivity, such as finding patterns in medical data to detect and classify autism spectrum disorder and Alzheimer’s disease.

The ENIGMA Network brings together researchers in imaging genomics to understand brain structure, function, and disease based on brain imaging and genetic data. ENIGMA’s 500 scientists now study 12 brain diseases in more than 35 countries, and have published the largest-ever genomics analyses of the brain.

Author discusses severed heads, cryogenics

By Melissa Masatani

What is the likelihood of resurrecting David Bowie? Were hot topics on the Health Sciences Campus recently as award-winning author John Corey Whaley discussed his work just released, a novel—Noggin, a finalist for the National Book Award.

More than 50 people attended the Jan. 25 Visions and Voices event, held at Arnesty Auditorium. The discussion, titled “What We Can Learn From A Severed Head,” was part of USC’s arts and humanities initiative and co-sponsored by the Keck School of Medicine of USC’s Program in Medical Humanities, Arts, and Ethics; the USC Pacific Center for Health Policy and Ethics; and the USC Institute for Humanities and Ethics.

Whaley read an excerpt from the novel. He also said he was inspired by the book; I wanted to write a novel like (Kurt Vonnegut’s) Slaughterhouse-Five, a book that makes you laugh so hard you’re crying on one page, and then the next you’re actually crying,” he said.

Noggin tells the story of a 16-year-old terminal cancer patient who volunteers for a cryogenics experiment, where his head is removed from his body and frozen, then reattached to a donor’s body five years later. While Whaley said he did some research into current cryogenics experimentation to write the novel — and hopes such a procedure can someday bring back the recently deceased musician David Bowie — he did not intend to explore the medical aspect of the procedure.

“I’m not a scientist and this book is not about science,” he said. “It’s about humanity. I wanted to write about what it’s like to be out of sync with people you love.”

The novel also indirectly addresses the ethics of such a procedure, as Whaley said he wanted the story to focus on personal and professional issues of the experiment, relating it to Mary Shelley’s classic novel Frankenstein; or, The Modern Prometheus.

“Noggin is very closely related to Frankenstein,” he said. “Will the same character of Victor Frankenstein ever exist the way that existence was intended to feel? Certainly for Frankenstein’s monster, that’s the struggle. What he learns is that he will always be a freak and Travis (Vogon’s main character) can be seen as a cautionary tale, too.”

MYOPIA

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children, Hispanics/Latino and non-Hispanic white children. Future research may include re-examining the MEPEDS cohort to evaluate how widespread use of “screens” and other environmental or behavioral factors may be affecting the progression of childhood myopia over time.

From 2003 through 2011, MEPEDS provided team exams at USC Eye Institute clinics to more than 9,000 Los Angeles-area children ages 6 months through 6 years.

“Typically, children do not undergo vision testing until they reach school age,” Varma said. “By including younger children, we have the opportunity to identify eye diseases and their causes at the pre-Symptomatic stage.”

USC Eye Institute researchers and clinicians collected basic health information during a home visit with the child and parents, followed by a detailed eye examination under dilution that collected the more than 5,000 eye measurements for each child. To date, data from the USC study has generated more than 17,000 papers and presentations on the prevalence of childhood eye diseases, including myopia, hyperopia (far-sightedness), amblyopia (too-called “lazy eye”) and strabismus (abnormal alignment of the eyes).

Keck School second-year student goes extra 26.2 miles to help patients

By Melissa Masatani

Jeremiah Wang was looking at a group of kids in a crowded, makeshift clinic in Mexico when he knew he had made the right decision to become a doctor.

The then-first-year student at the Keck School of Medicine of USC was a volunteer with Healing Hearts Across Borders (HHAB), a nonprofit organization that brings dozens of medical volunteers to Tijuana to provide care to some of the border city’s poorest areas. The effort was founded in 1999 by the late Kevin Lake, MD, and is now led by a team of doctors.

Some of the patients have AIC (glycated hemoglobin) levels that are literally off the chart,” said Wang, now in his second year at the Keck School. “AIC is how we measure if someone is diabetic. A 6.5 or below is normal, but in Mexico we see numbers as high as 15—very, very young people, and even teenagers.”

The 26-year-old has returned to Mexico each of the past two years to participate in the volunteer effort and has even run a marathon to prove how strongly he believes in being able to provide quality health care to those who need it most.

“Last year, a friend of mine organized a Keck School marathon team to raise funds for HHAB,” Wang said. “I was so inspired, not only was she putting her money where her mouth is, but that she was actually going to run the Los Angeles Marathon. So I joined her and it was the most painful thing I’ve ever done in my life, but it was also the greatest.”

Wang is coordinating this year’s Keck School marathon team and plans to organize the fundraising effort to benefit HHAB. The 2015 Keck School team raised $3,000, which is enough to fund one of HHAB’s four annual trips, so Wang hopes to at least match that amount in the 2016 Marathon, since the entire HHAB effort is funded through donations, in-kind donations.

“The glucometers were all donated by companies, and participants donated a baby scale,” Wang said. “Every little thing helps.

“As a medical student, you do get very good exposure to patients at (the Keck) Hospital; the USC Medical Center;,” said Wang, who now is one of HHAB’s co-presidents overseeing student involvement. “But they say this is the purest form of medicine we can practice because there’s no bureaucracy; if you have a question for the pharmacy, you walk over to the pharmacy.”

For more information about the Keck School’s HHAB Marathon, contact usc.hhab@gmail.com.
New app, cloud platform could help predict child’s asthma attack

USC SCIENTISTS are part of a team working on a smartphone app and cloud services platform that will predict the probability of a child’s future asthma attack and provide personalized risk management advice. Frank Gilliland, MD, PhD, MPH, professor of preventive medicine at the Keck School of Medicine of USC, said the integrative Biomedical Real-Time Health Evaluation (BREATHE) platform he and colleagues from UCLA are developing is a potentially revolutionary approach to managing asthma, one of the most common chronic childhood diseases. “We think this is the future for asthma care,” said Gilliland, co-principal investigator of the project. “We will use cutting-edge, high-volume information about physiology, symptoms, medication use and environmental exposures.” — Zen Vuong

Teens with fewer mental health issues turn to e-cigarettes

A NEW STUDY has found that teenagers with moderate mental health problems who may not have considered smoking conventional cigarettes are turning to electronic cigarettes. Surveyed teens who picked up vaping had emotional and behavioral problems that fell midway between smokers and teens who neither vaped nor smoked. “Our study raises questions of whether e-cigarettes may be re-creating lower-risk teens with fewer mental health problems who might not have been interested in any nicotine or tobacco products if e-cigarettes did not exist,” said Adam Leventhal, PhD, lead author and associate professor of preventive medicine and psychology at the Keck School of Medicine of USC. The study was published online in the Journal of Psychiatric Research. — Zen Vuong

Researchers develop model for breast cancer survival rates

USC RESEARCHERS have developed a mathematical model to forecast metastatic breast cancer survival rates using techniques usually reserved for weather prediction, financial forecasting and surfing the Web. “What the modeling does is bring the sort of complexity of modern-day weather forecasting to try to understand where tumors go, when they go and how they get to that location,” said Jorge Nivola, MD, an associate professor of clinical medicine at the Keck School of Medicine of USC and co-author of the new study. The study, published online in the Journal of Breast Cancer, is called “Breast Cancer: A Nature Partner Journal, looked at 25 years of data regarding 446 breast cancer patients at Memorial Sloan Kettering Cancer Center. "We will use some very detailed, high-volume information about physiology, symptoms, medication use and environmental exposures.” — Zen Vuong

Navigating health care is topic of Agus’ new book

By Mary Dacuma

It’s a great time to be alive. At least, that’s what David B. Agus, MD, bestselling author and director of the USC Norris Westside Cancer Center, argues in his newest book, Th1s Lucky Year: How to Thrive in the Brave New World of Health. Agus, a professor of medicine at the Keck School of Medicine of USC, wrote his third book as a guide for consumers to navigate the health care revolution to edit their DNA for a longer lifespan, lose weight effortlessly without fad diets and prolong fertility well into their forties, among other remarkable options. “Only the dozens of us how to think, act and behave certain ways will reap the benefits of the tremendous opportunities afforded us through the power of these medical revolutions,” he said. The book is available now at book retailers nationwide.

Teens to run marathon for USC Norris

By Amanda Busick

The beautiful and remote Big Island of Hawaii is the home of free young, dedicated athletes, but on Feb. 14 the teenagers will be in the big city running the Los Angeles Marathon in support of Team Concern, a group that raises money for the Adolescent and Young Adult (AYA) Cancer Program at USC.

The AYA Program is a collaborative effort between the USC Norris Comprehensive Cancer Center and USC Norris Cancer Hospital, Children’s Hospital Los Angeles and Los Angeles County + USC Medical Center that concentrates on treatment, emotional needs and social support for teens and young adults with cancer. Team Concern, part of the Concern Foundation, has been one of the earliest and most consistent supporters of the AYA program, donating more than $350,000 to the program in the last five years. The foundation is an official partner of the LA Marathon. The program is a cause the students can easily get behind. Kobe Miller, 16, takes the matter very personally. “I lost two immediate family members to cancer, so I would like to help prevent the same from happening to others,” he said. Kobe is not the only one among the five who has been affected by cancer. In fact, almost all of the students have had a relative or close friend battle cancer at some point. Stella Javier, 17, was quick to point out that not only are they helping fight cancer, they are helping themselves grow as human beings. “My favorite thing about running is the effect it has on my mental, emotional, and physical being and how the benefits have leaked into my everyday life,” she said, adding that it is not always easy. “It’s about finding a balance between my mental and physical capabilities, remembering ‘mind over matter’ and pushing through those walls I hit along the way.” Their trip will include a dinner and breakfast with Team Concern before the 26.2-mile race. But they also may find some time to go to Six Flags Magic Mountain in Valence to let off a little steam before the big day, as well as a tour of the USC campus, as some of them are interested in attending the school. Patrick Baker, their coach, thinks his student-athletes have what it takes to complete the race, even though it’s the first time running a marathon for all of them. “They wake up early every Sunday morning when most teenagers are sleeping,” he said. “They show up on time and give their best effort with a positive attitude. They inspire me with their dedication and their trust in the training process.” Their training schedule currently includes between 10-20 miles on their own during the week and a group run on the weekends of up to 15 miles. This is where they find encouragement and cheer each other on to finish their challenge. “We run the best when we run happy and in gratitude,” said Baker, who will be running with them at the marathon. “I felt this could be an opportunity that could change their lives.”