By Sharon Brock

A USC alumnus and his wife are donating $50 million to a USC brain research institute to advance understanding of one of biology’s most complex and important puzzles: the brain.

The gift from Mark and Mary Stevens will endow and name the USC Mark and Mary Stevens Neuro Imaging and Informatics Institute. Located at the Keck School of Medicine of USC Viterbi School of Engineering, the institute works with faculty in biology, genetics, biostatistics, computer science, mathematics, pharmacology and numerous other disciplines.

The Stevens’ gift promises to improve the lives of people worldwide by quickening the translation of basic research into new therapies, prevention and cures for brain injury and disease, including Alzheimer’s, schizophrenia and traumatic brain injury.

In an interview with the Los Angeles Times, Mark Stevens said that he and his wife consider neuroscience to be “the next great frontier in medicine and science.”

Stevens said in the interview that he has “a front row seat” to the toll of such neurological diseases as Alzheimer’s, from which his father suffers. “If you look at the spectrum of neurological disorders, I would argue that it touches more families than cancer and heart disease. It touches youth and it touches old age,” said Stevens.

Led by professors Arthur Toga, PhD, and Paul Thompson, PhD, along with a team of more than 130 faculty and scientific staff, the institute and its Laboratory of Neuro Imaging were brought to USC in 2013. Over its three decades, the institute has amassed the world’s largest repository of neuroimaging data.

### Keck scientists pave the way for possible cure of asthma

Scientists led by molecular immunologists at the Keck School of Medicine of USC have identified a way to target a recently discovered cell type that causes asthma, opening the door to cure the chronic respiratory disease that affects 25 million Americans.

The team, which includes investigators from Janssen Research and Development, Dana-Farber Cancer Institute and Harvard Medical School, published its results in the March 17 edition of the peer-reviewed scientific journal Immunity.

Asthma is a chronic lung disease that irritates and narrows the airways, according to the Centers for Disease Control and Prevention.

With no known cure for the 7 million children who suffer from this disease in the United States, as well as millions of adults, the goal of asthma treatment is to control the symptoms. The exact causes of the chronic disease are unknown, but researchers believe a combination of genetic and environmental factors contribute to developing asthma. Discovered within the last decade, type 2 innate lymphoid cells, or ILC2s, are a subset of immune cells that trigger primary asthma syndromes such as mucus production and hypersensitive airways. ILC2s do not express previously identified immune cell markers, however, making them difficult to identify.

### Medical students open envelopes and learn their fates on Match Day

Medical students rank and learn their fates on Match Day according to their preferences for residency programs rank students.

The lists are combined and programs rank students.

By July, students would spend the next few hours learning where they would spend the next few years of their lives.

Medical students rank their preferences for residency programs, and residency programs rank students.

The lists are combined and matches are made using a computer algorithm by the National Resident Matching Program.

Moments before the fateful hour of 9 a.m., the crowd shouted “5…4…3…2…1… woo hoo!” as students scurried off to peel open their envelopes with excitement.

### 250 volunteers from USC offer medical care at L.A. Marathon

A medical volunteer program of the Keck School of Medicine and other Keck programs, staff offered aid to runners in the annual L.A. Marathon on March 15.

Officials said about 2,000 people were treated by medical personnel along the route.

Volunteers who staffed the 12 medical stations along the course and at the finish line included medical students from the Keck School of Medicine, plus students and professionals that included physical therapists, physicians assistants, medical assistants, nurses and resident and attending physicians from LAC+USC, Harbor-UCLA and UCLA-Olive Medical Center.

At 8:55 a.m., fourth-year medical students and engaged couple Lynn Ngai and Phil Wu held hands and their breaths — hoping to match in the same residency program come July.

Ngai and Wu were among 167 excited and hopeful USC medical students who gathered March 20 in Harry and Celesta Pappas Quad for the annual Match Day, joining 17,000 graduating U.S. medical students who opened envelopes together and learned where they would spend the next few years of their lives.

Medical students rank their preferences for residency programs, and residency programs rank students.

The lists are combined and matches are made using a computer algorithm by the National Resident Matching Program.

Moments before the fateful hour of 9 a.m., the crowd shouted “5…4…3…2…1… woo hoo!” as students scurried off to peel open their envelopes with excitement. Shrieks and screams echoed across the quad as tears flowed and students dispersed to share their news with family and friends.

“I’m going to the beach,” exclaimed T.C. Scotton, who matched with the UCLA Semel Institute for Neuro Imaging.

### 250 volunteers from USC offer medical care at L.A. Marathon

250 volunteers from the Keck School of Medicine’s Department of Emergency Medicine and other Keck of USC staff offered aid to runners in the annual L.A. Marathon on March 15.

Officials said about 2,000 people were treated by medical personnel along the route.

Volunteers who staffed the 12 medical stations along the course and at the finish line included medical students from the Keck School of Medicine, plus students and professionals that included physical therapists, physicians assistants, medical assistants, nurses, and resident and attending physicians from LAC+USC, Harbor-UCLA and UCLA-Olive Medical Center.

With no known cure for the 7 million children who suffer from this disease in the United States, as well as millions of adults, the goal of asthma treatment is to control the symptoms. The exact causes of the chronic disease are unknown, but researchers believe a combination of genetic and environmental factors contribute to developing asthma. Discovered within the last decade, type 2 innate lymphoid cells, or ILC2s, are a subset of immune cells that trigger primary asthma syndromes such as mucus production and hypersensitive airways. ILC2s do not express previously identified immune cell markers, however, making them difficult to identify.
Stem cell event spotlights next generation

By Cristy Lytal

Osteoporosis, leukaemia, and muscle injuries are at least one thing in common — they are engaging the next generation of top stem cell scientists.

Five of these scientists presented their research March 1 at the Junior Faculty Candidate Mini-Symposium hosted by USC’s Department of Stem Cell Biology and Regenerative Medicine:

Hao Yoon Koch, PhD, from the California Institute of Technology introduced his research about so-called gene circuits in the immune systems of mammals. These complex networks of genes work together to control whether immune stem cells replicate themselves or differentiate into more specialized cell types: macrophages and T-cells.

Using a combination of experimental and mathematical approaches, Koch has offered a potential mechanism by which he’s identified a technique for safely studying these disease mechanisms.

Using a combination of experimental and mathematical approaches, Koch has offered a potential mechanism by which he’s identified a technique for safely studying these disease mechanisms.

Rosemary Ovenstone, from the University of Texas, Southwestern, described an important difference between blood-forming, or hematopoietic, stem cells (HSCs) and partially or fully differentiated blood cells. Individual HSCs synthesize about 40 times less protein than their more differentiated counterparts. Subtle changes to this level of protein synthesis can promote or prevent aging and diseases, including leukemia, anemia and bone marrow failure.

Joseph T. Rodgers, PhD, from Stanford University discussed how stem cells repair and regenerate tissue, including muscle, skin and bone. He has found that nearby stem cells also help repair bone by recruiting an entire body to help with repair if needed. Rodgers has identified some of the key molecular signals that put these stem cells on alert — including a hormone called hepatocyte growth factor (HGF) that could potentially be injected into patients to stimulate wound healing.

Pedro Batista, PhD, from Stanford University began his talk by declaring his passion for messenger RNA (mRNA), for which he has given genetic information from DNA to create proteins or protein-making machinery. Much of this mRNA has been chemically modified into a molecule called “N6-methyladenosine (m6A).” Batista has made inroads into the mystery of these modifications by finding that m6A enables stem cells to differentiate into specific cell types, and it prevents tumor formation.

Andre Malcolm, PhD, FRS, chair of the Department of Stem Cell Biology and Regenerative Medicine, concluded the day’s activities by offering his enthusiastic thanks to these six leading candidates for junior faculty positions at USC. “It’s a real treat to have five individuals of the caliber of five that are visiting,” he said. “It was an excellent series of very diverse talks.”

Florian Merkle, PhD, from Harvard University described converting stem cells into the brain cells that malfunction in two common diseases: obesity and narcolepsy. He created a technique for safely studying these diseases in the laboratory by producing three types of brain cells: hypocretin (HCRT) neurons that promote wakefulness, agouti-related peptide (AGRP) neurons that promote feeding, and pro-opiomelanocortin (POMC) neurons that influence the body’s temperature.

His research could pave the way for correcting mutations or transplanting replacement neurons into patients with these and other diseases.

Robert A.J. Signer, PhD, from the University of Texas, Southwestern, described an important difference between blood-forming, or hematopoietic, stem cells (HSCs) and partially or fully differentiated blood cells. Individual HSCs synthesize about 40 times less protein than their more differentiated counterparts. Subtle changes to this level of protein synthesis can promote or prevent aging and diseases, including leukemia, anemia and bone marrow failure.

Joseph T. Rodgers, PhD, from Stanford University discussed how stem cells repair and regenerate tissue, including muscle, skin and bone. He has found that nearby stem cells also help repair bone by recruiting an entire body to help with repair if needed. Rodgers has identified some of the key molecular signals that put these stem cells on alert — including a hormone called hepatocyte growth factor (HGF) that could potentially be injected into patients to stimulate wound healing.

Pedro Batista, PhD, from Stanford University began his talk by declaring his passion for messenger RNA (mRNA), for which he has given genetic information from DNA to create proteins or protein-making machinery. Much of this mRNA has been chemically modified into a molecule called “N6-methyladenosine (m6A).” Batista has made inroads into the mystery of these modifications by finding that m6A enables stem cells to differentiate into specific cell types, and it prevents tumor formation.

Andre Malcolm, PhD, FRS, chair of the Department of Stem Cell Biology and Regenerative Medicine, concluded the day’s activities by offering his enthusiastic thanks to these six leading candidates for junior faculty positions at USC. “It’s a real treat to have five individuals of the caliber of five that are visiting,” he said. “It was an excellent series of very diverse talks.”

Amidst the day’s presentations was Joseph T. Rodgers of Stanford University, who discussed how stem cells repair and regenerate tissue.
A total of 31 medical students received their scholarships during the March 7 gala at Town & Gown.

A Gala raises $290,000 for medical scholarships

About 300 people were on hand March 7 at Town & Gown of USC to celebrate and raise funds for medical scholarships at the Keck Scholarship Gala. The event raised $290,000. Carmen A. Puliafito, MD, MBA, dean of the Keck School of Medicine of USC, told those in attendance that their donations enable exceptional students to pursue medical studies, conduct research and assist with hands-on patient care regardless of their socioeconomic circumstances.

“We can only compete to attract the best and brightest students — men and women who will ultimately become our future residents, faculty, physicians and researchers — by offering full and partial scholarships,” Puliafito told the crowd.

“Your generosity will impact not only the excellent training of our talented medical students, but also the lives of the patients they will help throughout their careers. The event’s emcee was Fritz Coleman, longtime weathercaster for KNBC-TV in Los Angeles. Coleman has been active in charitable causes throughout his 32-year career as a local on-air personality.

Emeritus Professor Shaul G. Massry, MD, was awarded the Distinguished Faculty Service Award for “the final frontier in medical science’s progress toward a fuller understanding of human life and health.” He is president and CEO of Molina Healthcare, Inc. He is president and CEO of the Fortune 500 company Molina Healthcare, Inc.

During the event, 31 Keck School scholarship recipients were recognized by Henri R. Ford, MD, MHA, vice dean for educational affairs. Sponsors of the event included Keck Medical Center of USC, the USC Institute of Ulology and the USC Office of Diversity, plus several Keck School departments.

Award during the festivities. Massry is the former chair of nephrology at the Keck School of Medicine and president of the Meira and Shaul G. Massry Foundation, which awards the Massry Prize to recognize outstanding contributions to the biomedical sciences and the advancement of health. Receiving the Alumni Service Award was Antonio T. Alamo, MD, a 1991 graduate of the Keck School of Medicine. He runs an internal medicine practice in Los Vegas and chairs Nevada’s gambling commission.

The recipient of the Distinguished Alumni Merit Award was J. Maro Molina, MD, who earned his medical degree from USC in 1984. He is president and CEO of the Fortune 500 company Molina Healthcare, Inc.

The gala also included a cocktail reception in Town & Gown’s courtyard and foyer. Sponsors of the event included Keck Medical Center of USC, the USC Institute of Ulology and the USC Office of Diversity, plus several Keck School departments.

GIFT: Mark and Mary Stevens Neuroimaging and Informatics Institute

Continued from page 1

Immensely Fritz Coleman of KNBC-TV receives a plaque from Carmen A. Puliafito to commemorate the event.

Other USC co-authors include Nisheel Patel, Ilhawarva Sankaranarayanan, Yuzo Suzuki and Diamanda Rigas. The study was supported by the National Institutes of Health and the American Association of Immunology.

ASTHMA: USC researchers are zeroing in on a potential cure

“If we can target ILC2s, we might be able to cure asthma or exacerbations caused by these particular cells,” said Onish Akiian, PhD, associate professor of molecular and cellular immunology at the Keck School and principal investigator of the study. “In this study, we discovered molecules critical to ILC2 homeostasis, survival and function. We believe that targeting these molecules or related pathways could one day cure a patient with ILC2-dependent asthma.”

Akiian’s team used mouse and human cells to show that inducible T cell costimulator molecules (ICOS) and their interaction with ICOS ligand (ICOS-L) are crucial for ILC2 function and survival. ICOS and ICOS-L are proteins that influence cell behavior and cell function. Akiian’s team developed a humanized mouse model to show how human ILC2s function in vivo. The model is currently being used to study how ILC2s contribute to human asthma and test potential therapies in preclinical studies.

“Because ILC2s are the only cells that express both ICOS and ICOS-L, our research sets the stage for designing new therapeutic approaches that target ILC2s to treat asthma,” said Hadi Maza, PhD, a research associate in Akiian’s lab and the study’s first author.

The study was supported by the National Institutes of Health and the American Association of Immunology.

Continued from page 1

A healthy and diseased brain

Mark and Mary Stevens Neuroimaging and Informatics Institute

A healthy and diseased brain

enhance their already spectacular philanthropic legacy,” said USC President C. L. Max Nikias. “They significantly widen the scope of their support for American higher education and bring their philanthropy to particularly pressing and important areas of inquiry. Neuroscience has been called ‘the final frontier’ in medical science’s progress toward a fuller understanding of human life and health. Through the Stevens’ support, USC researchers will have the opportunity to address many of the most pressing questions in medicine today.”

PhD, associate professor of molecular and cellular immunology at the Keck School and principal investigator of the study. “In this study, we discovered molecules critical to ILC2 homeostasis, survival and function. We believe that targeting these molecules or related pathways could one day cure a patient with ILC2-dependent asthma.” Akiian’s team used mouse and human cells to show that inducible T cell costimulator molecules (ICOS) and their interaction with ICOS ligand (ICOS-L) are crucial for ILC2 function and survival. ICOS and ICOS-L are proteins that influence cell behavior and cell function. Akiian’s team developed a humanized mouse model to show how human ILC2s function in vivo. The model is currently being used to study how ILC2s contribute to human asthma and test potential therapies in preclinical studies. “Because ILC2s are the only cells that express both ICOS and ICOS-L, our research sets the stage for designing new therapeutic approaches that target ILC2s to treat asthma,” said Hadi Maza, PhD, a research associate in Akiian’s lab and the study’s first author.

The study was supported by the National Institutes of Health and the American Association of Immunology.

Continued from page 1

A healthy and diseased brain

enhance their already spectacular philanthropic legacy,” said USC President C. L. Max Nikias. “They significantly widen the scope of their support for American higher education and bring their philanthropy to particularly pressing and important areas of inquiry. Neuroscience has been called ‘the final frontier’ in medical science’s progress toward a fuller understanding of human life and health. Through the Stevens’ support, USC researchers will have the opportunity to address many of the most pressing questions in medicine today.”

PhD, associate professor of molecular and cellular immunology at the Keck School and principal investigator of the study. “In this study, we discovered molecules critical to ILC2 homeostasis, survival and function. We believe that targeting these molecules or related pathways could one day cure a patient with ILC2-dependent asthma.” Akiian’s team used mouse and human cells to show that inducible T cell costimulator molecules (ICOS) and their interaction with ICOS ligand (ICOS-L) are crucial for ILC2 function and survival. ICOS and ICOS-L are proteins that influence cell behavior and cell function. Akiian’s team developed a humanized mouse model to show how human ILC2s function in vivo. The model is currently being used to study how ILC2s contribute to human asthma and test potential therapies in preclinical studies. “Because ILC2s are the only cells that express both ICOS and ICOS-L, our research sets the stage for designing new therapeutic approaches that target ILC2s to treat asthma,” said Hadi Maza, PhD, a research associate in Akiian’s lab and the study’s first author.

The study was supported by the National Institutes of Health and the American Association of Immunology.

Continued from page 1

A healthy and diseased brain

enhance their already spectacular philanthropic legacy,” said USC President C. L. Max Nikias. “They significantly widen the scope of their support for American higher education and bring their philanthropy to particularly pressing and important areas of inquiry. Neuroscience has been called ‘the final frontier’ in medical science’s progress toward a fuller understanding of human life and health. Through the Stevens’ support, USC researchers will have the opportunity to address many of the most pressing questions in medicine today.”

PhD, associate professor of molecular and cellular immunology at the Keck School and principal investigator of the study. “In this study, we discovered molecules critical to ILC2 homeostasis, survival and function. We believe that targeting these molecules or related pathways could one day cure a patient with ILC2-dependent asthma.” Akiian’s team used mouse and human cells to show that inducible T cell costimulator molecules (ICOS) and their interaction with ICOS ligand (ICOS-L) are crucial for ILC2 function and survival. ICOS and ICOS-L are proteins that influence cell behavior and cell function. Akiian’s team developed a humanized mouse model to show how human ILC2s function in vivo. The model is currently being used to study how ILC2s contribute to human asthma and test potential therapies in preclinical studies. “Because ILC2s are the only cells that express both ICOS and ICOS-L, our research sets the stage for designing new therapeutic approaches that target ILC2s to treat asthma,” said Hadi Maza, PhD, a research associate in Akiian’s lab and the study’s first author.

The study was supported by the National Institutes of Health and the American Association of Immunology.

Continued from page 1

A healthy and diseased brain

enhance their already spectacular philanthropic legacy,” said USC President C. L. Max Nikias. “They significantly widen the scope of their support for American higher education and bring their philanthropy to particularly pressing and important areas of inquiry. Neuroscience has been called ‘the final frontier’ in medical science’s progress toward a fuller understanding of human life and health. Through the Stevens’ support, USC researchers will have the opportunity to address many of the most pressing questions in medicine today.”

PhD, associate professor of molecular and cellular immunology at the Keck School and principal investigator of the study. “In this study, we discovered molecules critical to ILC2 homeostasis, survival and function. We believe that targeting these molecules or related pathways could one day cure a patient with ILC2-dependent asthma.” Akiian’s team used mouse and human cells to show that inducible T cell costimulator molecules (ICOS) and their interaction with ICOS ligand (ICOS-L) are crucial for ILC2 function and survival. ICOS and ICOS-L are proteins that influence cell behavior and cell function. Akiian’s team developed a humanized mouse model to show how human ILC2s function in vivo. The model is currently being used to study how ILC2s contribute to human asthma and test potential therapies in preclinical studies. “Because ILC2s are the only cells that express both ICOS and ICOS-L, our research sets the stage for designing new therapeutic approaches that target ILC2s to treat asthma,” said Hadi Maza, PhD, a research associate in Akiian’s lab and the study’s first author.

The study was supported by the National Institutes of Health and the American Association of Immunology.

Continued from page 1

A healthy and diseased brain

enhance their already spectacular philanthropic legacy,” said USC President C. L. Max Nikias. “They significantly widen the scope of their support for American higher education and bring their philanthropy to particularly pressing and important areas of inquiry. Neuroscience has been called ‘the final frontier’ in medical science’s progress toward a fuller understanding of human life and health. Through the Stevens’ support, USC researchers will have the opportunity to address many of the most pressing questions in medicine today.”

PhD, associate professor of molecular and cellular immunology at the Keck School and principal investigator of the study. “In this study, we discovered molecules critical to ILC2 homeostasis, survival and function. We believe that targeting these molecules or related pathways could one day cure a patient with ILC2-dependent asthma.” Akiian’s team used mouse and human cells to show that inducible T cell costimulator molecules (ICOS) and their interaction with ICOS ligand (ICOS-L) are crucial for ILC2 function and survival. ICOS and ICOS-L are proteins that influence cell behavior and cell function. Akiian’s team developed a humanized mouse model to show how human ILC2s function in vivo. The model is currently being used to study how ILC2s contribute to human asthma and test potential therapies in preclinical studies. “Because ILC2s are the only cells that express both ICOS and ICOS-L, our research sets the stage for designing new therapeutic approaches that target ILC2s to treat asthma,” said Hadi Maza, PhD, a research associate in Akiian’s lab and the study’s first author.

The study was supported by the National Institutes of Health and the American Association of Immunology.
Protein-based therapy shows promise vs. resistant leukemia

Resistance of leukemia cells to contemporary chemotherapy is one of the most formidable obstacles to treating the most common form of childhood cancer, known as acute lymphoblastic leukemia (ALL). Now, researchers at Children’s Hospital Los Angeles (CHLA) and USC have designed and developed a new protein-based therapy they believe will prove highly effective against drug-resistant leukemia cells. The new approach may also amplify the potency of treatment options such as chemotherapy and radiation therapy.

The work, published online Jan. 26 by the Journal of Clinical Investigation, demonstrated the effectiveness of the new fusion protein in mouse models using leukemia cells taken directly from patients with ALL, which represented more than 25 percent of the cases of cancer among age 15. The cancer once had a very high mortality rate, but today almost 80 percent of children affected by ALL have achieved long-term survival. “That’s great news, unless your child is one of the 20 percent,” said the study’s principal investigator, Faith M. Uckun of the Children’s Center for Cancer and Blood Disease at CHLA and USC Norris Comprehensive Cancer Center. “Despite advances in available therapies, unmet and urgent needs remain in the fight against leukemia. We still have children with disease that our drugs can’t help enough. And for patients who relapse, their chances of long-term survival are less than 20 percent. ‘We’ve got to do better.’” — Debra Kain

MATCH DAY: It’s envelope time

T.C. Scotton and Harut Hovsepian hug in celebration of their matches. Both will stay in Southern California.

Doctors talk to Norris supporters

STEPHEN B. GRUBER, director of USC Norris Comprehensive Cancer Center, hosted the USC Norris Ambassadors at a Friends and Family Luncheon on March 12. Also speaking were two other doctors: Art Ulene, at right above, a longtime broadcast media medical expert, and Stuart Siegel, founder and co-director of the USC Norris Adolescent and Young Adult (AYA) Program. The luncheon was attended by USC Norris Ambassadors USCs, who promote and share the cancer center’s mission. Siegel discussed how AYA@USC Norris aims to improve youth survival rates through research, clinical trials, specialized support services and educational initiatives.