BREAKING NEW GROUND
Women in Science Advance New Generations of Discovery
Letters to the editor, questions, comments, address changes, requests to be added/removed from the mailing list and all other inquiries should be addressed to:

Kukla Vera
Director of Communications
USC School of Pharmacy
1985 Zonal Avenue—PSC 700
Los Angeles, California 90089-9121
kvera@pharmacy.usc.edu
323-442-3497

About the USC School of Pharmacy

One of the top 10 pharmacy schools nationwide and the highest-ranked private school, the USC School of Pharmacy continues its century-old reputation for innovative programming, practice and collaboration. The School created the nation’s first Doctor of Pharmacy program, the first clinical pharmacy program, the first clinical clerkships, the first doctorates in Pharmaceutical Economics and Regulatory Science, and the first PharmD/MBA dual-degree program, among other innovations in education, research and practice. The USC School of Pharmacy is the only private pharmacy school on a major health sciences campus, which facilitates partnerships with other health professionals as well as new breakthroughs in care. It also is the only school of pharmacy that owns and operates three pharmacies.

The School is home to the International Center for Regulatory Science at USC, and is a partner in the USC Leonard D. Schaeffer Center for Health Policy and Economics and the USC Center for Drug Discovery and Development. The School pioneered a national model of clinical pharmacy care through work in safety-net clinics throughout Southern California. A focus on clinical pharmacy, community outreach, regulatory science, drug discovery and development, and health economics and policy positions the USC School of Pharmacy as a leader in the safe, efficient and optimal use of medication therapy that can save lives and improve the human condition.

On the cover: PhD candidates Zhen Meng, Martha Pastuszka and Maira Soto
Background image on cover: Lacrimal gland acini, by Zhen Meng, Hamm-Alvarez Laboratory

Opposite page: For the past 20 years, Associate Professor Kathleen Rodgers, PhD, has studied the ability of angiotensin peptides to regenerate injured tissue—research that has led to clinical trials in diabetes, and skin and bone marrow reconstitution.

Results magazine, published semi-annually, highlights some of the School’s latest advances and achievements, as well as the faculty, students, alumni and donors who make this work possible.
Men still greatly outnumber women in science, technology, engineering and math (STEM) professorships, but you wouldn’t know that by looking at the USC School of Pharmacy’s faculty.
A THRILLING RIDE

I never cease to be gratified by the connections fostered by the Trojan Family. Our March Scholarship Luncheon brought together donors who span half a century—from George Hori, PharmD ’57, to Vinson Lee, PharmD ’06. Then, just a few weeks ago, I had the privilege of hosting our friends from Allergan and those they help train in our fellowship program. Gavin S. Herbert, whose legacy at our School is justly famous, was on hand to help us celebrate the decades-old program.

Now chairman emeritus of Allergan and a USC life trustee, Gavin started the fellowship program back in the ’70s with then-Dean John Biles. The two men share a long history. It was Dean Biles who recreated the formulas for the original products that launched Allergan in the ’50s when the chief chemist died unexpectedly, taking the formulas with him. According to Gavin, “there would be no Allergan today had John not recreated those formulas.”

So, too, have Allergan and Gavin Herbert greatly influenced the USC School of Pharmacy. Our fellowships are highly prized nationwide, and the Herbert family’s generosity has been extraordinary. The advent of clinical clerkships—launched at USC in 1970 and now required programming at pharmacy schools throughout the country—began through discussions with Gavin Herbert.

“...in 1970 and now required programming at pharmacy schools throughout the country—began through discussions with Gavin Herbert. Today, I still look to him for sage advice. I also listen carefully to the scientists at our School. Many are featured in our cover story about the amazing work of our faculty women and PhD students, as the former rank as research leaders, while the latter provide the promise of the future. In this issue, you’ll also learn about the national conference we hosted in February, gathering healthcare experts of all stripes—pharmacists, physicians, nurses and policy influencers—to develop new models of care that improve patient outcomes while saving money.

We are in for a great ride as healthcare evolves, and we are ready, hopeful and enthusiastic to drive the way—just as we are grateful to tremendous supporters such as Gavin Herbert, George Hori, Vinson Lee and so many of you, who are taking this thrilling ride with us.

R. Pete Vanderveen, PhD, RPh
Dean
John Stauffer Decanal Chair in Pharmaceutical Sciences
Cover Story
While gender disparities remain a reality in much of academic science, the USC School of Pharmacy stands out for its uncommonly large cadre of female faculty—all of whom are leaders in making extraordinary contributions to fundamental scientific knowledge and advances in patient care. They also take pride in nurturing the next generation of scientists.

A Team Effort
A conference hosted by the School draws physicians, pharmacists, nurses and other health experts to discuss ways to improve medication use and safety.

IN THIS ISSUE
8 Broad Spectrum
News and notes, including studies on the overprescription of antibiotics, delayed aging, hepatitis C and off-label use of antipsychotics; recent grants and awards; and commencement and faculty by the numbers

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28 Alumni
30 Faculty
34 Students
A TEAM EFFORT

At a conference hosted by the USC School of Pharmacy in February, physicians, pharmacists, nurses and other healthcare providers and policy experts said a collaborative approach is key to improving patient outcomes and containing costs.

While overall health quality was the main issue of the day, the gathering specifically examined ways to improve medication use and safety. The U.S. currently spends about $300 billion a year on prescription drugs and another $300 billion fixing problems resulting from non-adherence to medication regimens.

In keeping with its collaborative theme, the “Optimizing Medication Safety and Healthcare Quality” conference was sponsored by the USC School of Pharmacy and the USC Leonard D. Schaeffer Center for Health Policy and Economics, along with the U.S. Department of Health and Human Services’ Centers for Medicare and Medicaid Innovation. Nearly 200 people attended the event.

continued on page 6

1. Alan Endo, PharmD, Enterprise Pharmacy Services (California)
2. Kim Van Wyk, PharmD, Mountain Pacific Quality Health (Montana)
3. Mark Loafman, MD, U.S. Health Resources and Services Administration and Feinberg School of Pharmacy, Northwestern University (Illinois)
4. Nicole Brandt, PharmD, University of Maryland School of Pharmacy
5. Dennis Helling, PharmD, formerly of Kaiser Permanente (Colorado)
6. Kermit Crawford, RPh, Walgreens (Illinois) and Will Lang, American Association of Colleges of Pharmacy (Virginia)
7. Michael Hochman, MD, AltaMed Health Services (California)
8. Alexander Capron, JD, USC University Professor, USC Health Systems Improvement Collaborative (California)
10. Conference co-moderator Steven Chen, PharmD, the Hygeia Centennial Chair in Clinical Pharmacy at the USC School of Pharmacy
11. Nancy Chung, PharmD, University of Houston College of Pharmacy (Texas)
12. Jennifer Polzin, PharmD, Kaiser Permanente (California)
13. Emily Kosiorg, PharmD, University of Colorado School of Pharmacy, and Michelle Schlueter, PharmD, UC San Diego Health System
14. Leonard D. Schaeffer, USC School of Pharmacy Dean R. Pete Vanderveen and Mary Odell, UniHealth Foundation (California)
15. Terry Olson, MD, Heritage ACO Development Organization (California)
Keynote speaker Leonard D. Schaeffer—the Judge Robert Maclay Widney Professor at USC and benefactor of the USC Schaeffer Center—said we are looking at a decade of continuous and unpredictable change. He explained that the incremental unfolding of the Affordable Care Act (ACA) over 10 years presents an environment in which stakeholders will advocate for changes that support their specific interests, while regulations will vary across state lines, creating inconsistency as well as unsustainable debt and fiscal-crisis-driven policy. Ultimately this makes healthcare costs a national security issue.

“Healthcare costs are driving the deficit,” he said. “We can afford everything except healthcare.” On a brighter note, he added: “You have opportunities to meet the challenges created by fiscal pressure, regulatory change and consumerism that are driving a rationale for collaboration. It’s up to each of you to help shape the future and not be its victims.”

Preceding Schaeffer at the podium was R. Pete Vanderveen, dean of the USC School of Pharmacy, who launched the conference with a message promoting collaboration as the best way to serve patients in today’s changing healthcare environment.

Mark Loafman, associate professor at the Feinberg School of Medicine at Northwestern University, described a current healthcare system and workforce that can be greatly improved through interdisciplinary teams. His presentation demonstrated the value of an integrated approach in which physicians, pharmacists and nurses work together to improve patient outcomes and save healthcare dollars. Loafman also is a leader of the Patient Safety Clinical Pharmacy Services Collaborative and a physician adviser for the Federal Health Futures Group.

Dennis Helling, executive director emeritus at Kaiser Permanente-Colorado, talked about Kaiser’s cooperative approach to patient care and the value that it has brought to the system and its patients.

Overwhelmingly, the day’s presentations focused on opportunities for increasing value in healthcare through interdisciplinary teams, with an emphasis on the role pharmacists play in managing medication use. Speakers shared their experiences in various venues, including safety-net clinics, accountable care organizations, hospitals and community pharmacies. Attendees also looked at current approaches to helping patients manage their health, including face-to-face appointments and telephone consultations.

Lunch speaker Alexander Capron, University Professor and a leader of the USC Health Systems Improvement Collaborative, described the need for better communication with patients in order to improve health outcomes. For instance, he noted that primary care providers must work to ensure that prescribed medicine is actually taken as directed.

“The old model—in which physicians simply bemoan patients’ noncompliance—will have to change,” he said.

“Multidisciplinary teams and the integration of clinical pharmacy services can help achieve our important national aims.”

—DENNIS WAGNER, CO-DIRECTOR OF THE PARTNERSHIP FOR PATIENTS, CMS INNOVATION CENTER
“And this means a change of attitude ... and a change of the frontline provider to someone with expertise in facilitating proper medication use.”

Dennis Wagner, co-director of the Partnership for Patients, CMS Innovation Center, participated in the conference from Washington, D.C. He discussed how CMS is testing novel care models in real time so that those demonstrating better quality and lower cost can be implemented more quickly. He also explained Partnership for Patients’ focus on reducing preventable hospital-acquired conditions by 40 percent and reducing hospital readmissions within 30 days by 20 percent.

“Medication safety is central to our work,” he said. “Multidisciplinary teams and the integration of clinical pharmacy services can help achieve our important national aims.”

Steven Chen, associate professor at the USC School of Pharmacy, and Michael Hochman, medical director for innovation at AltaMed Health Services, shared insights on their CMS Innovation grant project that is integrating clinical pharmacy teams in several sites and evaluating their impact. So far, at the midpoint of their project, feedback has been positive from staff, patients and the quality team.

“Now we have to make the business case for clinical pharmacy services,” said Hochman, alluding to new payment options that need to be used to cover the services. Chen focused his comments on how the integration of pharmacy teams aims to produce $31.7 million in savings during the three-year grant period.

Taking the discussion to the community pharmacy setting was Kermit Crawford, president of pharmacy, health and wellness for Walgreens, who stressed that pharmacies are the most accessible points of care nationwide. “Sixty-three percent of all Americans live within three miles of a Walgreens store,” he said. “At Walgreens, we’re freeing up our pharmacists so that they can interact with patients face to face and improve adherence.”

Roosevelt University College of Pharmacy in Chicago Dean George MacKinnon noted, “The silent killer is [commonly considered to be] hypertension, but the real silent killer is unmanaged medication use.”

ON THE SAME TEAM

Dinner speaker Kevin Michael Key shared a unique perspective with attendees—one that went to the heart of the reason for the conference itself. “I’m not a physician, a pharmacist, a nurse or someone who has to pay for everyone’s healthcare,” he said. “But I guess I’m the reason you’re here, because I am a patient.”

Key shared his personal story of when his life and health were “really in the toilet” and he had out-of-control diabetes and blood pressure—
USC Examines Overprescribed Antibiotics

The overprescription of antibiotics for colds and other respiratory infections not only wastes millions of dollars, but it also contributes to the rise of antibiotic-resistant bacteria. To test a potential solution, USC researchers had physicians in Los Angeles clinics put posters in their exam rooms explaining safe antibiotic use. Each poster provided the information in English and Spanish in the form of a letter featuring the photo and signature of the participating physician.

“Antibiotics make bacteria more resistant and can make future infections harder to treat. This means that antibiotics might not work when you really need them. Only use an antibiotic when it is necessary to treat your illness.” — Excerpt from poster

“Most quality improvement efforts have used audits or pay-for-performance incentives to try to change what providers do, but they ignore social influences that affect all people, including physicians,” says senior author Jason Doctor of the USC Leonard D. Schaeffer Center for Health Economics and Policy and associate professor of clinical pharmacy and pharmaceutical economics and policy at the USC School of Pharmacy. “Our study is the first to apply the principles of commitment and consistency to prescribing behavior and finds a simple, low-cost intervention that shows great promise in reducing inappropriate antibiotic prescription.”

After the posters were displayed, the research team examined clinic records over the following three months, comparing the rates of inappropriate antibiotic prescriptions to a control group that did not display the poster. The results showed that unnecessary prescriptions fell by nearly 10 percentage points among physicians who used the poster, while they actually rose by more than 9 percent among those who did not.

Doctor and his fellow authors, including Daniella Meeker, a Merkin Fellow at the USC Schaeffer Center, estimate that this simple notice could eliminate 2.6 million unnecessary antibiotic prescriptions each year and save $70.4 million in drug costs alone if used nationwide.

The study was supported by a grant from the National Institute on Aging, a division of the National Institutes of Health. Its results were published in *JAMA Internal Medicine*, an online publication of the *Journal of the American Medical Association*. 
Goldman Advances Delayed Aging

Although the fountain of youth is a fantasy, the next best thing might soon be a reality, according to research led by Dana Goldman, director of the USC Leonard D. Schaeffer Center for Health Policy and Economics. The study, which appears in the journal Health Affairs, considers how the aging process can be slowed down through methods ranging from altering hormone levels to manipulating genes. This “delayed aging” could potentially add as many as 2.2 years to lives that are also healthier overall.

“Delayed aging is about adding healthy life years rather than disabled life years,” Goldman told PBS NewsHour, which ran a feature on the study.

He explains that the issue is growing more crucial as the population ages. “That means they’re at risk for a number of different diseases. In fact, diseases such as Alzheimer’s, and to some extent cancer, reflect success in that people are living long enough so that they’ll actually be afflicted by these conditions.”

Phrased bluntly, aging itself is becoming the most important risk factor. “We now have a situation where we really need to think about whether we want to make a greater investment in this area of delayed aging,” says Goldman.

The study used a microsimulation of the future health and spending of older Americans to compare “disease specific” scenarios with a hypothetical “delayed aging” scenario to estimate the impact on longevity, disability and entitlement program costs. The scenarios found that, in addition to the positive effects on people’s lives, successful research in this area could yield significant economic benefits for society. Delayed aging could yield as much as $7.1 trillion over 50 years in terms of health-care savings and increased productivity.

“Even if it’s only a 1 in 100 shot—and I think it’s much better than that—we should be taking the risk, because the value to society is so great,” says Goldman.

McCombs Examines Progression of Hepatitis C

Only a minority of patients with hepatitis C (HCV) accept treatment—and fewer still achieve the undetectable viral loads that reduce their rates of illness and death, according to a study led by Associate Professor Jeffrey McCombs, PhD, of the USC School of Pharmacy and the USC Schaeffer Center for Health Policy and Economics. He and his colleagues sought to describe the progression of HCV in clinical practice by following a group of 28,769 patients from the Department of Veterans Affairs’ HCV clinical registry.

HCV affects nearly 170 million people worldwide and an estimated 3.2 million people in the United States. Its risks include cirrhosis, liver failure and liver cancer. While antiviral therapy can eliminate or reduce such risks, “its effectiveness under real-world clinical conditions is limited by adverse effects and other factors,” McCombs and his colleagues note.

The study found that “only 1 in 4 patients with HCV and a detectable viral load were willing to initiate treatment. Once treated, only a fraction of patients achieved the minimum treatment response of a single undetectable viral load test.” Still, those who did reach undetectable viral loads reduced their risk of liver-related events by 27 percent.

The results of McComb’s research appear in JAMA Internal Medicine, an online publication of the Journal of the American Medical Association.
If a picture paints a thousand words, then the fotonovelas of Associate Professor Mel Baron multiply that effect many times by using photos and text to promote health literacy in underserved Latino communities. Baron’s booklets use popular soap-opera storytelling techniques in a comic-book format to provide vital information in an easily understandable, culturally appropriate package that can be widely shared. He has produced seven booklets so far, and an eighth is on the way.

Now two important grants will enable Baron and the School of Pharmacy to expand their development and distribution. The UniHealth Foundation awarded Baron $100,000, which will be used to revise, print and distribute Baron’s existing fotonovelas on pediatric asthma, childhood obesity and diabetes.

“The fotonovelas are a much-appreciated addition to community health promoters’ toolboxes,” says Mary Odell, UniHealth Foundation president.

Meanwhile, Baron has received a two-year grant of $50,000 from the Confidence Foundation to develop a fotonovela focusing on breast cancer.

The booklets are distributed through safety-net clinics, health fairs, the USC Family of Schools and local pharmacies. La Opinión is distributing the fotonovelas on childhood obesity, asthma and diabetes to 144,000 households, while Los Angeles PBS station KLCS-TV is airing Rosa Out of Control, the first audio-visual novella in a series. Rosa Out of Control focuses on childhood obesity.

The fotonovelas’ reach also extends overseas, as Baron is working on a project that will take his fotonovelas to the Netherlands.

“Our fotonovelas have been translated to Dutch,” he says. “We will also conduct research to evaluate the effectiveness of the fotonovelas on the test audience.”

### CALLING ALL ALUMNI: SHARE YOUR FEEDBACK

Did your USC education provide you with the knowledge and experience to prepare you for your career? If you currently employ recent graduates of the School, do you find them to be ready to meet the challenges of their positions? Let us know your thoughts! Email kvera@pharmacy.usc.edu. Your input helps us improve our educational programming. Thank you!

### COMMENCEMENT BY THE NUMBERS

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Antipsychotics are among the most commonly prescribed psychotropic medications in the United States—including their increasing off-label use in treating insomnia. Despite antipsychotics’ many benefits, Assistant Professor Susie H. Park points to the lack of evidence regarding their effectiveness in treating the sleeplessness that affects up to one-third of all Americans.

“What the managed care policy-makers need to be aware of is that currently … there is no long-term efficacy and safety data to suggest that atypical antipsychotic medications should in fact be used [for insomnia],” Park wrote in an article in *Formulary*. She calls for more research before prescribing antipsychotics for this problem and, in the meantime, suggests using other hypnotic agents instead.

Although she suggests caution, Park stresses that research must forge ahead, as insomnia is an increasing health problem that is far more serious than many realize. In this nation alone, “the loss of productivity associated with untreated or improperly managed insomnia is estimated to be roughly about 40 billion dollars each year,” she says.

Park’s article is available at formularyjournal.modernmedicine.com.

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**Popular Mechanics Names Loeb Top Innovator**

Gerald E. Loeb, MD, received a Breakthrough Innovator Award from *Popular Mechanics* for developing BioTac®, a sensing technology that enables robots to replicate the tactile abilities of the human finger. Loeb is a professor of biomedical engineering and adjunct professor of neurology in the School of Pharmacy and the USC Viterbi School of Engineering. He also directs the Medical Device Development Facility at USC and serves on the board of the International Center for Regulatory Science, housed at the School of Pharmacy.

Loeb shares the award with USC alumnus Jeremy Fishel. Together, they founded SynTouch, the company that manufactures BioTac® and other sensor technologies that have medical, industrial and military applications.

*Popular Mechanics* gives only 10 of the awards each year. In addition to recognition in the magazine, which reaches nine million readers per issue, recipients are honored at a gala ceremony at Hearst Tower in New York.

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**QUOTABLE**

“Nine out of 10 patients with high blood pressure saw their readings drop within 45 days of working with pharmacy teams.”

—The teams were led by Steven Chen, PharmD, the Hygeia Centennial Chair in Clinical Pharmacy at the USC School of Pharmacy, as part of a study on how pharmacists can help fulfill the health needs of underserved patients. The results were reported in the Orange County Register in April.
Healthcare Decision Analysis Program Off and Running

“Today the big trend is toward comparative effectiveness. You must show that your product is better than the standard of care. If not, [government payers] won’t pay for it.”

So said Claes Hornstrand, executive director and therapeutic area head, Global Value Access and Policy at Amgen, during his guest lecture in the Healthcare Decision Analysis program’s Competitive Intelligence and Pricing course. Also offered this spring was a course in International Comparisons of Health Systems.

The students in the class were an eclectic group including graduate students pursuing degrees in health economics as well as working professionals planning to earn the new master’s degree while gaining additional skills that will advance their careers.

To learn more about the flexible program, visit hcda.usc.edu.

PharmD Students Conduct Research with Schaeffer Center

In summer 2013, four PharmD candidates teamed with faculty at the USC Leonard D. Schaeffer Center for Health Policy and Economics on research spanning a range of health economics issues.

Tadeh Vartanian collaborated with Associate Professor Neeraj Sood on “Show Me the Money: Tracing of Funds in Pharmaceutical Markets.” Analyzing 2012 U.S. retail pharmacy prescription drug sales, Vartanian found that patients have collective out-of-pocket costs of $49,239 million, with the majority of the remaining $236,449 million—or 82.8 percent of drug spending—paid by health benefit entities such as Medicare, Medicaid, private health plans and other agencies.

“With $81.81 for every $100 spent going to the various players in the pharmaceutical market, it is important to understand the contributions of each sector,” Vartanian says.

Manan Shah, who also worked with Sood, traveled to Gujarat, India, to conduct interviews with healthcare workers for her project “Understanding Treatment for Child Diarrhea in India.” The research “aims to better understand how health providers in India treat children with diarrhea—a leading cause of death in children under five—and how treatment differs between the public and private sector.” The data will be used to analyze and prepare policy recommendations and potential interventions.

Ying Long collaborated with Sood and Associate Professor Geoffrey Joyce on “Prescription Drug Prices Variation: Same Prescription, Different Prices.” Long’s study intends to reveal the extent of prescription drug price variation within the same neighborhood and expose information barriers.

“Patients should be provided with sufficient resources to price shop for prescription drugs and healthcare services for the best deal,” says Long. “Policy on healthcare price transparency needs improvement to make healthcare more affordable and accessible for vulnerable populations.”

Barbara Blaylock worked with Research Associate Professor Julie Zissimopoulos on “Microsimulation Validation Methods and Applications to Health Policy Research.”

Blaylock’s findings noted that validation and uncertainty analysis are not frequently conducted or included in the published results of microsimulations—which are used to aid health policy decisions by forecasting health status and economic outcomes at an individual level—due to the expense and time often required for such analyses.

These and other projects are made possible through the School of Pharmacy’s faculty based at the Schaeffer Center, a partnership with the USC Price School of Public Policy.

Cho Earns Prestigious FIP Internship

Third-year PharmD student Victoria Cho is the first-ever USC School of Pharmacy student to earn an internship with the International Pharmaceutical Federation (FIP), the global federation of national associations of pharmacists and pharmaceutical scientists. She is one of just two pharmacy students from around the world selected to intern in summer 2014 at the organization’s headquarters in The Hague, the Netherlands.

During her time at FIP, Cho will focus on pharmaceutical policy—specifically on several FIP initiatives, including smoking cessation and data analysis on public health issues. She says her trip to Uganda in 2013 as part of an outreach program through the USC Institute for Global Health fueled her interest in public health and the power of education.

She previously received a Schweitzer Fellowship for her work with elderly Chinese participants at APC Senior Wellness Center.
BY THE NUMBERS

DURING THE LAST FIVE YEARS, OUR FACULTY SERVED ON:

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FULL-TIME FACULTY

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FOR THE FIRST NINE MONTHS OF 2013 ALONE, USC SCHOOL OF PHARMACY FACULTY RECEIVED:

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<td>$12.5 million</td>
<td>Extramural funding, a 29.4% increase over all of 2012</td>
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From laboratory to clinical advances, women faculty are advancing discovery while nurturing the next generation of scientists.

By Susan L. Wampler
According to a 2013 special report in *Nature*, citing National Science Foundation statistics, men still greatly outnumber women in science, technology, engineering and math (STEM) professorships despite women earning half of such PhDs. A similar gap persists outside academia.

**LIANA ASATRYAN, PhD**
Research Assistant Professor

**BORN/RAISED** Armenia

**EARLY ASPIRATION** Archaeologist

**INSPIRATION** The complexity of nature; people who can make a discovery

**KEY INGREDIENT FOR LAB SUCCESS** Being thoughtful and organized

**HIGHEST ASPIRATION** Identify a new biological pathway/mechanism that can serve as a target for drug discovery

**BEST PART OF USC** Support from peers and the resources for work

**BIGGEST CHALLENGE** Getting more funding for research

**OUTSIDE INTERESTS** Reading, travel

**ADVICE** They should definitely consider if they have a drive for discovery.

**ROBERTA DIAZ BRINTON, PhD**
R. Pete Vanderveen Chair in Therapeutic Discovery and Development

**BORN/RAISED** Southern New Jersey

**EARLY ASPIRATION** Something atypical for females growing up in the 1950s and ‘60s

**INSPIRATION** Those who have overcome great odds

**KEY INGREDIENT FOR LAB SUCCESS** Address the most challenging issues. Dream big. Work hard.

**PROUDEST ACHIEVEMENT** Translating bench discoveries to clinical trials—twice; receiving the Presidential Citizens Medal

**HIGHEST ASPIRATION** Preventing and curing Alzheimer’s

**BIGGEST CHALLENGE** Keeping up with all I seek to accomplish!

**OUTSIDE INTERESTS** Being in nature

**ADVICE** The planet’s challenges are too great for any one perspective to answer.

**SARAH HAMM-ALVAREZ, PhD**
Gavin S. Herbert Professor in Pharmaceutical Sciences

**BORN/RAISED** Danville, Kentucky

**EARLY ASPIRATION** Doctor, chemist, lawyer, writer

**INSPIRATION** Lab members, students, family, nature

**KEY INGREDIENT FOR LAB SUCCESS** Perseverance, curiosity

**PROUDEST ACHIEVEMENT** Sjögren’s syndrome biomarker; mentoring students and junior faculty

**HIGHEST ASPIRATION** To raise a happy, healthy daughter; look back at my career and see time well spent

**BEST PART OF USC** Supportive colleagues, terrific students

**OUTSIDE INTERESTS** Family, cooking, hiking in New Mexico

**ADVICE** Never be embarrassed to ask questions. Cultivate your individuality and work ethic.
Pharmacy is widely acknowledged as the most egalitarian STEM field—with women comprising more than half of the profession. However, most women pharmacists work on the clinical side, not in drug development careers, which are typically occupied by PhD-trained scientists and continue to be heavily male-dominated. But you wouldn’t know that by looking at the USC School of Pharmacy’s faculty.

“We have an unusually large concentration of women at all ranks—established, mid-career and new recruits,” says Sarah Hamm-Alvarez, the School’s executive vice dean, vice dean for research and graduate affairs, and the Gavin S. Herbert Professor in Pharmaceutical Sciences. “We have the resources in house to go from bench to bedside to outcomes research, and we have a number of clinical trials in progress.”

Among those is a trial for a biomarker she discovered for Sjögren’s syndrome, a severe autoimmune disorder that can lead to internal organ damage but is hard to distinguish from ordinary dry eyes.

Roberta Diaz Brinton, the R. Pete Vanderveen Chair in Therapeutic Discovery and Development, has two major clinical trials underway for her Alzheimer’s research, including a revolutionary therapy with the potential to regenerate the nerve cells and pathways necessary for memory.
“USC has an environment where everyone can reach his or her potential, regardless of gender, race, etc.,” says Brinton. “When I was recruited to the university in 1988 as the first joint appointee in neuroscience, they just wanted promising new investigators with great potential.”

She adds that an atmosphere supporting the translation of laboratory breakthroughs into new treatments is “a gift we all have responsibility for nurturing.” Brinton is doing her part to foster passion in new generations of scientists as longtime director of USC’s Science, Technology and Research (STAR) program—a collaborative effort that promotes K-12 STEM education—as well as through her mentoring of School of Pharmacy students. She is by no means alone in such efforts.

“I’m close to my students, and we stay in touch after they graduate,” says Jean Chen Shih, University Professor and the Boyd P. and Elsie D. Welin Professor, who has been at the School for 39 years.

The School’s first female tenure-track professor, Shih was also the university’s first National Institutes of Health Merit Award winner—a prize she has earned twice. Her pioneering work cloning human monoamine oxidase (MAO) A and B remains an important building block for potential new treatments for depression, aggression, anxiety and autism, and she is now in a Phase 2 clinical trial investigating how MAO-A affects the progression of prostate cancer.
“Our students see that even women in leadership maintain balance and have family lives in addition to flourishing research careers.”

— ANNIE WONG-BERINGER, PharmD, Professor
“I’m proud to have trained many students who are now leaders in academia or industry,” says Shih. Among them are a dean at a Taiwan university and section chiefs at major pharmaceutical companies such as Roche and Amgen.

Today, the School of Pharmacy’s PhD programs are full of talented, energetic young women.

“The School is incredibly student-centric and offers opportunities to further our goals in every way possible, from supporting students to present at global conferences to mentoring us to become future leaders,” says Anna Naito, a PhD candidate in molecular pharmacology and toxicology who is simultaneously pursuing a master’s in the School’s regulatory science program.

“I think that science as a whole realizes women are vital for the field to move forward,” adds PhD candidate Christine Solinsky, who is in the clinical and experimental therapeutics program. “Personally, I have had the great privilege of knowing a number of successful women who have balanced incredibly successful careers with their private lives.”

Such role models abound at the USC School of Pharmacy. “My current PI, Dr. Kathleen Rodgers, is someone I really look up to—not only because of her great scientific career, but...”

ZHEN MENG
PhD candidate, Pharmaceutical Sciences
BORN/RAISED Shandong Province, China
INSPIRATION My parents always inspire me to be the best of myself.
PRIMARY RESEARCH INTEREST Pathological mechanisms for eye problems such as dry eye syndrome; working to establish the basis for treating these diseases
USC LABORATORY Sarah Hamm-Alvarez
WHY USC Diversity; the variety of research directions within the faculty that provides an opportunity to focus on our interests
OUTSIDE INTERESTS Outdoor activities, hiking, badminton
ADVICE You will always be inspired when you do something you really like.

ANNA NAITO
PhD candidate, Molecular Pharmacology and Toxicology; MS candidate, Regulatory Science
BORN/RAISED Redondo Beach, Calif.
EARLY ASPIRATION Concert pianist
INSPIRATION To reduce the 100,000 annual U.S. deaths from alcoholism
PRIMARY RESEARCH INTEREST Neuropharmacology, addiction
Proudest achievement We are the first group to create ultra-sensitive ethanol receptors.
USC LABORATORY Ron Alkana
WHY USC Opportunity to combine a pharmacology degree with regulatory science
OUTSIDE INTERESTS Travel, reading, riding horseback
ADVICE Keep an open mind—you never know where and how far your ideas can take you.

MARTHA PASTUSZKA
PhD candidate, Molecular Pharmacology and Toxicology
BORN/RAISED San Fernando Valley
EARLY ASPIRATION President
INSPIRATION People who do things for others without expecting a reward
PRIMARY RESEARCH INTEREST Environmentally responsive protein polymers; biomanufacturing
Proudest achievement Getting my PhD
HIGHEST ASPIRATION Chief scientific officer
USC LABORATORY Andrew MacKay
BEST PART OF USC A building full of people who want you to succeed; a school at the forefront of translational research
OUTSIDE INTERESTS Running
ADVICE Read “Why Are There Still So Few Women in Science?” by Eileen Pollack.
also because she truly cares for students and the patients who will benefit from our work,” says Maira Soto, a PhD candidate in the clinical and experimental therapeutics program.

“Our students see that even women in leadership—and we have a lot of those—maintain balance and have family lives in addition to flourishing research careers,” says Annie Wong-Beringer, professor of clinical pharmacy. Her own research includes collaborating on a multicenter study for new breakthrough treatments, based on an individual’s genetic background, to fight staph infections—considered by the *New England Journal of Medicine* to be an unanswerable problem.

For all of the School’s faculty, says Brinton: “It’s not just about feeding the intellect. It’s about passion and a purposeful life.”

“There are few fields where, every day, you have the possibility to do something that has never been done before,” says pharmaceutical sciences PhD candidate Zoé Folchman-Wagner.

Adds Professor Frances Richmond, director of the International Center for Regulatory Science: “This School encourages new ideas and programs. It’s a philosophy and a culture here.”

CHRISTINE SOLINSKY
PhD candidate, Clinical and Experimental Therapeutics
BORN/RAISED Tucson, Ariz.
EARLY ASPIRATION Librarian or flight attendant
PRIMARY RESEARCH INTEREST Alzheimer’s disease
PROUDEST ACHIEVEMENT I am exactly where I should be.
HIGHEST ASPIRATION To be a leader in Alzheimer’s research and translate discoveries into real improvements in care
USC LABORATORY Roberta Diaz-Brinton
BEST PART OF USC This is a tight-knit, supportive group.
OUTSIDE INTERESTS Spending time with friends, reading, participating in leadership roles and exploring LA
ADVICE Don’t let anyone tell you that you can’t have it all.

MAIRA SOTO
PhD candidate, Clinical and Experimental Therapeutics
BORN/RAISED LAC+USC Medical Center; Lincoln Heights
EARLY ASPIRATION Nurse
INSPIRATION My bright, compassionate mother, who only made it to second grade
PRIMARY RESEARCH INTEREST Immune system
PROUDEST ACHIEVEMENT Getting my PhD
HIGHEST ASPIRATION Research that benefits patients
USC LABORATORY Kathleen Rodgers
BEST PART OF USC A lab with exceptionally bright people who are also close friends
OUTSIDE INTERESTS Painting, cooking, home brewing
ADVICE The joy you receive from the work you do will push you forward.

MEGAN YARDLEY
PhD candidate, Pharmaceutical Sciences; MS candidate, Management of Drug Development
BORN/RAISED Bangor, Maine
EARLY ASPIRATION Doctor
INSPIRATION My dad, a recovering alcohol and drug addict who has helped countless people overcome their addiction
PRIMARY RESEARCH INTEREST Alcohol-use disorders, neuropharmacology
PROUDEST ACHIEVEMENT Getting my PhD and MDD
HIGHEST ASPIRATION To make a difference
USC LABORATORY Daryl Davies
BEST PART OF USC Supportive mentors; incredibly strong alumni network
OUTSIDE INTERESTS Travel
ADVICE Don’t let anyone ever discourage you. Surround yourself with people who support you.
“There are few fields where, every day, you have the possibility to do something that has never been done before.”
—ZOE FOLCHMAN-WAGNER, PhD CANDIDATE
Image, pages 14–15: Roberta Diaz Brinton, PhD, Juliana Huang-Levine, PharmD, Sarah Hamm-Alvarez, PhD, and Annie Wong-Beringer, PharmD in front of a coronal section of hippocampus, mouse brain, by Shuhua Chen, Brinton Laboratory

Image, pages 22–23: Frances J. Richmond, PhD, Jessica Zaro, PhD, Bangyan Stiles, PhD, Liana Asatryan, PhD, and Jean Chen Shih, PhD in front of human prostate adenocarcinoma cells showing localization of an MAO-A-targeting drug, by Bogdan Olonyuk, Center for USC–Taiwan Translational Research
School Launches $100M Initiative

The USC School of Pharmacy kicked off its $100 million fundraising initiative with a gala at the historic Belasco Theater. The campaign centers on providing crucial support for faculty and research endowment, academic and professional priorities, scholarships, and capital projects. At the event, supporters, faculty and USC leadership celebrated the School’s achievements even as they planned for greater advances ahead.

In opening the evening’s program, USC President C. L. Max Nikias hailed the School of Pharmacy’s accomplishments and legacy. “The School of Pharmacy has cleared a trailblazing path of many ‘firsts’ that others have followed,” he said. “As the top private school of pharmacy in the nation, it still lays claim to one distinction that no other institution can match: It is the only school in the nation that spans the entire spectrum of pharmaceutical development and clinical care.”

Dean R. Vanderveen pointed to such victories as pharmacists’ attainment of provider status in California as he spoke about the School’s leadership in advancing education, research and practice. “The USC School of Pharmacy is truly the school of the future,” he said. “Along with our many innovations in research and policy, we are molding the next generation of pharmacists. These men and women will fill an ever-increasing role in caring for patients and responsibly guiding them to optimal health outcomes.”

The School has already raised 39 percent of its $100 million goal, with support from 2,373 donors, with 14 percent of giving coming from young alumni less than 10 years after graduation.

The initiative is part of the Campaign for the University of Southern California, a multiyear effort to secure $6 billion or more in private philanthropy to advance USC’s academic priorities and impact. USC has raised more than $3 billion in three and a half years.

### FUNDING GOALS

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<th>Endowment for Naming Centers</th>
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<td>- International Center for Regulatory Science</td>
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<td>- Center for Advancement of Community Pharmacy Practice</td>
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<td>- Expand technology and enhancement of learning and research capabilities</td>
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<td>- Expansion/renovation of the Pharmaceutical Sciences Center and the Center for Health Professions buildings</td>
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<td>- New student center</td>
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<td>- Endowment for new space on the Health Sciences Campus</td>
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<th>TOTAL</th>
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At the campaign launch, Dean Vanderveen announced that William A. Heeres will serve as the initiative’s chairman. Heeres, who also chairs the School’s Board of Councilors, sees the effort as a powerful way to not only advance the School, but also the entire profession of pharmacy.

“I’m amazed at what the School and the profession have accomplished in the last 50 years. We must build on these achievements,” he says. “We’re at an auspicious moment and we must provide the support to build on it.”

Heeres and his wife, Josephine, have long been ardent supporters of the School. In 2002, they endowed the William A. and Josephine A. Heeres Chair in Community Pharmacy—the first such chair in the nation. Their other support over the years includes the Heeres Challenge, which raised more than a million dollars to renovate teaching facilities.

“I ask that all Trojans, alums and friends alike, join us and consider a generous gift to the USC School of Pharmacy,” says Heeres. “Every gift makes a difference.”
Students Acknowledge Scholarship Donors

At this year’s annual Scholarship Luncheon, students had the opportunity to thank the generous donors who helped them achieve their dream of attending the USC School of Pharmacy. For the 2013–14 academic year, 114 donors provided awards totaling some $600,000. Fourteen new scholarships were established this year. Student speakers at the event were PharmD candidates Andy Gelejian, Kevin Henke, Lauren Kawabata, Nana Numapau and Staci Tagawa.

“I am deeply honored to finally have the chance to thank you,” said Numapau. “As an immigrant and the first in my family to attain this level of education, I am faced with different challenges, but the biggest of all my obstacles is financial hardship. I would not have gotten this far without your extreme generosity over the years. You continue to reaffirm in us that our dreams are possible. We can only hope to one day return and do the same for other students.”

“I would not have gotten this far without your extreme generosity over the years....We can only hope to one day return and do the same for other students.”

IN MEMORIAM: Henry Fong, PharmD ’58

Henry Fong, PharmD ’58 passed away in March 2014 at age 83. He and his wife, Jane, owned Cathay Medical Industries and managed two pharmacies—Cathay Medical Pharmacy and College Pharmacy, both in Chinatown in Los Angeles. His sons, David Fong, PharmD ’82, and George Fong, PharmD ’84, are also graduates of the School, and granddaughter Jennifer is a pharmacy student at the University of the Pacific.

Jane and Henry Fong supported several programs at the School, including the Heeres Challenge, the Hygeia Centennial Chair in Clinical Pharmacy, QSAD Centurion, the Pharmacy Alumni Association, and the Jane and Henry Fong Scholarship. Dr. Fong was a Presidential USC Associates member.

He is survived by his wife of 46 years, Jane, his two sons, daughter Michelle and five grandchildren.
Korean-American Pharmacists Association Awards Annual Scholarship

Chang Ho Yoo, president of the California Korean-American Pharmacists Association, recently presented a check to Dean R. Pete Vanderveen to support scholarships at the School.

This year’s recipient of the scholarship is Nicole Choi, who is following a family tradition, as her mother is also a pharmacist.

The association follows a tradition as well—one that includes a longstanding partnership with the School of Pharmacy through scholarship awards and support of student activities. Its former president San Ju Lee serves on the School’s Board of Councilors, and his son John is a recent USC School of Pharmacy graduate—who now works at his father’s pharmacy, Lee’s Drug and Gifts. President Yoo’s son, Craig, is a current student in the School’s PharmD program.

The organization recently hosted a group of visiting Korean pharmacy students, which included a tour of the USC School of Pharmacy as well as various clinical and community pharmacy settings.

IN MEMORIAM: Bob Hahn

USC School of Pharmacy Board of Councilors associate member K. Robert “Bob” Hahn passed away on December 15 at the age of 92. Hahn was a lawyer by training who served for many years as an executive and vice chair of what is now Learjet. As a successful businessman in a technological field, he understood the value of interdisciplinary training and was drawn to support the School of Pharmacy after learning about its PharmD/MBA degree. His generosity included establishing the K. Robert and Mary C. Hahn Scholarship, which was also named for his late wife. In 2010, Hahn was awarded the School of Pharmacy Dean’s Medal. He is survived by three daughters and six grandchildren. Hahn is shown at right with one of his scholarship recipients, Ashlee Klevens, PharmD ’13.
Kaiser Health News and USA TODAY Spotlight Alumna’s Expansion of Pharmacy Services

Kaiser Health News and USA TODAY, among other newspapers nationwide, reported on the work of Diana Arouchanova, PharmD ’04, who started her own pharmacy to better integrate the range of services important to enhancing people’s health. “I was never one of those pharmacists who was just behind the counter filling prescriptions and affixing labels,” says Arouchanova. “I always wanted to practice my clinical knowledge.”

Arouchanova’s Clinicare Pharmacy in Northridge, Calif., is one of many pharmacies throughout the state that offer a full range of services—from immunizations to helping people safely manage their medications to checking blood pressure and cholesterol.

“With the Affordable Care Act and Senate Bill 493 coming into play, I think pharmacists will have more expanded roles as practicing clinicians,” says Arouchanova.

Arouchanova sees her role as part of the healthcare team in improving patient care. Uniquely, making healthcare even more convenient for patients, a primary care physician has office space right in Clinicare. “People still need to see a physician and get diagnosed,” she says.

In the Kaiser Health News/USA TODAY story, Jill Freedman—a longtime customer of Arouchanova’s—said, “Sometimes it takes two or three phone calls to a doctor’s office to get somebody to listen.”

As an example of the services Arouchanova provides, the story related how Freedman’s blood pressure was so high that she feared a heart attack or stroke. Arouchanova reviewed the woman’s medications and found a dangerous combination of two prescriptions. She immediately contacted Freedman’s physician to change the medications, and then started checking Freedman’s blood pressure daily to make sure it dropped to normal.

“Had she not been on top of what I’m going through, God knows how many more weeks this could have potentially gone on,” Freedman says. In addition, Arouchanova helps her keep track of the numerous medications she takes for hypertension, Crohn’s disease and ulcerative colitis.

The Kaiser Health News/USA TODAY piece also included details about a federally funded project that the School of Pharmacy’s Michelle Lee, PhD, is engaged in to gauge how much pharmacists can aid high-risk patients in controlling chronic diseases.

The USC School of Pharmacy has been a key driver in expanding the pharmacist’s role, and the movement now has nationwide momentum. Other states, including New Mexico and North Carolina, also embrace the advantages of allowing pharmacists to take on more duties.

“We are the most overeducated and underutilized healthcare professionals in the U.S.,” Dean R. Pete Vanderveen told Kaiser Health News/USA TODAY. “It doesn’t take eight years of education and a professional doctorate to fill a bottle with pills.”

ALUMNI UPDATES

Elina Baskina, PharmD ’11, has joined the USC University Park Campus Pharmacy as a pharmacist.

John Bruce, PharmD ’70, and his Cal-Med Pharmacy were honored by the city of Mission Viejo as a business and community partner in November. He was presented with a scroll by Mission Viejo Council Member Rhonda Reardon.

Kenneth Dawson ’48 and his wife, Jeanne, who live in Arroyo Grande, recently celebrated their 65th wedding anniversary. Dawson also celebrated his 90th birthday at a party hosted by his daughter, Patricia Liguore, son-in-law, Kevin Liguore, and son, James Dawson.

Jonathan Watanabe, PharmD ’07, MS, PhD, joined the faculty of the UCSD Skaggs School of Pharmacy and Pharmaceutical Sciences as assistant professor of biostatistics.

Kandace West, PharmD ’12, is founder and CEO of Pharmacist Integrative Healthcare, Inc. in Chatsworth, Calif., which assists clients by optimizing medication therapy and promoting medication safety.

Ellen Whalen, DrSc ’12, presented the SC CTSI Career Development Seminar “Regulatory Science 6—Regulatory Audit Compliance” in Los Angeles in December.

IN MEMORIAM

Norman Karas, PharmD ’65, passed away in April 2013.

George Sheets, PharmD ’61, of Laguna Beach, passed away in 2013.

James A. Waer, PharmD ’69, passed away in February 2014.

Robert Wilderman, PharmD ’64, passed away in August 2013 from a brain tumor.
Remembering Associate Dean Ronald Alkana

Ronald Alkana, PharmD ’70—associate dean for graduate affairs and programs at the School of Pharmacy—died on February 23 while jogging near his home in Seal Beach, Calif. He was also a professor in both the Titus Family Department of Clinical Pharmacy and Pharmaceutical Economics & Policy and the Department of Pharmacology and Pharmaceutical Sciences.

Dr. Alkana had been with the School since joining as an assistant professor in 1976. Over the course of his USC career, he was honored with dozens of teaching and mentoring awards, including Professor of the Year on six different occasions.

His interdisciplinary research investigated the mechanisms of action of psychoactive drugs at the cellular and molecular levels. He was dedicated to developing new prevention and treatment strategies for alcoholism, drug abuse and psychological disorders. Just before his death, he presented a paper about alcohol receptor sites in the brain and their potential as brain mapping tools at the Gordon Research Conference: Alcohol & the Nervous System, in Galveston, Texas.

After earning his PharmD at USC, he received a PhD in psychobiology from the University of California, Irvine in 1975. With expertise that combined clinical and basic science research, he provided insightful and inspiring mentorship to students in both degree programs at the USC School of Pharmacy. He also championed dual- and joint-degree opportunities and was instrumental in establishing the PharmD/Juris Doctor and PharmD/Master of Science in Global Medicine, among others. In addition, as a member of the science advisory board for the USC International Center for Regulatory Science, he actively worked to make the MS in that discipline available to students pursuing PharmD and PhD degrees at the School.

“Dr. Alkana was a dedicated teacher who loved USC and treasured his students,” says School of Pharmacy Dean R. Pete Vanderveen. “He leaves an impressive legacy of scientists and pharmacists who have been inspired by him.”

PhD student Anna Naito describes him as a mentor. “He subtly suggested ideas to guide me in the right direction and allow me to flourish as a stronger scientist,” she says. “Although he was a leader in his field, he never wanted to stop learning. One of his best attributes was his ability to listen and be accepting of all ideas, which helped strengthen our project by looking at our research from all possible angles.”

Even with his dedication to his family and his passion for research and teaching, Dr. Alkana found time to be an ardent surfer. He also made the Guinness Book of World Records for the distinction of eating the most bananas in two minutes—a feat from his graduate-school days.

His field-related distinctions include being among the earliest members of the Society of Neuroscience, as well as serving as vice president of the Southern California Chapter of the Society of Toxicology and on the Neuron and Glia National Science Foundation Grant Review Panel. In 1999, he was named the Outstanding Alumnus of the Year for the USC School of Pharmacy, and Phi Delta Chi recognized him as Alumnus of the Year in 2012. He published more than 100 papers on pharmacology and toxicology of drugs that affect the brain and behavior.

Dr. Alkana is survived by his wife of 44 years, Linda Alkana, a history professor at California State University, Long Beach; his son, Alex, a law student; his daughter, Lorna, an artist and writer; his mother, Madelyn Davis of Huntington Beach; his father, Sam Alkana of Long Beach; and his sister, Joyce Fink of Riverside.

Donations honoring his legacy may be made to the Dr. Ron Alkana Memorial Research Fund at the USC School of Pharmacy and sent to the attention of: Jennifer Watson, 1985 Zonal Avenue, Los Angeles, CA 90089-9121. Please make checks payable to the USC School of Pharmacy, noting “Dr. Ron Alkana Memorial Research Fund” in the memo line of the check.

WINTER RETREAT

Mike Quick, who was honored for his dedication and support of QSAD and the School of Pharmacy, is pictured here with QSAD President John Bruce, PharmD ’70, and Dean Pete Vanderveen. During Quick’s 50-year career with AmerisourceBergen, he was instrumental in providing the School with significant scholarships for students and support for the School’s three pharmacies. He has been a signature sponsor of the Winter Retreat for the past 19 years.
FACULTY UPDATES

James Adams, PhD, was a guest on the KPFK radio program Focus on Food in October, and was quoted by Inc. in March about the health risks associated with consuming caffeine frequently and in mass quantities.

Melvin Baron, PharmD, spoke to students at Loyola High School of Los Angeles about careers in pharmacy in March; authored fotonovelas about childhood obesity, diabetes and asthma that were distributed by La Opinión in the spring; and created the audio-visual novela “Rosa Out of Control,” which aired on KCLS in March and May (see story, page 10).

Paul Berlinger, PharmD, was awarded a $192,377 grant from the Cystic Fibrosis Foundation for his project “Targeting CF Infection and Inflammation with Aerosolized Theta-defensin”; was elected secretary-treasurer of the American College of Clinical Pharmacy (ACCP) Pharmacokinetics/Pharmacodynamics/Pharmacogenomics Practice and Research Network; and will present “Antibacterial Activity of the Macro cyclic Peptide (RTD-1) against Clinical Isolates of Pseudomonas aeruginosa” at the European Cystic Fibrosis Conference in Gothenburg, Sweden, in June.

Kathleen Hill Besinque, PharmD, presented “Facilitation Skills, Core of Trust and Conflict Management” at the USC Interprofessional Education Faculty Workshop Seminar at the university’s Alhambra campus in March.

Robert Díaz Brinton, PhD, was referenced by Bloomberg News in September for her National Institutes of Health (NIH) grant focusing on developing a treatment for Alzheimer’s disease.

Julio Camarero, PhD, presented at PepTalk 2014 in Palm Springs, Calif., in January, and had his research on in vivo activation of the p53 tumor suppressor pathway by an engineered cyclotide featured in GEN: Genetic Engineering & Biotechnology News and by the organization Faculty of 1000 in February.

Roger Clemens, DrPH, was quoted by redOrbit in February about a recent study finding scientific evidence that supports the recommended dietary guidelines from U.S. advisory committees.

Daryl Davies, PhD, had his two studies focusing on treating alcohol-use disorders featured on the NIH National Center for Advancing Translational Sciences homepage in November; presented “A Multi-Prong Approach to the Development of Novel Compounds for the Treatment of Alcohol Use Disorders” at the Gordon Research Conference: Alcohol & the Nervous System, in Galveston, Texas, in February; was an invited panel speaker at the third annual Presidential Career Symposium: Launch Your Career, at the University of Texas MD Anderson Cancer Center in Houston in February; and received a USC Mellon Mentoring Award in April.

Chuanqing Ding, MD, MSc, PhD, was awarded a $28,500 grant from the Southern California Clinical and Translational Science Institute Pilot Funding Program for the project “Development and Characterization of a Rapamycin-Based Eye Drop for the Treatment of Autoimmune-Mediated Dry Eye.”

Jason Doctor, PhD, was interviewed by La Opinión in January about antibiotics for respiratory infections; was featured in Scientific American, Pourquoi Docteur (France), NPS MedicineWise (Australia) and on CBS News for his study on prescribing antibiotics for colds; was featured in Mother Jones in February for his study about reducing unnecessary antibiotic prescriptions through posted signs; and co-presented “A Simulation to Predict Reductions in Lifetime Medical Expenditures after Obese Adolescents Undergo Roux-En-Y Gastric Bypass Surgery” at the 19th annual International Society for Pharmacoeconomics and Outcomes Research (ISPOR) meeting in May.

Julie Dopheide, PharmD, presented the continuing education webinar “ADHD Is Color Blind—Understanding and Eliminating Treatment Disparities in Minorities” in February.

Melissa Durham, PharmD, was certified as an ambulatory care pharmacist by the Board of Pharmacy Specialties; has been credentialed as a diplomat of the American Academy of Pain Management; presented “Therapeutic Update—New Drugs in Pain Management” at the California Pharmacists Association EdNet Symposium in San Francisco and Los Angeles in October; presented “Interprofessional Education: Best Practices and Pathways to Success” at the Society for Teachers of Family Medicine Conference on Medical Student Education in Nashville in January; and presented “Reflection as a Teaching Tool in Interprofessional Education” at the USC IPE Faculty Workshop Seminar at the university’s Alhambra campus in March.

Jeffery Goad, PharmD, MPH, vice chair for Continuing Professional Development, Credentialing and Distance Education, led the continuing medical education/continuing education program “Adult Immunization: Making the Most of Everyday Opportunities” for Medscape Pharmacists Education in October; was selected as an American Pharmacists Association (APhA) fellow for 2014; and was the key opinion leader and senior researcher on a project with...
research on HIV/AIDS at the Health Affairs issue briefing at the National Press Club in Washington, D.C., in March. The event was kicked off by Howard Koh, U.S. assistant secretary for health, and the audience included more than 100 guests from the media, congressional and administrative offices, policy think tanks, advocacy organizations and academia.

Joel Hay, PhD, published an article in the Orange County Register in October about Senate Bill 493, which permits qualified pharmacists to order and interpret lab tests, provide vaccine shots, dispense some medicines, and initiate, adjust or discontinue certain medications; was quoted by the Los Angeles Times in October about how drugstores may be misleading people about flu-shot coverage; was quoted by the Long Beach Press-Telegram in November about city moratoria on electronic cigarettes; and was part of a number of presentations at the 19th annual ISPOR meeting in May, including “Cost-Effectiveness Comparison of Denosumab and Zoledronic Acid in the Treatment of Postmenopausal Osteoporosis.”

Geoffrey Joyce, PhD, participated in a live radio broadcast about the ACA for KFWB’s Morning News in October; was quoted by NBC News in October about how issues with the ACA website could hurt public perception of the law and of the federal government; was quoted by the Los Angeles Daily News about Medicare fraud in November; was quoted in The Guardian in December about virtual doctors’ offices and their impact on cost; and was quoted by Marketplace on the ACA enrollment deadline in March.

Darius Lakdawalla, PhD, Quintiles Chair in Pharmaceutical Development and Regulatory Innovation, was featured by Science Codex in October for his research finding that nutritional supplements given to children in hospitals reduced their length of stay, resulting in a decrease in costs of $1,768 per patient.

Grant Lawless, RPh, MD, program director of the Master’s Program in Healthcare Decision Analysis, co-chaired and presented at the Association for Value-Based Cancer Care’s fourth annual conference in May.

Jeffrey McCombs, PhD, director of Graduate Studies, was featured by HealthDay News in November for his research finding that only a minority of patients with hepatitis C are willing to begin treatment, and was part of three presentations at the 19th annual ISPOR meeting in May, including “Comparative Effectiveness of Surgery and Drug Therapy in Newly Diagnosed Patients with Carotid Artery Stenosis.”

Edith Mirzaian, PharmD, presented “Medication Management: CMS Updates and MTM Opportunities for Pharmacists” at the Orange County Pharmacists Association meeting in Garden Grove, Calif., in November.

Tien Ng, PharmD, was awarded a $217,626 investigator-initiated grant from Otsuka America Pharmaceuticals, Inc. for the “Aquaregia Utility for Hypnotremic Acute Heart Failure (AQUA-AHF) Study”; presented the continuing education program “Key Papers in Cardiovascular Diseases” at the California Society of Health-System Pharmacists Seminar in Anaheim, Calif., in November; and presented the continuing education program “Antiplatelets for PCI: Guidelines and Future Directions” for the San Gabriel Valley Society of Health-System Pharmacists in Pasadena in November.
**FACULTY UPDATES**

Michael Nichol, PhD, co-presented “Characteristics of Girls and Young Women Who Receive Two Versus Three Doses of the HPV Vaccine” and “Association between Health Status and Factor Consumption among Persons with Hemophilia B Using Propensity Score Matching” at the 19th annual ISPOR meeting in May.

Neeraj Sood, PhD, wrote “A Better Way to Encourage Price Shopping for Health Care” for the Harvard Business Review blog in September; was featured on MSNBC in March for his study finding that the ACA can increase HIV awareness; and was part of three presentations at the 19th annual ISPOR meeting in May, including “Characteristics of Girls and Young Women Who Receive Two Versus Three Doses of the HPV Vaccine.”

Glen Stimmel, PharmD, conducted and facilitated the Strategic Planning Retreat for the board of the College of Psychiatric and Neurologic Pharmacists Foundation in January.

Dean R. Pete Vanderveen was featured in a USA TODAY/Kaiser Health News article in February about the expanded role of the pharmacist; was cited by The Courier-Journal (Louisville, Ky.) in March about the changing role of pharmacists in America; testified at the Board of Pharmacy in Sacramento in March about the implementation of Senate Bill 493, which permits qualified pharmacists to order and interpret lab tests, provide vaccine shots, dispense some medicines, and initiate, adjust or discontinue certain medications; was on Capitol Hill for meetings with members of Congress and their staffs about the value pharmacists bring to the healthcare enterprise in March; and attended the APhA annual meeting in Orlando, Fla., with many faculty members and students.

Bradley Williams, PharmD, has been appointed director of the Education and Information Core of the USC Alzheimer’s Disease Research Center, and presented “Medication Issues among Adults Aging with a Disability” at the Morbidity and Mortality Conference in Downey, Calif., in February.

Michael Wincor, PharmD, associate dean of Technology and Global Initiatives, and interim chair of Clinical Pharmacy, Psychiatry and the Behavioral Sciences, traveled to Singapore, where he was a consultant for the Institute for Mental Health and the Ministry of Health; presented “Pharmacy Education: Preparing Practitioners and Scholars” at the Asian Association of Schools of Pharmacy 2013 Conference; presented “Management of Sleep Disorders” at the National University of Singapore Hospital; and presented “Insomnia and Depression in the Elderly: A Case-Based Approach” at the Tan Tock Seng Hospital. He also presented the keynote speech “Clinical Pharmacy Education, Postgraduate Programs, Specialization and FIPEd” at University Days 2013 in Almaty, Kazakhstan, in December, and signed a memorandum of understanding with Tajen University while helping celebrate its 48th anniversary in March.

Julie Zissimopoulos, PhD, was interviewed in October on KPCC about the economic effects of the government shutdown.

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**Beringer and Ng Receive Grants for Heart and Lung Studies**

Two USC School of Pharmacy faculty members have received separate grants aimed at developing treatments for disorders of the heart and lungs. Associate Professor Tien Ng, PharmD, garnered a grant of $217,626 from Otsuka America Pharmaceuticals, Inc. to conduct the study “Aquaresis Utility for Hyponatremic Acute Heart Failure (AQUA-AHF).” Meanwhile, Associate Professor Paul Beringer, PharmD, was awarded $192,377 from the Cystic Fibrosis Foundation for “Targeting CF Infection and Inflammation with Aerosolized Theta-defensin.”

Ng’s project seeks to determine whether vasopressin receptor antagonists offer a more effective and safer option for removing excess fluid from patients hospitalized with heart failure than conventional diuretic therapy. Beringer’s research is testing the potential of Rhesus theta defensin-1 (RTD-1), a protein found in nonhuman primates, as a novel agent for treating infection and lung inflammation in cystic fibrosis patients. His co-investigator is Michael Selsted, MD, PhD, chair of the Department of Pathology at the Keck School of Medicine of USC. Beringer holds a joint appointment at the Keck School.

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**President’s Economic Report Cites USC Schaeffer Center**

For the second year in a row, the Economic Report of the President includes research from the USC Leonard D. Schaeffer Center for Health Policy and Economics. The 2014 report, released in March, cited two studies by Neeraj Sood, School of Pharmacy associate professor, in a section about the relationship between employer-based health insurance premiums and the employment rate. The Obama administration included Sood’s findings that the Affordable Care Act will increase employment by between 250,000 and 400,000 jobs per year by the second half of this decade.
Nutritional Supplements Reduce Kids’ Hospital Stays

A new study that demonstrates giving oral nutritional supplements to pediatric inpatients can result in shorter hospital stays and decreased costs counts among its authors Darius Lakdawalla, Quintiles Chair in Pharmaceutical Development and Regulatory Innovation, and Dana Goldman, director of the USC Leonard D. Schaeffer Center for Health Policy and Economics.

The 11-year retrospective study, covering 2000–2010, associated the use of supplements with a 14.8 percent decrease in length of stay and a reduction in hospital costs of $1,768 per patient. Researchers used information from the Premier Research Database, which contains data on more than half a million hospitalized pediatric cases for patients aged 2 to 8 years.

The ambitious study is the latest in health economics and outcomes research to illustrate the impact of oral nutrition supplement use in hospitalized patients. It constituted a partnership of USC, Children’s Hospital of Philadelphia, Harvard Medical School, Massachusetts General Hospital and Precision Health Economics, a consulting company that includes Lakdawalla and Goldman as co-founders.

“While other studies have examined the use of nutritional supplements in adults, prior to this study there weren’t any that rigorously quantified the impact of oral nutritional supplements on health economic outcomes in the general pediatric population,” Lakdawalla explains. “These results suggest that nutritional solutions can be a cost-effective approach to improving pediatric patients’ hospital care.”

The results were presented at the 2013 North American Society for Pediatric Gastroenterology, Hepatology and Nutrition Annual Meeting in Chicago.

Two Professors Garner New Cancer Research Grants

Groundbreaking cancer research taking place in the USC School of Pharmacy’s labs is getting a boost thanks to two new grants from the Ming Hsieh Institute (MHI) for Engineering Medicine for Cancer.

Research Assistant Professor Jennica Zaro, PhD, and Assistant Professor J. Andrew MacKay, PhD, have been awarded grants from MHI in the amounts of $99,265 and $100,000, respectively, for their innovative cancer studies.

MacKay’s grant will support the project “Bispecific Hybrid Nanworms for Immunotherapy of B-cell Lymphoma,” on which he is principal investigator, collaborating with Keck School of Medicine professors Peter Conti, MD, PhD, and Alan Epstein, MD, PhD, and Visiting Associate Professor of Research Zibo Li.

The grant will cover a five-year collaboration on switchable nanoparticles that activate apoptic signaling pathways in cancer, building on the prior work of MacKay and Conti on diagnostic imaging of smart, genetically engineered nanomedicines.

This study aims to develop temperature-responsive elastin-like peptide (ELP) nanworms, and to develop and evaluate two specific nanworms with anti-CD20 properties. CD20 is found on the cell surface of malignant B-cells, which are produced by some cancers and autoimmune diseases.

“In the long term, the grant will help to expand on prior work to ELPs that could contribute momentum toward more widespread applications,” says MacKay.

“In addition, it will be used for mouse model testing to bring the research closer to clinical translation, and the use of these nanoparticles in treating CD20-related disorders, including cancer.”

Zaro’s grant will be used for the project “Optimization of pH-sensitive peptide nanocostructures for use in targeting the mildly acidic tumor microenvironment,” on which she is also collaborating with Peter Conti of the Keck School.

The new award will serve as a renewal for a grant project started in 2012, with optimization as the new focus. The prior grant resulted in a National Institutes of Health R21 grant to evaluate the constructs for protein drug delivery, with the goal of submitting for an R01 grant in June 2014.

Zaro’s research is intended to help differentiate tumor cells from normal cells, which is one of the biggest challenges in cancer diagnostics and therapeutics.

“The specific aims of this grant are to evaluate the in vivo toxicity of the nanoconstructs, particularly the liver and the kidney, and to quantitatively measure and improve in vivo targeting of nanoconstructs in tumor-bearing mice,” explains Zaro. “The results of this study will establish the feasibility of clinical applications and could find broad applications in various drug delivery systems.”
Cedona Watts, PharmD ’14, recently received acclaim from the Association of Black Health-System Pharmacists (ABHP) and the American College of Clinical Pharmacy (ACCP). She earned the Student Achievement Award from the ABHP for success both in and beyond the classroom. Meanwhile, the ACCP recognized her excellence in academics, leadership and community service.

Community service has been a crucial aspect of Watts’ time at the School. She has volunteered at health fairs and for a variety of health organizations, working with diverse patient populations to bring attention to such issues as healthy eating, vaccinations, heart disease, diabetes, menopause, osteoporosis and cancer, and providing blood pressure screenings, immunizations and counseling.

“I am fortunate to have been selected and grateful that the ABHP acknowledges my leadership potential,” she says. “The award is motivation to continue to practice what I have learned at USC, which is to provide excellent and compassionate pharmaceutical care to patients. It is also a motivation to continue to stay active and promote the pharmacy profession.”

Watts will continue her pharmacy training as a post-graduate, year-one pharmacy practice resident at the Sentara RMH Medical Center in Harrisonburg, Va. She is interested in oncology clinical pharmacy practice and hopes to pursue a career in academia.

PharmD candidate Amanda Wong is one of only 13 students nationwide to be selected by the American Pharmacists Association (APhA) Foundation for a 2014 scholarship. She received the $1,000 Robert D. Gibson Scholarship for her “potential to become a leader for the profession of pharmacy, as demonstrated by involvement in school and community activities and academic performance,” according to the APhA.

Wong is currently secretary of Phi Lambda Sigma, the National Pharmacy Leadership Society, and was previously a U.S. Albert Schweitzer Fellow as well as co-president of the PharmSCC Clinic. She also mentors pre-pharmacy students at her alma mater, the University of California, Irvine. Her project, BrailleRx, helps the blind and visually impaired manage their medications.

She and her fellow recipients were honored during the APhA Annual Meeting and Exposition.

More than 50 School of Pharmacy students held a three-day workshop to help USC retirees and spouses enroll in the best Medicare Part D plan for their specific needs. The annual event is held in partnership with the USC Emeriti Center and USC Senior Care. This year’s student participants counseled 62 retirees in person, plus many more over the phone.

The results saved a total of nearly $50,000—an average of $797 per person.
Student Earns Pharmacist of the Year Award

Daniel Kudryashov, PharmD ’15, has won the Good Government Student Pharmacist of the Year Award from the American Pharmacists Association (APhA) Academy of Student Pharmacists. The prize honors the recipient’s ability to raise awareness of local and national pharmacy issues while embracing the concept of collaboration among students, practitioners and state pharmacy associations. It includes a $1,000 scholarship and is bestowed at the APhA Annual Meeting and Exposition.

Kudryashov’s advocacy includes serving as director of legislative affairs for the National Community Pharmacy Association student chapter, representing the American Pharmacy Student Alliance at the Board of Trustees of the California Pharmacists Association (CPHA) and founding the CPHA Grassroots Advocacy Liaison Program. In addition to his studies and research, he works as an intern pharmacist at the Keck Hospital of USC inpatient pharmacy.

PhD Students Win Big at Nanotechnology Conferences

The School of Pharmacy remains at the leading edge of the nanotechnology revolution, as demonstrated by the top honors awarded to PhD candidates Pu Shi and Martha Pastuszka at separate, major conferences.

Pastuszka earned a best abstract award for “Thermally Responsive Intracellular Switch” at the 11th annual Nanomedicine and Drug Delivery Symposium in La Jolla, Calif., co-sponsored by the USC School of Pharmacy and the University of California, San Diego Skaggs School of Pharmacy and Pharmaceutical Sciences. “My poster describes how we can control what a cell does or does not do,” Pastuszka says. “Being able to control this at our own will helps us understand why a cell acts abnormally in diseases such as cancer. My poster described the first experiments to test out this new technology.”

Shi received the best presentation award for “RGD-Mediated Tumor-Targeted Rapamycin Delivery Using Protein Polymer Nanocarriers” at the UCLA-USC-Caltech Nanotechnology & Nanomedicine Symposium.

“The aim of our project is to develop a novel drug nanocarrier, Rapamycin, for human breast tumor treatment,” explains Shi. “The new Rapamycin formulation significantly prolongs drug release, lowers cytotoxicity and improves anti-tumor efficacy in vivo.” Both students work in the lab of Assistant Professor J. Andrew MacKay, who also co-organized the La Jolla conference. “It is gratifying to see Martha and Pu gain recognition at focused international meetings in our field,” says their mentor. “At both conferences, I received a number of very positive comments regarding the high quality of their contributions.”

MacKay adds, “It has been very exciting to watch them, and all of my group members, mature into seasoned scientists.”
Legislative Day Addresses Healthcare Reform

USC School of Pharmacy student organizations hosted nearly 200 participants, including industry leaders and elected officials, at the School’s annual Legislative Day. The agenda focused on advancing the profession’s range of care in the era of the Affordable Care Act (ACA) and the passage of California Senate Bill 493, which gives pharmacists healthcare provider status. The event was held at the USC Health Sciences Campus and concluded just before Governor Jerry Brown signed SB 493 into law.

“Healthcare reform gives us the opportunity to grasp what we have wanted to do—it’s a huge step forward,” said Dean R. Pete Vanderveen in his opening remarks.

Rebecca Cupp, vice president of pharmacy for Ralphs Grocery Company, offered further encouragement. “Don’t just go down this road, accelerate down it,” she told future pharmacy pioneers. “It is a very exciting time to be in pharmacy.”

State Senator Ed Hernandez, who authored SB 493, compared the ACA’s growing pains to the introduction of Medicare. He noted that the state faces capacity challenges in meeting the needs of the four to five million newly covered Californians. Hernandez—who, as an optometrist, is a healthcare provider himself—saw the California senate bill as a way to ease the strain on primary physicians while enhancing care. “I realized how underutilized pharmacists were, and we don’t have enough primary care providers to offer access to those entering the system,” he explains.

Jonathan Nelson, government and special projects manager for the California Society of Health-System Pharmacists, praised Hernandez’s passion to increase healthcare access. He also thanked Dean Vanderveen and all the others who promoted SB 493. California Pharmacists Association (CPhA) CEO Jon Roth discussed the importance of grassroots advocacy in moving vital legislation forward.

Kathleen Hill Besinque—CPHA president-elect and School of Pharmacy assistant dean for curriculum and assessment—urged students to follow their passion and to remember that “no” never means “you give up, just that you have to find a different way.”

Legislative Day is hosted by the School’s student pharmacy organizations under the leadership of Lillian Lee, Theresa Tran and Joseph Lee. The program concluded with a message from Victor Law, a board member of the California State Board of Pharmacy and chairman of United Pharmacists Network, a platinum sponsor of the event for many years. Ralphs was also a platinum sponsor. Gold sponsors included CPHA and the South Bay-Long Beach Society of Health-System Pharmacists.

Students Clerk in Japan

Fourth-year PharmD students Ha Nguyen and Tram Nguyen traveled to Japan in November to complete a six-week international clerkship at Tokyo University of Pharmacy and Life Sciences, organized by the USC School of Pharmacy’s Office of Global Initiatives, headed by Associate Dean Michael Wincor.

“The most interesting aspect of the clerkship for me was the interaction with the students, professors and pharmacists in both community and hospital pharmacies,” says Ha, who hopes to practice pharmacy and teach after graduation. “I think nowadays, beside knowledge and skill, it is really important for students to develop an appreciation and passion for the pharmacy profession.”

For Tram, the opportunity was particularly relevant to her future aspirations.

“I hope to have my own independent pharmacy in a Vietnamese community,” she says. “The Japanese pharmacy system is quite similar to the one in Vietnam, so I hope what I learned from this clerkship will be able to help me improve the Vietnamese system in the future.”

This international clerkship experience is just one example of how the USC School of Pharmacy provides students with unique experience on a global scale, notes Wincor.

Pu Shi, PhD candidate, will be honored with a Phi Kappa Phi award for his research accomplishments and publication, in Advanced Materials, of “Triggered Sorting and Co-Assembly of Genetically Engineered Protein Microdomains in the Cytoplasm—A Milestone in Synthetic Organelle Development.”

USC’s chapter of the American Pharmacists Association Academy of Student Pharmacists claimed several patient care and community service project awards at the annual meeting in March. USC’s Operation Diabetes program topped the nation, while USC’s Operation Heart was second runner-up nationally and USC’s Operation Self-Care was the Region 8 winner.

The USC chapter of the California Society of Health-System Pharmacists received a 2013 Student Chapter of Distinction Award for excellence in finance, business processes, membership and membership satisfaction. USC has won the distinction two years in a row.

PhD candidate Jordan Despanie has been awarded a Clinical and Translational Science Institute predoctoral training fellowship.

USC School of Pharmacy’s Theta Chapter of the Rho Chi Society received the 2014 national Chapter Achievement Award in March.
This year, more than 150 USC pharmacy students benefited from scholarships funded by donors. Help the USC School of Pharmacy continue to attract and retain the very best and brightest students by making a gift to support student scholarships today. To learn how to structure a gift customized to your financial planning, contact Mary Wackerman at 323-442-1360 or mwacker@usc.edu.

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“You offer us financial support and also a hope and belief in us—reminding us that all our dreams are possible.”

NANA NUMAPAU, PharmD Class of 2014, addressing donors at the Annual Scholarship Luncheon

Photo above: Andy Gelejian, Lauren Kawabata, Nana Numapau, Staci Tagawa and Kevin Henke were the student speakers at the 2014 Scholarship Luncheon.
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