

# SCHOOL OF PHARMACY *NEWS*



University of Colorado at Denver  
and Health Sciences Center

## Bacteria that fight back

By Kenna Bruner  
Office of Public Relations

**Due to global overuse and misuse of antibiotics, wonder drugs developed in the 20th century are not only becoming ineffective against the microbes they were designed to fight, but the drugs themselves are contributing to the growing worldwide problem of drug-resistant bacteria.**

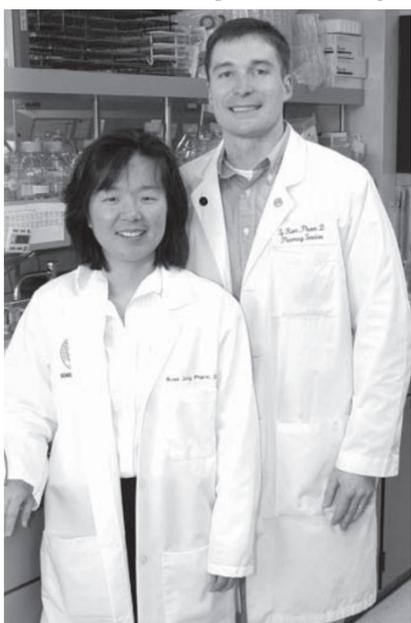
Microbes thought defeated long ago, including *Pseudomonas aeruginosa*, are mutating to resist not just the first line of pharmacological defense, but the drugs of last resort. When these bacteria overrun a weakened immune system, the person suffers a life-threatening infection.

In order to defeat this deadly pathogen, researchers at the CU School of Pharmacy first must know their enemy, and what they've discovered so far is that *Pseudomonas aeruginosa* is a fascinating adversary. *Pseudomonas* deploy multiple levels of defense and will even cooperate with each other to resist the effects of antibiotics.

Rose Jung, PharmD, assistant professor in the Department of Clinical Pharmacy at the CU School of Pharmacy, and Ty Kiser, PharmD, a fellow in critical care and infectious disease at the school, are mercenaries in a high stakes microscopic war.

"Misuse and mismanagement of antibiotics have contributed to drug resistance," said Dr. Jung. "Antibiotics can be our friend, but not all illnesses require antibiotics. Educating people about this is very important."

Until a few years ago, multi-drug resistant infections from *Pseudomonas* bacteria were unheard of outside hospitals where the concentration of chronically ill patients, hands-on medical care and broad use of antibiotics contribute to an environment ripe for cultivating hardy bacteria strains. Antibiotic-defiant



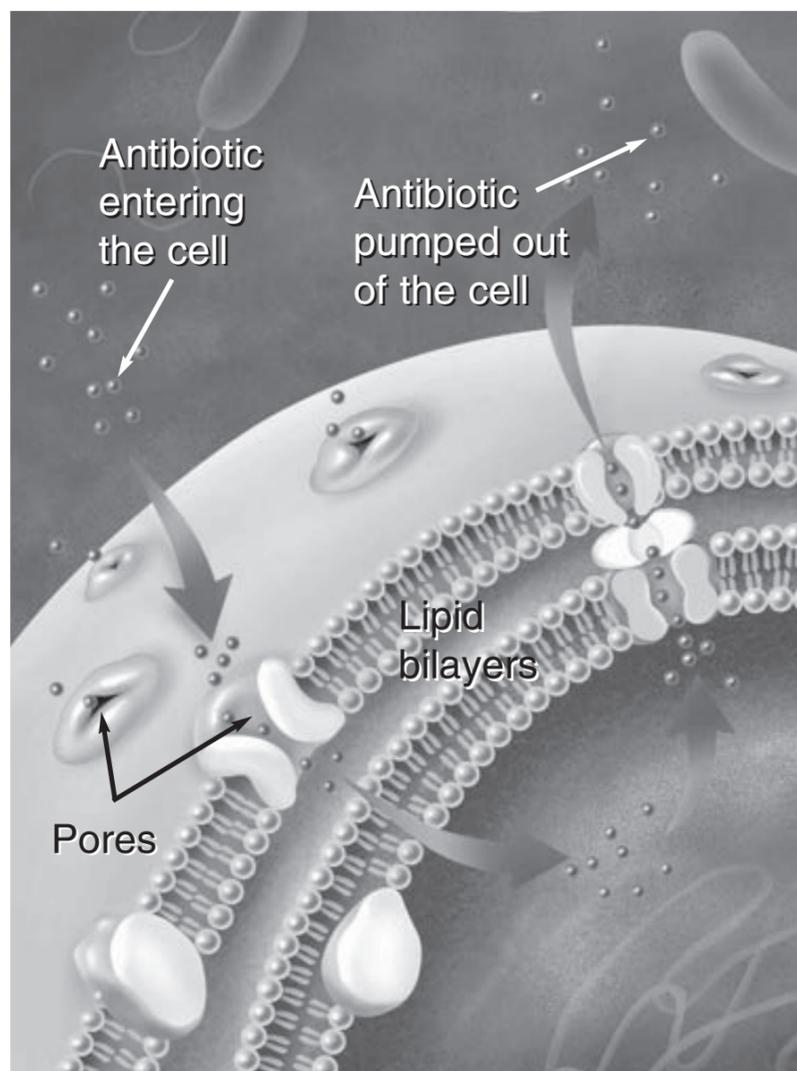
Rose Jung, PharmD, left, and Ty Kiser, PharmD, in their laboratory in the CU School of Pharmacy.

"One of the scariest things about these bacteria," said Dr. Kiser, "is that there aren't many new drugs in the pipeline to fight them. We're seeing strains of *Pseudomonas* that are resistant to about all the antibiotics we have."

Antibiotic resistance occurs when bacteria change in a way that reduces or eliminates the effectiveness of the drugs. These changed bacteria survive and thrive, making them tougher to fight with available drugs. Antibiotics prescribed for decades to fight infection also indiscriminately cut a swath through microbe communities living in the body destroying normal bacteria. When

*Pseudomonas* account for more than 10 percent of all hospital-acquired infections, according to the Centers for Disease Control and Prevention (CDC). And resistant strains are now infecting people without a connection to a hospital.

Notorious for its resistance to antibiotics, *Pseudomonas aeruginosa* is an opportunistic pathogen that causes complicated and life-threatening infections. Although the bacteria do not usually pose a threat to a healthy person, *Pseudomonas aeruginosa* can be passed from one person to another, causing grave infections in someone with a compromised immune system or recovering from an operation. It is a frequent cause of hospital-acquired infections such as pneumonia, urinary tract infections and bacteremia.



*Pseudomonas* exhibits a frightening ability to expel the very antibiotics that are supposed to kill them. Illustration by Laurie O'Keefe, medical/biological illustrations.

good microbes are destroyed as a result, the drug-resistant bacteria move in, take up residence and flourish.

Throughout the world today, nearly all significant bacterial infections are becoming drug-resistant, according to Drs. Jung and Kiser. The CDC calls antibiotic resistance one of the world's most pressing public health problems.

The World Health Organization reports that worldwide, 60 percent of hospital-acquired infections become drug-resistant. Estimates are that infections from drug-resistant bacteria kill 40,000 people in this country each year.

*Pseudomonas* bacteria are living benignly in the intestines of about 3 percent of the world's population or about nine million Americans. When a healthy body undergoes significant physical stress due to surgery, injury or a disease such as cancer, the bacteria respond by storming out of the gut to run amok in the bloodstream. Once established, they are difficult to eradicate.

Worrisome, and yet oddly fascinating, is the ability of *Pseudomonas* bacteria to adapt and survive despite an onslaught on antibiotic treatments. These single cell organisms' ability to fend off drugs is remarkably sophisticated and nothing short of amazing.

"There are a lot of things we don't know about this bacteria," said Dr. Jung, "but we do know they are more intelligent than other bacteria."

The researchers will often stain *Pseudomonas* to highlight it under the microscope. Glowing an eerie blue-green, they reveal a sophisticated arsenal for survival. A unique mechanism developed by *Pseudomonas* is their efflux pumps that discharge waste materials from inside the organism, including antibiotics and other drugs. The efflux pumps operate like a sump pump in the basement of a house; as soon as antibiotics get into the bacterium, the drug is immediately pumped back out.

These chameleon-like bacteria will develop a bio-film, a slimy material they produce when threatened, so that drugs slide right off. The wily bacteria concoct enzymes that break apart the antibiotic molecules; they change bonding sites to keep drugs from docking onto them and they alter their genes to

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## Edward Skaff closes his pharmacy and opens new business

By Kenna Bruner  
Office of Public Relations

In the School of Pharmacy room that bears his name, Edward Skaff, BS '59, reflected on his decision to leave retail pharmacy after 44 years to start a new business venture.

The pharmacy career that brought him satisfaction and joy for so many years had become frustrating due to burdensome managed care regulations, third-party prescriptions and shrinking profit margins. It was time to try something new, and he didn't have to go far to find it.

Skaff sold his Evergreen Drugs pharmacy to Safeway and this summer is opening a liquor store that features a walk-in wine cellar, a wine-tasting room and a walk-in cigar humidior. Since the three pharmacies he has owned in Colorado had liquor licenses, he is already familiar with the retail liquor business.

His decision to close the stores was difficult, he says, and caused by multiple factors. With the rising control wielded by managed health care, an independent pharmacy is



Standing next to a painting of the original location of his first retail pharmacy store in Evergreen, Colo., Edward Skaff reminisces about his 44 years as an independent retail pharmacist.

filling more than 90 percent of its prescriptions for third-party insurance companies that dictate what drugs and manufacturers to use. Mail order prescription filling is becoming mandatory in many cases, preventing patients from using their local pharmacy at all.

Added to the mix was the rocky

start of Medicare's new prescription drug benefit and its often slow reimbursement.

"Prescription Benefit Managers (PBMs) dictate where a patient must get a prescription filled and what the price is," said Skaff. "So a pharmacist becomes a billing agent rather than a health consultant. Pharmacists today have a lot of challenges ahead of them." (PBMs monitor prescription claims for managed care organizations tracking the drugs and pharmaceuticals that are prescribed by a plan's participating physicians.)

Skaff's interest in retail business began early when he worked in his father's grocery store in the San Luis Valley of southern Colorado. Not content to follow in his father's footsteps, Skaff decided to combine retail with his other interests in medicine, health and science. Retail pharmacy was the perfect fit for him.

He opened his first store in 1962 in Evergreen, Colo. Two other stores followed, one in Aspen Park near Conifer, and another in Idaho Springs. The Evergreen location was the first to open and the last to close.

In those early days, his salary from the first store was a whopping \$400 a month. He sold hand lotion he whipped up in his home kitchen. Less than 10 percent of the drugs on the shelf today were available 40 years ago, he says, and it was possible to stock a pharmacy for \$20,000 compared to today's cost of \$250,000.

Skaff's stores were at the heart and soul of the communities and provided customers with more than medications and personalized patient care. They were general stores where residents in those small communities could buy a variety of merchandise, from greeting cards and gifts, to fabric and fountain pens.

The heartfelt comments and letters to the editor in Evergreen's newspaper attest to the void left by his pharmacy's closing. And while he's leaving pharmacy practice with conflicted feelings, Skaff nevertheless remains optimistic that the profession is being left in the capable hands of students graduating from the School of Pharmacy. A long-time supporter, Skaff says it's important to give back to the school that helped make him a successful pharmacist with a thriving business.

"The school gave me a good foundation in pharmacy and a career that I've loved," he said. "I would like others to go on with a career in pharmacy and I hope the independent businesses survive."

### Bacteria that Fight Back *Continued from page 1*

adversely affect the different antibiotics that are used against them.

And like in old Western movies when the pioneers would circle their wagons to defend themselves against marauders, microscopic *Pseudomonas* bacteria in effect do the same. They form Lilliputian "villages" by connecting with each other in order to escape attack from drugs and the body's white blood cells. It appears, say Drs. Jung and Kiser, that in the middle of these villages are roadways by which the bacteria can transport and share nutrients.

In what may be *Pseudomonas*' most amazing feat, they communicate with each other. Drs. Jung and Kiser believe that the bacteria produce certain types of chemicals allowing for communication.

"These bacteria are so smart. We're seeing all kinds of different mechanisms of resistance," said Kiser. "What we're trying to do is figure them out and learn what kinds of pumps they are expressing, which pumps affect different drugs, and if there is a way we can affect the pumps to utilize antibiotics that will kill the bacteria and treat the patient."

In the meantime, a significant number of hospital patients must face infection virtually unarmed, since our antibiotic arsenal is becoming increasingly compromised. Drs. Jung and Kiser conducted a national survey contacting Intensive Care Units around the country. Survey results show that in the last five years, there has been a dramatic increase in the number of multi-drug resistant bacteria, meaning the bacteria can't be treated with any known antibiotics.

In 2000, 14 percent of all bacteria were resistant to marketed antibiotics, according to their study. That translates to one out of five patients infected with bacteria who did not respond to any drug treatment.

"There are times when we have to tell a patient there are no more antibiotics to use. People are dying because of it," said Jung.

What Jung and Kiser hope their research ultimately accomplishes is an understanding of this dangerous yet intriguing pathogen in order to break through its many defenses. They're working as if our lives depend on it - because they do.

### SCHOOL OF PHARMACY NEWS

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## Dr. John Carpenter to serve on FDA committee

The Federal Drug Administration (FDA) has appointed John Carpenter, PhD, to serve on its Advisory Committee on Pharmaceutical Sciences.

The FDA describes the function of the committee to "...provide advice on scientific and technical issues concerning the safety and effectiveness of human generic drug products for use in the treatment of a broad spectrum of human diseases..., to the Commissioner of Food and Drugs.

"The committee may also review agency sponsored intramural and extramural biomedical research programs in support of FDA's generic drug regulatory responsibilities." The 13 committee members "are selected by the commissioner from among authorities knowledgeable in the fields of pharmaceutical manufacturing, clinical pharmacology, pharmacokinetics, bioavailability and bioequivalence research, the design and evaluation of clinical trials, laboratory analytical techniques, pharmaceutical chemistry, physiochemistry, biochemistry, biostatistics and related biomedical and pharmacological specialties."

Dr. Carpenter's research experience and views on protein therapeutics will have a positive impact on the drug reviews and policy recommendations coming from this committee.

### Cultural sensitivity is threaded through course curriculum

The School of Pharmacy's ongoing commitment to promoting and enhancing cultural diversity has culminated in a program whose focus is as diverse as the patients that students encounter in practice.

The Cultural Competency Education Program integrates cultural competency and sensitivity throughout the curriculum to assure that graduates enter practice able to provide competent care to an increasingly diverse population of patients.

"As a pharmacist, you don't know who is going to walk through the door asking for your help," said Ralph Altieri, PhD, associate dean for academic affairs. "A student who graduates from our school must be a part of the solution, to actively address health disparities and provide services where they're needed."

In didactic courses, cultural competency education focuses on therapeutics issues, such as the differences among groups in prevalence of diseases and differences in response to specific medications. Groups are defined by age, gender, ethnicity and race.

In the professional skills development courses, students learn skills associated with pharmacy practice. Two activities that incorporate cultural competency education are simulated patient encounters and case-based studies in which students must resolve cases and make recommendations on drug therapy for a variety of disease states and conditions.

Students work up cases from patient charts while taking into consideration such factors as insurance, financial constraints, relationships, mental history, chronic conditions and medications.

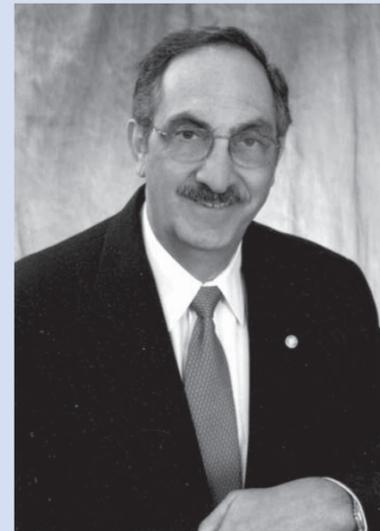
More cultural competency education occurs in active learning courses. Students provide patient counseling and clinical pharmacy services that focus on rural and underserved minority populations through programs at community health centers, health fairs and brown bag sessions.

"We teach them to treat the whole patient, not just the medical condition," said Connie Valdez, PharmD, MSED, an instructor in Professional Skills Development courses. "Students must look at whether medication is feasible, does it fit in with the patient's culture, and can they afford it. A student told me she now looks at a patient as a person, not as chart or prescription.

That, to me, is success."

## Alumnus celebrates his Italian heritage

By Kenna Bruner  
Office of Public Relations



John Panepinto, BS

On a crisp fall day in 2004, John Panepinto, BS 1965, walked past the Christopher Columbus monument by the library in Pueblo, Colo., as he had done innumerable times before. But on that particular day, he happened to stop and read the plaque on the statue. It was then that he realized the monument erected in 1905 would turn 100 in 2005.

A second generation Italian-American and charter member of the Pueblo chapter of the Order Sons of Italy in America, Panepinto didn't want such a significant date to pass unnoticed. His desire to observe the anniversary of the day the monument was dedicated a century ago led to a commemorative publication of Italian-Americans' history in Pueblo and a special Columbus Day observance in 2005.

The project was shaped by a respect for the bravery and passion of Italian immigrants who arrived in Colorado seeking a better life. Pueblo County has 150,000 residents - 15 to 20 percent of whom are of Italian descent. Panepinto hoped they would feel a sense of connection to their roots and to the community.

"As a group, we wanted to pay homage to the pioneer folks who came to Colorado with nothing but a dream to make a new life for themselves," said Panepinto, a pharmacist and staff manager at Albertsons Grocery Warehouse. "They were so grateful for the opportunity to live here that they wanted to honor Columbus who had opened up a new world to them where they could celebrate their freedom. I felt like they deserved the recognition."

The School of Pharmacy alumnus strove to make the 100th anniversary celebration publication a medium for celebrating the community's Italian background. The book illustrates the cultural richness of the Pueblo area and features historic photographs, stories and family histories.

The national Sons of Italy organization is using the publication as a model for its other lodges to follow.

The bust of Columbus on a marble pedestal was presented to the city of Pueblo by the Christopher Columbus Lodge and Columbian Federation of Italian Societies in the United States. The lodge president at the time was from Pueblo and was instrumental in getting the statue placed there. In 1905, Colorado became the first state to observe a special day honoring the Italian explorer.

A highlight of the project for Panepinto was learning about the family histories of people in the community. He learned that the grandparents of one of his friends came to Pueblo from the same village in Sicily as his own grandparents. The immigrants - grandparents of many in the Sons of Italy lodge - worked in the mines and smelters or farmed or owned grocery stores.

"Many of us remember the stories our grandparents told, but we'll be losing that history someday, so that's why I was pushing for the book," he said. "If we don't try to save those stories, they will someday be gone."

For copies of the booklet call 719-561-8966 or e-mail regina-john@comcast.net

## What will the pharmacy profession look like in 2015?

By Kenna Bruner  
Office of Public Relations

By the year 2015, pharmacists will be the primary health care professionals responsible for providing patient care that ensures optimal medication therapy outcomes, according to Lucinda Maine, PhD, vice president and CEO of the American Association of Colleges of Pharmacy in Alexandria, Va.

Dr. Maine's presentation to faculty and students at the annual Marguerite Holden Lecture on Feb. 10 focused on the consensus statement titled Future Vision of Pharmacy Practice composed by the Joint Commission of Pharmacy Practitioners (JCPP).

As primary medication therapy managers, pharmacists will interact with patients and health care professionals from other disciplines to be the most trusted and accessible source of medications.

"Nobody else comes close to knowing what you as students already know about medication," said Dr. Maine. "We can point to practices across the country in all setting where pharmacists have made a difference in the way patients understand and use their medications, thus saving lives, saving dollars, and maybe saving our profession."

The JCPP articulated the vision for how pharmacy could be practiced in 2015 and how the profession will benefit society. Established in 1977, the JCPP serves as a forum for discussion on issues of importance to the pharmacy profession. Chief executive and elected officers of national pharmacy organizations meet regularly to discuss critical issues and consider what the profession's future might look like. The culmination of the most recent planning efforts was the endorsement in 2004 of pharmacy's 2015 vision.

"We have essentially been saying this is pharmacy's future since 1989, so why did we think it would make any difference for us to put it on paper," said Dr. Maine. "Because the change we wrestled over, worried about, and finally implemented in the 1990s - that every graduate of every college of pharmacy in the United States finishes school with a doctor of pharmacy degree - is attributed as a driver that would make the most difference."

Dr. Maine also referenced a



Lucinda Maine, PhD, talks with pharmacy students at a reception following her presentation on what the future may hold for the profession.

report released by the Institute of Medicine which stated that as many as 100,000 people die every year due to medical errors. That report and others since have stated that medications that fail to perform in the way they are intended or that are not well managed can cause patient deaths as well.

"The evidence is unassailable, that just because the FDA approves

a drug and a doctor prescribes it, it's not always true that the drug is safe," she said. "Medication use is complex. It takes a real expert, supported in a system that allows that expertise to be put to good use to avoid unintended consequences of medication use. If we use pharmacists' talents correctly and collaboratively, it really does make a difference. That's what pharmacy prac-

tice should look like in 2015."

To illustrate her point, Dr. Maine talked about *A Whole New Mind*, a book by Daniel Pink that has become her "bible" for describing how the pharmacy practice of the future must evolve. The information age is giving way to the conceptual age, according to the book, and the successful worker of the future must integrate creative complex processing with the knowledge and analytical side of the brain.

"Being able to take complex processes, like chronically-ill patients with three or four co-morbidities and 12 concurrently prescribed therapies, some of which are high tech and require careful management, and bring the processes together in one treatment plan is what pharmacists do.

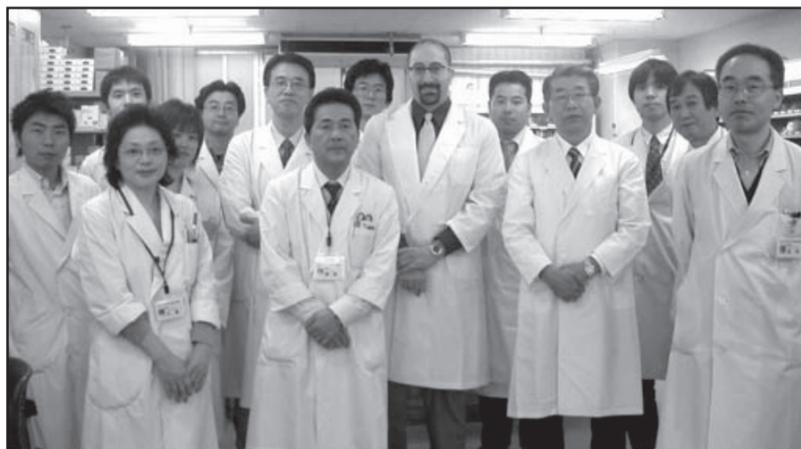
Pharmacists bring together all levels of complexity in their work," she said. "This is truly expertise unparalleled."

## Clinical pharmacy instructor invited to Japan

For 16 days in March, Joseph Saseen, PharmD, shared his expertise in clinical pharmacy with pharmacists and educators in Japan.

An associate professor in clinical pharmacy at the School of Pharmacy, Dr. Saseen was invited by Japan's Ministry of Health, Welfare and Labor to participate as a visiting professor in the Project for the Promotion of Advanced Research on Medical Safety.

Pharmacy education in Japan is undergoing a significant change. Four-year degree programs are expanding to a six-year degree, as is the standard in the United States. Pharmacy education in Japan has traditionally focused on pharmaceutical science over clinical pharmacy. A sweeping redesign of the curriculum is underway to shift the



Joseph Saseen, PharmD, (center) shares his expertise on pharmacy education with Japanese educators.

focus toward a more balanced program that will include enhanced instruction on pharmacotherapy and evidence based medicine. Their experiential training component has been 12 to 18 weeks, while in Colorado, students get 42 weeks of clinical experience.

Dr. Saseen, who also holds an appointment in the School of Medicine, teaching family medicine residents about medication, presented a seminar

on Incorporating Evidence Based Medicine into Clinical Pharmacy Practice Education, and a plenary session on Educating Clinical Pharmacists to Improve Public Health by Reducing Cardiovascular Disease in various settings in Tokyo and surrounding prefectures.

"I looked at what their needs were and made recommendations based on how we teach students evidence based medicine and how we integrate evidence based medicine into our therapeutics instruction," said Dr. Saseen. "The comparison was like night and day. I came back with the realization that the pharmacy profession in America is a lot more advanced than we think it is."



Dr. Saseen (right) meets with pharmacists in Tokyo.

## Students gain experience at Colorado Area Health Education Centers

Most people do not know how much effort goes on behind the scenes to set up a rotation experience outside the Denver-Metro area.

Practice sites anywhere beyond a reasonable daily commuting distance require a six-week relocation for each student. There is not time between rotations for a student to conduct a search for an apartment nor is a stay at the local YMCA a likely option. Instead the School of Pharmacy's Office of Experiential Training must ensure reasonable housing for students during their time on these rotations. That number is approaching 200 per year.

Much of the effort is accomplished with the dedicated help of the Colorado Area Health Education Centers (Colorado AHECs). The AHEC system is a community and academic partnership involving USDHSC and the five AHECs, each serving a designated region of the state. These are agencies whose mission is to enhance health care in rural Colorado communities and, as part of their efforts, work within their communities to find host families for UCDHSC students on rotation.

In a recent effort by the Southeastern AHEC to encourage volunteers, an enthusiastic host family was asked to relate one of their experiences. Both student and hosts benefited from this experience. Here is the remarkable story of one of our graduates as told by her hosts, reprinted with the permission of the SECAHEC.

### "She's like family" – A note from a host family

By Tankey Lowry

Huong Pham, pharmacy graduate of 2004, met the Lowry family during her rotation at Jeff's Pharmacy in Colorado City, Colo. (Feb.-April 2004). Huong was born in Vietnam. Her life in Vietnam was a good one, her father was an attorney and her family was a happy one. But with the war, their lives took a drastic change.

At 12 years old, Huong, along with two brothers, escaped by boat to flee the ravages of war. During this time, they survived hunger, pirates and illness. Eventually, they ended up in California. They knew of a relative who lived in California and she became their hope for a new beginning.

They located the relative and stayed with her, but she soon informed them that she did not



Huong Pham and her host family in Trinidad, Colo.

have room for them nor could she afford more mouths to feed. Huong found herself and two brothers sleeping on the streets, covered with newspapers to keep warm in a

strange new country.

This is only a small part of the story of a young Vietnamese girl who came to America for the same reasons our forefathers did generations ago: freedom and opportunity. Huong struggled, became a successful hair dresser in California and had 15 employees working under her direction. She had become self sufficient and sponsored many more of her family members to become American citizens.

When her mother became ill, Huong felt helpless as she watched her mother die. She was deter-

mined to return to the education system and learn all she could about medicine and in turn, help others who were ill. With great criticism from her family in California, she applied and was accepted into the School of Pharmacy. The rest is her story of success.

Huong has truly become one of our family and she loves rural Colorado. She currently is working as a pharmacist at Wal-Mart in Trinidad, Colo. She and a nephew she is helping through college have spent holidays and other special times with us.

**Continued on Page 7...**

## Pharmacists provide health care to villagers in Ecuador

On a crisp March morning, high in the Andes Mountains of Ecuador, the people of the Ecuadorian village, Sangolqui, patiently wait for a makeshift health clinic to open. They come seeking help for a mix of maladies, from coughs and hypertension to parasites and other infections.

With the nearest doctor a three-hour trek down the mountain to the capital of Quito, clinics staffed by medical mission volunteers are a lifeline for villagers who lack even the most basic health care.

This was the first medical relief experience for Sarah Carson, P2, and Hilda Bi, PharmD, assistant professor at the University of Colorado School of Pharmacy.

They teamed up with five physicians from Boulder and Denver, a nurse from Boulder and 20 pre-medical students from CU-Boulder to provide health care to the underprivileged through The Timmy Foundation, a non-profit organization that sends medical relief teams into Third World countries.



Hilda Bi, PharmD, assistant professor, volunteers on her first medical relief experience.

With an arsenal of different classes of medications donated and brought from the United States, team members treated 200 patients



Sarah Carson, P2, tends to an Ecuadorian baby while on a medical mission.

each day for a week. They were able to dispense a month's worth of medicine. Currently the Timmy Foundation in conjunction with Tierra Nueva, a hospital in Quito, is working out a plan to provide continuous care for patients who needed long term follow-up.

"We treated a variety of infections and in one instance had a girl go into shock due to a long standing urinary tract infection that had turned into pyelonephritis, a serious kidney infection," said Carson.

"One of the physicians asked me what he should give her. I hadn't had infectious disease classes yet and I'm wondering, pyelo-ne-what? I quickly researched and recommended a large dose of Ciprofloxacin before sending her to the emergency room."

In May, they received a follow-up on the patient that stated she was treated with long term antibiotic therapy and though still weak, she was on her way to recovering completely.

"There was a good bond between the pharmacists and the physicians," Carson said. "We

worked well as a team and served as valuable resources for each other."

"When doctors would prescribe medications we didn't have, Sarah and I had to make a professional judgment about what was available to substitute," said Dr. Bi. "We didn't have a scale to weigh the children, so we had to estimate their weights to determine what dose of antibiotic was appropriate for them

while staying within the correct dosing range." With the aid of translators, Dr. Bi and Carson counseled patients about maintaining a healthy lifestyle and diet. Though she had not taken Spanish since high school, Carson counseled patients on medications as best as she could, sometimes with comical results. Once, she referred to a patient's kidneys as his "reindeers." The indigenous people spoke the native language of Cechua which made communication difficult, however Dr. Bi and Carson mentioned that though there were cultural and language barriers, it did not impede on the quality of health care given.

For Dr. Bi, the trip's highlight was seeing delight on a little boy's face when she gave him a care package containing a bar of soap, toothbrush, toothpaste and shampoo. It may have simply been a bar of soap, but to the boy who had nothing, it was treasure. "The people were so appreciative," said Dr. Bi.

She hopes to take a group of pharmacy students to Cameroon on a similar medical mission within two years.

## Student Research Forum showcases innovation and discovery

By Kenna Bruner  
Office of Public Relations

The 20th Annual Graduate Student Research Forum was held Jan. 27 with students participating from the Health Sciences Center's School of Pharmacy, as well as the schools of dentistry, medicine, nursing, and the graduate school.

The forum was funded through the American Medical Association Foundation via the Colorado Medical Society Alliance and the National Institutes of Health. A group of schools, departments, divisions and programs provided financial support to the forum for \$250 research prizes that were awarded at the event.

The primary goal of the forum is to promote advanced research studies in HSC's schools.

Elizabeth Redente, third-year PhD student, received a top overall award. Tia Estey, sixth-year PhD student, and Heather Walczak, fifth-year PhD student, each received outstanding research awards. The projects were presented through posters reviewed by a team of faculty members.

Elizabeth Redente received an award for her research project titled *Temporal Changes in Macrophage Activation May Mediate Lung Tumor Progression*. Al Malkinson, PhD, professor, pharmaceutical sciences, is her advisor.

Redente is studying lung cancer progression in mice. Researchers have a primary lung tumor model in which mice are given a chemical carcinogen to induce the growth of malignant tumors.

What she saw during the course of the tumor progression was that macrophages seemed to accumulate around the tumor. Since the macrophages didn't seem to be actually killing the tumor, Redente began looking at macrophage activation states. Macrophages typically are activated to kill bacteria or dying cells, but they can also be activated to behave in an alternative manner.

During the course of tumor development, macrophages were activated in an altruistic manner where they lost their fighter-specific abilities and weren't killing cells. Macrophages are potentially releasing growth molecules that can actually promote growth, and then switching back to their typical activation. Redente has been documenting that change.



Elizabeth Redente, a PhD student, presents her award-winning research at the annual student poster forum.

The next phase of her project will be to figure out what that change means; what is actually going on in the system; and looking at the interactions between a tumor and the cells in the environment surrounding the tumor, particularly the macrophage population.

"Until very recently, all tumor research has focused on the tumor; what's happening in those cells and what's changing," said Redente. "Now, we're thinking that maybe the environment of the cells surrounding the tumor is actually supporting the tumor."

"I was encouraged to know that other people were excited about my research," she said. "When you're a student working in a lab, you wonder if what you're doing is going to mean anything to anyone else."

Tia Estey received an outstanding research award, for her project titled *Mechanisms Involved in the Protection of UV-Induced Protein Inactivation by the Corneal Crystalline Aldehyde Dehydrogenase 3A1 (ALDH3A1)*.

Estey's research project was collaboration between the two labs in the Pharmaceutical Sciences Department. Others involved with the project are Phil Weston, professional research assistant; Miriam Cantore, visiting graduate student from Italy; John Carpenter, PhD, professor, pharmaceutical sciences; and Vasilis Vasiliou, PhD, associate professor, molecular toxicology.

The focus of this research is to understand how ALDH3A1 protects the cornea and other ocular tissues against oxidative stress. Researchers hypothesized that ALDH3A1 can protect other proteins from inactivation and damage through various mechanisms. In this project, they investigated three specific protective mechanisms: metabolism of toxic aldehydes,

chaperone-like activity, and direct absorption of UV-light.

"ALDH3A1 is one of the most abundant corneal proteins, yet its biological role remains a mystery," said Estey. "I am interested

in working toward a better understanding

of how ALDH3A1 may be involved with protecting other proteins against UV-induced oxidative stress. This project has also given me the opportunity to work with two dynamic labs, which has been both challenging and exciting."

Heather Walczak also received an outstanding research award for her project titled *Induction of Apoptosis in Colon Cancer Cells by the Non-Steroidal Anti-Inflammatory Drug Sulindac is Independent of Epidermal Growth Factor Receptor (EGFR) Expression*.

Also listed on the project's poster were Dennis Ahnen, MD, professor, gastroenterology, as principal investigator, and Pamela Rice, PhD, postdoctoral research fellow, gastroenterology.

Walczak is studying EGFR expression, signaling and NSAIDs in colorectal cancer (CRC) and hopes to further the understanding

of the mechanism by which sulindac induces downregulation of EGFR and the resulting biologic and biochemical consequences of this downregulation. In this project, they set out to determine if downregulation of EGFR is necessary for the growth-inhibitory effects of sulindac.

(Downregulation is a decrease in the number of receptors on the surface of target cells, making the cells less sensitive to a hormone or another agent.)

Previous studies have shown that increased signaling through the EGFR family of receptors is a common, early event in CRC and substantial data suggest there may be interactions between the effects of NSAIDs and EGFR signaling.

"Previous data from our lab suggests that downregulation of EGFR signaling by sulindac may occur, at least in part, by inhibiting activation and expression of EGFR. This inhibition may account for part of the inhibitory and chemopreventive effects of sulindac," said Walczak. "In the clinic, EGFR inhibitors have thus far shown limited effectiveness."

"Although the downregulation of EGFR is but one of sulindac's effects, I am hoping to be able to increase the understanding of the mechanisms responsible for the growth inhibitory effects of sulindac, thus leading to the development of more effective and less toxic chemopreventive and chemotherapeutic agents," she said.

### Headache poster winners



P1 students, (L-R) Alexandria Affleck, Jaime Mesenbrink, Filmon Ghebreghiorghis, Caleb Burkitt, Sara Lake and Kyrian Uzeoshi, and Dr. Christopher Turner, with the poster that won them a pizza lunch - and some praise. The competition focused on producing educational material that might be posted in a community pharmacy setting.

## Health fair benefits community and students

At the Native American Cancer Research's Fourth Annual Get on the Path to Wellness Health Fair held April 1 in Denver, School of Pharmacy students had the opportunity to educate and counsel Native American patients on a variety of health topics.

Throughout the course of the day, 44 pharmacy students assisted in providing free health awareness and educational screening services that included blood pressure screenings, BMI measurements, cholesterol and glucose testing/screening, and bone mineral density screening. They also provided patient education on heartburn awareness, diabetes, hypertension, dyslipidemia, cardiovascular risk, how to use over-the-counter/alternative/prescription medications, pediatric issues, and osteoporosis.

Several school of pharmacy faculty and adjunct faculty participated in precepting the students during the health fair.

Participation in the health fair is an opportunity for students to practice their patient counseling skills and to provide community services, said Connie Valdez, PharmD, assistant professor of clinical pharmacy. The health fair connects American Indians in the Denver Metro area to health care providers and other resources to help them build and maintain healthy lifestyles.

"We could not have participated in the health fair at this level without student assistance," said Dr. Valdez. "As the afternoon became busy, many students stayed for an extended time to assist with the increased patient flow. Overall, the health fair was very successful."

### Two pharmacy students share their experiences



Health fair an opportunity for students to hone their counseling skills.



Faculty and students volunteer at the Get on the Path to Wellness Health Fair.

For Olivia Rapacchietta, P2, and Nick Pollard, P3, the highlight of the day was taking part in a ceremony honoring Native American cancer survivors. They appreciated the opportunity to provide valuable health screenings and patient education to the Native American population that faces a variety of challenging health disparities, such as the high frequency of diabetes, hypertension, dyslipidemia, obesity and osteoporosis.

Rapacchietta is president-elect of the Student National Pharmaceutical Association. Her varied duties were to assist Dr. Valdez with planning the health fair, train and prepare student volunteers, collect over-the-counter medication samples that were given to patients, and oversee the day's activities.

"The health fair was a great opportunity for students to get involved and be exposed to an amazing and unique cultural experience," she said.

### AHEC Students

*Continued from page 5*

Huong has shown us determination, an unbelievable work ethic, humble gratitude and such a wonderful, giving spirit! She has restored our faith in America. She says that, "Vietnam gave me birth, but America gave me life."

Our family has been blessed by being a part of Huong Pham's life and we will have many more special times together. Thanks to SECAHEC for working with these won-

derful students and allowing everyday people like us to provide support as a host family while the students fulfill their dreams!

Anyone interested in hosting students should contact the Colorado AHEC System Core office for more information at 303-724-0360, toll free 1-866-474-1022, or visit the AHEC website at [www.uchsc.edu/ahec](http://www.uchsc.edu/ahec).

"The best part of the day was participating in the honoring of Native American cancer survivors. The celebration included a prayer and song in their native tongue that was beautiful to hear."

Pollard split his day with making sure activities went smoothly and helping run the bone density circuit. He found the patients he counseled to be receptive to the recommendations he gave them and eager to learn more about their health. There was one elderly woman, however, who may have had osteoporosis and who resisted his advice to take calcium and vitamin D supplements and visit her physician for a diagnosis.

"I spent much time explaining to her about why osteoporosis can be such a debilitating disease and how she could easily slow its progression," he said. "She was very set in her ways, but I think I was able to get through to her in the end."

## SNPhA receives *Holden Community Services Award*

The Student National Pharmaceutical Association (SNPhA) was selected to receive the 2006 *Holden Community Services Award*.

The student members of this organization have established several community education programs covering a wide range of health issues for varying populations.

### Examples include:

- reviews of patient charts for the Denver Indian Health & Family Services Clinic and the recommendation for medications under the guidance of a faculty member (DIHFS does not have a pharmacist on staff)
- blood pressure monitoring and patient counseling as part of the Black Church Initiative Health Fairs
- provision of the pharmacists perspective on health issues facing the gay, lesbian, bisexual and transgendered community at GLBT Community Center-run medication review sessions
- adolescent counseling programs and discussions of good medical information sources

In addition, SNPhA members hosted a multicultural food celebration, raising funds for Cash Smith and his family, Hurricane Katrina transplants to Colorado; worked with the Platte Valley Medical Center to immunize the indigent and elderly during flu shot clinics; and assisted the campus diversity office's Health Careers Pre-Collegiate Development Program in motivating underrepresented students to pursue higher education and health care training in particular.

The funds awarded to SNPhA will further the members' work in similar projects during 2006-2007.

## A day in Frisco



Nearly a dozen students took advantage of attending the annual ASHP meetings in San Francisco in March. Besides attending policy and educational sessions and meeting with area alumni at a dinner provided by the dean, Lam Nguyen, Ashley Hall, Ashley Garcia, Shannon Matsko, Dominique Minjarez and Amber Majors took a tour of the city.

# Congratulations, School

## Doctor of Pharmacy — May 2006

Jaime Elaine Anderson  
*Phi Lambda Sigma*  
Stephen James Arnold  
*Rho Chi*  
Etieonyong Gibson Asuquo  
Malisa Lorene Bassett  
Mulugeta W. Berhe  
Richard James Blaskovich  
*Rho Chi*  
*Phi Lambda Sigma*  
Roy Dean Brunson  
*Rho Chi*  
Kelly Gault Butler  
Taite Pete Byerly  
Theresa Thi Thu Tam Cao  
Joseph Roy Cardwell  
Anna Elizabeth Casullo  
Vincent Todd Celio  
Christopher Anthony Christiansen  
Angela Cook  
Anthony Scott Cooper  
Jennifer Claire Cooper  
*Rho Chi*  
Brenda Correa  
Meritha Rose Corzatt  
Susan Irene Diana  
Jessica Jordan Dover  
Carolyn Ann Dunn  
*Phi Lambda Sigma*  
Anastacio J. Duran  
Meghann Lucille Edwards  
Duane Eshima  
Cheryl Ann Ewing  
Lauren Alice Fitzpatrick  
*Rho Chi*  
Laurel Kathleen Forrest  
Courtney Jane Frisch  
*Rho Chi*  
John Leonard Giordana

Katey E. Girard  
*Phi Lambda Sigma*  
Asfawosen Kiros Haileselassie  
Steven Bruce Harlass  
Christy Lynn Harmon  
Heather Ann Hess  
Victoria Renee Holts  
Wendy Joyce Johnson  
*Phi Lambda Sigma*  
Sun Hwa Jung  
Theodore W. Kalkreuth  
Fitsumberhan Kidane  
Amanuel Girma Kifle  
Kari Dawn Kingery  
Hung Thanh Le  
*Rho Chi*  
Jenny-Anh Phuong Le  
Nga Thi Le  
Stephanie Jones Lee  
Dawn Lefevre  
Daniel Rocco Liccione  
Michael Eugene Long  
Jaime Christine Longbottom  
Chad Edward-Carl Lundin  
Francis Ryan Macalalag  
Adrienne Margaret Mackzum  
*Rho Chi*  
Kerri Dawn Martinez  
*Rho Chi*  
*Phi Lambda Sigma*  
Molly Leigh McAleer  
Yoseph Gabre Kristos Mekonnen  
*Rho Chi*  
Lynette Dawn Melgosa  
Kasinda Lee Mercer  
Eric Mudd  
*Rho Chi*  
Rebecca Lynn Muniz-Hansen  
Sara J. Murphy  
*Rho Chi*

Steven Paul Naccarato  
Andrew Bernard Newland  
Khue Nguyen  
Phuong Mary Nguyen  
Thanh-Ngoc Thi Nguyen  
Thuy-Van Ngoc Nguyen  
Bernadette Azinwi Niba  
Edward Paul O'Donnell  
*Rho Chi*  
*Phi Lambda Sigma*  
Gregory Hamilton Palmrose  
Henna R. Patel  
Rashmi Babubhai Patel  
Kieu Tu Cong Pham  
Valentina Pidkalyuk  
Bryn Elizabeth Pieschel  
Kimberly Dawn Portzline  
Oswaldo Ramirez  
Eric Thomas Rewerts  
Jaclyn Michelle Ripley  
Melissa Renee Rodgers  
Aaron Michael Romero  
Kathryn Maureen Ryer  
*Phi Lambda Sigma*  
Danielle Olivia Salaz  
*Rho Chi*  
Sara Ann Sandoval  
*Phi Lambda Sigma*  
Laura Marie Schiefelbein  
*Rho Chi*  
Eric Lee Schulteis  
Angela Marie Schuman  
Nellianna Shaffer  
Parisa Shahmohammadi  
*Rho Chi*  
Michael Evan Shore  
*Phi Lambda Sigma*  
Megan Dian Short  
*Rho Chi*

Sara Kathleen Singh  
Amy Marie Sion  
*Phi Lambda Sigma*  
Jaime Jo Smith  
Jennifer Elise Spears  
*Phi Lambda Sigma*  
Jason Elliott Strasser  
Heather Elizabeth Swanson  
Kelly Patrick Taylor  
Damian Lamont Thrasher  
Davy Som To  
*Rho Chi*  
*Phi Lambda Sigma*  
Duy Thai Tran  
Thien-Thanh Thi Tran  
*Rho Chi*  
Rhiannon Verner Trepanier  
Jeremy Jason Trujillo  
Cortney Michelle Turnbow  
*Rho Chi*  
Laura Ann Duckworth Van Horn  
*Rho Chi*  
Kristen Nicole Villalta  
*Rho Chi*  
Melissa S. Von Stein  
Anthony Sean Wall  
Janell Lee Watkins  
Stacey Jo Weise  
Jill Sanders White  
Abraham T. Wick  
*Phi Lambda Sigma*  
Wiyanto Winatal  
*Rho Chi*  
Sommer Donnielle Zarbock  
*Rho Chi*  
*Phi Lambda Sigma*



# of Pharmacy Graduates



## Doctor of Philosophy

### December 2005

Yvonne Lentz,  
Pharmaceutical Sciences  
Brante Sampey,  
Toxicology

Patrick Kerzic,  
Toxicology  
Andrew Kosky,  
Pharmaceutical Sciences  
Mayank Patel,  
Pharmaceutical Sciences  
Shouvik Roy,  
Pharmaceutical Sciences  
Christina Vessely,  
Pharmaceutical Sciences

### May 2006

Christopher Crowell,  
Pharmaceutical Sciences  
Derrick Katayama,  
Pharmaceutical Sciences

## Doctor of Pharmacy - Non-traditional program

### December 2005

Kimberly Clawson Huber  
Celina Dara  
Tracy Humphrey  
Deborah Stevens-Conrad  
Troy William Stubbings

Lewis Joseph Gryziewicz, Jr.  
Sean Keefe  
Matthew Kern  
Bryan D. Killam  
Kathleen Anne McCartney  
Sharon Ann Mills-Warson  
Kamla Devi Oodal  
Sindhu Sudhakaran Pampati  
Simona Peker  
Ryan Merrill Stice  
Adrian Vega  
Frank Joseph Yunker

### May 2006

Ariane Danielle Austin  
Franklin Breve  
Janice L. Frobels  
Elise Jeanne Fuller



## Oh, the places you'll go and the people you'll meet

Some of our students who participated in foreign rotations have provided us with accounts of their experiences. Over the next two pages are their stories:

By Michael Shore

When I landed in Santiago, Chile after a nearly 27-hour journey, I was ready to stretch my legs and see what my rotation plan had in store for me. I was lucky enough to have family in Chile, waiting for

me outside of customs where an official blurted out a series of unintelligible phrases and I instinctively handed him my passport and documents. A wave of panic rushed over me as I realized that the "whole language thing" was going to be first priority on the list of things to get acquainted with. By the time I left, I can honestly say that my level of communication far exceeded the needs of a retail or hospital setting.

Chile has so much to offer. I set up a rotation with Cruz Verde, the

Chilean equivalent to Walgreens. I spent the first few days getting to know my three "jefas" (bosses). They took me to the break room, poured the coffee, and we talked about where I was from and what I was going to do in the pharmacy.

After hours of chatting, we went on a tour of the pharmacy and it was immediately apparent that the differences practicing in Chile versus the United States were going to be huge.

Chilean pharmacists don't waste time counting pills for dispensing. The manufacturers have already boxed the pills and put them in common quantities. If you take Lipitor, it comes in a box of 28 pills already unit dosed and blister-packed. Need a prescription for Lipitor? Not in Chile. If you think you need cholesterol-lowering medication, just ask for it by name and it's yours! Some medications do require prescriptions like benzodiazepines, methylphenidate and many controls. However, if you are feeling "blue," Mondays and Thursdays are 20 percent off all medications in the pharmacy and fluoxetine does not require a prescription. Get a box for yourself and still have enough pesos left over to buy a box of pre-counted happy pills for a downtrodden friend.

The pay scale was a hot topic of conversation in Chile. Pharmacists make a very good wage compared to most professions, however, it is about half of what entry-level pharmacists make in the United States. Pharmacists do not talk to the general public unless a consultation is requested. There is a row of five to 10 cash registers with "vendedores" (cashiers) who interact with the general public. A customer can present a prescription and it can be processed and paid for without a pharmacist ever being involved with the transaction. Furthermore, drug companies can actually offer incentives to the cashiers that sell

the medication, so cashiers are offered a percentage of the sale to promote one medication over another. This was the most difficult part of my experience to handle from an ethical standpoint. Take a situation where Niacin was "on special" and the patient was never offered a statin drug because it was not the sale item of the week. This was troubling. My preceptor and I agreed that the system was flawed in this aspect, but the process of change is slow to implement.

After three weeks of retail, I went to one of only five compounding pharmacies in the entire country. I was introduced to the processes of making specialty creams and ointments, tablets and capsules, tinctures and emollients. It was a great opportunity and I found that the Chilean pharmacy program is more heavily based in compounding than in the United States.

I learned a lot in my two months in Chile: different countries practice pharmacy in unique ways; people still need as many medications there as they do here, but access to medications can be markedly different in good and bad ways; and the siesta factor still exists. Most of all, I learned a deeper appreciation for the practice of pharmacy on every level. I have taken the tools I honed in Chile and used them on successive rotations to deliver better services to my customers and I plan to revisit Chile to see what changes they have made to do the same.

I never thought pharmacy school would afford me the opportunity to study in other countries or that I would receive credit for one of the best experiences of my life. Wine tasting, high mountain peaks, asados (barbeques), family and newfound friends added to the professional experience and made this a memorable and worthwhile rotation. Try one yourself.

### Students praised for going beyond the call of duty

Two pharmacy students were recently recognized for going the extra mile. We are publishing excerpts from two letters sent to the dean praising the students as evidence that the patient care students practice is noticed and does make a difference.

Matthew Thielbar, P3, rotated through Greenwood Pediatrics during the spring semester. In a letter to the dean, James Harrington, MD, wrote:

"What struck our practitioner staff most about Matt was his willingness to share information that he already was familiar with and most impressively, he was willing to do outside investigation on medications we had questions about. This research was done both in and out of the office. Examples of his help include investigating the drug availability of oral versus IM dexamethasone, a topic that came up during croup season. Matt helped us sort through some confusing facts in the literature. Matt pursued the issue of availability of accutane (isotretinoin) and the new iPledge program users need to participate in when using the medication.

"His information helped us understand the situation. Both of these projects were done outside of the office and communicated very promptly back to us. His involvement in our office was a great help to our staff. In addition, Matt was a very pleasant and personable individual to have in our office setting. We wish Matt well and success in the future."

The student in the next letter asked that her name not be included. The letter was written by a friend of someone the student had helped with medications while a patient at the University of Colorado Hospital. The student had greeted a former patient and the patient's friend while waiting for the walk signal at Ninth Ave. and Colorado Blvd. The patient's friend wrote:

"This student had assisted my dear lady friend with her medications as a student at the Health Sciences Center. The inquiry (from the student) was warm, sensitive, inspiring and extremely soothing to not only my friend, but for me as well. To have a student deliver much needed medication information to this patient after hospitalization, during refill settings at the hospital pharmacy, and to recognize and inquire about this individual when passing on the street is what I call beyond the call of duty.

"You must know how devoted this student is already, but I wished to give you a taste of what impression she leaves with the public. It is her devotion to the individual patient... and her personal acknowledgement and supportive inquiry today that makes her stand out among many. Please know that (my) acknowledgement is heartfelt, sincere, and sent with all urgency to commend your student on her dynamic caring, devotion to others, commitment to excellence, great capacity to remain involved, high professionalism with that splash of humanity filtering through each word expressed, the kindest smile, and strength of affection displayed during today's brief interlude. She has my vote for SOP Student of the Year, if there was such and honor to bestow upon her."

### Student/teacher team awarded scholarship

Patrina McCauley, P2 student and Dr. Marianne McCollum, assistant professor, were selected as one of only 35 student/teacher teams for a travel award to attend the American Association of Colleges of Pharmacy (AACP) Teachers Seminar and the AACP Annual Meeting. In July, the two will travel to San Diego and attend seminars on communications and teaching skills enhancement in addition to the regular annual meeting programs. This travel scholarship is provided through AACP by Wal-Mart which seeks to assist schools of pharmacy in producing a supply of graduates adequately prepared and committed to careers in academic pharmacy.

## A rotation in Vietnam enhanced a P4's cultural awareness

By Daniel Liccione

One of my favorite rotations was spent at a community pharmacy in beautiful Da Lat, Vietnam, which is a mountainous region in the south of that country. I was there with my very good friend and classmate, Hung Le, who is originally from Vietnam. We traveled there for our fifth rotation, Jan. 9 through Feb. 17, and spent most of our winter break there, too.

I couldn't pass up the opportunity to join my classmate. I have a lot of Vietnamese classmates, so I felt very comfortable and looked forward to spending time in their country. Hung set up the rotation and handled the logistics for it.



Daniel Liccione and Hung Le travel to Vietnam for their rotation.

The community pharmacists in Vietnam perform the same essential functions as those in the United States. Common duties include dispensing medications, consulting with patients, providing advice on health conditions, and having good rapport with doctors. For the majority of the medications though, a prescription is not required. Some drugs, such as psychotropics, antihypertensives, and diabetes medications required a doctor's prescription, at least for the initial fill. However, pharmacists there could diagnose certain conditions and prescribe the appropriate pharmacotherapy. Additionally, there were doctors' offices located in the pharmacy, so it was convenient for patients to be evaluated by a physician, and get their prescription filled afterwards.

A few of the medications were unfamiliar to us, as they are not available in the United States; this was notable for a couple of antibiotics. For the most part, the same drugs that we use here are available in Vietnam, but are sold for substantially less money there. This is especially true of generics. Herbal products, supplements and even folk remedies play a large role for the Vietnamese. Our pharmacy had a large selection of these items and some pharmacies dealt exclusively with natural products.

My practice efforts were limited due to the language barrier, but I was most helpful to English-speaking tourists seeking advice on common ailments (headache, dysentery, allergies, symptoms associated with the common cold) and on malaria-prophylaxis medications for various areas in southeastern Asia.

The highlights of the trip were taking excursions and sightseeing during our days off. We went hiking in the mountains, visited with villagers, toured a coffee plantation, visited pagodas and temples, and sampled exotic foods, among other things. Our days off were always filled with cultural experiences. Also, I mastered eating with chop sticks – they're easy to use

once you get the hang of things!

The Vietnamese people were wonderfully friendly, calm and well-mannered, even though the language was quite difficult and I wasn't able to pick up much. Hung had to translate a lot for me.

This rotation further affirmed my decision to enter community pharmacy. While I will practice in America, my cultural awareness was enhanced by the rotation, which I expect to be beneficial in practicing with this country's diverse patient population.

### University of Colorado School of Pharmacy *Awards, May 5, 2006*

- Kappa Epsilon Leader Awards*  
Shannon Mastko
- Phi Delta Chi Pharmacy Spirit Award*  
Michael Appel
- Phi Lambda Sigma Leadership Award*  
Stacy Shadburne
- Rho Chi Outstanding Student Award*  
Sarah Mercer
- Roche Pharmacy Communications Award*  
Megan Eck
- School of Pharmacy Clinical Practice Award*  
Laurel Forrest
- GlaxoSmithKline Patient Care Award*  
Nellianna Shaffer
- Mylan Pharmaceuticals Excellence in Pharmacy Award*  
Sommer Zarbock
- APHA/ASP Mortar and Pestle Professionalism Award*  
Eugene Medley
- Facts and Comparisons Award*  
Kristen Villalta
- Pharmacists Mutual Award*  
Sergey Simonovich
- Merck Awards*  
Dawn Hollingshead  
Katherine Miller  
Jana Harris
- Perrigo Excellence in Non-Prescription Medication Studies*  
Shannon Yessak
- School of Pharmacy Valedictorian Award*  
Parisa Shahmohammadi
- TEVA Outstanding Student Award*  
Richard Blaskovich
- School of Pharmacy Outstanding Scholastic Achievement Award*  
Jessica Meier  
James Vinton
- School of Pharmacy Scholastic Achievement Awards*  
Darcie Ryant
- Department of Pharmaceutical Sciences Awards*  
Jennifer Jorgensen  
Michael Long
- School of Pharmacy Professional Achievement Awards*  
Duke Cheney, P1  
Tara Vlasimsky, P2  
Matthew Marshall, P3  
Michael Long, P4
- The Lilly Achievement Award*  
Sarah Mercer
- Student Council Presidential Award*  
Justin Bowles
- The Dean's Distinguished Student Award*  
Kerri Martinez
- The Lefler Book Award*  
Lubna Farah
- Holden Community Service Award*  
Student National Pharmaceutical Association (SNPhA)

### Department of Clinical Pharmacy awards for 2005

**Rose Jung**

*Society of Infectious Diseases Pharmacists, Research Award:*  
Evaluation of efflux pumps in multidrug-resistant *Pseudomonas aeruginosa*

**Rose Jung and Ty Kiser**

American College of Clinical Pharmacy – Ortho McNeil Infectious Diseases Fellowship

**Marianne McCollum**

American College of Clinical Pharmacy – Career Development Award

**Laura Hansen and Sheryl Vondracek**

Induction as Fellows of the American College of Clinical Pharmacy

## Challenges confront pharmacy profession

By Kenna Bruner  
Office of Public Relations

Complex issues that will affect pharmacists for the foreseeable future loom large for the pharmacy profession, with Medicare prescription drug coverage and the ongoing debate on illegal drug importation at the top of the list.

In a presentation to School of Pharmacy students and faculty on Jan. 20, David Yost, chief executive officer for AmerisourceBergen Corporation, one of the world's largest pharmaceutical wholesale companies, presented an overview of what he considers hot button topics facing pharmacists: Medicare, counterfeit drugs, and radio frequency identification.

"You'll find your role in the health care system is going to increase dramatically," said Yost.

Yost considers Medicare Part D the biggest change in health care since President Lyndon Johnson's Great Society Program, a series of reform programs it was hoped would end poverty and dramatically improve health care.

For the first time, everyone with Medicare, regardless of health status or prescription drug usage, has access to prescription drug coverage. Patients who were unable to get prescriptions filled before this sweeping drug program went into effect are now able to do so, and that, says Yost, will provide opportunities in independent retail pharmacy. If people can go anywhere to get their medications, they will patronize the business where they get the best service, and that historically has been the local community pharmacy. Although the prescription benefit program got off to a rocky start, the result has been that community pharmacists have

emerged as heroes of health care.

"Without retail pharmacists stepping up to the plate and giving out temporary prescriptions to help people through the transition, the whole system would have imploded. It would have been absolute chaos," he said. "There's no question that the retail pharmacist will play an expanding role in Medicare Part D."

It is estimated that Medicare Part D will cost \$750 billion over 10 years. Generic medications will play a key role in whether the new drug program will be fiscally viable.

"If enough people aren't taking generics, there's no way the government will be able to afford this program," said Yost. "You as pharmacists will be called upon to be experts in generics and you will spend more time counseling about generics than your predecessors ever have."

Another area Yost predicts will emerge as a key issue for the pharmacy profession is supply chain integrity - counterfeit drugs and importation.

The World Health Organization estimates that up to 10 percent of the pharmaceuticals dispensed in the world are counterfeit, while in the United States it's nearly zero. The U.S. market represents half the pharmaceuticals dispensed in the world (\$254 billion out of a world market of \$550 billion). Half of the lifestyle drugs dispensed in Russia (such as medication for erectile dysfunction, depression and sleeplessness) are counterfeit, as are 90 percent of the AIDS drugs in Africa. The United States has had a few isolated instances of counterfeit drugs - 54 instances in 2005. "In many places in the world, when a physician has a patient who's not responding to medication, one of

the things he has to look at is whether the medication is authentic," said Yost. "One of the reasons the United States has such a pure system is that the secondary market is drying up."

Yost explained that secondary market products are generally products purchased from a source other than the original manufacturer. It is through a secondary market that counterfeit and adulterated products make their way into the distribution channel.

"When you get a product from someplace other than directly from

the manufacturers, there's more opportunity for things to go wrong."

The emerging technology of radio frequency identification (RFID) will allow manufacturers and distributors to electronically track drug products through the supply chain.

An RFID tag stores an identifying code on a microchip that is transmitted to a reader device. RFID makes it easier to ensure that drugs are authentic, and it creates

Continued on Page 15 ...

### School of Pharmacy Scholarships, May 5, 2006

#### Annibel Gardner Scholarships

Lam Nguyen Adam Nielsen

#### Burroughs Wellcome Endowment Scholarships

Megan Eck Momein Refaat

#### Colorado Pharmacists Society Scholarships

Daniel Bates Asad Omar

#### Eckerd Scholarships

Solomon Asress Michelle Pulido  
Brandon LaMarr Christopher Wilson  
Patrina McCauley

#### Erwin-Vincent Scholarship

Lubna Farah

#### Sara Kwon Memorial Scholarship

Patrina McCauley

#### JM Long Foundation Scholarships

Emilyn Cabrera Evelyn Phan  
Michele Garcia Sarah Puckett  
Tiffani Pham

#### James L. McDowell Memorial Scholarship

Jasmine Le

#### McKesson Scholarships

Raeanna Nerpel Lindsay Stansfield

#### NACDS Scholarship

Christian Dobbs

#### Pharmacists Mutual Scholarships

Julie Bohm Joshua Cluff

#### Wal-Mart Pharmacy Scholarships

Tin Chou Tram Quynh Vu Do  
Sean Fitzpatrick Bethanie Tran

#### Kaiser Permanente Kent M. Nelson Scholarships

Danielle Cassidy Sarah Mercer  
Stephanie Cho Thu Tran  
Shannon Matsko Tara Vlasimsky  
Michael Appel Jessica Hoang  
Xuan Nguyen Cassandra Bankovich  
Nancy Hoang Ashley Pearson  
Elena Chemanaeva Kyong Kim  
Jon Peterson Vina Dam  
Rory Lambert Tuyet-Hong Pham  
Jessica Engelbert Loc Le  
Christopher Ryan Ashley Hall  
Jennifer Meyer Trang Van  
Brittany Hanselin Binh Nguyen  
Berin Vattappillil Michele Hanselin  
Jenny Nguyen Ghadeer Wahdan  
Mandy Hemmert Minh-Thu Nguyen  
Tasheba West

#### Teresa McMahan Shulkin Memorial Scholarship

Justin Bowles



At a reception following his presentation, David Yost elaborates on critical issues pharmacists will face.

## Smiles all around during convocation awards night



## Dr. Christina Aquilante receives research grant

Christina Aquilante, PharmD, has received funding from the University of Colorado General Clinical Research Center (GCRC) Pilot/Feasibility Program for her pharmacogenetic research study investigating how patients respond differently to diabetes medications based on their genetic makeup.

Dr. Aquilante is an assistant professor of clinical pharmacy at the School of Pharmacy and conducts clinical research with a basic science (bench) component.

The GCRC provides the professional, hospital-based facilities (in this case University of Colorado Hospital), where research can be conducted with trained support staff to assist in conducting controlled studies. The GCRC Pilot/Feasibility Program provides junior researchers with funding to explore the feasibility of their research ideas and collect sufficient data to apply for funding from other peer-reviewed funding sources.

"This GCRC grant allows me to conduct clinical research that otherwise I wouldn't be able to do," said Dr. Aquilante. "The purpose of the pilot and feasibility program is to get junior investigators to conduct pilot studies that are contained and can be completed in a year, with the hope that they can use the information collected to apply for larger grants."

One of the drugs Dr. Aquilante is studying is rosiglitazone (Avandia), a popular insulin sensitizer prescribed to people with type 2 diabetes. This class of drugs helps the body make better use of its own natural insulin.

Using healthy, non-diabetic volunteers, Dr. Aquilante hopes to determine if genetics influence how the drug is transported through the body. Dr. Aquilante is utilizing a novel way to easily and effectively prescreen volunteers for her study. She gives them a trial size bottle of mouthwash to use and then spit into a test tube. From their mouth cells, she extracts their DNA. This method gives her plenty of DNA to work with as opposed to using a mouth swab.

After she runs their genetic sequence to see whether the volunteers possess a normal copy or a variant copy of a particular gene, they will move into the 24-hour intensive pharmacokinetic part of the study.

"Pharmacogenetics interests me because it's the perfect blend of clinical and basic pharmacy research," said Dr. Aquilante.



Christina Aquilante,  
PharmD

## Carol Stehley visits school



P2 student, Patrina McCauley is pictured with Carol Stehley during her visit to the School of Pharmacy. Carol's mother, Pearl S. Stehley, class of 1925, provided funds for a conference room and study spaces, as well as scholarship funds for students who come from Routt County, Colo. McCauley met all the scholarship criteria for 2005. Stehley's visit included a tour and observation of an English as Second Language class in the conference room named for her mother.

## School's diversity efforts recognized

The School of Pharmacy was well represented at the spring Diversity Awards Luncheon hosted by university administrators for faculty and students – thanking them for their tireless efforts to improve campus diversity.



Jason Thompson, director of the Office of Diversity, presents an award to Dean Louis Diamond for his commitment to enhancing cultural diversity in the school.

Dean Louis Diamond, Connie Valdez, PharmD, MSED, and the Student National Pharmaceutical Association (SNPhA) each were recognized at the awards luncheon held in May.

Dean Diamond has been dean of the pharmacy school since 1986. During his tenure, the school has emerged as one of the nation's premier institutions of pharmaceutical education and research. Under Dean Diamond's leadership, diversity is an integral part of the SOP's mission statement, strategic plan and expectations of every faculty and staff member. As a result of his efforts, the school has served as a model for enhancing diversity in pharmacy schools nationwide.

Upon his arrival as dean, there was little diversity in the pharmacy school among its students, faculty or staff. Within three years, he established a scholarship program for underrepresented minority students and other students classified as disadvantaged.

Diversity students now represent 40 percent and underrepresented minority students comprise 26 percent of the student body. Even more impressive is that the school has consistently graduated 95 percent of these students.

In 1986, there were only three women and no minority faculty members in the SOP. Since then, the number of women faculty members has increased to 36 percent and faculty members from diverse backgrounds has shown an increase

to 19 percent.

The SNPhA was created in 2003 to "accept the challenge of serving underserved communities." The overarching purpose of SNPhA is to plan, organize, coordinate and execute programs geared toward the improvement of the health, educational and social environment of underserved communities. SNPhA's primary objective is to educate these communities on better health practices and to increase their awareness and understanding of diseases.

Dr. Connie Valdez serves as an advisor to the student organization. SNPhA has been dedicated in providing community service during the past year. Activities have included: Daniel's Fund Summer Program, SNPhA Field Day, "Caring for Cash" Multicultural



From left are Stephanie Cho, Olivia Rapacchietta, Patrina McCauley, Nick Pollard and Connie Valdez, faculty advisor.

Food Fest, Platte Valley flu shot clinics, The Black Church Initiative, Denver Indian Health and Family Services Chart Review, The GLBT Center, Black Church Diabetes Class, "Get on the Path to Wellness" Health Fair and HIV/STD presentation at a local high school.

Dr. Valdez is an assistant professor in the Department of Clinical Pharmacy. She joined the University of Colorado in November 2002 and has been

actively involved in assisting with minority pipeline and outreach programs in addition to her faculty responsibilities. Dr. Valdez has been the Faculty Advisor to SNPhA since it was created on the health sciences campus in 2003. She has worked with SNPhA members on everything from meeting agendas to poster presentations. Dr. Valdez is a tireless supporter of the SNPhA organization has been instrumental in its growth of activities on campus and in the community.

## Briefs

### In Memoriam

Since the last newsletter, we received notice of the deaths of the following Alumni:

**Donald Grauberger**, Class of 1940, deceased August, 2005

**William Kuroki**, Class of 1950, deceased 2004

**Ledrey Olson**, Class of 1950

**Marjorie K. Steele**, Class of 1951, deceased 1990

**David Houtz**, Class of 1955, deceased November, 2005

**Craig Lund**, Class of 1975

### Marriages and Births

**Jeff Meyer, PhD, 2001**, and **Candice Cadwell Meyer, PharmD, 2000**, married in April 2001 and had their first child, Alexis Jeanine Meyer, Dec. 28, 2005. Jeff is a senior scientist with ZymoGenetics



in Seattle, Wash., and Candice is a clinical pharmacist in a hospital north of Seattle. They can be reached by e-mail at cadwell@comcast.net

**Rhonda (Roeder) Pohlman, BPharm, 2001**, is married to 1999 School of Medicine alumnus, **Chris Pohlman**. They are back in Boulder, Colorado and expecting their second child in December, 2006. They can be reached by e-mail at crpohlman@comcast.net or at 1405 Chambers Dr., Boulder, CO 80305.

**Paul Magee, PharmD, 2004**, and his wife Diana announced the birth of their second son,

Emery Dale Magee, December 17, 2005. Forest Magee is enjoying the role of big brother. More photos are available at [www.growingfamily.com](http://www.growingfamily.com) (use Emery's birthdates to locate and the password is Magee). Paul and family are living in Aurora.

**Jenifer Deutmeyer McGovern, PharmD,**



**2003**, and her husband Terry announced from Ohio, the birth of their son, Ethan George McGovern, March 5, 2006. Isabelle Rose, born August, 2003 is the proud big sister.

### Other News

**Janice R. Grosshans, BS, 1995**, is enjoying her position with Kaiser Permanente. Her 14-year-old daughter has begun high school and her son is completing his junior year in Engineering at CU Boulder. You can reach Janice at 16370 Jalna Ct., Brighton, CO 80603.

**Karen (Thornton) Shawler, BS, 1996**, and her husband Bruce live with their three-year-old son, Brandon, in Santa Barbara, CA. Karen is working part-time for Longs Pharmacy. She'd enjoy hearing from you at karen2k@hotmail.com.

**Kathleen (Bacalan) Carvalho, BS 1998/PharmD, 1999**, sent us her new name and says you can contact her at kbcarvalho@hotmail.com, 310-534-8080 or 26243 Monte Vista Ave., Lomita, CA 90717.

**Patricia Saunders, PharmD, 2005**, was recently appointed to a manager's position for King Soopers at 64th and McIntyre in Arvada, CO.

## Distinguished Coloradan award recipients

Algha D. "Al" Lodwick, RPh, MA, earned his pharmacy degree from the University of Iowa and his master's degree in communications from Goddard College. The focus for his master's degree was diabetes education, with an emphasis in dealing with patients with limited proficiency in English.

He is the manager of Clinical Pharmacy Support Services for St. Mary-Corwin Medical Center, in Pueblo, Colo. Mr. Lodwick was the founder of the Warfarin Institute of America and has monitored anticoagulation therapy for approximately 30,000 patient visits. The National Certification Board for Anticoagulation Providers has recognized him as a Certified Anticoagulation Care Provider and his clinic won the *Abbott Hospital Quality Award* in 1998.



Al Lodwick, RPh, MA and Mark Spitz, MD were selected by the faculty as Distinguished Coloradans.

Mr. Lodwick has authored 11 articles. He has been a speaker for numerous groups, from Navajo middle school students to the U.S. Food and Drug Administration and the 8th World Congress on the Internet in Medicine held in Geneva, Switzerland.

The University of Colorado students selected him twice as the Roche Preceptor of the year and he continues to be a valuable mentor and preceptor to the students.

Mark D. Spitz, MD, received his B.A. in chemistry from Arizona State University and his MD from the University of Arizona College of Medicine in Tucson. He completed a three-year residency in neurology at Baylor College of Medicine Affiliated Hospitals in Houston, Texas, and a two-year postdoctoral fellowship in clinical neurology and epilepsy at the Neurological Institute at the College of Physicians and Surgeons of Columbia University in New York City.

Since 1985, he has been affiliated with the University of Colorado Health Sciences Center, where he is currently a professor in the Department of Neurology. Dr. Spitz is board certified in neurology and clinical neurophysiology and is a fellow of the American Academy of Neurology. He is a member of several professional and scientific societies, including the American Clinical Neurophysiology Society and the American Epilepsy Society and serves on the Technology Committee of the latter.

Dr. Spitz was awarded the "Hero of the Week" for Community Service by the Rocky Mountain News in 1996, the *Who's Who in Medicine and Healthcare*, the *Commitment to Medical Excellence in Epilepsy Award* in 2003 and was listed in the "Best Doctors in America 2003-2004." He is an editor for *Epilepsy.com* and has authored or coauthored numerous publications and book chapters primarily on the subject of diagnosis and treatment of various forms of epilepsy.

## Supporting diversity



James Chung and Nedra Dunn, of Safeway, present Dean Louis Diamond and Development Director Sheldon Steinhauser with a check in April. This generous gift is slated for support of the school's diversity students and is in addition to Safeway's annual gift to the school's endowment fund, which underwrites needed student services.

## Thank you, alumni!

Thank you to the alumni who took time to complete the survey in the last issue of this newsletter or used the on-line survey. One percent of our newsletter recipients responded; half the average response for this sort of survey and not bad for a first try.

We would like to hear from more of you and if you did not save the newsletter and postage paid envelope, you can still find the survey online.

Just enter this web site address by the end of August: [www.zoomerang.com/survey.zgi?p=WEB224UAGU-UFRM](http://www.zoomerang.com/survey.zgi?p=WEB224UAGU-UFRM) and complete the questions.

## Preceptors of the Year



David Elm, PhD, Michael Godcharles, PharmD, BCPS, and John Flanigan, PharmD, were selected by the student body as preceptors of the year. The awards were announced at convocation on May 5 and presented at the banquet on May 25. The preceptors are pictured with Associate Dean Ralph Altieri.

## Recognition luncheon honors 20 staff members

On Friday, April 21, Dean Louis Diamond hosted a staff recognition luncheon in a charming old Victorian home and restaurant named Kate's, at 35th Avenue, in Denver.

Dean Diamond was joined by executive committee members Drs. Ralph Altieri, David Hill and Cathy Jarvis to honor the 20 staff members who attended. Dean Diamond spoke briefly to recognize the 200 plus years of accumulated School of Pharmacy service from the staff and to express appreciation for their dedicated service and contributions to the School of Pharmacy's continued success.

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an electronic pedigree, which is a record of the chain of custody from the point of manufacture to the point of dispensing.

"Eventually, we'll have chips on the bottle and ultimately, on the pill," said Yost. "You'll be able to track exactly where the merchandise is at any time. You'll know who's got what prescriptions and that privacy issue makes people jittery."

Yost ended the presentation with his rules of professional conduct:

- E-mails are forever.
- There is no such thing as a corporate secret.

- The boss views time differently than employees do.

- In your career, you'll come to ethical forks in the road. An issue is not always black or white. If you can't explain to your elderly aunt what you did and why, then you probably shouldn't do it.

"You should take pride in the fact that you're in a truly noble profession," he said. "It's not just the products you've got, but the information you have about the products. People's lives literally depend on what you do. It's important that you take your job seriously."

# Tell us your news

Name \_\_\_\_\_

Degrees/Year \_\_\_\_\_

Address \_\_\_\_\_

City, State and Zip Code \_\_\_\_\_

Phone \_\_\_\_\_ E-mail \_\_\_\_\_

You may publish my \_\_\_\_\_ address \_\_\_\_\_ phone \_\_\_\_\_ email \_\_\_\_\_

Spouse also CU alumni? \_\_\_\_\_ Year? \_\_\_\_\_

I'd like my former classmates to know: \_\_\_\_\_

**Please mail to:**

School of Pharmacy, 4200 E. Ninth Ave., Mail Stop C-238  
Denver, CO 80262 **OR** E-mail to: [SOP.alumni@UCHSC.edu](mailto:SOP.alumni@UCHSC.edu)



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## SCHOOL OF PHARMACY NEWS

Summer 2006



University of Colorado at Denver  
and Health Sciences Center



**Faculty, students  
and families enjoy  
commencement  
banquet**



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