

President's *report*

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The following is a glimpse of some recent achievements by the faculty, staff and students of the University of California and the national laboratories managed by the university.

IN THE NEWS

New chancellor ... *Gene D. Block*, University of Virginia provost and an accomplished biologist, has been appointed **UCLA** chancellor. The appointment was made during a special meeting of the **UC Board of Regents** in December. Block, 58, will hold a faculty appointment and take office on or before Aug. 1, 2007. *Norman Abrams*, a UCLA professor emeritus of law, has been serving as acting chancellor since *Albert Carnesale* retired in June. Abrams will continue as acting chancellor until Block takes office.

Medical school ... UC regents have authorized **UC Riverside** to proceed with planning for a school of medicine. The campus has begun a national search for a founding dean for the school. It will also hire initial faculty and staff, develop curriculum that focuses on improved health care in both primary and specialty care, and seek private support. It plans to submit a final proposal and refined business plan to UC officials by the end of 2007. Projected to open in 2012, the school would be the first new public medical school west of the Mississippi since 1971.

Law school ... **UC Irvine** has received approval from UC regents to establish a school of law. Irvine would be the first campus to open a public law school in California in more than 40 years. A national search for a founding dean has begun, and the first students are expected to enroll in fall 2009. It would serve 600 students within five years of opening and eventually include 30 fulltime faculty. It would be only the second public law school in Southern California.

Humanities prize ... A **UCLA** English professor and former administrator renowned for his study of the role of racial and ethnic minorities in American literature has been selected as the recipient of the richest prize in the humanities. *Eric J. Sundquist*, who has taught on and off at UCLA since 1989, will receive \$1.5 million over three years as one of four 2006 recipients of the Andrew W. Mellon Foundation's Distinguished Achievement Award. Sundquist is the UCLA Foundation Professor of Literature and former acting dean of humanities at UCLA.

New majors ... Three new majors will be available to entering freshmen and transfer students at **UC Merced** in fall 2007: economics, history and political science. Also added: new minors in anthropology and political science. The new majors do not appear in the 2007-08 application, but prospective students may select any major open to them on the current application, then switch to one of the new majors when registering for classes.

HEALTH AND NUTRITION

Alzheimer's disease ... **UCLA** researchers using innovative brain-scan technology have shown that the abnormal brain protein deposits that define Alzheimer's disease can be detected in mild cognitive impairment – a condition that increases the risk for developing Alzheimer's and affects 15 to 20 million Americans. The new study is the first to report a real-time “window into the brain” that identifies the major abnormal deposits of the disease in people who may not develop Alzheimer's for years to come. The researchers used positron emission tomography imaging employing a small molecule invented at UCLA that binds to the abnormal proteins – amyloid plaques and neurofibrillary tangles – that may cause the disease.

Breast cancer ... The chemical compound for the abortion pill has been found to prevent the growth of mammary tumors caused by the mutant gene responsible for a majority of breast and ovarian cancers, according to **UC Irvine** scientists. This compound, called mifepristone, prevented breast tumors by inhibiting progesterone, a hormone involved with the female reproductive cycle, in breast tissue cells. The discovery points to new prevention methods for women who have a genetic predisposition to breast and ovarian cancers. Currently, these women often have their breasts or ovaries surgically removed to reduce the risk of developing cancer.

Medicare help ... The **UC San Francisco School of Pharmacy** has received a \$3.7 million grant from the Amgen Foundation to fund an innovative program that will help underserved elderly Californians learn about and select from Medicare prescription drug plans. There currently are more than 70 of these drug plans in the state, most of which are Medicare Part D plans. Called Partners in D, the three-and-a-half year program will create an educational system and collaborative outreach network for pharmacy students and faculty and community pharmacists. UCSF will work with the six other schools of pharmacy in California through the program.

Herbal assist ... *UC Davis* and *UC Irvine* researchers and colleagues have developed drugs that treated rheumatoid arthritis and prevented the onset of type 1 diabetes in rats, introducing the drugs via a cellular structure long suspected of playing a key role in those diseases. The drugs, derived from an herb that has been used medicinally since the Middle Ages, act on a specific opening, an ion channel known as Kv1.3, in the membranes of effector memory T cells. The researchers confirmed that Kv1.3 is involved not only in multiple sclerosis, but other autoimmune diseases such as rheumatoid arthritis and type 1 diabetes.

DEVELOPMENTS AND DISCOVERIES

Mandarin language ... It's been shown that the left side of the brain processes language and the right side processes music; but what about a language like Mandarin Chinese, which is musical in nature with wide tonal ranges? *UC Irvine* researcher *Fan-Gang Zeng* and Chinese colleagues studied brain scans of subjects as they listened to spoken Mandarin. They found that the brain processes the music, or pitch, of the words first in the right hemisphere before the left side of the brain processes the semantics, or meaning, of the information. The results show that language processing is more complex than previously thought, and it gives clues to why people who use auditory prosthetic devices have difficulty understanding Mandarin.

Jelly beans ... Sports-formulated jelly beans were just as effective as sports drinks and gels in maintaining blood sugar levels and improving exercise performance among endurance athletes who participated in a study by researchers from the *UC Davis Sports Medicine Program*. Cyclists and triathletes in the study completed a series of four, 10-kilometer time trials while ingesting three different kinds of carbohydrate supplements or water only. The athletes achieved 32-to-38-second faster times in the trials with the carbohydrate supplements than they did while consuming only water. In addition, the athletes completed the time trials with the highest average "power outputs" with the sports-formulated jelly beans. Power output is the amount of force applied to the bicycle pedals to go faster. Sports-formulated jelly beans contain electrolytes and vitamins, standard jelly beans do not.

Nanoscale images ... *Lawrence Livermore National Laboratory* scientists for the first time have validated the idea of using extremely short and intense X-ray pulses to capture images of objects such as proteins before the X-rays destroy the sample. At the same time, the team also established a speed record of 25 femtoseconds for flash imaging. The new method will be applicable to atomic-resolution imaging of complex biomolecules when even more powerful X-ray lasers, currently under construction, are available. The technique will allow scientists to gain insight into the fields of materials science, plasma physics, biology and medicine.

Top quark ... A group of 50 international physicists, led by *UC Riverside's Ann Heinson*, has detected for the first time a subatomic particle, the top quark, produced without the simultaneous production of its antimatter partner – an

extremely rare event. The discovery of the single top quark could help scientists better explain how the universe works and how objects acquire their mass, thereby assisting human understanding of the fundamental nature of the universe. Heinson, a research physicist, says researchers had been looking for single top quarks for 12 years. Since it does not occur naturally, the top quark must be created experimentally in a high-energy particle accelerator, an instrument capable of recreating the conditions of the early universe.

DNA research ... The veil of mystery surrounding our extinct hominid cousins, the Neanderthals, has been at least partially lifted to reveal surprising results. Scientists with *Lawrence Berkeley National Laboratory* and the *Joint Genome Institute* (which is managed by *UC*) have sequenced genomic DNA from fossilized Neanderthal bones. Their results show that the genomes of modern humans and Neanderthals are at least 99.5-percent identical, but despite this genetic similarity, and despite the two species having cohabitated the same geographic region for thousands of years, there is no evidence of any significant crossbreeding between the two. Based on these early results, *Homo sapiens* and *Homo neanderthalensis* last shared a common ancestor approximately 700,000 years ago.

Hybrid butterflies ... High in the Sierra Nevada mountains, a new species of butterfly has emerged as a hybrid of two existing species. It is the first time that this type of species formation has been shown in animals, according to a *UC Davis* researcher and colleagues. *Arthur Shapiro*, professor of evolution and ecology at *UC Davis*, said scientists are still learning about the ways new species can form. This type of speciation has been shown in plants, but never in animals, he says. *Lycaeides melissa* butterflies live on the eastern side of the Sierra, and *Lycaeides idas* live to the west. In between, in the harsh climate above the tree line, is a third, alpine species of *Lycaeides*.

THE CUTTING EDGE

Bomb-sniffing bees ... Scientists at *Los Alamos National Laboratory* have developed a method for training the common honey bee to detect the explosives used in bombs. Based on knowledge of bee biology, the new techniques could become a leading tool in the fight against the use of improvised explosive devices, or IEDs, which present a critical vulnerability for U.S. soldiers abroad and is an emerging danger for civilians worldwide. By studying bee behavior and testing and improving on technologies already on the market, *Los Alamos* scientists developed methods to harness the honey bee's exceptional olfactory sense where the bees' natural reaction to nectar, a proboscis extension reflex (sticking out their tongue), could be used to record an unmistakable response to a scent. Using Pavlovian training techniques common to bee research, they trained bees to give a positive detection response, via the proboscis extension reflex, when they were exposed to vapors from TNT, C4, TATP explosives and propellants.

Handling nanomaterials ... The first comprehensive, international survey of workplace safety practices in the burgeoning nanotechnology industry finds that many nanotech companies and laboratories believe nanoparticles – specks of matter that are smaller than living cells – may pose specific environmental and health risks for workers. The study was carried out by **UC Santa Barbara** researchers. It's an important study because it reinforces the perspective that there needs to be more information regarding the toxicology of new nanomaterials and how they should be handled in the contexts of industry, consumers and the environment, says *Patricia Holden*, principal investigator for this project and associate professor at UCSB's **Bren School of Environmental Science and Management**.

Stem cell ... **UCSF** scientists have determined that adult stem cells in a specific region of the mouse brain have a built-in mechanism that allows the cells to participate in the repair and remodeling of damaged tissue in the region. As the cells are also present in the human brain, the same capacity or potential may exist in humans, the researchers say. If it does, it is possible that the cells' behavior could be enhanced to treat tissues damaged throughout the brain by disorders such as stroke and traumatic injury. The study was led by UCSF's *Chay T. Kuo*, funded by the California Institute for Regenerative Medicine.

Airborne bacteria ... Want biodiversity? Look no further than the air around you. It could be teeming with more than 1,800 types of bacteria, according to a first-of-its-kind census of airborne microbes recently conducted by scientists from **Lawrence Berkeley National Laboratory**. The team used an innovative DNA test to catalog the bacteria in air samples taken from San Antonio and Austin, Texas. Surprisingly, they found a widely varied bacterial population that rivals the diversity found in soil. The research paves the way for regional bacterial censuses that will help a federal Department of Homeland Security bioterrorism surveillance program differentiate between normal and suspicious fluctuations in airborne pathogens and help scientists establish a baseline of airborne microbes, which they can use to track how climate change affects bacterial populations.

PLANETS AND ENVIRONMENT

Climate accountability ... From energy-efficient buildings with sun-shading to campuswide recycling, **UC Merced** already has a history of following through on its commitment to sustainability. Now, the campus has defined a pathway for future compliance with stringent standards for climate accountability by becoming a member of the California Climate Action Registry, which was established by California statute as a non-profit voluntary registry for greenhouse gas (GHG) emissions. This nonprofit organization helps California organizations and companies to establish GHG emissions baselines against which any future GHG emission reduction requirements may be applied. **UC San Diego** was a founding member of the registry, and Merced joins **UC Santa Barbara, Davis, Berkeley, UCLA** and **Santa Cruz**.

Biodiversity study ... An international group of ecologists and economists shows that the loss of biodiversity is profoundly reducing the ocean's ability to produce seafood, resist diseases, filter pollutants, and rebound from stresses such as over fishing and climate change. The study, based at **UC Santa Barbara's National Center for Ecological Analysis and Synthesis**, reveals that every species lost causes a faster unraveling of the overall ecosystem. Conversely, every species recovered adds significantly to overall productivity and stability of the ecosystem and its ability to withstand stresses. The four-year analysis is the first to examine all existing data on ocean species and ecosystems, synthesizing historical, experimental, fisheries, and observational data sets to understand the importance of biodiversity at the global scale.

Climate change ... Increasing temperatures in California during the next 45 years could negatively affect the amount of almonds, walnuts, oranges, avocados and table grapes that Americans put on their tables. According to new research from **Lawrence Livermore National Laboratory**, production losses in some of California's most popular crops could be as high as 40 percent by mid-century. In the study, laboratory researchers evaluated the impact of climate change on six major perennial crops in California: wine grapes, almonds, table grapes, oranges, walnuts and avocados. Each of these crops is typically planted only once every 25-40 years, so that climate can change considerably in the lifetime of individual vines or trees.

Nutritious food ... Say good-bye to wisecracks about lousy cafeteria food and get ready for more salad bars and fresh produce in schools, universities and hospitals. That's the vision behind an ambitious two-year study of the feasibility of "farm-to-institution" programs launched in November by researchers at the **UC's Santa Cruz** and **Davis** campuses. These programs could be a lifeline for small- to mid-scale farmers struggling to stay afloat, and would improve the eating habits of millions of Americans, from young schoolchildren to elderly hospital patients, says project director *Patricia Allen*, associate director of the **UCSC Center for Agroecology & Sustainable Food Systems**. Due to the size of the institutional food market, farm-to-institution programs could catalyze a fundamental transformation in the way the nation produces and distributes food, she adds.

INSIGHTS ON SOCIETY

Language services ... **UC Davis Health System** has been selected as one of 10 participants in a national program to improve the quality of health care provided to hospital patients with limited English proficiency. Called Speaking Together: National Language Services Network, the project establishes what will be a high-level learning collaborative that will identify best practices in language services and then share those findings with health professionals across the nation. UC Davis is the only medical center in California selected for the program. It has more than 40 interpreters on staff, providing translation services in 19 languages. Medical interpreters for Spanish, Russian and Hmong-speaking patients typically are the most requested of the interpretive services at the medical center in Sacramento.

Social support ... Individuals facing challenges in their lives often seek comfort and support from family members and close friends. Research conducted by two social psychologists at *UC Santa Barbara*, however, has demonstrated that during times of stress Asian Americans are far less likely than other people, particularly Americans of European extraction, to seek emotional support, advice and help from their respective social networks. The research suggests that while European Americans view a request for social support as a proactive method of solving problems, Asian Americans are more concerned with the negative implications of asking for help, including the risk of burdening others, disrupting the harmony of the group, making the problem worse and bringing shame to oneself or one's family.

KUDOS

Committee appointment ... UC Irvine psychologist *Roxane Cohen Silver* has been appointed to the new federal advisory committee that will help develop travel policies for people visiting the United States. The 18-member Secure Borders and Open Doors Advisory Committee will develop travel policies that balance the need for stronger security while facilitating travel to the U.S., including that of visiting foreign students and scientists. A national expert in the field of stress and coping, Silver studies how individuals respond to traumatic life events and spearheaded the longest-running national study of psychological responses to the Sept. 11 terrorist attacks.

Distinguished scientists ... Fifty-six *University of California* researchers have been elected fellows of the American Association for the Advancement of Science, the world's largest general scientific society in the annual election, announced in November. Nine of UC's 10 campuses are represented in the 2006 election, and the UC-affiliated fellows constituted more than 10 percent of the 449 new association fellows. With this latest election, there are approximately 530 UC researchers who are fellows of the association, the most of any university or college in the nation. *UC Riverside* led the UC campuses with 21 fellows, including *Chancellor France A. Cordova*. Also, five fellows from *Lawrence Livermore* and *Los Alamos national laboratories* were elected in 2006.

INVESTING IN EDUCATION

Endowed scholarship ... *UC San Diego's Skaggs School of Pharmacy and Pharmaceutical Sciences*, which opened its doors in 2002, has established its first endowed scholarship. The Dr. Dong To Endowed Scholarship Fund reached the \$50,000 mark thanks to generous contributions of pharmacists and physicians, colleagues, friends, and family to honor To for his life long work and contributions to the pharmacy industry and Vietnamese community in San Diego. The fund will provide tuition assistance to Skaggs students. To is the former dean of the school of pharmacy at the University of Saigon.



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