

Summer 2006 Volume Six

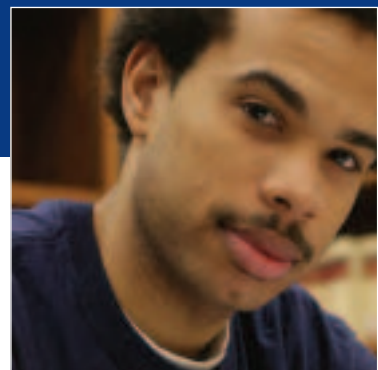
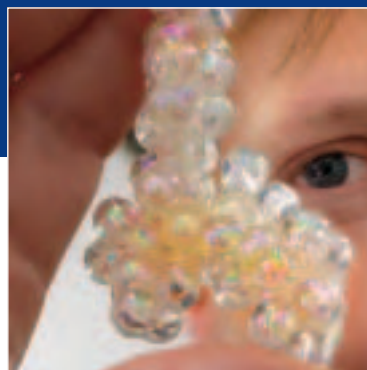
UCLA COLLEGE

R E P O R T

UCLA COLLEGE OF LETTERS AND SCIENCE

A celebration of success for Campaign UCLA and the College of Letters and Science

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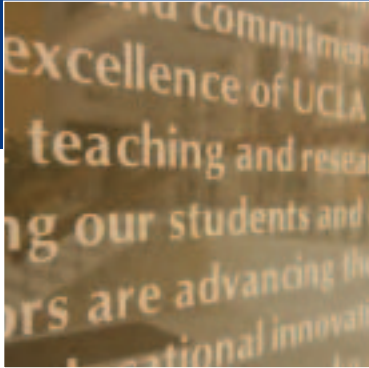
On the cover: Shapiro Fountain—named in honor of Shirley and Ralph Shapiro, long-time UCLA supporters and volunteers (see page 31).

Unless otherwise indicated, all photos by Reed Hutchinson.

UCLA COLLEGE

R E P O R T

A showcase of the
people and progress in
the UCLA College of
Letters and Science



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UCLA COLLEGE OF LETTERS AND SCIENCE

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College News

An update of events and progress in the UCLA College of Letters and Science.

"A Wonderful Record of Achievement"

UCLA's record-setting fundraising campaign included \$327 million for the College of Letters and Science—twice the original goal.

The UCLA College of Letters and Science raised more than double its fundraising goal for Campaign UCLA—\$327 million for faculty, undergraduate and graduate student support, and programs and research funding.

"The Campaign was a resounding success for the College—the superb result of the partnership among faculty, the deans, our development team and volunteers," said Patricia O'Brien, executive dean of the College of Letters and Science. "We have advanced our academic goals and enhanced our competitiveness in research and education."

Campaign UCLA, a 10-year effort for the university, concluded on December 31, 2005. Campaign UCLA is the largest and most successful fundraising campaign ever in higher education—the only one to surpass \$3 billion.

Some 17,000 donors made gifts both large and small to the College during the Campaign.

"Gifts committed over the course of the campaign have made possible more than 11,200 student support awards for undergraduate and graduate students," said O'Brien. "And, the creation of 38 new endowed chair funds brings the College total now to 63. This is a wonderful record of achievement."

Some 17,000 donors made gifts both large and small to the College during the

Campaign. (For other highlights of fundraising for the College, see page 16.)

"We are grateful to all of our donors and volunteers—each gift is important," said O'Brien.

"Private philanthropy has become a vital component in our efforts to ensure that we remain competitive among the nation's premier research universities," said O'Brien. "Even though Campaign UCLA has drawn to a close, we in the College remain committed to pursuing private gifts to enhance our work."

"We will now focus our efforts on the Chancellor's Ensuring Academic Excellence Initiative—which secures resources to attract top-flight scholars and students in the face of widening funding disparities between elite public research universities and private institutions."

For the overall results of Campaign UCLA, visit www.giveto.ucla.edu.

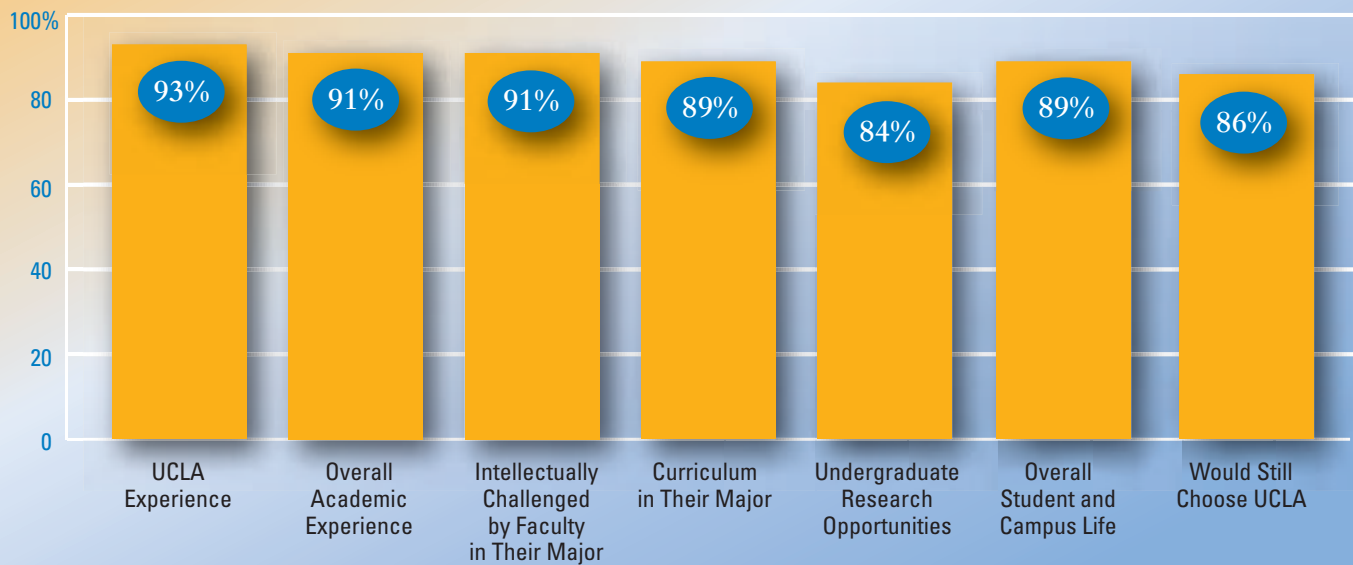
Dedicated donors and volunteers Shari and Garen Staglin received the 2006 Honorary Fellows Award of the College of Letters and Science. The Staglins were recognized at the annual College Awards Dinner on March 6.



Also honored were the six recipients of the Charles E. and Sue K. Young Undergraduate Awards and the Young Graduate Student Awards, which were established with support from Louis and Evelyn Blau in honor of UCLA's former chancellor and his late wife. From left: Indre Viskontas (cognitive neuroscience), Benjamin Wang (ecology and evolutionary biology), Jacqueline Ka-Wan Ng (biology), Albert Cespedes (biochemistry), Sara Culp (English), Matthew Hopper (history).

UCLA Senior Survey

Percent of students who are satisfied/very satisfied by the following:



UCLA seniors gave high marks to the university's academic environment and the intellectual challenges they experienced.

High Marks for the College

A first-of-its-kind study of seniors reveals strong positive views about intellectual challenges and the curriculum in the College.

What do UCLA seniors say about their education at UCLA?

Are they intellectually challenged by the university?

Do they believe they made the right choice in attending UCLA?

In a first-time study of the opinions of UCLA seniors as they prepared for graduation, Bruins reported strong satisfaction with their academic experience and campus life and are intellectually challenged by the curriculum and the faculty.

They also gave high marks to their broader campus experiences, including a wide range of experiences with students from diverse backgrounds.

"Students who come here want to be challenged intellectually and seek new ideas, and the results of the survey show they are getting what they came to UCLA for," said Judith L. Smith, vice provost for undergraduate education.

The survey received responses from 5,800 seniors—more than 80 percent of the graduating class.

The survey found that large majorities of students had high levels of satisfaction with intellectual challenges at UCLA. Among the findings:

- 91 percent of the students reported being satisfied or very satisfied with the intellectual challenges by faculty in their majors.
- 84 percent were satisfied or very satisfied with the intellectual challenges of their research opportunities.
- Students also thought highly of the curriculum in their majors and minors. Eighty-nine percent were satisfied or very satisfied with the curriculum in their majors and 87 percent were satisfied or very satisfied with the quality of faculty instruction in their majors.
- Among the 1,568 respondents who pursued an academic minor, 93 percent were satisfied or very satisfied with the curriculum in their minors, and 81 percent were satisfied or very satisfied with the quality of teaching assistant instruction in their minors.

Access to faculty also was commended by the overwhelming majority of respondents. The results show:

- 86 percent were satisfied or very satisfied with accessibility to faculty in their academic major.
- 92 percent who pursued a minor were satisfied or very satisfied with faculty accessibility in their academic minor.

"UCLA is among the top academic institutions in the nation, and we believe intellectual challenges in academics are important," Smith said. "We are gratified that our students expressed such strong sentiments about their satisfaction with their academic experiences."

UCLA plans to conduct the survey annually, and Smith said student feedback over a period of time will be helpful to the Academic Senate when it reviews course offerings and content.

The full survey results can be found at www.college.ucla.edu/seniorsurvey.

"We are gratified that our students expressed such strong sentiments about their satisfaction with their academic experiences."

Digging into the Human Past

By Robin Heffler

Archaeological achievements at UCLA and the potential for the field of study have been transformed by a visionary endowment from Lloyd Cotsen.

Lloyd Cotsen, volunteer and donor at the Institute named in his honor. "This Institute and its leadership," Cotsen said, "are the vehicles that will carry on a vision of archaeology's future through the intellectual pursuit of knowledge and adventure."



Elizabeth Carter has been conducting archaeological excavations at a site in southeastern Turkey since 1995, unearthing the culture and lifestyle of the ancient Halaf people who thrived between 6000 and 5000 B.C.E. Carter and her team of researchers have found evidence of where the Halaf lived, what they ate and with whom they traded.

Findings by the Carter team were extensive and enlightening, but nothing made an impact on the researchers like the discovery of a mass burial site containing 40 dismembered bodies—including some that may have been cannibalized.

"We've found a rather complicated ritual associated with death and burial," said Carter, a UCLA professor of Near Eastern languages and cultures. "This adds to our understanding of large, complex settlements in the ancient Near East that eventually became Uruk, one of the first large cities in the world."

Comprehensive, Interdisciplinary Study

Carter's research is supported by the Cotsen Institute of Archaeology at UCLA, a nationally-renowned center in the College of Letters and Science that promotes the interdisciplinary study of ancient human societies. Carter is one of 17 UCLA faculty with Institute-sponsored research projects that stretch around the globe, working along with 35 other scholars from 11 campus departments who are affiliated with the Cotsen Institute.

Founded in 1973, the Institute was renamed in 1999 to recognize the contributions of Lloyd E. Cotsen, the former president and CEO of Neutrogena Corp. Cotsen has been a volunteer for UCLA and donor to the campus for more than 30 years, and has a strong interest in archaeology. After working on digs in Greece for more than 20 seasons, his passion for the field led him to donate \$8 million to the Institute, setting the stage for an already-respected archaeology program to reach new levels of impact and achievement.

Growth and Prominence

"This is the largest program of its kind in North America," said anthropology professor Charles Stanish, director of the Cotsen Institute, holder of the Cotsen Chair in Archaeology, and newly-elected member of the American Academy of Arts and Sciences.

"Lloyd Cotsen's gift has transformed us from a small institute into one of the leading archaeology research centers in the world in the course of six years," Stanish said. "It has allowed us to pursue excellence, expanding the work of the talented people here."

The results can be seen in the advancement of the Institute's four stated missions: research, education, conservation and publication.

Stanish's own research is but one example of the far-reaching impact of the Cotsen gift. Stanish studies the evolution of civilizations in Peru and Bolivia, looking at political organizations and economics in the period from 3000 B.C.E. to 1400 C.E.

"The Cotsen gift helped build a museum in Peru that has helped preserve beautiful stone monoliths and to give the Amyara, the local people, a cultural center of their own," Stanish said.

Expanding Graduate Support and Offerings

Located in the Fowler Building on campus, the Cotsen Institute houses laboratories for regional field research projects, technical labs for the specialized analysis of archaeological materials, classrooms, a teaching lab, meeting rooms and offices. The Institute also trains graduate and undergraduate students on campus and in the field, publishes scholarly books each year, and presents public lectures and other educational programs.

With its education component largely focused on graduate students, the Institute has dramatically increased the availability of support stipends. This, in turn, has helped UCLA to compete for the best students on a level with the other top universities in archaeology: the University of Chicago, the University of Pennsylvania, Stanford, Harvard, UC Berkeley and the University of Michigan.

Prospective students in the Interdepartmental Graduate Program in Archaeology are especially encouraged to apply if their interests can form bridges with disciplines and departments that don't include archaeology—including botany, geology, mathematics, statistics, zoology—and if those interests bring together goals and specializations in the humanities, social, life and physical sciences.

Support for students also includes travel grants, which make it possible for both graduate and under-

graduate scholars to go to another hemisphere and learn archaeological techniques. A field school in Chile is set up just for this purpose. Students assisting UCLA faculty members with their projects receive on-the-job training at excavation sites worldwide.

A New Emphasis on Conservation Management

A new aspect of graduate student training is the UCLA/Getty Program in Archaeological and Ethnographic Conservation. The program has two primary goals: providing students with a solid educational base and practical training in both archaeological and ethnographic materials, and instilling an appreciation of the distinctive and often complex issues related to significance, access and use of these materials.

Through a partnership with the J. Paul Getty Trust, students study for three years to receive a masters degree in conservation, specifically related to archaeological and ethnographic materials. Faculty and staff at UCLA, the Getty Conservation Institute, and the J. Paul Getty Museum are teaching the first group of six graduate students, who began the program in fall 2005. Training includes instruction in the latest digital imaging techniques to conserve documents.

"This unique program for preserving and curating museum objects goes beyond preparing students to be archaeological technicians by creating leaders in the field of cultural heritage management," said Stanish.

The Getty program staff and faculty also have assisted Cotsen Institute faculty with projects requiring the analysis of objects recovered from excavations, and Stanish has plans to increase Getty participation in digs.

A research project that already has benefited from Getty involvement is the work of anthropology professor Christopher Donnan, former director of the Fowler Museum. Since he joined the UCLA faculty 36 years ago, Donnan, one of the world's leading



Archaeology graduate students Lyssa Stapleton (left) and Jamie Aprile (right) confer with their Albanian colleague, Esmeralda Agolli, at the Cotsen Institute's joint project at Lofkënd, Albania. (Photo: Rich MacDonald)



“Lloyd Cotsen’s gift has transformed us from a small institute into one of the leading archaeology research centers in the world in the course of six years. It has allowed us to pursue excellence, expanding the work of the talented people here.”

Charles Stanish, director of the Cotsen Institute, at the site of a newly-discovered ancient Inca village in the valley of Tarapacá in the Atacama Desert of Chile. “The Cotsen gift helped build a museum in Peru that has helped preserve beautiful stone monoliths and to give the Amyara, the local people, a cultural center of their own.” (Photo: Colleen Donley)

experts on ancient Peru, has been studying the civilization of the Moche people, who lived on the north coast of Peru between 200 and 800 C.E. and gave rise to the great civilizations of the New World.

Outside of academic circles, Donnan is perhaps best known for his excavation of the richest Moche tombs ever found, a spectacular collection of artifacts—many of them solid gold or silver—that were featured in a 2001 National Geographic magazine. More recently, through high-tech imaging techniques, the Getty conservation department identified minerals, semi-precious stones and plant materials from Donnan’s Peruvian excavation sites.

“By combining information contained in photos of Moche art held by museums and private collections worldwide with findings from our excavations, we can reconstruct Moche civilization,” said Donnan. “This is one of the few places in the world that can trace the rise of civilization in the increasing complexity of arts, technology and social organization.”

Engaging the Public

Beyond research and teaching, the Cotsen Institute has developed its outreach through an expanded program of publications and public programming.

Publishing research findings has become a highly competitive process at the Cotsen Institute. Stanish said the Institute has increased the quality and quantity of publications, while being selective about the manuscripts it accepts. Publications are written by UCLA scholars, as well as by researchers from all over the world.

The public is invited to a thriving calendar of lectures, seminars and noon “Pizza Talks”—as well as to visits into the workings of the Cotsen Institute itself. In

early May, the Institute held an open house, an annual event that offered tours of the laboratories where 75 archeologists store and analyze their findings. Donnan was one of the tour guides, along with UCLA Bone Lab director Thomas A. Wake, known as the “The Roadkill Scholar” for his work that examines the remains of small animals found at archaeological sites. Visitors viewed and heard about actual tools that gave the Stone Age its name, a system of identifying pottery with microscopic slivers of shard, and ways to use charcoal to deduce ancient agricultural practices.

“A Vision for Archaeology’s Future”

As part of his long-range goals for the Cotsen Institute, Stanish wants to expand public understanding of archaeology in general and the research projects of Institute scholars in particular. He also plans to initiate a summer program in which disadvantaged teens would spend two weeks in the local mountains learning about archaeology.

“We want to enhance programs for the community—for volunteers and donors—to go into the field,” he said. “We plan to work in collaboration with UCLA Extension and the Alumni Association to provide these kinds of opportunities.”

The combination of energetic research, innovative teaching and engaging public programs are all evidence of the dynamic progress in archaeology that was made possible by Lloyd Cotsen’s gift—and are aligned with his hopes for the field’s future at UCLA. Speaking at the ceremony celebrating the renaming of the Institute in his honor, Cotsen said, “This Institute and its leadership are the vehicles that will carry on a vision of archaeology’s future through the intellectual pursuit of knowledge—and adventure.” 

www.ioa.ucla.edu

Media Bias: It's Real, but Surprising

A UCLA study found political bias in most news coverage, but the findings defy some conventional wisdom about who is Right and who is Left.

While the editorial page of The Wall Street Journal is conservative, the newspaper's news pages are liberal—even more liberal than The New York Times.

Coverage by public television and radio is conservative compared to the rest of the mainstream media.

These are just a few of the compelling findings from a UCLA-led study, which is believed to be the first successful attempt to measure bias objectively in a range of media outlets and rank them accordingly.

"I suspected that many media outlets would tilt to the left because surveys have shown that reporters tend to vote more Democrat than Republican," said Tim Groseclose, a UCLA political scientist and the study's lead author. "But I was surprised at just how pronounced the distinctions are."

Groseclose and University of Missouri economist Jeffrey Milyo based their research on a standard gauge of a lawmaker's support for liberal causes. Americans for Democratic Action (ADA) scores lawmakers based on the percentage of times they vote on the liberal side of an issue—with 100 as most liberal and 0 as most conservative.

Groseclose, Milyo and a team of 21 research assistants scoured U.S. media coverage as well as speeches of U.S. lawmakers of the past 10 years. They tallied the number of times each media outlet referred to think tanks and policy groups, such as the left-leaning NAACP or the right-leaning Heritage Foundation. If a media outlet displayed a citation pattern similar to that of a lawmaker, then the study assigned both a similar ADA score.

Of the 20 major media outlets studied, 18 scored left of center, with CBS' Evening News, The New York Times and the Los Angeles Times ranking second, third and fourth most liberal behind the news pages of The Wall Street Journal.

Only Fox News' Special Report and The Washington Times scored to the right of the average U.S. voter.

The most centrist outlet proved to be the NewsHour With Jim Lehrer. A close second and third were CNN's NewsNight With Aaron Brown and ABC's Good Morning America.

"I suspected that many media outlets would tilt to the left because surveys have shown that reporters tend to vote more Democrat than Republican. But I was surprised at just how pronounced the distinctions are."

Perhaps surprisingly, the fourth most centrist outlet was Fox Special Report, which often is cited by liberals as an egregious example of a right-wing outlet. While Special Report proved to be right of center, the study found ABC's World News Tonight and NBC's Nightly News to be left of center. All three outlets were approximately equidistant from the center, the report found.

"If viewers spent an equal amount of time watching Fox's Special Report as ABC's World News and NBC's Nightly News, then they would receive a nearly perfectly balanced version of the news," said Milyo.

Another finding that contradicted conventional wisdom was that the Drudge Report was slightly left of center.

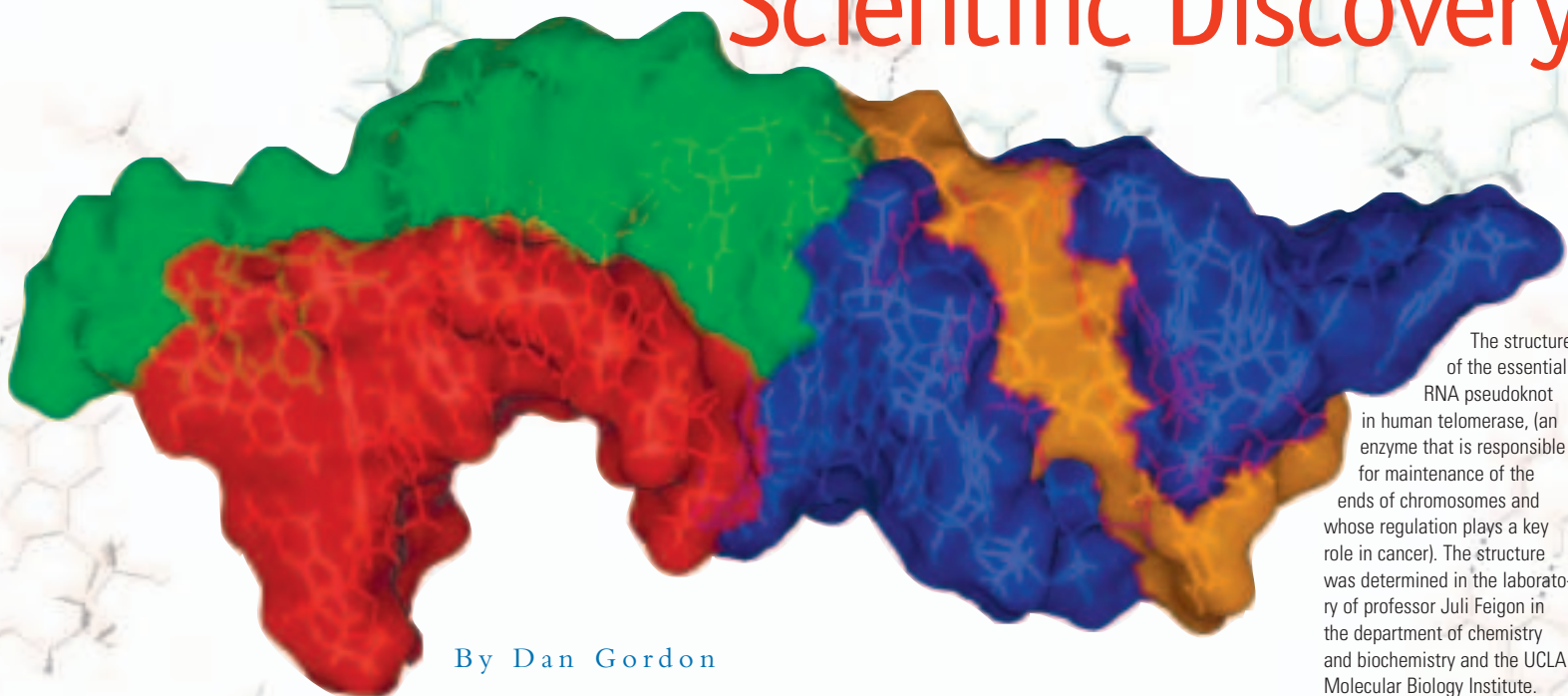
"One thing people should keep in mind is that our data for the Drudge Report was based almost entirely on the articles that the Drudge Report lists on other Web sites," said Groseclose. "Very little was based on the stories that Matt Drudge himself wrote. The fact that the Drudge Report appears left of center is merely a reflection of the overall bias of the media."

Yet another finding that contradicted convention relates to National Public Radio, often cited by conservatives as a liberal news outlet. But according to the study, it ranked eighth most liberal of the 20 that the study examined.

The results break new ground in the exploration of political bias in the media.

"Past researchers have been able to say whether an outlet is conservative or liberal, but no one has compared media outlets to lawmakers," Groseclose said. "Our work gives a precise characterization of the bias and relates it to a known commodity—politicians." www.polisci.ucla.edu/faculty/groseclose

A Cauldron of Scientific Discovery



The structure of the essential RNA pseudoknot in human telomerase, (an enzyme that is responsible for maintenance of the ends of chromosomes and whose regulation plays a key role in cancer). The structure was determined in the laboratory of professor Juli Feigon in the department of chemistry and biochemistry and the UCLA Molecular Biology Institute.

By Dan Gordon

For more than 45 years, the Molecular Biology Institute has spawned unique interdisciplinary collaborations that are addressing the fundamental questions of life.

It started more than four decades ago when a small group of faculty from chemistry, biology and the medical school began to talk informally about the need to transcend traditional disciplinary boundaries. Against the backdrop of their discussions, a scientific revolution was underway—for the first time, life processes could be studied at the molecular level. In 1965, UCLA's Molecular Biology Institute (MBI) and a related interdepartmental graduate program were born with fewer than a dozen faculty members and three graduate students.

Like the science it supports, MBI has grown by leaps and bounds in the ensuing years. Today, there are approximately 165 faculty members and nearly half that number pursuing doctoral degrees in the interdepartmental program, many based in a building that has become a cauldron of scientific discovery—a building named after the Institute's founding director, who won a Nobel Prize for his own research efforts. The ever-more-potent tools of the molecular biology trade are fueling advances in much of the scientific world. And by bringing together researchers from disparate departments on campus, MBI continues to provide fertile ground for the interdisciplinary collaborations that have kept UCLA at the forefront of a science that now has the unprecedented ability to address fundamental questions of life.

In 1961, Richard Dickerson was a postdoctoral fellow in the Cambridge laboratory of John Kendrew, one of the scientists who had described the first two protein structures, myoglobin and hemoglobin. Kendrew was launching a new scientific publication that he was considering calling the *Journal of Molecular Biology*, but was hesitant.

"Kendrew asked, 'Is molecular biology a legitimate term?'" recalled Dickerson, who would later become MBI's second director, serving from 1983 to 1994. "People had been using the term since 1938, but it didn't really have meaning until molecular structures of proteins began to be worked out."

But as scientists began to solve the mysteries of proteins and DNA structure, the idea that life processes should be studied at the molecular level was taking hold. “Chemists were looking at what molecules did, and biologists were studying what organisms did,” explained Steven Clarke, professor of chemistry and biochemistry and the current MBI director. “When people realized that biology could be explained in terms of the individual chemical molecules, everything changed.”

Soon, the emerging field would include biophysics; through x-ray diffraction technology, scientists could, by tracking individual atoms, begin to describe how life works, as well as what goes wrong in cases where it *doesn't* work.

Paul Boyer was recruited from the University of Minnesota to join the UCLA faculty in 1963 and was soon asked to be the first director of the new institute. Boyer would quickly establish a culture of cross-disciplinary teamwork that continues to distinguish the institute to this day.

While guiding the MBI through its formative years, Boyer was also pioneering a new way of looking at a complex biological problem. In 1997, Boyer was awarded the Nobel Prize in Chemistry for his co-discovery of the process behind the synthesis of ATP, the energy molecule that drives biological reactions.

Boyer's work was the most celebrated of many important discoveries that have come out of the Institute. MBI researchers presented the first evidence that DNA could “bend” and found, in studying the process of drug binding, that small changes in the DNA helix could be read by proteins. MBI researchers laid the laboratory groundwork for the development of COX-2 inhibitors, an important advance in the area of anti-inflammatory pain medication. A new understanding of aging and molecular repair processes came out of work by MBI scientists, as did the concept of gene splicing.

The intellectual framework for these and other discoveries was established through MBI's educational mission and purposeful mixing of scientists. On Boyer Hall's six floors, MBI members from approximately 10 departments are situated strategically in ways designed to lead to the most productive daily interactions. At weekly seminars and annual retreats, informal discussions often spawn new ways of thinking and potentially fruitful collaborations.

“This institute has enabled us to formalize interactions that, at other universities, would be hit and miss,” said Clarke. As molecular biology grows more complex, the interdisciplinary net is widening. MBI researchers are working more closely with neurobiolo-

gists at the UCLA Brain Research Institute toward a better understanding of the molecular mechanisms involved in learning and memory. While continuing to promote collaborations among biologists, chemists and faculty in the medical school, MBI is forging more ties with physicists, bioengineers and other researchers at the new California NanoSystems Institute on campus. Mass spectrometry and imaging technologies developed by engineers and physicists are opening new windows for looking at biology.

Clarke believes MBI's powerful mixing of expertise enables UCLA to stay at the cutting edge in the development of new scientific approaches. The last decade has seen the emergence of “omics” technologies. It started with genomics—studying genes in tandem rather than one at a time; more recently, scientists have begun to look at the full complement of proteins (proteomics), metabolites (metabolomics) and lipids (lipomics).

“These are new global ways of looking at molecules in the cell,” said Clarke. “Rather than studying one problem, we're developing approaches to studying the interactions of all molecules and systems so that we can understand the function of the living organism.”

Modern research tools are making it possible to address questions molecular biologists of previous generations couldn't have considered tackling.

Photo by Carol Petersen



The interdepartmental Ph.D. program in MBI, directed by biochemist Sabeeha Merchant, provides graduate students with unique opportunities to work with faculty from many UCLA departments—a much broader exposure to scientific fields than in traditional department-based programs. The program recently received a bequest from alumnus Philip Whitcome that, among other things, establishes an endowment for graduate student support.



Steven Clarke, director of the UCLA Molecular Biology Institute: “Chemists were looking at what molecules did, and biologists were studying what organisms did. When people realized that biology could be explained in terms of the individual chemical molecules, everything changed.”

Recombinant DNA technology has dramatically accelerated the pace of the science. Now, researchers can easily examine a section of the human genome in pursuit of a gene affected in disease, see what protein that gene encodes and study the protein.

“The science is advancing so quickly that faculty can’t be doing the same thing they were doing when they were hired,” said Clarke. “We all have to wake up each morning and ask ourselves what new things we can learn that will help us be more efficient.” To that end, MBI’s continuing education—both formal and informal—is critical. Many individual donations through Campaign UCLA established the Sigman Lectureship, which brings internationally-renowned scientists to the campus to share their expertise.

Graduate students and new faculty help to ensure a steady infusion of new ideas. The interdepartmental Ph.D. program, originally established by Boyer and today under the leadership of Sabeeha Merchant, professor of biochemistry and MBI associate director, continues to provide graduate students with opportunities

to work with faculty from multiple departments, exposing them to a much broader array of mentors from which to choose for their dissertation supervision than is available to students in traditional departmental Ph.D. programs.

The program will be reinvigorated thanks to a large bequest from alumnus Philip Whitcome that, among other things, establishes an endowment for graduate student support in MBI (*see page 30*). Merchant said that the funding will enable the interdepartmental program to develop a track for specialized students who will be afforded greater independence and the ability to tailor the program to their goals.

When recruiting new faculty, Clarke said, MBI’s leadership assesses where the science is moving and takes the opportunity to go after individuals whose area of expertise will best advance the research enterprise.

“These new faculty help to keep the older faculty sharp,” Clarke said. “The older faculty can then apply their wisdom to these exciting new areas, as

well as serving as mentors to the younger scientists.”

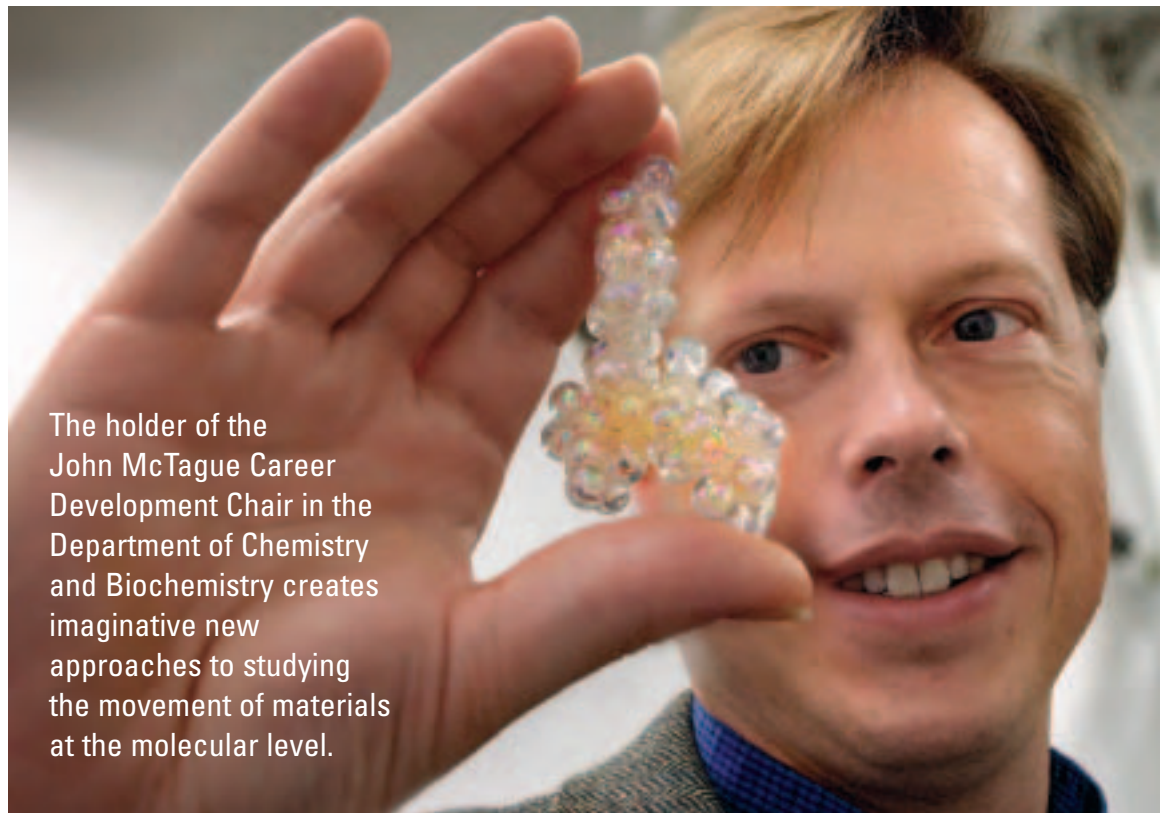
That level of collegiality impressed the Institute’s most recent faculty recruit, Feng Guo. After completing his postdoctoral training at the University of Colorado-Boulder, Guo, a structural biologist interested in the workings of a class of genes called micro-RNAs that are believed to regulate 10–30 percent of all protein gene expression, was pursued by top universities. UCLA was where he felt most at home.

“MBI has a strong structural biology community,” Guo said. “But just as important, the researchers are so interactive and willing to help each other. The assistance I’ve been getting from other laboratories as I start mine has made a huge difference.” 

“These are new global ways of looking at molecules in the cell. Rather than studying one problem, we’re developing approaches to studying the interactions of all molecules and systems so that we can understand the function of the living organism.”

Thomas G. Mason:

Creating a New Field is Just the Start



The holder of the John McTague Career Development Chair in the Department of Chemistry and Biochemistry creates imaginative new approaches to studying the movement of materials at the molecular level.

By Stuart Wolpert

For physical chemist Thomas G. Mason, his research agenda that intersects the microscopic realms in chemistry, physics, engineering and biology began with work in a discipline of his own creation.

As a graduate student at Princeton, Mason created a field called microrheology. Now used by scientists worldwide, microrheology is a method for examining viscosity and elasticity of soft materials on a microscopic scale, with applications for areas as diverse as the structures of petroleum, the interior of living cells, and the biology of cancer.

“Tom is extraordinarily inventive, technically brilliant, and a very fine teacher, and a man of great integrity,” said Charles Knobler, emeritus professor of chemistry and associate dean of physical sciences.

Mason, an assistant professor of the Department of Chemistry and Biochemistry, holds the John McTague Career Development Chair, which provides funding for research support. Before joining UCLA’s faculty in

2003, Mason worked as a senior physicist for six years at ExxonMobil’s Corporate Strategic Research Laboratory, where he conducted both basic research and applied industrial research on heavy crude oils, including studies of tar-like molecules called asphaltenes—the bottom of the barrel in oil production.

“Most of the oils refined in the world are light,” said Mason. “The Middle East has large reserves of light oils that are easy to refine. Heavier oils, which are so viscous, are harder to refine.

“Canada and Venezuela have enormous reserves of heavy oil. As lighter oils become scarce, the world will rely on heavy oils as the primary liquid hydrocarbon source.”

Mason studied how to control the behavior of asphaltenes in mixtures of crude oils. Heavier oils can contain 10–20 percent asphaltenes; because of this, heavier oils are discounted in price because the lighter crude oils are easier to process. He explored how to blend heavier and lighter oils together, and received patents for this research.

Mason, who also holds a joint appointment in the Department of Physics and Astronomy and is a member of the California NanoSystems Institute, decided to return to academia largely because he enjoys teaching students, and likes the wide range of research options at universities. He teaches thermodynamics, statistical mechanics and physical chemistry for undergraduates as well as graduates.

Why UCLA?

“UCLA’s vision of excellence inspires me,” Mason said. “When I’m in the UCLA environment, I feel challenged to live up to a very high standard. When I walk by Royce Hall and Powell Library, I think of the great people who had the foresight to make UCLA into what it is. I enjoy the warmth of my colleagues; senior colleagues have been very generous to me.”

A significant factor in Mason’s decision to come to UCLA was the McTague Chair, an endowment that provides five years of funding for Mason’s graduate student support, laboratory equipment and other research needs. John McTague, a distinguished chemist and national science policymaker, was a UCLA professor of chemistry from 1970 to 1982, and later served as vice president of technical affairs for Ford Motor Company. McTague made a gift to the College’s Department of Chemistry and Biochemistry that endowed two development chairs for junior faculty members.

The Department of Physics and Astronomy also offered Mason a joint appointment, and the California NanoSystems Institute gave additional start-up funding and membership, providing strong interdisciplinary support for Mason’s research.

Mason’s work opens innovative new approaches to an established field of study. For centuries, scientists have studied the deformation and flow, or “rheology” of materials on a large laboratory scale. However, until Mason developed the field of microrheology, scientists had not done so on the microscopic scale.

“I’m interested in understanding the degree to which complex soft materials are viscous and elastic,” said Mason, whose research is federally funded by a National Science Foundation CAREER Award and by the American Chemical Society’s Petroleum Research Fund. Many of these soft materials have a liquid base, and microscale to nanoscale solid particles, liquid droplets and polymers are added; thermal energy keeps these small components moving.

Understanding microrheology in synthetic materials is the first step to insights on what occurs in active materials like the interior of cells, and may help us understand how cells function and die. Cells can have “molecular motors,” Mason said, that grab and transport “cargo,” such as proteins, to other parts of the cell. Some cells change shape when they engulf particles or a virus; there is motion inside the cells.

A challenge is to understand the motion of particles inside cells.

“Can we map out, inside of a cell in three dimensions, the mechanical properties everywhere inside that cell?” Mason asked. “Right now, microrheology is the best technique to help us understand this.”

Within a cell, viscosity and elasticity are extraordinarily hard to measure, and can change over time. Mason is collaborating in this area with Michael Teitell, chief of pediatric pathology and associate professor of pathology and laboratory medicine in UCLA’s David Geffen School of Medicine; Teitell is an expert on cancer biology.

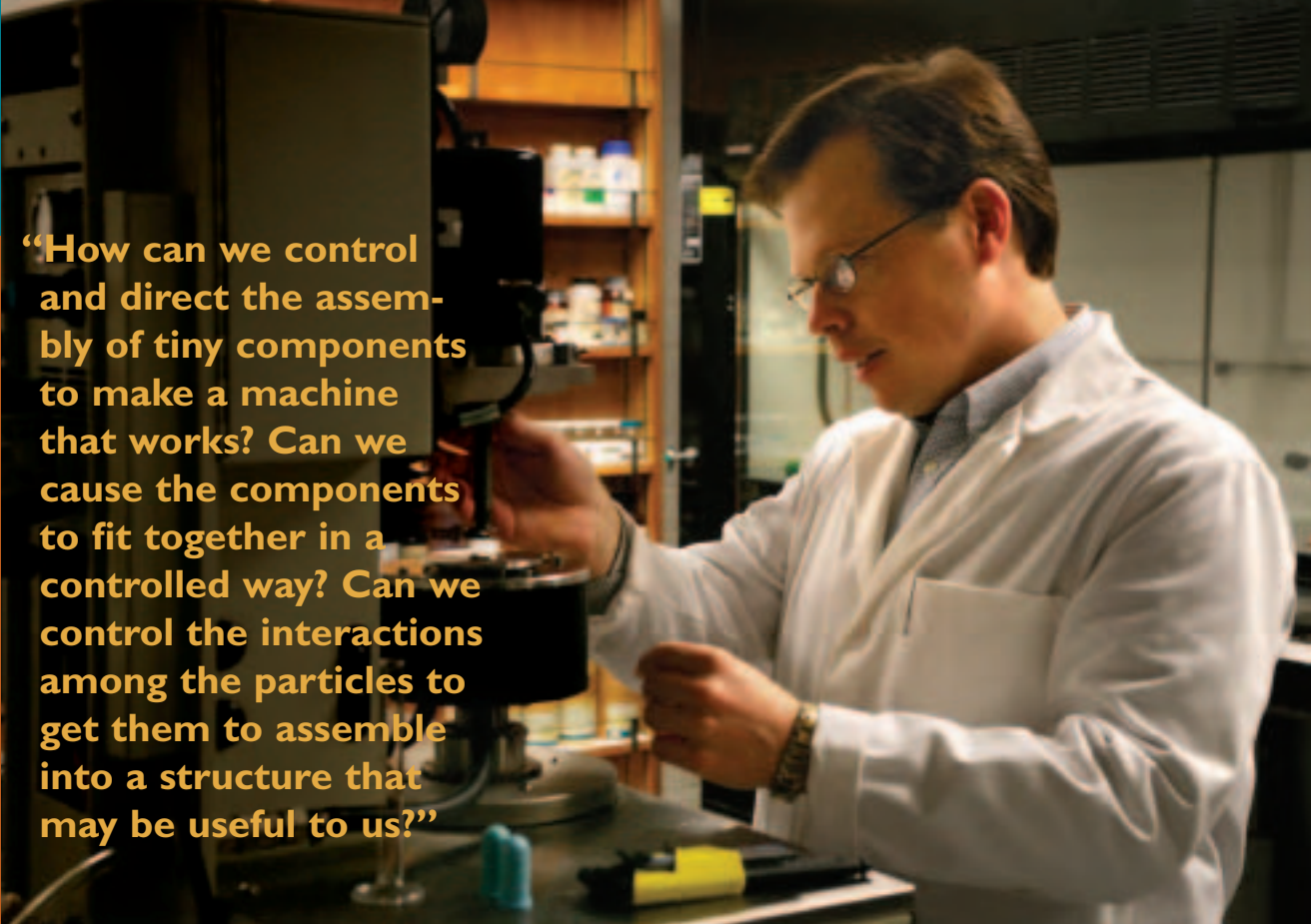
“Michael and I are interested in understanding differences in the rheology of normal cells compared to cancer cells,” Mason said. “Can we use microrheology to determine cell properties that can give us clues about cancer? We are in the process of setting up experiments to test that. How do rheological properties change when cells move, divide or die?”

As with much cutting-edge science, Mason’s research opens the possibility for dreams that sound like science fiction. Are microscale devices in solution that can actively identify cancer cells and eliminate them a real possibility? Could Mason’s research help achieve this goal? The answer, he said, is not any time soon, but perhaps in his lifetime.

If oil droplets can be coated with the right kind of molecules that enable cells to take in these droplets through membranes or the cell wall, that would be a significant advance in pharmaceuticals, Mason said.

“While this research is still in its formative stages, the fact that we can mass produce droplets as small as 10 nanometers with high pressure microfluidic techniques is cause for optimism.”

“Can we map out, inside of a cell in three dimensions, the mechanical properties everywhere inside that cell?” Mason asked. “Microrheology is the best technique to help us understand this.”



“How can we control and direct the assembly of tiny components to make a machine that works? Can we cause the components to fit together in a controlled way? Can we control the interactions among the particles to get them to assemble into a structure that may be useful to us?”

Chemist Thomas Mason: “UCLA’s vision of excellence inspires me. I feel challenged to live up to a very high standard. I want every day to count.”

For his doctoral dissertation, Mason studied the transition of an elastic solid into a viscous liquid as it is diluted. Mayonnaise, for example, is an emulsion that has properties of a solid; you can tip the jar sideways, and the mayonnaise stays put. Mayonnaise is made of droplets of oil stabilized by egg proteins and lipid-like molecules in the egg. When the droplets are highly concentrated, they pack together and deform to make the foam-like structure that is mayonnaise.

Mayonnaise behaves like an elastic material; you need a knife to spread it. As you add water, you can thin mayonnaise to the point where it flows like a liquid; you can change it from an elastic material to a viscous material by adding water in between the droplets.

“I wondered, why can’t we use optical methods like light scattering and microscopy to study the elasticity of materials by watching how probe particles move in them, instead of using a mechanical device?” Mason said. The idea of using an optical method for determining the local microscopic rheology emerged from that thought. He watched particles move in a viscoelastic material using an optical microscope. At first, his techniques were thermally driven; later, he excited their movement with laser tweezers. He looked at particles that have a variety of shapes and watched how they translated and rotated in the mate-

rials; from either type of motion, he figured out ways to determine the viscoelastic properties.

In a new approach to colloid chemistry, Mason can mass-produce billions of microscale particles having many different shapes. He studies how the particles interact and change structure when they are concentrated in solution. He can create, at the microscale, a model of molecular liquid crystals, and uses an optical microscope to observe these microscale particles as they move. Instead of watching microscopic particles move randomly, he can control tiny particles with laser tweezers.

“How can we control and direct the assembly of tiny components to make a machine that works?” Mason asked. “Can we cause the components to fit together in a controlled way? Can we control the interactions among the particles to get them to assemble into a structure that may be useful to us? Can we create useful complex structures out of fundamental parts, in solution, where we can mass-produce a small-scale engine, for example?”

“If we can figure out how to control the interactions and shapes of the components, then we may be able to create highly complex assemblies that have a functional purpose. If I make a device, I want to make the parts and control them; I want a directed process. I am optimistic about this research approach.” 

A Major Catalyst for Undergraduate Enrichment

By Robin Heffler

Babatunde Akinloye, a UCLA sophomore majoring in Afro-American studies, regularly returns to his South Central Los Angeles neighborhood and tells high school students how they too can strive for admission to UCLA and other colleges.

“My transition to UCLA was not as rough as for others, so I want to help those who were not as fortunate as I am in finding scholarships and supportive family resources,” said Akinloye, the recipient of a Wasserman Blue and Gold Scholarship that funded much of his undergraduate education.

“The Wasserman Blue and Gold Scholarship has alleviated much of my fiscal needs, and the counseling provided through the program has also been very beneficial,” said Akinloye. “My advisor, Angela Deaver Campbell (director of the Scholarship Resource Center), meets with me to monitor my academic performance. It helps that I’m not just navigating through UCLA on my own.”

Akinloye, who wants to use his degree to create films that represent the African-American experience, is one of 40 undergraduates in the Wasserman Blue and Gold Program, which helps bring to UCLA students from high schools that traditionally sent few students to the campus. This is one of several scholarship programs made possible by a gift from Lew and Edie Wasserman, establishing the largest endowment for undergraduate support at UCLA. In total, the Wasserman Fund provides \$5,000 scholarships to 120 students each year.

Benefactors of UCLA since the 1960s, the Wasserman family stipulated that recipients show both financial need and academic merit. Judith L. Smith, dean and vice provost for undergraduate education, fulfilled the Wassermans’ wishes by designing a program that addresses the several types of student needs.

“The Wasserman scholarships motivate and reward students who participate in academic enrichment activities,” said Smith. “On average, those who are eligible need about \$6,000 a year beyond what they receive from federal and state grants. If they don’t get it, they have to work or take out a loan. With a

A gift from Lew and Edie Wasserman supports more than 100 undergraduate students each year.

Wasserman scholarship they can really focus on education without worrying about finding a job or accumulating too many loans.”

Under the plan developed by Smith, who heads the College’s Division of Undergraduate Education, three scholarship programs were developed. The first was for students who complete their community college education as honors students. These students are eligible to apply for a Wasserman scholarship under the Transfer Alliance Program (TAP). Each year, 20 students receive these two-year awards for their junior and senior years at UCLA. In addition, 10 community college students from underrepresented high schools receive TAP Blue and Gold scholarships.

The largest group of awards is for 50 Wasserman Research Scholars, who are completing a senior thesis or an equivalent project in their academic field as part of the College undergraduate research program.

Tria Marie Ellison, for example, is a senior anthropology major and Wasserman Research Scholar. Her senior project is titled “Let the Lions Speak: The Story of Madi History Told through Craft Traditions in Northern Uganda.” Her work is part of a larger project in which a 19th-century fort in Uganda is being excavated for a range of linguistic, political and historical information.

“The Madi were displaced twice in the 1800s and once in the 1970s,” said Ellison, who has volunteered on several research projects for the history department and the Cotsen Institute of Archaeology (*for more on the Cotsen Institute, see page 4*).

“This research is important because we see people getting displaced from their homelands all the time,” said Ellison. “If we can understand the process, maybe we can change the politics and learn how to integrate the groups.”

Being a Wasserman Scholar allowed Ellison to concentrate on her research rather than searching for funds to support it. While she has been unable to travel to the excavation site because of political instability in Uganda, she hopes to get there next winter when she is in graduate school.

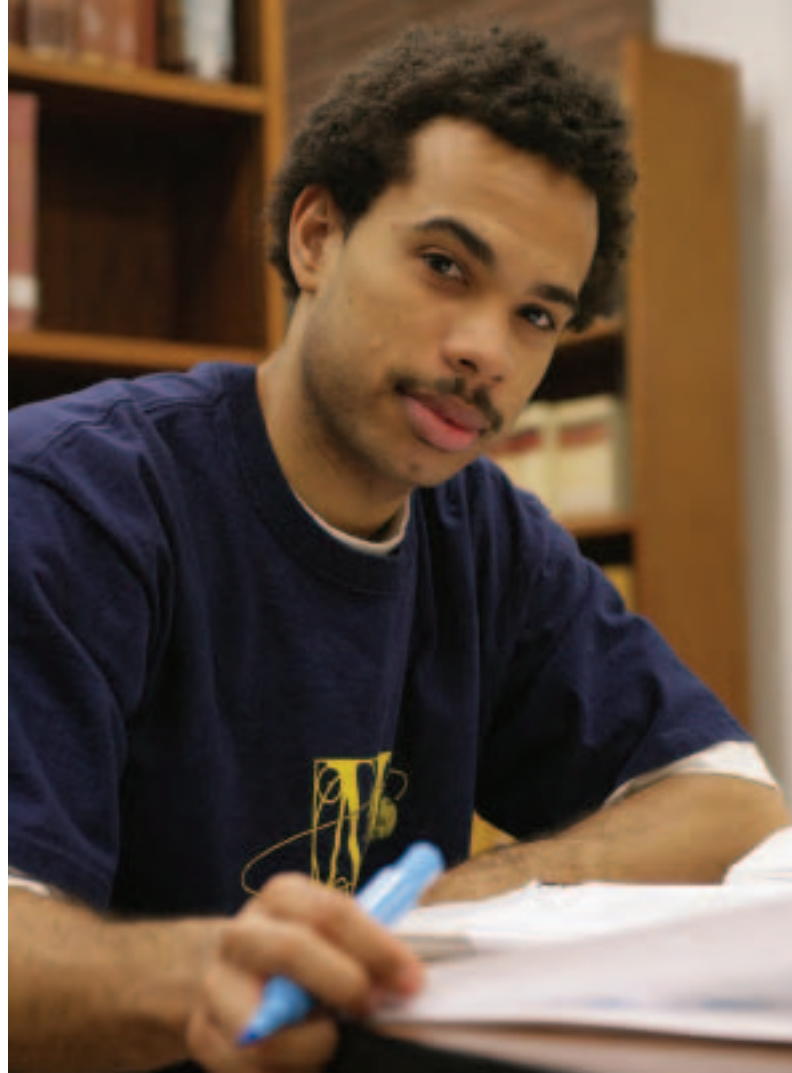
Ellison also credits the scholarship with helping her get into graduate school.

“Being a Wasserman scholar is a prestigious honor that I think influenced my acceptance to graduate school,” said Ellison, who in the fall will attend the University of Wisconsin to work toward a doctorate in anthropology. “I believe the reason I was accepted is that I have been doing so much research and went to field school in Panama, where I learned how to locate, set up and excavate a field site.”

Jeanne L. Perry, associate adjunct professor of molecular, cell, and developmental biology, sees the impact of the Wasserman Research Scholarships on students she mentors.

“It frees up their minds to think about a research problem, and take the time to design and carry out experiments,” Perry said. “The Wasserman scholars tend to be the best of my students.”

Elaine Lee and Grace Chang, two of Perry’s current students who are both Wasserman scholars, have each identified proteins in the genes of tuberculosis bacteria that are required for the bacteria to thrive. Lee and Chang are working on how these genes operate to see how the bacteria can be destroyed without



Undergraduate Aaron Allen conducts research on race and identity, with an emphasis on multiracial issues. Allen’s work is supported by a Wasserman Research Scholarship. He also serves as a tutor in the university’s Academic Advancement Program, and volunteers to tutor incarcerated teens.

“Through the Wasserman scholarships, we can encourage students to engage in academic programs that really enhance their experience at UCLA—both in their classroom work and in research.”

harming the human host, so that researchers can develop drugs to treat them.

“The Wasserman scholarships reward and facilitate undergraduate participation at so many levels—in research, teacher preparation, honors courses and civic projects,” said Smith. “Through the Wasserman scholarships we can encourage students to engage in academic programs that really enhance their experience at UCLA—both in their classroom work and in research.”

The Wasserman Scholarship Fund was established in 1998—an early leadership gift in Campaign UCLA from Lew and Edie Wasserman. In shaping the gift, the Wassermans were inspired by the letters they already received each year from UCLA students whose scholarships and fellowships were funded by the couple’s earlier gifts.

“A common thread goes through all these letters,” said Edie Wasserman. “They say, ‘we couldn’t have gone to school without you.’” 

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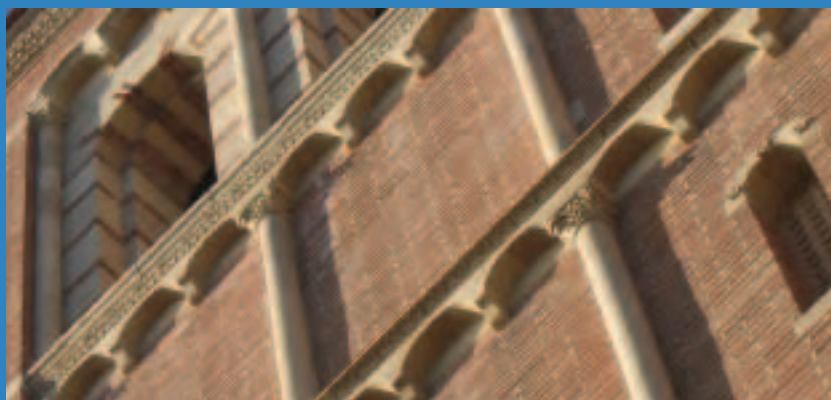
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“Our progress is possible because of the dedication and generosity of our donors and volunteers. I thank you for your continuing commitment to the College. Private philanthropy is vital to ensure that we remain competitive among the nation’s premier research universities.

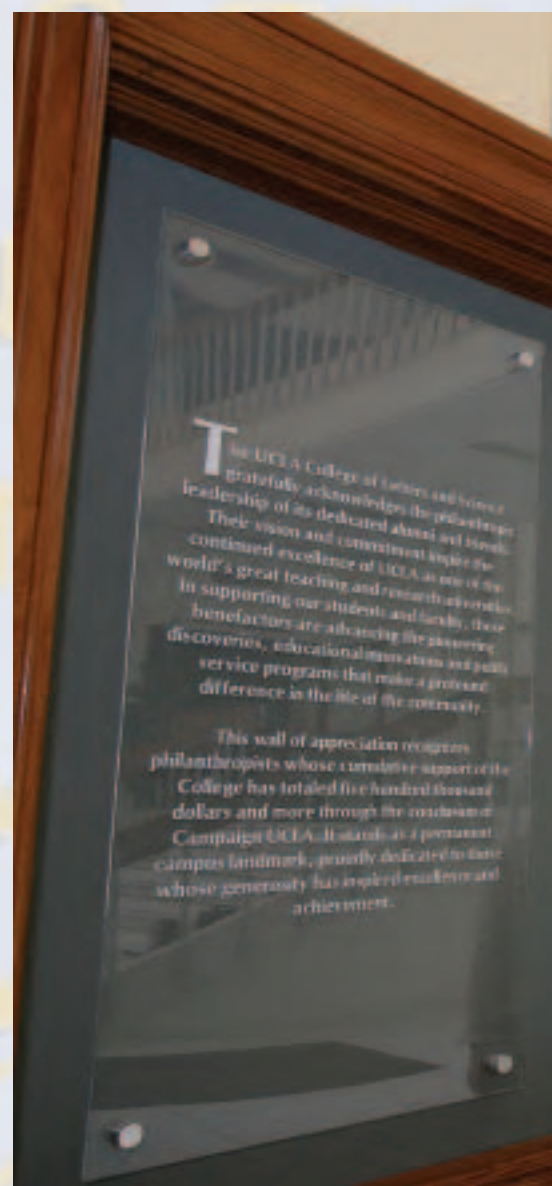
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PATRICIA O’BRIEN, EXECUTIVE DEAN
UCLA COLLEGE OF LETTERS AND SCIENCE



A TRIBUTE TO THE

COLLEGE'S LEA IN PHILANTHROPY



LEADERS

THIS APRIL, IN THE EAST FOYER OF MURPHY HALL, THE COLLEGE OF LETTERS AND SCIENCE INSTALLED A WALL OF PHILANTHROPY THAT COMMEMORATES THE COMMITMENT OF ITS MOST GENEROUS BENEFACTORS. ON THE WALL, THE COLLEGE RECOGNIZES THE FINANCIAL SUPPORT OF EVERY DONOR SINCE 1919 WITH LIFETIME GIVING OF \$500,000 OR MORE THROUGH THE CONCLUSION OF CAMPAIGN UCLA. THE WALL STANDS AS A PERMANENT CAMPUS LANDMARK, DEDICATED TO THOSE WHO HAVE INSPIRED EXCELLENCE AND ACHIEVEMENT.

“THIS WALL PAYS TRIBUTE TO THE PEOPLE AND ORGANIZATIONS WHO HAVE MADE SUCH A DIFFERENCE TO UCLA AND THE COLLEGE OF LETTERS AND SCIENCE,” SAID PATRICIA O’BRIEN, EXECUTIVE DEAN OF THE COLLEGE. “WE ARE SO GRATEFUL FOR THEIR SUPPORT—THEIR LEGACY WILL BE FOUND IN PERPETUITY IN THE FACULTY, STUDENTS AND PROGRAMS IN THE COLLEGE.”



Patricia O'Brien, executive dean of the College of Letters and Science (left), with donors and volunteer leaders Garen and Shari Staglin at the newly-installed "Leaders in Philanthropy" wall in Murphy Hall.

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We gratefully acknowledge all of our anonymous donors.

PAVING THE WAY FOR “A Boundless Future”

How can the Middle East diversify its social and economic development?

Earlier this year, the UCLA Ronald W. Burkle Center for International Relations and the Ministry of Foreign Affairs of Qatar cosponsored a conference in Doha to explore the prospects for economic and social development in the Middle East. Attended by senior-level leadership from government, business and universities worldwide, “Enriching the Middle East’s Economic Future” set the stage for change and sustainable international cooperation between the nations of the region, Asia, Europe and the United States.

President Bill Clinton opened the conference with a keynote address that emphasized the need for global cooperation to encourage economic and social development in the Middle East.

“I think it is quite important to continually bring the rest of the world into this region in a positive way—more foreign partners, more foreign investments, more partners for broad security, and more general understanding,” said Clinton. “And if we get the strategy right on the politics of the region, we will have a very positive future in the Middle East.”

The Burkle Center will publish the findings and recommendations, with a foreword by Clinton; his text follows. For a copy of the book, visit the Burkle Web site for the conference at www.international.ucla.edu/bcir.

By Bill Clinton

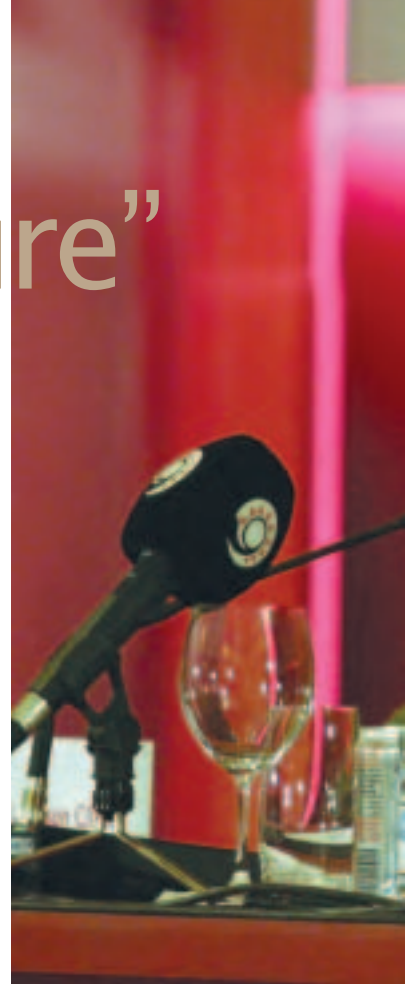
When the Emir and UCLA’s Burkle Center for International Policy invited me to return to Qatar and participate in their conference on “Enriching the Middle East’s Economic Future,” I agreed with enthusiasm and a sense of hope. I did so because I believe deeply that the story of the Middle East and the Arabian Gulf is more than the story of the price of oil, the conflict between the Palestinians and the Israelis, the war in Iraq and its aftermath, and the question of Iran.

There are other equally important stories about the Middle East and the worldwide Muslim community that need to be explored and discussed. These are the stories of the deepening economic, cultural and political engagement of many nations in the Middle East with societies around the world; of new efforts to promote economic diversification throughout the region; and of the readiness and eagerness of many in the Middle East to take on the hard, but necessary, challenge of economic development and reform—a challenge that is critical to the transformation of the region.

International experts from government, industry and academia worked collaboratively in Doha to lay the foundations for a far-reaching agenda to spur more sustainable economic development and growth throughout the Middle East. By lifting up the lives of everyone in the Gulf, we will enhance the economic and political security of people around the world.

The conference wisely gave careful consideration to new public sector policies and private sector approaches to growing a vibrant and innovative middle class throughout the region, as well as to developing regulatory structures that will promote entrepreneurial investment in new business sectors, open new markets, and provide support for the creation of new infrastructures. Participants looked carefully at how to bring the region’s vibrant intellectual capital and creative spirit, especially those of women, to all of its citizens, in the service of building productive and prosperous societies through expanded education and training opportunities. Also, as the head of an NGO myself, I wanted to take advantage of the opportunity to participate in this event and discuss the work that my foundation is doing to address some of the issues the Burkle Center aims to address.

We also focused on transforming the great 20th-century oil economies of the Middle East into 21st-century global energy economies. As we look ahead to the coming decades, it is practical and achievable for the Middle East to





President Bill Clinton opened a conference co-sponsored by the UCLA Ronald W. Burkle Center for International Relations and the government of Qatar to begin a new focus on social and economic change in the Middle East.

Bill Clinton: "By lifting up the lives of everyone in the Gulf, we will enhance the economic and political security of people around the world."

move to the forefront of innovation in the development of new and cleaner fuel sources for world markets, including wind and solar energy, and the development of cost-effective ways to provide liquefied natural gas around the world in a manner that addresses the increasing concerns about climate change and global warming. Climate change, alternative energy sources, and the threat posed by global warming have long been issues of interest to me. In fact, they are focus areas of my Global Initiative and it is my hope that by putting great minds together, we can come up with workable solutions to combat climate change.

The recommendations of our deliberations at Doha reflect many of the common aspirations of those who share a vision of a peaceful and secure Middle East that knows the blessings of prosperity, opportunity and democracy. Events like this conference, when people of good will from around the world come together to engage in a positive dialogue, ultimately pave the way for more partners, and more global understanding of the Middle East, its storied past and its boundless future. 

“The story of the Middle East and the Arabian Gulf is more than the story of the price of oil, the conflict between the Palestinians and the Israelis, the war in Iraq and its aftermath, and the question of Iran. There are other equally important stories about the Middle East and the worldwide Muslim community that need to be explored and discussed.”

By Meg Sullivan

In UCLA's top-ranked academic department, the exploration of linguistics creates new understanding of the intricacies of human speech.

“Wong tuwo,” said the Indonesian native in a long flowing tunic. “Wong tuwo.”
“Whaa-ung too-whoa,” repeated the UCLA graduate student in a t-shirt and cords. “Whaaa-ung too-whoa.”

In East Javanese, the words either means “old person,” “the person is old,” “wise person” or “parent.” It all depends on the context, subtle shifts in grammar, pronunciation and the presence or absence of an article that is sometimes tucked at the end.

Welcome to the experience that attracts many graduate students to UCLA's most highly-rated department: linguistics.

Opening a Broad World View



Linguistics department chair Tim Stowell: “If you’re ever dropped in an Amazonian jungle, these are the methodological tools that you would use to start understanding a totally unfamiliar language and end up being an expert.”

For two quarters, students like Katie Schack—who has dreamed of conducting fieldwork since spending a summer in New Guinea—immerse themselves in the methods of linguistic field study.

The students regularly meet with the speaker of a language with which none of them—or, for that matter, few people anywhere else—have had prior contact. Through exchanges with R. Diah Larasati, a visiting scholar from Indonesia, this year's graduate students have slowly pieced together about 90 percent of Larasati's native East Javanese.

The graduate students have analyzed four aspects of linguistics: **phonetics** or how we produce and translate the sound waves that come out of our mouths and go into our ears as language; **semantics** or how meaning is encoded in language; **syntax** or grammatical representations of meaning; and **phonology** or the idiosyncratic rules governing the way sounds combine when they come into contact with each other in different languages.

And working with faculty Kie Zuraw and Hilda Koopman, they've painstakingly tracked their progress in phonetic transcription, a specialized alphabet with hundreds of letters that correspond with every possible language sound.

“If you're ever dropped in an Amazonian jungle, these are the methodological tools that you would use to start understanding a totally unfamiliar language and end up being an expert,” explained department chair Tim Stowell.

As grueling as the experience may sound, there was a time last year when it seemed like nailing linguistics field methods at UCLA was going to get even tougher.

In a turn of events unprecedented in the College's history, eight linguistics faculty were being recruited by different institutions in this country and abroad.

For a department with 21 faculty members, that meant more than one-third could have been pulled from one of the best linguistics departments in the nation, ranked with MIT, as a top program, according to the National Research Council.

Gone would have been most of the personnel of the department's best known asset: the nation's first phonetics lab, made world famous by the late, great phonetician Peter Ladefoged, whose academic pedigree has been traced all the way back to Henry Sweet, the philologist said to have inspired George Bernard Shaw's "Pygmalion." (See www.linguistics.ucla.edu/people/ladefoged/remember/index.htm.)

w of Language

Gone also would have been the leaders of the department's hallmark collaboration between phonology and phonetics, a team that has demonstrated various subtle ways in which the physical limitations of the human voice production system have determined all kinds of otherwise inexplicable sound combinations in languages around the world.

Fortunately, the department wasn't at risk of losing the versatile Ed Keenan, the first American figure in semantics, an expert in the Micronesian language of Malagasy and a mathematical linguist. However the team that he has assembled stood to lose two of its most promising junior members.

Other institutions were "bending over backwards," Stowell said, to accommodate the scholars and their needs as researchers and teachers.

"Losing so many top faculty would have cut the heart out of one of our finest departments," said Patricia O'Brien, executive dean of the College of Letters and Science. "We did everything possible to retain these scholars."

"What appears to be encoded in our DNA is just astounding in its level of complexity and detail."

The university administration, ready to counter such recruitment bids, used a combination of funds from donors, the University of California system and the College.

Ultimately, UCLA prevailed; all of the faculty chose to stay at UCLA. The linguistics department now stands poised to be better than ever, said Stowell. But the situation illustrates the ongoing challenges

faced by the College in a period of mounting regard for UCLA's faculty, declining state support and increasing recruitment ambitions among private universities. (Seven of the eight linguistics faculty members were being wooed by private institutions.)

Stowell also faces a challenge of another kind: demonstrating the value of research that can seem to an outsider "like a pointless and trivial exercise."

"It's awfully difficult to convey why this work is interesting and important," Stowell said. Yet basic research into fundamental linguistic processes leads to broader understanding of the intricacy and universality of human language.

Consider just one of Stowell's areas of research: Headlines—the grammatical rules of headline writing and abbreviated English in many applications. In several scholarly presentations and a forthcoming book, Stowell contended that Headlines behaves like a mini-dialect, bound together by peculiar and predictable applications of verb tenses, articles and punctuation.

The discovery seems like just another fun fact, until Stowell starts to rattle off all the conventional languages that share some—if not all—of Headlines's quirks: Russian, Japanese, Chinese, Haitian Creole, Italian, Spanish and Catalan.

The implication is clear: although people struggle to master their native tongue and other languages, humans are all born with some basic capacity for language.

"What appears to be encoded in our DNA is just astounding in its level of complexity and detail," Stowell said.

But what is a given and what is learned still isn't certain. This, in no small measure, is the bailiwick of linguistics.

"The nature-or-nurture question pervades in a background kind of way almost all the work that goes on in linguistics," Stowell said.

Phonetics lab director Patricia Keating rubs her nose as she gives a tour of the facility that has been on the forefront of such quests. Her allergies are acting up because a torrent of dust has been unleashed by massive construction in 1950's era Campbell Hall.

Not that Keating is complaining. For years, she has had to send home research subjects during the summer months. It wasn't just that the research subjects were uncomfortable in the heat. The plastic collars that she uses to monitor their vocal chords couldn't function even though they are state-of-the-art.

"Subjects would start to sweat and the thing would slip around," Keating said. "It was hopeless—we just couldn't get a reading."



Patricia Keating, professor of linguistics and director of the department's renowned phonetics lab.

In a turn of events unprecedented in the College's history, eight linguistics faculty were being recruited by institutions in this country and abroad. "Losing so many top faculty would have cut the heart out of one of our finest departments. We did everything possible to retain these scholars."

While upgrading the building for a seismic retrofit, the university is adding much needed air-conditioning.

In addition to such upgrades, a new lab will be added to the facility that is already outfitted with a sound proof-booth and all kinds of specialized equipment for recording and analyzing sound. UCLA's Infant Language Perception Lab is expected to be up and operating by next spring. To be managed by a new hire specializing in the ways infants come to recognize their native tongue, the lab is believed to be the first of its kind in an American linguistics department. Megha Sundara, who will come to linguistics as an assistant professor, will join two faculty members whose work has put UCLA on the forefront of child language

acquisition: Nina Hyams, a UCLA linguistics professor who looks at syntax acquisition among children; and Susan Curtiss, a neurolinguist who looks at what lessons breakdowns in language capabilities—dementia, deficits and impairments—have for the understanding of normal language acquisition.

And so it has gone throughout the history of the department, which July 1 marks its 40th anniversary. Outside of the occasional star hire like Keenan, who 32 years later remains the department's best known researcher, the department has come by its strength the old fashioned way. Beginning in 1966 with Ladefoged, who died this year, the young department at a young university hired promising young faculty. Older faculty, in turn, nurtured junior faculty.

It's hard to argue with success. The process built a department known for the study of African languages, the languages of Micronesia and endangered languages around the world. Especially due to the efforts of long-time professors Pam Munro and Russell Schuh, the department is responsible for countless grammars and dictionaries of rarely studied languages, including Wolof, Chickasaw, San Lucas Quiaviní Zapotec, Mojave, Cahuilla, Kawaiisu, Gabrielino/Tongva, Maricopa, Tübatulabal, Tolkapaya Yavapai, Ngizim, Avatime, Miya, Hausa and Karekare.

Still, the ability to make strong senior hires has its place as the department continues to grow and evolve. To that end, the department this spring made offers to recruit two stars from other universities.

"It feels so good to go from the position of trying to keep people here to trying to add to our bottom line," Stowell said. "My entire career has been here, and I want UCLA to do well."

Meanwhile, back in the semantics lab, Katie Schack and fellow graduate student Tomoko Ishizuka have more modest ambitions. They just want to understand compound words in East Javanese. The problem is that, unlike English, the language has no "be" verbs.

Hence the difficulty in pinning down precisely when "wong tuwo" means "old person" and when it means "the person is old."

Taken at face value, almost any exercise in linguistic could seem patently esoteric. What can it possibly matter how a compound word is formed in one of the 5,000 different languages spoken on an archipelago of some 17,000 islands?

Pursued just three or four steps further, the question lays bare a whole new view of the world. 

www.humnet.ucla.edu/humnet/linguistics

New Progress in the Quest for Practical Hydrogen Power

A UCLA chemist has taken a significant step in creating storage for hydrogen that can be used in cars and other electronic devices.

In the push to develop practical hydrogen fuel cells to power cars and other devices, one of the biggest challenges has been finding ways to store hydrogen at the right temperatures and concentrations. Now UCLA chemist Omar Yaghi and colleagues at the University of Michigan have demonstrated the ability to store large amounts of hydrogen at the proper concentration—using materials of his own invention.

The materials, which Yaghi developed in the early 1990s, are called metal-organic frameworks (MOFs). Pronounced “moffs,” the materials have been described as crystal sponges—tiny openings on the nanoscale in which Yaghi and his colleagues can store gases that are usually difficult to store and transport.

MOFs can be made highly porous to increase their storage capacity; so porous that one gram of a MOF has the surface area of a football field. Yaghi’s laboratory has made more than 500 MOFs with a variety of properties and structures.

“We have made a class of materials in which we can change the components nearly at will,” said Yaghi, a professor in the Department of Chemistry and Biochemistry.

“Our idea was to create a material with pores that attract hydrogen, making it possible to stuff more hydrogen molecules into a small volume.”

While the U.S. Department of Energy estimates that practical hydrogen fuel will require concentrations of at least 6.5 percent, the UCLA team has achieved concentrations of 7.5 percent—nearly three times as much as has been reported previously.

Hydrogen, when burned, produces only water, and is harmless to the environment. Yaghi’s research could lead to a more practical hydrogen fuel that powers not only cars, but also laptop computers, cellular phones, digital cameras and other electronic devices.

“Before this work, the challenge has been: how do you store enough hydrogen for an automobile to run for 300 miles without refueling?” Yaghi said. “You have to concentrate the hydrogen into a small volume without using high pressure at very low temperature.

“Our idea was to create a material with pores that attract hydrogen, making it possible to stuff more hydrogen molecules into a small volume.”

In the research, which was funded by the National Science Foundation, the U.S. Department of Energy and the BASF Corporation, MOFs are used as storage devices in which hydrogen is physically absorbed.

How would hydrogen work in devices like cell phones, laptop computers and digital cameras?

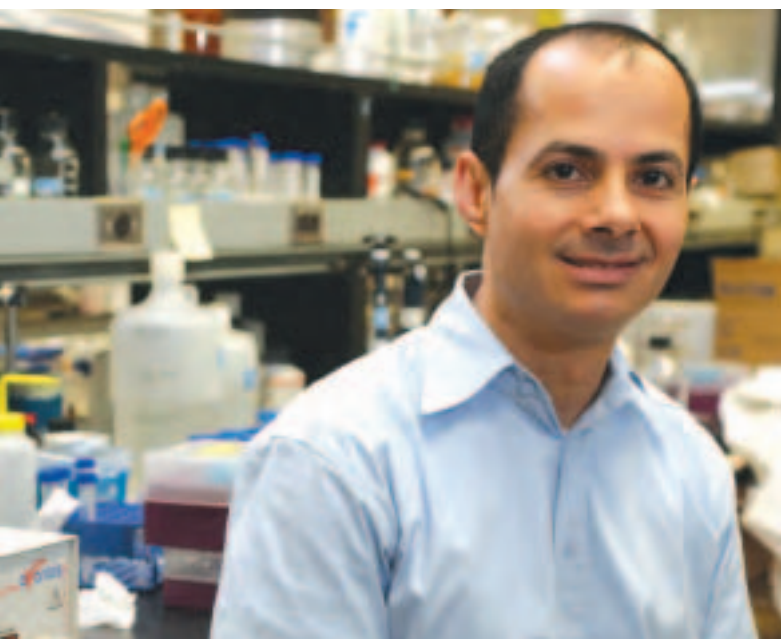
“Instead of a battery, a medium such as a MOF would store hydrogen and release it into a fuel cell,” Yaghi said.

“Molecules can go in and out of MOFs unobstructed,” said Yaghi, whose research overlaps chemistry, materials science and engineering.

“We can make polymers inside the pores with well-defined and predictable properties. There is no limit to what structures we can get, and thus no limit to the applications.”

www.chem.ucla.edu/dept/Faculty/yaghi

Omar Yaghi: “We have made a class of materials in which we can change the components nearly at will.”





A Generous Gift Transforms Japanese Studies at UCLA

Paul and Hisako Terasaki have endowed programs that will help build greater understanding between the United States and Japan.

Paul Terasaki: “In the Center for Japanese Studies we saw a great need for expansion into studies of contemporary Japan, and a need for many more visiting scholars.”

Paul Terasaki’s ties to UCLA are numerous and strong. Terasaki earned all three of his degrees from the university—a B.A. in preventive medicine and public health in 1950, and M.A. and Ph.D. degrees in zoology in 1952 and 1956. He joined the faculty of the UCLA Medical School in 1957 and served as a professor of surgery from 1969 until his retirement 30 years later. Three of his four children are UCLA alumni.

But Terasaki’s connections to UCLA range well beyond the academic. For several decades, he and his wife Hisako have been devoted and generous supporters of both the health sciences and the College of Letters and Science. Through the Nikkei Bruins—a group of Japanese-American alumni and friends of UCLA—they became involved with the Center for Japanese Studies (now housed in the International Institute) soon after the unit was established in 1991. In 1997 they created the Paul I. Terasaki Endowed Chair in U.S.-Japan Relations in the Center with a generous gift.

Now the Terasakis have extended their philanthropy to the Center with an additional gift, establishing another endowed chair, graduate and postdoctoral fellowships, relationship-building activities with other universities and civic groups, and outreach programs for K–12 education and the broader community. In

recognition of their exceptional commitment and support totaling \$5 million, the center has been renamed the Paul I. and Hisako Terasaki Center for Japanese Studies.

Asked about the gift, Paul Terasaki explained, “The UCLA campus is a wonderful place. The university seems to be very well off, but I know, having been there, that there are still many things that could be supported to a greater extent. For example, in the Center for Japanese Studies we saw a great need for expansion into studies of contemporary Japan and a need for many more visiting scholars.”

The Paul I. and Hisako Terasaki Chair in Contemporary Japanese Studies will enable the center to attract and retain an eminent senior scholar whose work addresses key issues in Japanese culture, politics, economics or social systems. The Terasaki Postdoctoral and Graduate Fellowships will bring talented, emerging scholars in Japanese studies to UCLA from around the world to work on innovative research projects and to teach in subject areas related to Japan’s past and future.

Another component of the gift, the Terasaki Program Endowment, will enable the center director to fund new initiatives and public programs, such as conferences, that will foster collaboration between the

center and other universities and think tanks. The Paul I. and Hisako Terasaki Community Outreach Program will support connections to local schools, providing training to K–12 teachers and curriculum materials for the study of historical and modern Japan, and will foster joint activities with the Japanese-American community, such as museum exhibitions, musical performances and other cultural projects.

Born in Boyle Heights in 1929, Paul Terasaki spent three years with his family in the Gila River internment camp in Arizona during World War II. After the war, the Terasakis moved to Chicago, where Paul completed high school and entered the University of Illinois. When he transferred to UCLA in 1948, his family followed him back to Los Angeles. Later, while studying for his Ph.D., he met and married Hisako, then a student at Los Angeles City College and now an accomplished and recognized artist.

After graduating, Terasaki became a professor of surgery in UCLA's School of Medicine and, ultimately, a pioneer in tissue typing for organ transplantation. The test he developed, the micro-lymphocytotoxicity test, became the international standard for tissue typing. He also established the UCLA Kidney Transplant Registry, which was active from 1971 to 1987. His corporation, One Lambda, has played a vital role in tissue typing and transplantation surgery, and the Terasaki Foundation, a research laboratory that he founded after his retirement from UCLA, focuses on the study of humoral immunity and transplantation.

The Terasakis hope that their gift will foster greater understanding between the U.S. and Japan by helping to produce and promote a new generation of scholars whose expertise focuses on modern Japan.

"I've been interested in Japan, mostly because my parents came from there," said Terasaki. "I want to help make sure that relations between the U.S. and Japan will be as good as possible. I think that the friendship between the two countries is a very important thing." 

"I want to help make sure that relations between the U.S. and Japan will be as good as possible."



Paul and Hisako Terasaki

For information about supporting the UCLA College of Letters and Science, call Tracie Christensen, assistant vice chancellor of development (310)206-0699.

Philip Whitcome: A “Payback” with Visionary Philanthropy for the Sciences

After receiving his Ph.D. in 1974 from UCLA’s Molecular Biology Institute (MBI), Philip J. Whitcome earned an M.B.A. and pursued a successful career as a biotech industry executive. In 2004, his success enabled him to create an undergraduate scholarship in UCLA’s Department of Biology.

“I had a fellowship at UCLA, and it’s payback time,” Whitcome said two years ago. “I want to initiate an activity that I can continue, that will help people benefit the way I benefited.”

Tragically, Whitcome became ill only a year later and died at the age of 57. His death was a tremendous loss to all who knew him, including his friends at UCLA. Not only had he been a devoted supporter of the university, but he was also an active member of the Sciences Board of Visitors, a group of scientists and executives who consult with College faculty and deans about how to enhance science education, develop partnerships with corporations, and encourage potential donors.

Dean of life sciences Emil Reisler said, “We miss Phil’s energy, his enthusiasm, and his dedication.”

But Whitcome’s support for UCLA was not over. His affection for the university and his insightful vision for its future had led him to bequeath \$5.2 million to endow the Philip J. Whitcome Ph.D. ’74 Scholarship Fund for UCLA undergraduates in biology or biochemistry, or graduate students in the interdepartmental program housed in the Molecular Biology Institute.

“A gift had been talked about for some time,” said Steven Clarke, director of the MBI. “But we had no idea that it would be of this magnitude.”

Whitcome’s extraordinary gift comes at a crucial moment for the MBI, when plans are under way to start a new program for highly talented Ph.D. students—plans that require substantial funding. Currently, the MBI Interdepartmental Program—like similar programs around the nation—requires graduate students to



Philip Whitcome: “I want to initiate an activity that will help people benefit in the way I benefited.”

A bequest from a fondly remembered alumnus will create an innovative program for top students in the Molecular Biology Institute and provide scholarships to undergraduates.

undertake a standard first-year course of study, with general survey classes, topical seminars, and laboratory rotations, before narrowing their field. The unique new program will eliminate the mandatory first-year curriculum for more advanced students and enable them to begin their dissertation research earlier. (See page 8)

According to Sabeeha Merchant, chair of the interdepartmental program, the new program will be designed to attract superior students “who are sophisticated, knowledgeable and know what they want to do. The intent is to enable them to finish the Ph.D. sooner.”

Said Clarke, “It will mean something special to these students to be called ‘Whitcome Fellows.’ It’s a distinctive recognition that they’re part of a special program, part of the vanguard.”

Whitcome’s visionary philanthropy will help place UCLA and the MBI at the forefront of science education for decades to come.

Dean of physical sciences Tony Chan explained, “The Whitcome gift will put us on an equal footing with private universities, enabling us to put together a competitive package for the best students in molecular biology.”

In 2004, Whitcome said he hoped his philanthropy would inspire other alumni and friends to support the University. It may well do that, but it will also encourage generations of bright young scholars to pursue their dreams of scientific investigation at UCLA. 

“The Whitcome gift will put us on an equal footing with private universities, enabling us to put together a competitive package for the best students in molecular biology.”



Ralph and Shirley Shapiro: Making an Impact across the College

Ralph and Shirley Shapiro, at the fountain at the top of Janss Steps named in their honor. Said Shirley: "It means more to me to support UCLA than to do a lot of other things."

Among UCLA's many alumni and friends are generous supporters who focus on one particular academic area. A few, like Ralph and Shirley Shapiro, gain satisfaction from supporting a range of campus schools and departments, from the arts to the libraries, to the basic sciences and medicine.

In recognition of the Shapiros' long-standing commitment to the university, now totaling more than \$11 million, the fountain at the top of Janss Steps has been named the Shirley and Ralph Shapiro Fountain.

Ralph Shapiro earned his B.A. in business administration at UCLA in the College of Letters and Science and, after a stint in the army, returned for a law degree. Shirley graduated from UCLA with a degree in education and became an elementary school teacher.

For the last twelve years, the College of Letters and Science has been one of the fortunate beneficiaries of the Shapiros' steadfast support. "Most of the undergrads on campus are in the College," said Ralph Shapiro, "but you don't have to have taken a class there to support it." Shirley added that, although she was an education major, "the classes that were the most interesting to me were the ones in Letters and Science."

Much of the Shapiros' philanthropy has been discretionary, allowing divisional deans and the executive dean to direct funds where they are needed most.

"Nobody I've met has enough resources to support all the things that need to be done," said Ralph. "There are a lot of unmet needs." The Shapiros were introduced to Patricia O'Brien two years ago, shortly before she was appointed executive dean of the College. "She was so terrific that we created an endowed discretionary fund for her," Ralph remarked. Recently O'Brien used some of that fund to establish fellowships for the recruitment of international graduate students. She commented, "The impact of Ralph's and Shirley's philanthropy is felt everywhere throughout the College. They not only support us, they challenge us to do our best."

The Shapiros also support specific areas within the College, such as the Center for Japanese Studies, the International Institute, the English department, the humanities, and physical sciences, among others.

In addition, they have created numerous scholarships and fellowships for outstanding students.

Ralph asserted, "Wonderful, bright students should not be prevented from getting an education simply because their families don't have the resources. We need to help UCLA bring the best and the brightest here. That's really what scholarships are about for us." Shirley added, "It's important to have young people who are so dedicated. They really are going to make a difference in our world."

In addition to their exceptional philanthropy, both Shapiros volunteer their personal time to the university: Ralph is a member of the the UCLA Foundation Board of Directors, while Shirley serves on the Board of Visitors of the School of the Arts and Architecture and the Board of Directors of Women and Philanthropy. They also are regular participants on the dinner committee for the College Awards Dinner.

"When you volunteer," Ralph said, "you meet people you wouldn't otherwise meet. Your common goal is to help make UCLA a better place. It's doubly enjoyable and gratifying when you're making a difference. If all of us did a little bit, it would be fabulous." 

"Wonderful, bright students should not be prevented from getting an education simply because their families don't have the resources. That's really what scholarships are about for us."

Imagine a

“I’ve always been interested in how things work, particularly living things. My field is molecular biology, investigating the unusual properties of biological systems. I’ve been at it for sixty years. It’s quite addictive.

“I believe the very best work happens when research and training are intermixed. Many of my most valued colleagues have been the graduate students and postdoctoral fellows with educated imaginations, fresh perspectives and questions no one had asked.

“The Nobel work solved a classic problem—how energy is captured and used in living cells. I’d been studying this unsuccessfully for years. Then, in 1970, looking back through the old data, I saw what all of us had missed: energy wasn’t used to create a key substance. It was used

**Lots of institutions dispense
existing knowledge.
The mission of a research
university is something more:
to produce new knowledge.**

to release that substance in the cell. From that moment, we were on the path to understanding how cells obtain the energy to serve the needs of living things.

“UCLA research is an enormous, diverse enterprise. Just look at the breadth and depth of new knowledge that flows from here year after year.

great river.

“But, there’s another factor that’s less apparent but equally remarkable—a unique, deliberate research culture here that capitalizes upon that breadth and depth and thrives on interchange among researchers and disciplines.

UCLA has a worldwide reputation for creating knowledge across an astounding range of inquiry. How does it do that?



Dr. Boyer’s 1997 Nobel Prize for Chemistry honors his pioneering investigation of the formation of adenosine triphosphate (ATP)—the molecule that provides the energy for biological reactions and processes in all living things. He was the founding director of UCLA’s Molecular Biology Institute.

This may not sound unusual, but—in too many academic settings—competition trumps cooperation.

“You know what lures me back on campus when I could be home, working on my low back-hand volley? There are a dozen or more research groups here, moving beyond my work, asking their own questions about protein structure and function, stem cells, gene splicing and cancer.

“And who knows what else?”

Paul Boyer. UCLA, Unabashed.

UCLA



The new Life Sciences Building—a 100,000-square-foot facility that will feature 49 laboratories to house work that spans the biological fields of study. The new Life Sciences Building will be a model for flexible workspace to adapt to changing needs for interdisciplinary research and teaching. Construction of the building is set to begin this summer.

For news about the UCLA College of Letters and Science, see page 2.

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