



More than 40,000 community members visited the *Los Angeles Times* Festival of Health and Fitness, held in association with USC on the University Park Campus on Oct. 6 and 7. USC faculty were among the featured speakers and celebrities at this third annual event. Pictured, in the children's area, young martial artists perform a demonstration of their skills; below, School of Pharmacy students Christina Chin and Daniella Dang perform hypertension and osteoporosis screenings in the USC Pharmacy during the festival.

## Festival of Health draws healthy-sized crowds



The Doctors of USC booth, visitors got a chance to perform simulated surgeries using laparoscopic tools and a video system.

Jon Nalick

## 'Protein chips' ahoy

### New technique boosts protein marker detection

A technique for detecting proteins by inducing them to stick to and bend a microscopic cantilever—essentially a diving board the size of a hair—is sensitive enough to serve as a diagnostic assay for the protein markers characteristic of prostate cancer, a team of scientists report in the September issue of the journal *Nature Biotechnology*.

These protein markers, called PSA for prostate-specific antigen, are found at elevated levels in the blood of men with prostate cancer, which is the number two killer of men in this country.

"The technique is sensitive enough to detect levels 20 times lower than the clinically relevant threshold," said lead author Arun Majumdar, professor of mechanical engineering at the University of California, Berkeley. "This is currently as good as and potentially better than the ELISA assay, which is the standard today for detecting protein markers like PSA."

The microcantilever technique has far broader applications, however. Any disease, ranging from breast cancer to AIDS, characterized by protein or DNA markers in blood or urine could conceivably be assayed by arrays of these microcantilevers. A microcantilever array would be one of the first "protein chips," analogous to the DNA chip used broadly today in research labs and the biotechnology industry to conduct hundreds of DNA analyses simultaneously.

"This offers the possibility of a common platform for high-throughput detection of proteins, DNA and/or RNA, in areas ranging from disease diagnosis to drug discovery," said Majumdar, a member of UC Berkeley's Health Sciences Initiative. "This could lead to fast screening and molecular profiling for many diseases and a possible cancer chip for detecting cancer."

"A big advantage of this technology is that one could look at multiple

## Top scoring NIH grant proposal nets USC immune researcher \$270,000

Chaim Jacob, associate professor of medicine at the Keck School, has been awarded the James R. Klinenberg Science Award, given by the Arthritis Foundation for the grant proposal that receives the highest ranking by its reviewers in a given year. Approximately 600 grant proposals were submitted this year.

As part of the award, Jacob will receive \$270,000 in funding over three years to work on "producing and characterizing knockout mice as models for understanding the role of certain cytokines in autoimmune disease," he explained. (Cytokines are proteins that play a role in generating an immune response; in autoimmune diseases, that response goes awry, turning against the cells in the very body in which it is housed.) Jacob said he was particularly

pleased by the award because it was based solely on the quality of the science involved, with evaluators using a National Institutes of Health-style grading system. "It's an honor for me and, I think, an honor for USC as well," he said.

Jacob has actually produced two mouse models based upon the regulatory genes Stat4 and Stat6.

One model has the Stat4 gene knocked out, the other has the Stat6 gene knocked out. Stat4 controls the production of interleukin-12; Stat6 controls production of interleukin-4. The interleukins are cytokines that are produced by T cells and act upon T cells. Specifically, interleukin-12 targets the subset of T helper cells called Th1 cells, which are involved in cell-mediated immunity (the part of the immune response in which

killer T cells and macrophages, etc., are called into action), while interleukin-4 targets the Th2 cells, which are involved in antibody-mediated immunity.

It has generally been assumed that autoimmune diseases are primarily Th2 diseases, caused by autoantibodies spewed out by Th2 cells. The antibodies then mark otherwise harmless tissues in the body for destruction.

Until Jacob's curiosity was aroused, nobody had thought to look upstream at the role of the Stat4 and Stat6 genes in autoimmunity. That's where his knockout mice come into play. Jacob has introduced these knockouts into mouse strains that naturally develop an autoimmune disease resembling systemic lupus.

"It's a lupus model," he said, "but

it's also a model for generalized autoimmunity, so that what we learn from these mice will be relevant to a large variety of autoimmune diseases."

And it has already yielded some startling results. Preliminary data has shown that knocking out the Stat4 gene increases the incidence and severity of the autoimmune disease; when the Stat6 gene is knocked out, levels of disease either decrease or disappear.

But the truly unexpected part is that the Stat4 knockouts show their increase in disease without a concomitant increase in autoimmune antibodies. And the Stat6 knockouts produce plenty of autoantibodies—more antibodies than the wild type mice, in fact—but without signs of

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See **SENSORS**, Page 3

# Study linking hair dyes and cancer trigger policy changes in Europe

Keck School preventive medicine researchers may have propelled numerous policy changes on the use of hair dye throughout Europe.

According to a study published in last February's issue of the *International Journal of Cancer*, the USC research team found that women who use permanent dyes at least once a month for a year or longer have twice the risk of bladder cancer as non-users—even after adjusting for smoking. Those who used dyes more often and for longer periods, as well as hairdressers (who

use dyes on their clients), face an even higher risk. Study authors in preventive medicine included J. Esteban Castelao, Manuela Gago-Dominguez, Ronald Ross, Mimi Yu and Jian-Min Yuan. The findings were part of a continuing study on bladder cancer incidence.

The hair dye study results raised concerns in Europe, where—as in the United States—about one-third of women over age 18 dye their hair.

The European Commission, a body that drafts legislation for members of the European Union, quickly

asked for a review of the research. The commission's Scientific Committee for Cosmetic Products and Non-food Products Intended for Consumers then declared in June that the research was sound, and the results call for more investigation into the components of hair dyes.

"We're pleased that European officials want to look further into the relationship between hair dyes and bladder cancer," said Gago-Dominguez, lead author of the study. USC researchers found that the use of permanent dyes—not temporary or

semi-permanent dyes—were associated with an increased risk of the malignancy.

Noting the cancer risk was "of concern," the European Commission's committee has demanded data from manufacturers about the exact chemicals contained in the dyes and how the human body absorbs them.

Officials also called for follow-up epidemiological studies in the European Union, and requested that the European Commission take further steps to control the use of hair dye chemicals.

Legislators have not taken similar action in the United States, where regulatory policies differ. The U.S. Food and Drug Administration only regulates cosmetics after they are released to the marketplace, and it does not have authority to require manufacturers to file data on ingredients or report cosmetic-related injuries.

The FDA provides general information on hair dye ingredients as well as requirements for safety and labeling on its Web site, at [www.cfsan.fda.gov/~dms/cos-prd.html](http://www.cfsan.fda.gov/~dms/cos-prd.html).

—Alicia Di Rado

## School of Dentistry reorganizes into five divisions

Trying to track down a USC School of Dentistry researcher to collaborate on a grant? Or maybe consult an oral health expert with a question? You may find the dental school's landscape has changed.

Starting July 1, the USC School of Dentistry reorganized into five new divisions "to streamline and enhance our organizational functions and structure," said Harold Slavkin, dean of dentistry.

The reorganization comes in harmony with four new initiatives at the school.

These encompass moving toward problem-based learning, expanding research into a variety of areas such as oral infection and immunity and antimicrobial therapeutics, increasing efforts to improve the community's oral health and infusing leadership skills and tools into health education.

As part of the efforts, dental faculty members will increasingly work in tandem with health

professionals from medicine, pharmacy, nursing, physical therapy and other disciplines.

The five new divisions are:

- Health Promotion, Disease Prevention and Epidemiology—led by Nan Mulligan, professor of dentistry. Aims to counter growing oral health disparities by stressing behavioral intervention, social services, education, nutrition and an interdisciplinary team approach to oral health care access. Researchers will take advantages of opportunities for community- and population-based epidemiology.

- Diagnostic Sciences—chaired by Mavash Navazesh, associate professor of dentistry. Since the mouth can reflect systemic disease, and is easily accessible, it has great potential for diagnostics (through testing of oral fluids, cells, tissues and microbes.) Slavkin expects division members to collaborate with researchers in psychology, pediatrics and physical, internal and geriatric medicine, as well as other health fields.

- Surgical, Therapeutic and Bioengineering Sciences—chaired by new faculty member Ilan Rotstein, associate professor of dentistry. Faculty will work with researchers from other health fields to advance cell and tissue engineering, develop new surgical procedures, drugs and biomaterials, as well as use improved imaging to enhance surgeries and other treatment techniques.

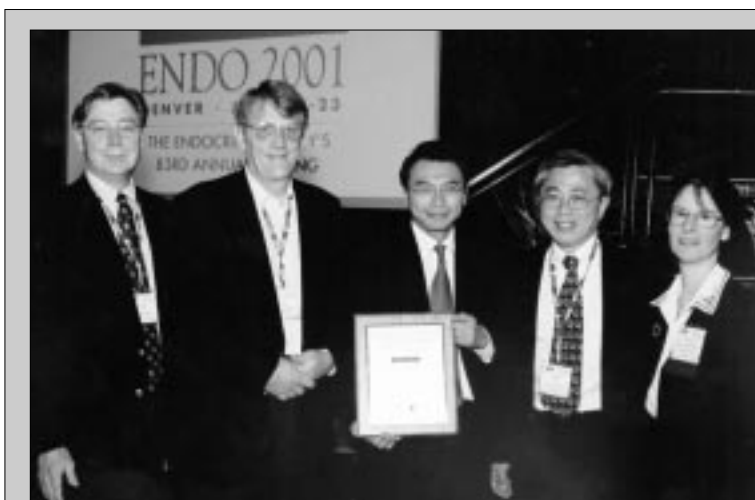
- Primary Oral Health Care—piloted by co-chairs Mike Mulvehill, professor of clinical dentistry, and Casey Chen, associate professor of dentistry. Focuses on the role of the dentist as a primary oral health resource and counselor to individuals, families and communities. Clinically, the division stresses the science and art of health care, as well as surgical and non-surgical interventions to manage disease. Examples of research areas include practice management, health care delivery models, oral health care economics, and integration of pri-

mary care professions (dentistry, medicine, pharmacy and nursing) with bioengineering, economics, business and social work.

- Interdisciplinary Craniofacial Health Care—chaired by Peter Sinclair, professor of dentistry. Stresses interdisciplinary diagnosis and treatment for craniofacial problems calling for reconstruction and rehabilitation. Areas include periodontic, orthodontic, implant, orthognathic and restorative maxillofacial care. Basic science and translational research will draw on partnerships with geneticists, physicians, nurses, social and behavioral scientists, speech and physical therapists and other related specialists.

In addition, Slavkin has formed an executive management team of associate deans and chairs of the new divisions. Other changes include the naming of Malcom Snead, professor of dentistry, as associate dean for research.

—Alicia Di Rado



Peter Butler, professor of medicine and chair of the division of endocrinology and diabetes, second from left, and research fellow Soon Song, center, received the Endocrine Society's first prize for best clinical paper published in *The Journal of Clinical Endocrinology and Metabolism* in the year 2000. The paper, "Direct Measurement of Pulsatile Insulin Secretion from the Portal Vein in Human Subjects," reported that insulin is secreted from beta cells in the pancreas almost exclusively in secretory bursts every four to six minutes. The result: very large amplitude oscillations of insulin concentration in the portal vein, which directly perfuses the liver, Butler said. Prior to this study, no one had shown this effect in human beings.

## Breast Health Day honors cancer survivors on Oct. 20

USC/Norris cancer survivors, their families and women from the community are expected at the Lee Breast Center's "Breast Health Day 2001" on Saturday, Oct. 20, from 8:30 a.m. to 12:30 p.m., at the Ritz-Carlton Hotel, Pasadena.

The day's events will feature educational sessions presented by breast health experts from USC/Norris. Christy Russell, assistant professor of medicine and associate director of the Harold E. and Henrietta C. Lee Breast Center, will offer information about breast health awareness,

including prevention, diagnosis and treatment. Melvin J. Silverstein, professor of surgery and director of the Lee Breast Center, will describe novel surgical approaches to breast cancer. Susan Downey, professor of clinical surgery and chief of plastic surgery at USC/Norris, and Randy Sherman, professor and chair of the Department of Plastic and Reconstructive Surgery, will discuss cosmetic surgery and reconstruction.

The ninth annual event, funded in part by

Marie Eckstrom and the Thomas F. Eckstrom Family Trust Fund, will also feature various organizations involved in promoting breast health and assisting breast cancer survivors, including the American Cancer Society and the Wellness Community. The day will close with a panel discussion on cancer survivorship.

The cost is \$25 per person and includes valet parking, program and lunch.

RSVP to (213) 740-1744 by Wednesday, Oct. 17, 2001.

## HSC Weekly

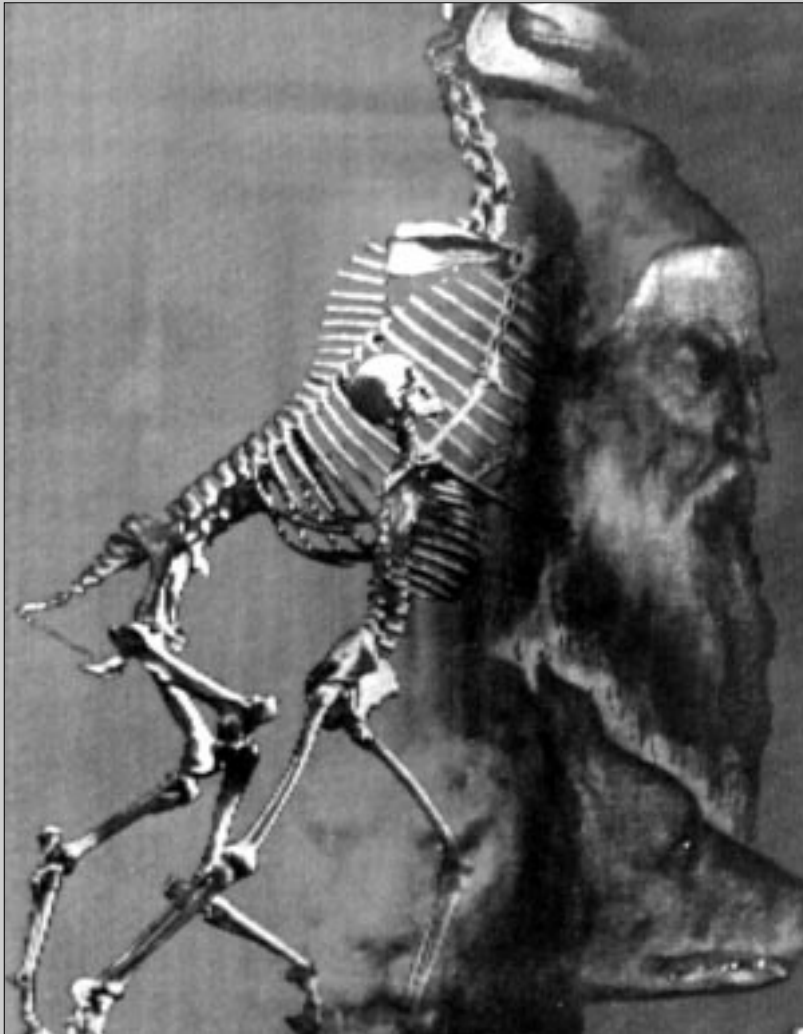
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## IGM exhibit melds the disparate disciplines of art and science



In a mix of art and science, USC's Institute for Genetic Medicine (IGM) is hosting the works of internationally known artist, Barbara Strasen, in a new show "Ingest, Gambol, Masticate."

Strasen's display at the IGM represents a bridge between art and science, which are often considered disparate disciplines.

Strasen is collaborating with USC genetic scientist Laurence Kedes, IGM's executive director and founder, to illustrate how the creative process for people in the arts and sciences are similar.

"We scientists too easily forget that the tedium of the repetitive work that leads to scientific discovery is backed by inspiration, creativity and insight. Likewise, the studio artist needs to be reminded that the intuition needed to create a viewable work originates from the same intellectual processes a scientist goes through to formulate a hypothesis," says Kedes.

"Ingest, Gambol, Masticate" shares an acronym with the Institute for Genetic Medicine, but in the artist's words represents so much



more. "Ingest, Gambol, Masticate" invites the viewer to discover congruence and commonality between unlike images, inducing a process that extends into real life. The artwork prompts the viewer to illuminate the dark corners of denial; embrace unresolved bits of our lives and act in accordance with all the resources available to us," says Strasen.

Inspired by studies from psychology, philosophy, art history and literature, Strasen's work presents a "slide show" that mirrors human consciousness against a changing landscape, drifting in and out of focus. Through the use of acrylics, plexiglas, computer and laser print, and her signature layering technique, Strasen shapes an interpretation of reality based on the connections between humans and animals, nature and culture, modern and prehistoric elements, life and death, fact and myth.

The exhibit is open to the public during regular business hours and is located on the second floor of the IGM building on the Health Sciences Campus. It will run through Dec. 8.

Above and left are two of the art works on display as part of "Ingest, Gambol, Masticate," an exhibit filled with unusual images.

## SENSORS: 'In a short time, we've really made enormous advances'

Continued from Page 1  
markers in a single reaction, whereas currently available assays require a separate reaction for each analyte," said colleague Richard J. Cote, professor of pathology and urology at the Keck School of Medicine and the USC/Norris Comprehensive Cancer Center. "So the cost of performing a cantilever assay as opposed to a typical ELISA assay is potentially much, much lower."

Another advantage this technique has over current assays such as ELISA—enzyme-linked immunosorbent assay—is that there is no need to attach fluorescent tags to molecules.

This could prove very useful in testing how well candidate drugs bind to their targets, since drugs typically are so small that attaching fluorescent labels interferes with their binding to a protein or enzyme.

Cote said that the technique is ideal for detecting single base-pair variations in DNA, the most common form of biological diversity.

Thanks to the Human Genome Project, scientists are finding more and more of these single nucleotide variations—called single nucleotide polymorphisms, or SNPs—and expect them to have major signifi-

cance in biomedical research.

"From a discovery point of view, this is a very, important advance," Cote said.

UC Berkeley graduate student Guanhua Wu fabricated the cantilevers from silicon nitride using techniques identical to those employed by the semiconductor industry to make microprocessors.

He worked closely with colleagues at Oak Ridge National Laboratory (ORNL) in Tennessee, who perfected a way to coat the top surfaces of the cantilevers with antibodies.

When proteins bind to these antibodies, they elbow one another apart and force the lever to bend downward. The cantilevers can also be coated with single-strand DNA for binding to complementary DNA.

The higher the concentration of the protein or DNA being measured, the greater the deflection of the cantilever, so that the chips not only detect the presence of the protein, but also its amount. Majumdar and his colleagues measured the deflection with a laser.

The cantilevers themselves are about 50 microns wide—half the width of a human hair—200 microns long (a fifth of a millimeter) and half a micron thick. When mole-

cules bind to the surface, the cantilever moves only about 10-20 nanometers—the diameter of 100-200 hydrogen atoms. Lasers can detect a deflection as small as a fraction of a nanometer, however. That is the equivalent of a cantilever the length of a football field bending the mere width of a quarter, ORNL researcher Thomas Thundat said.

"The primary advantage of the microcantilever method originates from its sensitivity, based on the ability to detect cantilever motion with sub-nanometer precision, as well as the ease with which it may be fabricated into a multi-element sensor array," he said. "No other sensor technology offers such versatility."

Majumdar and his UC Berkeley colleagues have found a way to put several hundred cantilevers onto a single silicon chip, and have developed a way to measure the deflection of all simultaneously with a single low-power laser or light emitting diode.

"It's not trivial to go from one cantilever to hundreds of them on a chip, a millimeter apart, detecting hundreds of different biomolecules," Majumdar said. "But that's what we need to do low-cost, high-throughput, label-free assays."

Thundat first reported in 1994 that MEMS (microelectromechanical systems) cantilevers bend when molecules glom onto them. Following similar reports in 1999 by researchers in Germany and Switzerland, various groups began experimenting with different proteins and DNA to see how the cantilevers perform and whether they could be used to detect many different chemicals and biological molecules.

What had been missing was an explanation for the phenomenon and proof that the deflection is a quantitative measure of the amount of a specific protein that binds to the cantilever.

"This present study represents the first and most quantitative investigation of a clinical application," Thundat said.

Majumdar and his colleagues explained the origin of cantilever deflection in a February 13, 2001, paper in the *Proceedings of the National Academy of Sciences*, describing why and how the binding of antigen and antibody or two complementary strands of DNA alters the surface stress and bends the cantilever.

The current paper shows that cantilever deflection accurately reflects

the amount of protein binding. Majumdar said that, in practice, three or four cantilevers will have to be used in parallel for each molecule detected, so that a comparison can be made between the deflection of bound and unbound cantilevers. This is necessary because local conditions make the microscopic levers flutter, bend and sway.

Nevertheless, cheap arrays of cantilevers would allow enough "controls" to make for accurate assays.

"In just two years, this has gone from a possible way of detecting biological reactions to a highly sensitive method for detecting PSA, comparable to the best assays currently available," Cote said.

"In a very short period of time, we've really made enormous advances. I'd be surprised if this doesn't become a viable assay system within the next three to five years," he added.

The work was supported by the Innovative Molecular Analysis Technologies program of the National Cancer Institute and by the Department of Energy. Oak Ridge National Laboratory is a Department of Energy facility managed by UT-Battelle.

—Lori Oliwenstein

## Volunteers needed for Nov. 10 Health Fair

USC volunteers, health educators and service providers are needed for the upcoming USC Healthy Communities Campaign Health Fair in Boyle Heights.

The "Healthy Families, Healthy Communities" fair is scheduled for Saturday, Nov. 10, and will bring much-needed health resources and information to more than 1,600 elementary school students, families and residents of the neighborhoods surrounding the Health Sciences Campus.

Last fall, faculty and staff members and students from the Keck School, the School of Pharmacy, physical therapy and kinesiology, nursing, and occupational science and occupational therapy programs created displays and talked about important health issues with visitors to the fair. From art activities for kids to diabetes screenings, the fair offered a variety of booths and attractions focused on wellness.

This year, USC Civic and Community Relations staff members are working with local Assemblyman Gil Cedillo (D-46th District) to put on the fair. The organizers stress that participation from USC students, faculty and staff members is key to making this year's health fair a success. They are looking for exhibitors, information booths, health services, interactive offerings and volunteers to engage children, their parents and other fair visitors in learning about good health. They also invite people to attend the fair and meet neighbors.

The "Healthy Families, Healthy Communities" fair will take place from 10 a.m. to 3 p.m. on Nov. 10, and will be located on Matthews Street, between Cesar Chavez Avenue and First Street in Boyle Heights—southeast of the junction of the San Bernardino (10) and Golden State (5) freeways.

For information about volunteering or other details, contact María Hernández at (213) 743-4511.

## Nominees sought for Distinguished Emeriti Awards

The Retired Faculty Association is calling on department chairs and active and retired faculty to nominate candidates for the Distinguished Emeriti Awards.

The awards, which recognize outstanding retired faculty members' achievement in teaching, research, community service and other areas of academic life, will be bestowed on four individuals at the Academic Awards Convocation on March 19, 2002. The award includes a \$2,000 honorarium.

The deadline for nomination is Oct. 29. For more information or nomination forms, call (310) 545-7851 or (213) 740-4561. Completed forms should be sent to the Retired Faculty Honors Committee, USC Special Events Office, Kaprelian Hall #104, Los Angeles, 90089-2532.

The nomination packet can also be found online at: <http://www.usc.edu/specialevents/ahc>

## IMMUNE: Seeking causes of disease

Continued from Page 1  
disease.

"This may suggest that autoantibodies—specifically anti-DNA antibodies—which have long been considered directly linked to the severity of the disease and part of the disease process, may not be connected," said Jacob.

It suggests that autoantibodies aren't necessarily the bad guys of autoimmunity—that it's possible to develop autoimmune disease without producing anti-DNA antibody, and to produce anti-DNA antibody without developing autoimmune disease. "If this is true," he noted, "it's a potential

paradigm shift."

In addition to pursuing further evidence that these initial findings are true, said Jacob, the award will be used to try and understand the molecular mechanism of this phenomenon. And, he said, he wants to explore whether Stat6 might be useful in the treatment of autoimmune disease.

"We're finding that the way in which autoimmunity was thought about was too simplistic and probably not necessarily true," Jacob noted. "We're finding that these concepts need to be revisited and rethought."

—Lori Oliwenstein

## Child Care Center to host Crafts Fair Oct. 26

The USC Health Sciences Campus Child Care Center will host its 16th annual Crafts Fair on Friday, October 26, from 9 a.m. until 3 p.m., in the HSC main quad. A wide variety of craft items will be available for sale, as will raffle tickets for a number of special donated items. The proceeds from the raffle will go toward much-needed improvements in the play yards at the Child Care Center.

# Calendar

### Oct. 15 – Dec. 8

9 a.m. to 5 p.m. The IGM Art Exhibition, open to the public, Mon. – Fri. IGM 2250. Info: (310) 479-1827

### Monday, Oct. 15

Noon. Cancer Center Grand Rounds. "Structural Study of Biological Methylation," Xiaodong Cheng, Emory Univ. Norris Tower 7th Floor Conf. Ctr. Info: 865-0800

### Tuesday, Oct. 16

8 a.m. Neurology Grand Rounds. "Case Presentation," Natan Shaoul, USC. Univ. Hospital, Troy Room. Info: 226-2639

11 a.m. Endocrinology and Diabetes Grand Rounds. "Insulinoma," Ewa Konca, Vikram Kamdar, and Dilip Parekh, USC. AHC Aud., Room 102. Info: 442-2806

### Wednesday, Oct. 17

1:30 – 3:30 p.m. Family Medicine Grand Rounds. "Resident Presentations: Internal Medicine," Somer Karaalp, Afshin Akhavan, and Shadiar Ohadi, USC. Univ. Hospital, Cardinal Room. Info: 442-1317

### Thursday, Oct. 18

Noon. Center for Liver Diseases Research Seminar. "Hepatic Insulin Resistance and Metabolic Syndrome," Richard Bergman, USC. AHC Aud., Room 102. Info: 442-1800

Noon. Physiology & Biophysics Seminar. "Coupling of Vasopressin Induced Ca<sup>2+</sup> Mobilization to Apical Exocytosis in Renal Collecting Duct," Daniel Yip, Univ. of Florida. McKibben Hall, Room 156. Info: 442-1039

5 p.m. "Low Back Pain—Spinal Cord Lesions," Leslie Weiner, USC. KAM 308. Info: 226-2639

### Friday, Oct. 19

Noon. Molecular Pharmacology and Toxicology Research Seminar. "Molecular Mechanisms of Resistance to Excitotoxin-Induced Cell Death: Genetic and Cellular Approaches," P. Elyse Schauwecker, USC. PSC 104. Info: 442-1551

### Tuesday, Oct. 23

8 a.m. Neurology Grand Rounds. "Movement Disorders and Dementia," Donna Masteran, UCLA. Univ. Hospital, Troy Room. Info: 226-2639

9:30 a.m. Neurology Post Grand Rounds Conference. "Psychopharmacology," Lon Schneider, USC. Univ. Hospital, Troy Room. Info: 226-2639

Noon. Cancer Center Grand Rounds. "From Data to Diagnosis: Interpreting

Genetic Test Results for Hereditary Cancer Risk," Tom Frank, Myriad Genetic Laboratories. Norris Tower 7th Floor Conf. Ctr. Info: 865-0800

12:15 p.m. Psychiatry Grand Rounds. "Clinical Case Presentation: Wilson's Disease," Susan Turkel, USC. Hoffman Hall, Hastings Aud. Info: 226-5572

### Wednesday, Oct. 24

12:30 – 1:30 p.m. Family Medicine Grand Rounds. "OB Presentation," Susana Gonzalez and Boyao Huan USC. Univ. Hospital, Cardinal Room. Info: 442-1317

### Thursday, Oct. 25

Noon. Center for Liver Diseases Research Seminar. "Novel Therapeutics for Liver Disease: Hepatocyte Immortalization and Gene Therapy," Mark Zern, UC Davis. AHC Aud., Room 102. Info: 442-1800

Noon. Physiology & Biophysics Seminar. "Identification and Characterization of Synaptic Vesicle Pools in Frog Motor Nerve Terminals," William Betz, Univ. of Colorado. McKibben Hall, Room 156. Info: 442-1040

5 p.m. "Lumbar Spinal Canal-Cervical Radiculopathy," Leslie Weiner, USC. KAM 308. Info: 226-2639

Notice: Deadline for calendar submission is 4 p.m. Tuesday to be considered for that week's issue. Please note that timely submission does not guarantee an item will be printed. Send calendar items to HSC Weekly, DEI 2510 or fax to 442-2832, or e-mail to [lpatt@hsc.usc.edu](mailto:lpatt@hsc.usc.edu). Entries must include day, date, time, title of talk, first and last name of speaker, affiliation of speaker, location, and a phone number for information.

The HSC Calendar is online at  
<http://www.usc.edu/hsc/calendar.html>

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