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Decoding leukemia patient genome another step forward in cancer fight

By Caroline Arbanas

Decoding the complete DNA of cancer patients is giving School of Medicine scientists a clearer picture of the complexity of the disease and allowing them to see intriguing and unexpected genetic relationships among patients.

The scientists have sequenced the genome of a second patient with acute myeloid leukemia (AML), discovering a suite of genetic changes in the cancer cells.

Their research, reported online Aug. 5 in the New England Journal of Medicine, has revealed that one of these mutations also is common in certain brain tumors called gliomas and that another occurred in a second patient with the same type of leukemia. Neither mutation had been previously been linked to leukemia.

The fact that these genetic mistakes sometimes occur in other patients strongly suggests the mutations are relevant to the development and progression of cancer, the researchers said. Although this information does not yet point to better treatment options, it highlights the strong potential of sequencing many cancer genomes to unravel the genetic basis of cancer.

"Only by sequencing complete genomes of cancer patients are we going to find unexpected, recurring genetic mutations that are highly likely to be important for cancer to develop and grow," said senior author Timothy Ley, M.D., the Alan A. and Edith Wolff Professor of Medicine, who led the team that sequenced the first genome of a cancer patient last year.

"Gaining a genome-wide understanding of cancer lays the foundation for developing more powerful ways to diagnose, classify and treat patients," Ley said.

Interestingly, a large majority of the mutations were found in long stretches of DNA between genes in regions of the genome that may influence how genes work. These areas are not yet well understood by scientists and are only now being mined for their connections to cancer.

A large team of researchers at

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DAVID KILPER

Helping teachers teach Tiffany Knight, Ph.D. (right), assistant professor of biology in Arts & Sciences, identifies an invasive plant to a group of high-school teachers attending the Life Sciences for Global Community degree program at WUSTL this summer. The teachers — (from left) Vandana Gudi, Miami (Fla.) Dade Schools; Sally Viers, Saint Louis Public Schools; and Erin Tantillo and Caroline Milne, both from Barrington (Ill.) High School — were working this July day on invasive plants at Tyson Research Center. The program, led by Barbara Schaal, Ph.D., the Mary-Dell Chilton Distinguished Professor in Biology, is supported by a $3.2 million grant from the National Science Foundation. Each summer, Schaal and colleagues collaborate to teach courses designed specifically for high-school educators. Teachers from across the country stay on campus for two summer institutes and then complete online coursework during the academic year at no cost. In May, the first class of 23 graduated from the program with master of science in biology degrees. "Working with high-school teachers allows me to bring modern ecological research to the next generation of students," Knight said.

Orientation welcomes new students

By Neil Schoenherr

Members of the Class of 2013 and new transfer and exchange students soon will be arriving on campus and will be welcomed with a variety of activities during New Student Orientation Aug. 20-25.

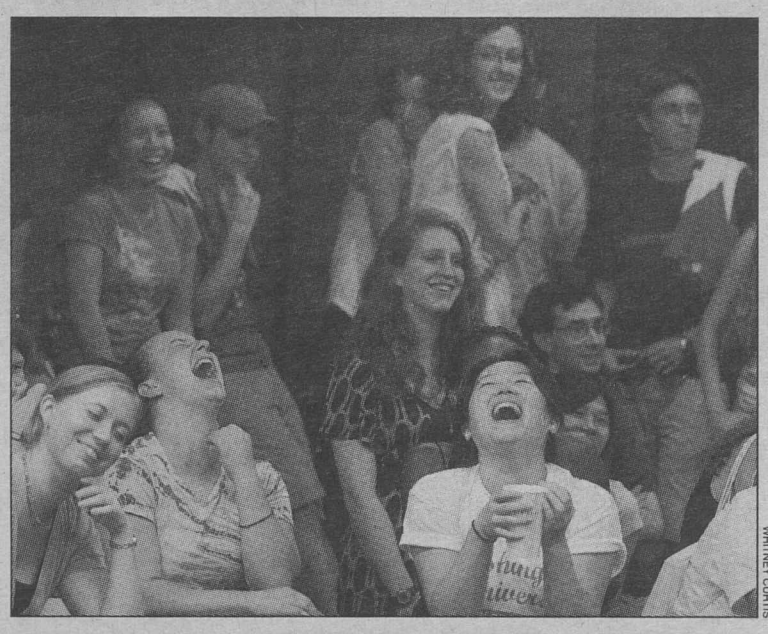
New events this year include a reception for students who took a year off from school for study abroad or other reasons; a program on the history of the University; a text message-based scavenger hunt; and daily morning fun runs and yoga.

Once again, a highlight of orientation will be the Freshman Reading Program.

The annual program is designed to reach freshmen before they arrive on campus to help them focus on skills they will continue to cultivate throughout the academic year and in their entire college careers. It also encourages interaction with members of the WUSTL faculty in informal discussions outside the classroom setting.

This summer, incoming students are reading "When the Emperor Was Divine" by Julie Otsuka. The book was chosen by the Freshman Reading Program steering committee and explores the experience of a Japanese-American family interned during WWII.

"We're very excited about this year's book choice and all of the related speakers and programs this fall being offered in partnership with the Center for Ethics and Human Values," said Alicia Schnell, director of special projects. "We hope the book, which explores the experience of a Japanese-American family who was interned during World War II, will spark good discussion and thought among the first-year students about history, race, justice and many other related themes."



WHITNEY CURTIS

The Student Union's "SUP All Night" is an orientation-week favorite. New students participate in a variety of late-night activities in the Danforth University Center such as music, movies, dancing, Guitar Hero and more.

In planning for this year's Freshman Reading Program, Schnell and others discovered a set of historical documents in the Chancellor's archives that shed light on Washington University's relationship to the Japanese internment during World War II. The University elected to accept the transfer of a significant number of Japanese-American students who would have otherwise been sent to internment camps. Many of these documents can be viewed online at frp.wustl.edu/internmenthistory.

As part of orientation, students will attend small discussions on the book led by nearly 90 faculty members Aug. 24.

Freshmen will encounter themes from "When the Emperor Was Divine" during the semester in lectures, classroom discussions and on-campus programming and exhibits. The programs are further explorations of the issues raised in the book. Otsuka also will give an Assembly Series lecture at 3:30 p.m. Sept. 15.

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Chancellor plays key role in report on energy challenges

U.S. energy future hinges on rapid rollout of emerging clean energy technologies

America has the potential to solve its energy crisis over the next decade, but doing so requires a substantial immediate investment in the development and deployment of emerging clean energy technologies, said Chancellor Mark S. Wrighton, vice chair of a new National Resource Council report on America's energy challenges.

The key message of the report, said Wrighton, is that America's long-term energy viability hinges on its willingness to expedite the rollout of new and emerging technologies for improving energy efficiency, harvesting new forms of energy and reducing greenhouse gas emissions.

Initiating deployment of these technologies is urgent; actions taken — or not taken — between now and 2020 to develop and demonstrate several key technologies will largely determine the nation's energy options for many decades to come, the report concludes.

Titled "America's Energy Future: Technology and Transformation," the capstone report summarizes findings from the America's Energy Future project, an ongoing research effort sponsored by the National Research Council, the operating arm of the National Academy of Sciences and National Academy of Engineering.

Led by Harold T. Shapiro, Ph.D., president emeritus and professor of economics and public affairs at Princeton University, the project's committee of advisers includes Wrighton and more than two dozen other leading academic and government science experts.

"Our committee began its work with the aim of establishing a realistic technological basis for development of policies and plans for assuring that America would have abundant, affordable energy resources with minimum adverse consequences to the environment," Wrighton said. "Further, the committee was concerned with the need to assure America's energy security."

The committee's work revealed that much can be gained by deploying existing technologies over the next 10 years to improve efficiency of buildings, vehicles and devices that consume energy.

"Fossil energy resources, including coal, gas and petroleum, will remain important, and therefore addressing the accumulation of CO^2 from the use of these fuels is important," Wrighton said. "New sources of energy need to be developed,

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Kharasch named interim vice chancellor for research

By Jim Dryden

Evan D. Kharasch, M.D., Ph.D., has been named interim vice chancellor for research, effective July 20.

Edward S. Macias, Ph.D., provost, executive vice chancellor for academic affairs and the Barbara and David Thomas Distinguished Professor in Arts & Sciences, made the announcement.

"I want to thank Ed Macias for moving so quickly to identify such an outstanding candidate," said Chancellor Mark S. Wrighton. "We are pleased to be able to appoint Evan Kharasch to this position. Professor Kharasch is a highly respected faculty member with a laudable record of achievement in research. His major contributions in translational anesthesiology demonstrate that he is tuned in both to the intricacies of basic science and to its practical application. He is very well prepared to encourage interdisciplinary research initiatives throughout the University."

Kharasch

Kharasch, the Russell D. and Mary B. Shelden Professor of Anesthesiology and professor of biochemistry and molecular biophysics, succeeds Samuel L. Stanley Jr., M.D., who left June 30 to accept an appointment as president of the State University of New York Stony Brook. Stanley had been vice chancellor for research since 2006, when he took over the position following Theodore J. Cicero, Ph.D., professor of psychiatry and of anatomy and neurobiology.

"Following the announcement of Sam Stanley's departure, I e-mailed the entire faculty and consulted widely to seek nominations for an interim appointment," Macias said. "Many potential candidates were contacted to determine their interest, interviews were conducted and an extended version of the advisory committee that chose Sam Stanley was consulted on the applicant pool. Professor Kharasch was selected as a top candidate, and it pleases me that he has agreed to take on this significant role."

As interim vice chancellor for research, Kharasch will be an officer of the University and a member of the University Council.

"It is a privilege and honor to serve this great University and its research mission," Kharasch said. "I appreciate the confidence of Chancellor Wrighton, Provost Ed Macias and the members of the team who advised him."

As interim vice chancellor, Kharasch will be the chief officer responsible for the University's research mission, overseeing an enterprise that generates more than $500 million for sponsored research from an array of funding sources. He will become the institutional official responsible for all compliance programs that oversee the University community's adherence to guidelines governing laboratory animal care and use and research involving human volunteers.

His areas of oversight also will include the development of research policies, management of grants and contracts, the continuing education of faculty and staff regarding research regulations, issues related to conflict of interest and research integrity and intellectual property and technology transfer.

"Research at Washington University is an extraordinary enterprise with local, national and global impact. I look forward to working with our deans, department heads and wonderfully talented faculty to support their efforts and foster excellence in all our research endeavors," Kharasch said.

Kharasch has directed the Department of Anesthesiology's Division of Clinical and Translational Research since 2005, when he came to WUSTL from the University of Washington in Seattle. In 2007, he was named to the Shelden Professorship. His own research interests include basic, translational and clinical pharmacology, with an emphasis on mechanisms and clinical aspects of drug disposition, interactions, toxicity and pharmacogenetics, toward a better understanding of individual differences in responses to drugs and optimized therapy.

"Assuring that the policies and procedures associated with our research enterprise remain robust and effective is an important responsibility for the vice chancellor for research, and I am confident that Professor Kharasch will continue the wonderful work done by Sam Stanley and Ted Cicero before him," Wrighton said. "He is committed to serving the University and all of its faculty and will be an important advocate for our research mission. I look forward to working with him as a member of the leadership team."

Law school admissions goes green

The School of Law is leading the way in green admissions practices by committing to a paperless application process.

"We receive close to 4,000 applications a year, and they used to all come in paper form," said Janet Bolin, associate dean of admissions and student services.

"Not only did that mean a lot of paper was being used, but somebody in our office had to file it all," she said. "We would have stacks and stacks of paper that all had to be processed. With our new online system, it's done so much more easily."

The law school is using admissions software accessed through the Law School Admissions Council (LSAC) Web site. Instead of mailing an application, students now upload their material online, including their completed application, personal statement, application fee and resume.

LSAC uploads the applicants LSAT scores, transcripts and letters of recommendation. The admissions office staff then reviews the candidates' files on their computers without having to print any paperwork. Once the file is deemed complete, it is ready to be evaluated by an Admissions Committee member.

"I am very proud of the law school admissions team members for their commitment to reducing the impact of their work on the environment," said Chancellor Mark S. Wrighton. "Changes to their admissions process maximize the benefits of current technologies while reducing paper waste."

By going paperless, the law school's admissions office also saved a major portion of its budget in 2008-09 and is experiencing ongoing savings in the current budget.

The law school is among the 35 (roughly 15 percent) LSAC member law schools that went paperless last year. The process also creates cost savings and environmentally friendly practices at LSAC, since LSAC previously would print any material that was submitted online through the common application and mail it to the appropriate schools.

In rare instances, paper applications are still available upon request at the law school. These applications are scanned into the computer and then shredded, with the shreds being recycled.

Although the change from paper to paperless took getting used to, it was not a difficult transition, said Mary Ann Clifford, assistant dean of admissions.

"Once we began the process, the advantages far outweighed any disadvantage of not having paper files," Clifford said. "It is great to have quick access to the application documents and be able to review the files from anywhere at anytime."

The acceptance process is also green. Correspondence with the applicants is initially done by e-mail, and the acceptance packet is considerably downsized from the previous year's acceptance binders.

Admitted students now receive a "Washington University in St. Louis School of Law" inscribed flash drive in the mail. Although the law school still sends a small amount of mail to candidates, any brochures that were previously sent are now in PDF form on the storage device.

The flash drive also includes admissions videos and provides space for the applicant to save further correspondence with the law school.

"Going paperless coincides nicely with the fact that it's a very technology-driven age, especially among students coming straight from undergraduate schools," said Anna Donovan, admissions/communications assistant. "Most have multiple e-mail accounts, and they're on their BlackBerrys, cell phones and laptops all the time. They really seem to like the speed with which everything flows in the admissions process."

Stretch departmental funds by hiring a work-study student

By Jessica Daues

Student Financial Services can help departments locate and hire part-time student workers for the 2009-10 academic year — and, at the same time, help departments stretch their budgets a bit further.

During this budget-challenged year, departments hiring eligible federal work-study students will only pay 25 percent of the student's total earnings. The other 75 percent will be covered with U.S. Department of Education funding.

Each year, the U.S. Department of Education provides WUSTL with funding that subsidizes the wages of student workers eligible to participate in the Federal Work-Study Program.

This helps departments obtain talented, part-time employees and, at the same time, helps students finance some of their education costs.

"This year, more students are expected to seek out part-time campus employment as a way to help their families cover their college expenses during this time of economic uncertainty," said James McDonald, assistant director of Student Financial Services.

"To better support the departments hiring eligible students, the University is committing the maximum funding for student's federal work-study earnings," McDonald said.

More than 850 work-study-eligible undergraduates worked in more than 160 University departments during the 2008-09 academic year.

For assistance with hiring work-study-eligible students, contact McDonald at 935-6847 or James_McDonald@wustl.edu.

Genome

Mutations relevant to cancer development

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The Genome Center and the Siteman Cancer Center conducted the research. The same team broke new ground late last year when it became the first to sequence the entire genome of a cancer patient, a woman with AML who had died of the disease.

That research, published in Nature, demonstrated the feasibility of decoding the genome of a patient's cancer cells and comparing it to the genome of the patient's normal, healthy cells to find the genetic mutations unique to the person's disease. In that study, the scientists found a completely different set of mutations than those in the current study, and none of the new mutations in that patient was found to occur in tests of almost 200 other patients with AML — a finding that underscores the genetic complexity and diversity of cancer.

"Only by sequencing thousands of cancer genomes are we going to find and make sense of the complex web of genetic mutations and the altered molecular pathways in this disease," said lead author Elaine Mardis, Ph.D., co-director of the Genome Center.

In their latest endeavor, the scientists sequenced the genome of a man diagnosed with AML at age 38 who has been in remission for more than three years. His genome was chosen for sequencing because he had typical clinical and molecular features of the disease, including two AML-linked mutations that already were known to the researchers.

An estimated 13,000 cases of AML will be diagnosed in the United States this year, and some 9,000 will die of the disease. It occurs most often among those age 60 or older and becomes more difficult to treat as patients age. The five-year survival rate for adults with AML is about 20 percent.

The researchers sequenced the patient's genome using a sample of healthy skin cells. In all, the scientists identified about 750 mutations in the patient's AML genome. However, careful analysis indicated that the vast majority appears to be random, background mutations that were not relevant to the development of the disease.

With further study, researchers defined 64 mutations that were the most likely to be important for the patient's cancer. Twelve were found in genes that code for proteins, including a mutation in the IDH1 gene that only recently has been linked to gliomas, and 52 mutations were in long stretches of DNA that do not contain genes at all but potentially affect when and how neighboring genes are expressed.

"Other than the two mutations the patient was known to have before his genome was sequenced, we never would have guessed any of these mutations — they were a huge surprise," said co-author Richard K. Wilson, Ph.D., director of the Genome Center. "That so many of the mutations were found outside of protein-coding genes also underscores the need to sequence whole genomes to find all the mutations that occur in cancer. If we only look at genes with known or suspected links to cancer, we'll miss many mutations that are potentially relevant."

The investigators also tested 187 additional samples of DNA from the leukemia cells of AML patients, looking specifically for any of the 64 mutations. They found the IDH1 mutation in 15 samples, making it one of the most common mutations linked to date to AML. Another mutation in the non-coding region of the genome occurred in one other patient, which suggests to the researchers that it is important.

Orientation

Convocation an annual tradition

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For more information, visit frp.wustl.edu.

New Student Orientation officially kicks off Aug. 20 with "move-in" and residence hall floor meetings. Convocation, Chancellor Mark S. Wrighton's annual opportunity to welcome all new students and parents to the University, will take place at 7:30 p.m. in the Athletic Complex.

An array of departmental open houses is scheduled for Aug. 21. The open houses give students an opportunity to meet with representatives from the faculty and staff to learn more about the departments.

The football team's Red/Green scrimmage and tailgate party will be held at 4:30 p.m. at Francis Field.

The day's closing event is the Club 40 Dance at 10 p.m. in the South 40 Clock Tower Plaza.

Aug. 22 will feature deans meetings and residence hall floor meetings.

Highlighting the evening will be "Choices 101 — An Introduction to the First Year Experience," presented by upperclass students. A discussion will follow. The presentation will be at 8 p.m. in Edison Theatre. The evening ends with an event hosted in the Danforth University Center by Student Union, titled "SUP All Night."

Aug. 23 consists of a full schedule of adviser meetings for many incoming students. At 8 p.m., students will attend "The Date," an interactive theatrical presentation that examines the issues of sexual assault and alcohol on college campuses. A discussion will follow.

The evening ends with a comedy show in the Athletic Complex sponsored by Campus Programming Council.

On Aug. 24 students will have the opportunity to explore St. Louis and learn more about their new city. A U-Pass and student ID are required. Cornerstone will host a panel of students who will talk about their academic experience, and several faculty members will host lectures on their favorite academic topics. The evening culminates with a movie festival in the Athletic Complex featuring films created by the new students.

Aug. 25 will feature more campus orientation. "Freshmen Foundations," a presentation by Richard J. Smith, Ph.D., the Ralph E. Morrow Distinguished University Professor and dean of the Graduate School of Arts & Sciences, provides an opportunity for students to gain an insider's view of how to succeed in the classroom while at the same time creating a healthy balance outside the classroom.

Cornerstone will host a panel of students who will talk about their academic experience. More faculty lectures also are listed for this day. An outdoor movie will be shown at 8 p.m. in the South 40 Swamp.

Also scheduled during the week are a variety of events designed especially for international, transfer and exchange students.

To view the complete schedule for freshmen, transfer students and parents, visit orientation.wustl.edu.

School of Medicine Update

ROBERT BOSTON

Lizzie Sextro of Rosati-Kain High School and David Ayeke of St. Louis University High School work in the lab during the Ferring Scholars Program.

Scholars program gives high-school students a taste of the medical field

By Beth Miller

For Donald Woodson, taking part in the Ferring Scholars Program at the School of Medicine in June was "the perfect opportunity."

Woodson, a rising sophomore at Metro High School, was one of 25 high-school students taking part in the three-year summer program for those interested in careers in health care or biomedical research. Students from four area high schools — Cardinal Ritter, Rosati-Kain, Metro and St. Louis University High — are selected for the program by their science teachers or principals to begin the program after their freshman year.

Over a two-week period, the students participated in a lab course in which they worked with DNA and *E. coli* bacteria, took tours of the medical center and attended information sessions about careers given by medical and graduate students and faculty.

Michael R. DeBaun, M.D., the Ferring Family Chair in Pediatric Cancer and Related Disorders and professor of pediatrics, of biostatistics and of neurology, heads the program. Joyce Linn is program coordinator. The program is supported by John and Allison Ferring and the medical school's Institute of Clinical and Translational Science.

DeBaun said the Ferring Scholar Program was established to provide a unique mentoring opportunity for bright and highly motivated students who attend high schools in close proximity to the medical campus.

"We are honored that John and Alison Ferring have made a decision to invest in the next generation of physician scientists," DeBaun said. "As the area high schools serve a diverse student body, our students are likewise diverse, with approximately 50 percent of the participants being young women and approximately 50 percent being of African descent. I look forward to the day that one of our graduates will become my colleague here at the medical center."

Although Woodson had worked in a lab before, he said the Ferring Scholars Program gave him more hands-on experience performing experiments.

"Being in this program really solidified my interest in medicine," Woodson said. "All of the doctors who talked to us were so excited about their jobs — you could see the fire in their eyes when they talked about what they do."

Woodson said his favorite speaker was Alan L. Schwartz, Ph.D., M.D., the Harriet B. Spoehrer Professor and head of the Department of Pediatrics.

"When he talked about what he does, it made me really excited about going into the medical field," he said.

Laura Cline, a rising sophomore at Rosati-Kain High School, said she found rapport with Jose Pineda, M.D., assistant professor of pediatrics and of neurology and director of the Pediatric Neurocritical Care Program.

"I could picture myself in that type of job working with children and the brain," she said.

About half of the students in this summer's program will be selected to continue. Those chosen will spend next summer working in a lab on campus. At the end of the summer, they will present their research at a poster session.

In the final summer, the students spend at least six weeks working in the lab on a project that they will present at the end of the summer to peers and mentors. In addition, students will work with their mentors to prepare their college admission materials. They are also encouraged to submit their research findings to regional or national scientific meetings or competitions.

Ten students completed the program in 2006, and 15 students completed the program in 2008.

Library hosts 'Changing the Face of Medicine' exhibit

Women doctors are the focus of a new traveling exhibition that opened Aug. 10 at the Bernard Becker Medical Library.

The Becker Library and the Academic Women's Network are hosting the exhibit at the School of Medicine.

"Changing the Face of Medicine: Celebrating America's Women Physicians" tells the story of how American women who wanted to practice medicine have struggled over the past two centuries to gain access to medical education and to work in the medical specialty they chose. The exhibit, on display through Sept. 18, features several prominent female physicians from the School of Medicine, including Virginia Weldon, M.D., and the late Gerty Cori, M.D., who won the Nobel Prize with her husband, Carl Cori, M.D., for discovering the enzymes that convert glycogen to sugar and back into glycogen.

Interactive kiosks traveling with the exhibition offer access to the National Library of Medicine's "Local Legends" Web site, which features outstanding women physicians from every state, including Jessie Ternberg, M.D., Ph.D., professor emerita of surgery and of surgery in pediatrics at the School of Medicine. A section of the Web site called "Share Your Story" allows the public to add the names and biographies of women physicians they know.

An opening reception and lecture will be held at 6 p.m. Aug. 13, featuring Ellen S. More, Ph.D., head of the office of Medical History and Archives and professor of psychiatry at the University of Massachusetts Medical School. A panel discussion will be held at 4:30 p.m. Sept. 3, featuring Walt Schalick, M.D., Ph.D., assistant professor of medical history, University of Wisconsin-Madison, as moderator; Ternberg; Pat Cole, M.D., associate professor of clinical medicine; Dayna Early, M.D., associate professor of medicine; and Lisa Moscoso, M.D., Ph.D., assistant professor of pediatrics.

The traveling exhibition has been made possible by the National Library of Medicine and the National Institutes of Health Office of Research on Women's Health. The American Medical Women's Association provided additional support.

Researchers team to battle childhood hunger

A team of plant and physician-scientists with a vision of eradicating malnutrition throughout the developing world has formed the Global Harvest Alliance (GHA), a humanitarian effort involving the School of Medicine, St. Louis Children's Hospital and the Donald Danforth Plant Science Center.

The focus of the newly formed Alliance is to create low-cost, nutritionally complete foods to prevent and treat all forms of under-nutrition. These foods will incorporate crops that are protein and micronutrient rich and disease- and pest-resistant and that can be disseminated through smallholder farmers.

Mark Manary with a child in Malawi.

Heading the team is Mark Manary, M.D., the Helene B. Roberson Professor of Pediatrics and a member of the Donald Danforth Plant Science Center. Manary has a successful track record with such innovation. His peanut butter-based, ready-to-use therapeutic food (RUTF) for the treatment of severe malnutrition has consistently resulted in 90 percent recovery rates in research and operational projects. The World Health Organization declared Manary's RUTF the most effective method by which malnourished children should be restored to health.

Manary also explores the basic mechanisms by which malnutrition compromises human health, gaining new scientific insights to improve and refine his approach to combating malnutrition. Rather than merely treating malnutrition, Manary began collaborating with colleagues at the Danforth Plant Science Center in 2004 to create a formidable preventive strategy. The intent is to enhance crops so that they can thrive where malnutrition is rampant and provide a complete package of nutrients needed for health. With Manary's RUTF efforts complemented by the Danforth Center's cassava team, the full vision for the GHA began to take shape.

"Effective solutions to the crisis of childhood malnutrition must involve interventions spanning a diverse spectrum of disciplines including health care, agriculture and home economics," Manary said. "People in the developing world derive most of their nutrients from plants; plants constitute 90 percent of the diet of many Africans. Therefore effective prevention strategies must include food crops that provide more complete nutrition."

The Donald Danforth Plant Science Center has received funds from the Bill & Melinda Gates Foundation to conduct research as part of BioCassava Plus, an international research initiative that strives to make cassava a more nutritionally rich and balanced staple plant crop. Farmer-preferred varieties are being collected, analyzed and genetically enhanced to improve their nutrient composition; concurrently, Manary is building a network of in-country nutritionists to add to the team of Danforth Center scientists already in place.

Led by GHA and other Danforth Center scientists, teams will field-test improved cassava varieties in Kenya and Nigeria during the next five years.

Through the efforts of the Danforth Center and its collaborators, it is anticipated that the improved varieties will be widely available in Africa within 10 years, improving survival rates and quality of life for millions of children and families that would otherwise suffer malnutrition.

The GHA also will explore improvements in additional staple crops, including sorghum and a protein-rich legume such as cowpea or peanuts.

New paging system coming to Medical Center

A 10 million-square-foot cellular network will be built on the Washington University Medical Center campus this year as part of a new paging system.

Sprint and Telecommunications Facilities Corp., the joint School of Medicine- and BJC HealthCare-operated company that supports telecommunications services, will build the network, estimated to be complete in early 2010.

More than 8,000 pagers will be replaced next year with Sprint devices enabled with text messaging. The new network and devices will provide more reliable paging and messaging.

In addition, TFC and Sprint are building an on-site customer-service and retail center in the Clinical Science Research Building link to provide one-stop support for all devices and billing as well as sales of personal devices and equipment. The TFC Customer Center, scheduled to hold a grand opening Aug. 18-20, will be open 7 a.m.-7 p.m. weekdays and 7 a.m.-5 p.m. on weekends.

"This Next-Generation Paging Project brings a cellular signal into antennas on each floor of every building on the main medical campus," said Chris Mossengren, TFC project manager. "This private network is being engineered to specifications unique to building layouts, clinical environments and to customer and patient needs."

Employees of the School of Medicine, Barnes-Jewish Hospital and St. Louis Children's Hospital who have pagers provided by TFC will have their devices replaced with a new Sprint device beginning next spring. Training also will be provided for those receiving the new devices.

For more information about the Next Generation Paging Project or the new TFC Customer Center, go to nextgenerationpaging.wustl.edu.

Farmer's market at the Medical Center

Local growers will bring fresh produce to a farmer's market on the School of Medicine campus beginning Thursday, Aug. 13, from 11:30 a.m.-4:30 p.m. The market will be in the Fountain Plaza outside of the Barnes & Noble bookstore. Open to all employees and visitors, the market also will be offered Aug. 20 and 27 and Sept. 3 and 10.

University Events

Transformative power of live theater will be hallmark of PAD's season

BY LIAM OTTEN

Live performance has always been a multidisciplinary event, its three great streams — theater, music and dance — forever shifting and combining in new and unpredictable ways.

For its 2009-10 season, the Performing Arts Department (PAD) in Arts & Sciences will present a handful of works that together highlight both the boundless possibility and the transformational power of the stage.

"Great art does not merely copy human experience," said Robert Henke, Ph.D., chair of the PAD and professor of drama in Arts & Sciences. "It transforms it, quite literally, by concentrating and distilling experience through pre-existing but always changing forms."

The season will open with the annual A.E. Hotchner Playwriting Festival, which will showcase four new plays written by Washington University students. Named in honor of alumnus A.E. Hotchner (A.B. and J.D.), the festival consists of a two-week workshop — led by Liz Engelman, a former president and current board chair of Literary Managers and Dramaturgs of the Americas — followed by two evenings of staged readings.

The first evening, Sept. 25, will feature "Razor Love" by Max Rissman and "Steps" by Margaret Stamell. The following evening, Sept. 26, will feature Jonathan Baude's "Match or Kasparov Never Played Black" and Jessica Atkin's "What Will You Tell Your Children?"

The PAD season will continue Oct. 16-Nov. 1 with the musical "Ragtime," Terrence McNally's Tony Award-winning adaption of the 1975 novel by E.L. Doctorow. Jointly produced with the St. Louis Black Repertory, "Ragtime" intertwines the lives of three families at the dawn of the 20th century but centers on jazzman Coalhouse Walker Jr., a successful piano player who turns to violence after a white mob destroys his custom Model T.

COURTESY PHOTO

San Francisco-based choreographer Rulan Tangen will serve as a visiting distinguished professor this fall and will set a work for "Transmotion" at the Dance Theatre concert in December.

Ron Himes, founder of the Black Rep as well as the PAD's Henry E. Hampton Jr. artist-in-residence, will direct the show, which includes music and lyrics by Stephen Flaherty and Lynn Ahrens.

Next up is Martin McDonagh's "The Pillowman" Nov. 19-22. Directed by Annamaria Pileggi, senior lecturer in drama, this haunting and darkly funny tale — winner of the 2004 Olivier Award for Best New Play — is set in a Kafkaesque police state and centers on a writer, Katurian, who must sacrifice his life in order to save his fiction.

"Transmotion," the 2009 Washington University Dance Theatre concert, will run Dec. 4-6. Directed by Cecil Slaughter, senior lecturer in dance, the performance will feature dozens of student dancers in professionally choreographed works by both faculty and guest artists.

Highlights will include settings by adjunct instructor Mary Ann Rund and by visiting choreographers Rulan Tangen, director of San Francisco's Dancing Earth—Indigenous Contemporary Dance Creations; and Paula Weber, chair and professor of dance at the University of Missouri-Kansas City.

The season will continue Feb. 19-28 with Eric Overmyer's "On the Verge (or The Geography of Yearning)" — a kaleidoscopic comedy following three Victorian women as they trek through time, space and pop culture — directed by Andrea Urice, senior lecturer in drama.

William Whitaker, senior lecturer in drama, will direct Lynn Nottage's "Fabulation," a satiric morality tale about a Manhattan publicist whose life begins to spiral out of control March 25-28.

From April 9-11, the PAD will host its fourth biannual Young Choreographers Showcase, featuring original works — selected by audition — by student choreographers.

Concluding the season April 23-May 2 will be "Metamorphoses," the acclaimed play by MacArthur "genius award" winner Mary Zimmerman. Based on ancient Roman myths drawn from the works of Ovid, this inventive evening is neither musical nor drama nor dance concert but instead fuses elements of all three forms to create a unique epic at once modern and timeless. Henry Schvey, Ph.D., professor in the PAD, will direct, with choreography by Slaughter.

The A.E. Hotchner Playwriting Festival is free and open to the public. Tickets to "Ragtime" are $20, or $15 for faculty and staff and $10 for children, students and seniors.

All other events are $15, or $10 for students, seniors, faculty and staff.

Subscriptions to three or more events are available for $12 per show. In addition, the PAD offers a special "season pass" for $58. A current WUSTL ID is required; registration deadline is Oct. 2.

For more information about the PAD season or to order tickets, call the Edison Theatre Box Office at 935-6543.

Theater and dance auditions

The Performing Arts Department will hold auditions for its 2009-10 theatrical season at 7 p.m. Aug. 27 and 28.

"All students and members of the Washington University community are invited to audition, not just PAD majors," said Cindy Kahn, assistant to the chair, adding that pre-registration is required. Those interested can sign up on the call board across from the PAD office, located in Mallinckrodt Room 312.

"We also need to fill design and technical positions — stage managers, scenic designers, costume designers, backstage crew, sound designers and lighting designers," Kahn said. "Those who don't want to be in the spotlight themselves are still welcome to participate.

"It is the department's intention to increase diversity in casting in all of the season's productions," Kahn said, noting that "Ragtime" and "Fabulation" explicitly call for ethnically diverse casts. "Our hope is that more minority students will audition."

Auditions for Washington University Dance Theatre take place at 7 p.m. Sept. 8 in the Annelise Mertz Dance Studio, located in Mallinckrodt Room 207.

For more information about theater auditions, contact Jeffery Matthews, senior lecturer in drama, at jmatthew@wustl.edu or 935-4059.

For more information about dance auditions, contact Cecil Slaughter, senior lecturer in dance, at cslaught@wustl.edu or 935-8075.

The PAD also will hold its annual welcome party at 4 p.m. Aug. 24 in Mallinckrodt's A.E. Hotchner Studio Theatre. For more information, call 935-5858. — *Liam Otten*

Myocarditis • Solar System • Newborn Brain

"University Events" lists a portion of the activities taking place Aug. 13-Sept. 3 at Washington University. Visit the Web for expanded calendars for the Danforth Campus (news-info.wustl.edu/calendars) and the School of Medicine (medschool.wustl.edu/calendars.html).

Exhibits

"Changing the Face of Medicine: Celebrating America's Women Physicians." Through Sept. 18. Bernard Becker Medical Library. 362-7080.

"Double Exposure: Al Parker's Illustrations, From Model to Magazine." Through Sept. 30. Olin Library, Lvl. 1, Grand Staircase Lobby and Ginkgo Rm. 935-7741.

"Edward and Joshua Geltman: A Photographic Journey." Through Sept. 20. Farrell Learning & Teaching Center, Hearth Gallery. 747-3284.

Lectures

Thursday, Aug. 13

6 p.m. School of Medicine Lecture. "Changing the Face of Medicine: Political Change, Personal Stories, 1849-2009." Ellen S. More, prof. of psychiatry, U. of Mass. Medical School. Bernard Becker Medical Library. 362-7080.

Friday, Aug. 14

9:15 a.m. Pediatric Grand Rounds. "Diagnosis, Prognosis and Treatment for Myocarditis in Children." Susan Foerster, asst. prof. of pediatrics. Clopton Aud., 4950 Children's Place. 454-6006.

Friday, Aug. 21

7:30 p.m. Saint Louis Astronomical Society Meeting. "The Formation of the Solar System." Angela Speck, asst. prof. of physics, U. of Mo. McDonnell Hall, Rm. 162. 935-4614.

Saturday, Aug. 22

7:30 a.m.-2:15 p.m. Oncology CME Course. "Advances in Diagnosis and Treatment of Hematologic Malignancies." Cost: $140 for physicians, $90 for allied health professionals. Four Seasons Hotel Ballroom, Lumiere Place Casino & Hotels, 999 Second St. (4:30 p.m. Physician reception.) To register: 362-6891.

Friday, Aug. 28

9:15 a.m. Pediatric Grand Rounds. "Journeys in the Newborn Brain." Terrie Inder, assoc. prof. of pediatrics. Clopton Aud., 4950 Children's Place. 454-6006.

Thursday, Sept. 3

8 a.m. Siteman Cancer Center Lecture. Rena Schechter Memorial Lecture. "Clinical and Translational Studies in Head and Neck Cancer at the University of Chicago." Everett E. Vokes, prof. of medicine, The U. of Chicago Medical Center. Clopton Aud., 4950 Children's Place. 454-8981.

4:30 p.m. School of Medicine Panel Discussion. "Women's Careers in Medicine." Kenton King Ctr., Bernard Becker Medical Library. (Refreshments served.) 362-7080.

Music

Thursday, Sept. 3

8 p.m. Concert. Danforth University Center Chamber Music Series. Erin Schreiber, violin, and Martin Kennedy, piano. Danforth University Center, Formal Lounge. 935-3964.

And More

Thursday, Aug. 27

7 p.m. Performing Arts Dept. Auditions. For the 2009-2010 performance season. (Also 7 p.m. Aug. 28). Sign up at Mallinckrodt Ctr., Rm. 312. 935-5858.

Warhol grant to support upcoming Kemper exhibit

BY LIAM OTTEN

The Mildred Lane Kemper Art Museum has received a $50,000 grant from the Andy Warhol Foundation for the Visual Arts Inc. to support the exhibition "Sharon Lockhart — Lunch Break."

Organized by Sabine Eckmann, Ph.D., director and chief curator of the Kemper Art Museum, the exhibition will open Feb. 10, 2010, and remain on view through April 19, 2010.

Established in 1987, the Warhol Foundation aims to foster innovative artistic expression and the creative process by encouraging and supporting cultural organizations that, in turn, directly or indirectly support artists and their work. The foundation is focused primarily on supporting work of a challenging and often experimental nature as well as curatorial research leading to new scholarship in the field of contemporary art.

Sharon Lockhart is a conceptual artist known for exploring the relationship between film and still photography. In "Lunch Break," Lockhart observes the daily routines of workers at the Bath Iron Works, a major shipyard and U.S. Navy supplier located in Bath, Maine.

The exhibition will include two filmic installations, "LUNCH BREAK" and "EXIT," in which slow-moving and static cameras subtly capture workers' rhythms and movements as they take their breaks, socialize or leave for the day. Three related series of photographs — focusing on the workers' lunch boxes, group portraits and independent vendors working within the shipyard — exhibit cinematic qualities of staging and casting while simultaneously revealing a quiet humanism.

Warhol Foundation Grants are made on a project basis to curatorial programs at museums, artists' organizations and other cultural institutions to originate innovative and scholarly presentations of contemporary visual arts. Projects may include exhibitions, catalogues and other organizational activities directly related to these areas. The program also supports the creation of new work through re-granting initiatives and artist-in-residence programs.

The grant to the Kemper Art Museum was one of 46 awarded so far this year and one of only two awards to Missouri institutions.

The Charlotte Street Foundation City received a three-year, $150,000 grant for its Urban Culture Project, which provides free studios to artists in downtown Kansas City.

The Kemper Art Museum previously received Warhol Foundation funding for the exhibition "Reality Bites: Making Avant-Garde Art in Post-Wall Germany," which debuted in 2007.

Green Your Office

Order an appropriate amount of food for office events.

Ethnic profiling to be examined in series of events this fall

By Liam Otten

Ethnic profiling is illegal in the United States, prohibited by the Fourth Amendment, which requires probable cause for searches and seizures, and by the 14th Amendment, which calls for equal protection under the law.

And yet, as the recent arrest of Harvard scholar Henry Louis Gates demonstrates, the issue remains far from settled.

Recent statistics compiled by the state of Missouri show that black drivers are 67 percent more likely to be pulled over than white drivers. In the wake of 9/11, a Cornell University poll found that almost half of Americans believe government should restrict the civil rights of Muslims. And this spring, a report from the American Civil Liberties Union argued that U.S. authorities detain thousands of people each year solely "on the basis of religion, race or nationality."

This fall, Washington University will present a semester-long series exploring the history, impact and ethical issues surrounding ethnic profiling.

"Ethnic Profiling: A Challenge to Democracy" will include lectures, debates and panel discussions as well as workshops, performances and film screenings.

"'A Challenge to Democracy' will draw upon academic researchers from philosophy, political sciences, history, law, social science, business, medicine and other disciplines," said Stuart D. Yoak, Ph.D., executive officer of the Center for the Study of Ethics & Human Values, which organized the series.

COURTESY PHOTO

"Night Watch #3" (2007) by Roger Y. Shimomura, from his series "Minidoka of my Mind." During World War II, Shimomura was sent with his family to an internment camp for Japanese Americans. Shimomura will talk about the experience on campus Oct. 12.

"The series will demonstrate the power of approaching a complex ethical topic — involving both scholarly and practical concerns — from a multidisciplinary perspective," Yoak said.

"Included will be experts and professionals in public policy, law enforcement and national security charged with the practical application of values concerning ethnic profiling," he said.

"A Challenge to Democracy" takes its name from a World War II propaganda film defending the U.S. government's forcible internment of approximately 120,000 Japanese Americans. Though upheld by an infamous Supreme Court ruling — Korematsu v. United States (1944) — the internments later were judged by a 1983 congressional report to have been "not militarily necessary" and motivated by "anti-Japanese agitation (that) fed on racial stereotypes and fears."

Several events will deal specifically with the internments. In August, the Freshman Reading Program — which aims to provide incoming students with a common intellectual experience — will center on Julie Otsuka's novel "When the Emperor Was Divine," which explores the effects of internment on a Japanese-American family. Otsuka will speak about her work Sept. 15 as part of the Assembly Series.

The Performing Arts Department in Arts & Sciences will host "Dancing Who I Am," a panel discussion and dance concert exploring the role of ethnicity in dance, Sept. 12. Participants will include critic Elizabeth Zimmer, former dance editor of The Village Voice; and Thomas DeFrantz, Ph.D., a professor of music and theater arts at Massachusetts Institute of Technology.

On Oct. 2, Michael Adams and Gyo Obata will discuss how internment impacted their respective families. Obata, a co-founder of HOK, the worldwide architecture firm based in St. Louis, is the son of noted California painter Chiura Obata. During the war, the Obata family was sent to the Topaz War Relocation Center in central Utah, but Gyo — like many other Japanese students — was able to avoid internment by continuing his education at WUSTL, where he enrolled at the School of Architecture.

Michael Adams, also a WUSTL alumnus, is the son of famed photographer Ansel Adams. In the 1930s, Ansel and his wife, Virginia, sold work by Chiura Obata through their Yosemite gallery, Best's Studio.

In 1943, Ansel — departing from his signature landscape images — created a series of photographs documenting life in California's Manzanar War Relocation Center, which he published the following year as a book, "Born Free and Equal."

Immediately following the talk, the Mildred Lane Kemper Art Museum will open a Teaching Gallery exhibition titled "A Challenge to Democracy: Ethnic Profiling of Japanese Americans During World War II."

Jointly curated by Angela Miller, Ph.D., professor of art history and archaeology in Arts & Sciences, and graduate students Elissa Weichbrodt and Anna Warbelow, the exhibit will explore the pervasive nature of ethnic profiling through a variety of visual records and material ranging from books and magazines to a sampling of photographs by Ansel Adams and paintings by Chiura Obata.

Chiura's art also serves as a backdrop for "Dust Storm: Art and Survival in a Time of Paranoia," a one-man play about the camps written by Rick Foster and performed by Zac Drake Oct. 3 and 4.

On Oct. 12, celebrated painter Roger Y. Shimomura, who spent the war in the camps with his family, will discuss how the experience shaped his work for the Sam Fox School of Design & Visual Arts. Other events will include concerts, poetry readings and theatrical performances as well as discussions of ethnic profiling in dance, fashion, law, philosophy and other fields.

All events are free and open to the public. For updates, a complete schedule or more information, call 935-9358 or visit humanvalues.wustl.edu.

Fall Sports Preview

Experienced runners set sights on nationals

The men's and women's cross country teams each return a wealth of talent. The women return all five of their top runners from last year, and the men saw just one of its top performers graduate last spring.

The women's team finished second at last year's University Athletic Association (UAA) championships, but junior Taryn Surtees finished first overall, becoming the seventh student-athlete in school history to accomplish the feat. The women placed third at the NCAA Midwest Regional meet and 12th at the NCAA championships.

In addition to Surtees, senior Molly Schlamb, senior Hope Rathnam, sophomore Liz Phillips and sophomore Erica Jackey each earned points at the NCAA championship meet, and all return this season.

Last season was a vital year of experience for a young men's cross country team, and this season, the Bears intend to make their mark on the national stage. Junior Dave Spandorfer leads a group of four returning runners that earned points at last year's NCAA regional championship. Senior Alex Bearden, senior Matt Kruger and sophomore Tucker Hartley also return for 2009.

Both seasons open at 9 a.m. Sept. 5 with the Big River Running Early Bird Meet in Forest Park.

Football team hungry for league title

The Bears return 17 starters from last season — seven on offense, eight on defense, and two on special teams — to a team hungry for its first University Athletic Association (UAA) title since 2004.

Seniors Matt Glenn and Greg Lachaud and junior Jim O'Brien return in the backfield. Glenn, a second-team all-league honoree, and O'Brien will be the top two threats to carry the ball.

Coach Larry Kindbom has seven wide receivers who saw extensive playing time last season, led by junior Tom Gulyas and senior Matt Mangini. Gulyas, a first-team all-UAA performer, led the team with 51 catches for 632 yards and three touchdowns.

Sophomore first-team all-UAA performer Joe Rhein and classmate Phill Stoecker started all 10 games in their rookie campaign on the offensive line, while junior David Mackey made nine starts up front to earn honorable-mention all-UAA honors.

Senior Nick Gialessas, an honorable-mention all-UAA selection last year, leads a group of five who will be on the defensive line. Seniors Tim Taylor and juniors Greg Larson and John Schneider have all started and will be in the rotation.

Senior co-captain Andrew Berryman is back with five other linebackers who saw significant time last year. Berryman, a first-team all-UAA performer, led the team in tackles for loss (8.5) and sacks (2.5). Senior Brett Schiffman picked up a second-team all-league honors a year ago, while junior Kyle Huber earned honorable-mention accolades.

Developing depth in the secondary will be a key for the Bears, as Kindbom will look to seniors Tim Machan and Tim Olivos to be the core of the defense.

The season opens at 7 p.m. Sept. 5 at Francis Field when the Bears host Greenville College.

Women's soccer looks to build on success

Second-year head coach Jim Conlon returns 18 letterwinners and five starters from last year's team, which posted a 15-4 overall mark and advanced to the NCAA sectional semifinal. The Bears also won their third-straight University Athletic Association (UAA) title and fifth in the past six years.

JOE ANGELES

Junior Jim O'Brien (23) returns to the football team this season as one of the Bears' top ball carriers.

Senior Libby Held, a first-team All-America and all-UAA honoree in 2008, started 20 games for the Bears in the center backfield. She was part of the Bears' defense that allowed just 19 goals all season, posting eight shutouts.

Also returning is senior forward Caryn Rosoff, a first-team all-central region and all-UAA selection. Rosoff led the team with nine goals and 22 points. Joining her up front is sophomore Lee Ann Felder, an honorable-mention all-UAA honoree who scored six goals in her rookie year.

Senior Becca Heymann, a member of the all-region second-team and the all-UAA first team, played in all 21 games at midfield. Heymann's seven assists led the team and combined with a pair of goals gave her 11 points for the year. Senior midfielder Elyse Hanly started 17 games in the midfield, while senior forward Carter Schwarberg picked up honorable-mention all-UAA after appearing in all 21 games.

The women's season opens at home 5:30 p.m. Sept. 1, hosting Illinois Wesleyan at Francis Field.

Lots of optimism for men's soccer squad

The men's soccer team enters the 2009 season with a great deal of optimism as the squad returns a number of key components that resulted in a 12-5-1 record a year ago.

Head coach Joe Clarke brings back four of his top five goal scorers from last season in addition to honorable mention All-University Athletic Association (UAA) goalkeeper John Smelcer.

Senior John Hengel, junior Harry Beddo and sophomore Patrick McClean will pace the offense. Hengel enjoyed his best season with eight goals, four assists and six game-winning goals in 2008, earning honorable mention all-UAA honors. McLean was the Bears' second leading scorer with four goals and an assist, while Beddo notched four goals during his sophomore campaign.

With Smelcer tending the nets for one final season, WUSTL will feature one of the top goalkeepers in NCAA Division III. It also returns two touted defensive specialists. Junior Alex Neumann and Randall Schoen both started in the backfield for all 18 games last season, as the team gave up just 12 goals through its first 15 games.

The men's team opens its season at 7:30 p.m. Sept. 1 when it hosts Illinois Wesleyan University at Francis Field.

Volleyball expects run at national title

Last season marked the first time since 1999 that the volleyball team failed to advance to the NCAA Division III quarterfinals. Heading into 2009, the Bears expect to improve on last year's regional finals appearance and make a run at a 10th national championship.

WUSTL returns three starters, the libero and 10 letter winners overall to a team that posted a 32-7 record in 2008 and captured the University Athletic Association (UAA) championship with a 3-2 win over eventual national champion Emory University.

While the team graduated four key contributors, the Bears return two 2008 All-Americans. Senior middle hitter Erin Albers was a third-team All-America honoree last year. Sophomore Erin Kasson earned honorable mention All-America recognition in her freshman season as a middle blocker.

Laura Brazeal, who earned honorable mention all-UAA honors, is the team's libero. Sophomore Tricia Brandt is back as defensive specialist.

The volleyball team begins its season at 6 p.m. Sept. 1 in the WU Field House when it hosts Harris-Stowe State University and Greenville College for a dual match doubleheader.

Tuition benefit helps juggle career and MBA program

By Melody Walker

Are you a seasoned professional ready to advance your career and knowledge of the business world? You may be eligible for the 50 percent tuition benefit offered to WUSTL staff and faculty to pursue one of two programs toward a master's of business administration (MBA) degree at Olin Business School.

The executive MBA (EMBA) and the professional MBA (PMBA) programs are designed for full-time employees at different career stages. The 50 percent University benefit covers tuition only and excludes meals, parking, lodging, travel and books.

Significant work experience (typically ranging from eight years to more than 20), demonstrated career progression and proven academic ability are a few of the prerequisites for the EMBA program.

The executive program allows students to balance a full-time work schedule and courses over a period of 20 months. Two class schedules are available: the weekend program, which meets every other week on Fridays and Saturdays; and the monthly program, which meets for three days, once a month, Thursday-Saturday.

The curriculum for both formats (57.75 credit hours) is centered on the complex challenges faced by mid- to senior-level executives.

WUSTL professors, doctors, scientists and administrators from various schools have taken advantage of the graduate school tuition benefit at Olin.

Akash Sharma, M.D., an instructor in radiology at the School of Medicine, is currently in the EMBA program. "We all received training on the clinical side in medical school, but physicians rarely get training about the business of medicine," Sharma said. "With cost of health care at the forefront, physicians' awareness of the issues and participation in reform is needed now more than ever."

Sharma said the program is challenging, but so are the rewards. "The teamwork, negotiations and project management concepts that we have learned so far are universal for any professional, so I am starting to see how my learning is affecting my mindset and my approach to these issues at work," he said.

Students in the PMBA program come from a wide range of industries and have an average of five years of professional work experience. Professional MBA students take classes two evenings per week. Students can accelerate their studies by taking more than two classes per week, weekend classes or weeklong classes and earn the MBA in about two-and-a-half years. Fifty-four credits are required to graduate, and more than half the courses are electives.

All Olin MBAs (full-time MBA, professional MBA and executive MBA) who complete the program successfully graduate with the same degree, fully accredited by the Association to Advance Collegiate Schools of Business International.

To inquire about the PMBA program, contact the team at mba@wustl.edu or 935-7301 or visit olin.wustl.edu/pmba.

Faculty and staff may be eligible for additional subsidies from Olin to cover tuition for the EMBA. For information about the EMBA program, visit olin.wustl.edu/emba or call Debra Williams, director of admissions EMBA program, at 935-3622.

Energy

– from Page 1

including wind, solar and biofuels, and these will require investments in research and development."

The committee identified important infrastructural issues that need to be addressed, including the need to modernize the existing system for transmission and distribution of electricity, and Wrighton emphasized that these systems need to be put in place quickly.

"There is much that can be done immediately that will contribute to the energy needs and environmental concerns of the United States," he said.

A strong advocate of the need for more research on clean energy technologies, Wrighton recently saw to it that the University invest more than $55 million to create a new International Center for Advanced Renewable Energy and Sustainability (I-CARES).

Now in its third year, I-CARES encourages and coordinates University-wide and external collaborative research in the areas of renewable energy and sustainability — including biofuels, CO^2 mitigation and coal-related issues.

The University will host a symposium Nov. 2 to discuss America's energy future, and the program will be announced soon. Further, through its McDonnell International Scholars Academy, WUSTL will undertake a project to assess the global energy future. A symposium to address global energy needs and concerns will take place in October 2010.

The project on the global energy future will involve WUSTL and its 25 research university partners in the McDonnell Academy. The symposium on global energy future will take place at the time of the formal dedication of Stephen F. and Camilla T. Brauer Hall, which will house the Department of Energy, Environmental and Chemical Engineering.

Deploying existing energy-efficiency technologies is a near-term and low-cost way to reduce U.S. energy demand, the report says. Fully deploying these technologies in buildings alone could save enough power to eliminate the need for new electricity generating plants to meet growing U.S. demand.

However, some new plants would likely still be needed to address regional supply imbalances, replace obsolete technology or present more environmentally friendly sources of electricity. Deployment of efficiency technologies in the building, industrial and transportation sectors could reduce projected U.S. energy use by 15 percent in 2020 and by

"There is much that can be done immediately that will contribute to the energy needs and environmental concerns of the United States."

Mark S. Wrighton

30 percent in 2030. Even greater energy savings would be possible with more aggressive policies and incentives.

The United States has many promising options for obtaining new sources of electricity over the next two to three decades, especially if carbon capture and storage and evolutionary nuclear technologies can be deployed at an adequate scale. However, according to the report, the deployment of these new technologies is very likely to result in higher consumer prices for electricity. In addition, the nation's electrical grid will require expansion and modernization to enhance its reliability and security, accommodate changes in load growth and electricity demand, and to enable the deployment of new energy efficiency and supply technologies, especially intermittent wind and solar energy.

In the transportation sector, petroleum will continue to be an indispensable fuel in future decades, but maintaining current rates of domestic petroleum production (about 5.1 million barrels per day in 2008) will be challenging. There are limited options for replacing petroleum or reducing petroleum use before 2020, but more substantial long-term options exist that could make significant contributions by 2030 or 2035.

Reductions in petroleum use could be obtained through increased vehicle efficiency, production of alternative liquid fuels such as cellulosic ethanol or coal-and-biomass fuels and expanding deployment of battery electric and hydrogen fuel-cell vehicles.

Substantial reductions in greenhouse gas emissions from the electricity and transportation sectors are achievable over the next two to three decades, the report says.

In both cases, adopting a portfolio approach — deploying a variety of alternative technologies aimed at reducing emissions — would be necessary. For the electricity sector, enabling this approach will require demonstrating, within the next decade, that carbon capture and storage technologies are technically and commercially viable in both new and existing power plants and in liquid fuels production. It will also be necessary to demonstrate the commercial viability of evolutionary nuclear plants.

To begin accelerated deployments of new energy technologies by 2020, and to ensure that innovative ideas continue to be explored, the public and private sectors will need extensive research development and demonstration over the next decade. The report notes that a broad portfolio approach, supporting basic research through the demonstration stage, will likely be more effective than targeted efforts aimed at identifying technology winners and losers.

At the demonstration stage, high-priority technologies include carbon capture and storage, evolutionary nuclear technologies, cellulosic ethanol and advanced light-duty vehicles. The more long-term research and development needs include new technologies for producing liquid fuels from renewable resources, advanced batteries and fuel cells, large-scale electricity storage, enhanced geothermal power, and advanced solar photovoltaic technologies.

In addition, because many barriers exist that could delay or prevent technology deployment, the report recommends that sustained policy and regulatory actions as well as other forms of incentives be employed to drive adoption.

New Livable Lives Initiative offering faculty grants

By Jessica Martin

The Livable Lives Initiative at the George Warren Brown School of Social Work invites University faculty to apply for grants to support projects that move forward the thinking, research, advocacy and policymaking directed toward achieving livable lives.

The Brown School's Center for Social Development (CSD) is providing administrative and material support to launch this initiative with resources made possible by the Ford Foundation.

"These challenging economic times demand new thinking about practices, programs and policies that allow individuals and families to lead stable, secure and satisfying lives," said Edward F. Lawlor, Ph.D., dean and the William E. Gordon Professor.

"Washington University is well positioned to play a significant role in this effort, and we hope this initiative will become a University-wide undertaking. I am pleased that CSD is able to play a lead role in launching this important work," Lawlor said.

The initiative will provide up to six grants of $5,000 each. The grant application deadline is Sept. 30.

The Livable Lives initiative has four main goals:

- document conditions that may inhabit or promote the achievement of livable lives;
- formulate and test innovations;
- inform policies and practices that lead to more livable lives; and
- study impacts of these policies and practices.

All applicants and anyone interested in learning about the Livable Lives Initiative are invited to attend a meeting at 11:30 a.m. Sept. 10 at Whittemore House.

To RSVP and to receive a Request for Proposal, contact Carrie Freeman, CSD administrative coordinator, at cfreeman@wustl.edu by Aug. 24.

Whittemore House to host open house

Whittemore House is hosting a member appreciation and open house event Wednesday, Aug. 19, from 4-6 p.m. with hopes of attracting new members.

The open house and member celebration is free and open to all WUSTL faculty and staff. Hamburgers, hot dogs, grilled chicken, assorted side dishes and summer beverages will be served.

"This event is an excellent opportunity to thank current members for their association with Whittemore House and to encourage other faculty and staff members to become better acquainted with Whittemore House," said Steven P. Hoffner, assistant vice chancellor for operations.

Whittemore House, a private club for faculty, staff and friends of the University since 1969, was built in 1912 and was donated to the University in 1966 by Emma Whittemore to be used for faculty conferences and dining.

To become a member of Whittemore House, a person must be a faculty or staff member, a retired faculty or staff member or a friend of the University. Spouses and children are included in membership.

Whittemore House offers private meeting rooms, comfortable sitting rooms, a veranda and large dining room. It is available for lunch, dinner, conferences and special events such as birthdays, anniversaries, family reunions and wedding ceremonies and receptions.

For more information, call Art Casolari, Whittemore House general manager, at 935-3831 or visit whittemorehouse.org.

Girod selected to relief initiative

Junior Candace Girod, majoring in women, gender and sexuality studies in Arts & Sciences, has been selected as one of 50 United States students to the Oxfam America CHANGE Initiative.

Oxfam America is an international relief and development organization that creates lasting solutions to poverty, hunger and injustice.

Each year, Oxfam's CHANGE Initiative brings together some of the most gifted and committed student activists in the United States.

These students commit to engage with Oxfam for an entire academic year beginning with a weeklong advocacy and leadership training program.

The purpose of the week is to develop students' skills, expand their knowledge of global issues and provide them with tangible work that they can undertake upon their return to campus.

This year's training took place July 18-24 in Boston.

Record

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Notables

Of note

Alaji Bah, a graduate student in biochemistry, has been awarded the 2009 Etter Student Lecturer award from the American Crystallographic Association (ACA) and has been invited to present his work in the Structural Enzymology session at the 2009 ACA meeting in Toronto. Bah engineered a thrombin variant that is active only in the anticoagulant pathway and has potential clinical relevance. …

Joseph Corbo, M.D., Ph.D., assistant professor of pathology and immunology and of genetics, has received a two-year, $100,000 grant from the American Health Assistance Foundation for research titled "Identifying cis-Regulatory Elements around the ARMS2 Locus." …

Tyrone L. Daulton, Ph.D., research scientist in the Center for Materials Innovation, has received a one-year, $35,176 grant from the Naval Research Laboratory for research titled "Microcharacterization of Biogenic Nanowire Structures by Electron Microscopy." …

Christine Floss, Ph.D., research associate professor of physics in Arts & Sciences, has received a three-year, $168,493 grant from the National Aeronautics and Space Administration for research titled "Search for Impact Craters on the Stardust Interstellar Collector Tray." …

James L. Gibson, Ph.D., the Sidney W. Souers Professor of Government in Arts & Sciences, has received a one-year, $98,700 grant from the National Science Foundation for research titled "SGER: Money, Politics, and the Legitimacy of State Supreme Courts: The Impact of Recusals and Disqualifications." …

Robert O. Heuckeroth, M.D., Ph.D., associate professor of pediatrics and of developmental biology, was one of only four physician-scientists nationwide to receive the Clinical Scientist Award in Translational Research from the Burroughs Wellcome Fund. The five-year, $750,000 award will support his work into the genetic and non-genetic risk for Hirschsprung disease. …

Aimee James, Ph.D., assistant professor of surgery, has received a two-year, $242,000 grant from the National Cancer Institute for research titled "Peer Outreach to Facilitate Colorectal Cancer Screening in Safety Net Clinics." …

David K. Levine, Ph.D., the Biggs Distinguished Professor of Economics in Arts & Sciences, has received a three-year, $212,040 grant from the National Science Foundation for research titled "Applications of the Self Control/Dual Self Model in Economics." …

Katharina Lodders, Ph.D., research professor in earth and planetary sciences in Arts & Sciences, has received a two-year, $92,000 grant from the National Aeronautics and Space Administration for research titled "Bright Earths: Models of the Post Giant Impact Atmospheres of Young Terrestrial Planets." …

Lynn McCloskey, assistant provost-analysis, was awarded the Distinguished Service Award during the 2009 annual meeting of the Association of American Universities Data Exchange. McCloskey was selected by the nominating committee for her sustained and dedicated efforts on behalf of the data exchange. …

Herman D. Pontzer, Ph.D., assistant professor of anthropology in Arts & Sciences, and **Susan B. Racette**, Ph.D., research assistant professor of physical therapy, have received a two-year, $196,972 grant from the National Science Foundation for research titled "Metabolic Cost of Living in Human Foragers." Also included in the grant was William W. Wong, Ph.D., of the Baylor College of Medicine. …

Tiffany Reese, Ph.D., postdoctoral research scholar in pathology and immunology, has received a three-year, $140,000 fellowship from the Damon Runyon Cancer Research Foundation for research titled "The Immune Response to Latent Gamma Herpesvirus Infection." …

Michelle M. Sandau, Ph.D., postdoctoral research scholar in pathology and immunology, has received a two-year, $59,238 fellowship from the National Institute of Allergy and Infectious Disease for research entitled "Analysis of Bidirectional Signaling Mechanisms for BTLA and HVEm." …

Robert D. Schreiber, Ph.D., the Alumni Professor of Pathology and Immunology and professor of molecular microbiology, has received a one-year, $145,340 contract from Igenica Pharmaceuticals for research titled "Monoclonal Antibodies To Human Cell Surface Tumor Antigens." …

Anjan Thakor, Ph.D., the John E. Simon Professor of Finance, ranked No. 4 — the top 1 percent — of the most prolific authors in seven leading finance journals, according to a recent St. Joseph University and Trinity University study. Thakor also ranked No. 11 among those published in 26 core finance journals. Other WUSTL professors ranked were **Stuart Greenbaum**, Ph.D., the Bank of America Professor of Managerial Leadership, at No. 56 in leading journals (No. 144 in core journals), **Philip Dybvig**, Ph.D., the Boatman's Bancshares Professor of Banking and Finance, at No. 184 (No. 239), and **Guofu Zhou**, Ph.D., professor of finance, at No. 295 (No. 268). …

Suzanne Till, graduate student in international affairs in Arts & Sciences, has been selected by the Kiva organization as a Kiva Fellow. The Kiva organization alleviates poverty by connecting individual lenders directly to unique entrepreneurs around the world and using the Internet to showcase borrowers to match with potential lenders. As a Kiva Fellow, Till will travel internationally for 10-12 weeks this fall to study microlending. Follow Till on her blog at mssuzanne.wordpress.com. …

Nneka Ufere, while a first-year medical student, was named editor of an issue of Virtual Mentor, the American Medical Association's online ethics journal written by students and residents. Virtual Mentor explores the ethical challenges that students, residents and other physicians are likely to face in their training and daily practice. Theme issue editors are selected each year through a competitive process from among medical students and residents. …

Lihong Wang (contact principal investigator), Ph.D., the Gene K. Beare Distinguished Professor in Biomedical Engineering, and **Barbara Monsees** (principal investigator), M.D., professor of radiology, have received a five-year, $3,063,610 grant from the National Cancer Institute for research titled "Monitoring of Breast Neoadjuvant Therapy by Thermo- and Photo-Accoustic Tomograph." …

Chancellor **Mark S. Wrighton** received the John D. Levy Human Relations Award from the American Jewish Committee at a ceremony at the Ritz-Carlton St. Louis May 18. The committee's St. Louis chapter bestows the award on individuals whose tireless work has left a positive and indelible impact on the quality of life of the community they live in.

Danforth recognized for his contribution to science

Chancellor Emeritus William H. Danforth, M.D., was presented the 2009 American Society of Plant Biologists Leadership in Science Public Service Award during the annual meeting in Honolulu July 21. The award was presented in recognition of Danforth's outstanding contributions to science and society.

Danforth

While Danforth, who serves as chair of the Donald Danforth Plant Science Center, initially trained as a medical doctor and biochemist, he has maintained a lifelong interest in food, agriculture and sustainability. As chancellor, he urged the establishment of a strong plant biology program in the Department of Biology in Arts & Sciences and raised the University's national prominence in the field.

Following his retirement as chancellor in 1995, Danforth became the driving force behind the establishment of the Donald Danforth Plant Science Center, which has vigorously pursued its mission to improve the human condition through plant science. In just one decade, the center has become the largest independent plant science research institute in the world.

It is the centerpiece of an innovative initiative that is applying the most modern scientific and business thinking to the age-old problem of providing food, plant and forestry products to the people of the world in ways that can be sustained for generations to come.

In 2003, Danforth was appointed by then secretary of agriculture, Ann M. Veneman, to chair the Research, Education and Economics Task Force of the U.S. Department of Agriculture (USDA), which recommended the establishment of the National Institute of Food and Agriculture within the USDA. The mission of this institute, which has been authorized by Congress, is to encourage technological innovations in and enhancements to American agriculture.

Obituaries

Imergoot, associate intramurals director, 60

Lynn Imergoot, associate director of intramurals and club sports and former women's tennis coach, died July 24, 2009, from injuries sustained in a car accident. Imergoot was 60.

Imergoot — the first head coach in WUSTL's women's tennis history — built the women's tennis program from ground level into a national contender.

In 30 seasons (1975-2005) as head coach of the Bears, she tabulated a career record of 435-164 (.726). Imergoot, a five-time University Athletic Association Coach of the Year, guided Washington University to seven NCAA tournament appearances.

In addition to her tennis duties, Imergoot served as director of women's and co-ed intramurals from 1973-79, as coordinator of women's athletics from 1977-1984, and as assistant athletic director from 1984-2005.

"Lynn was a leader in building women's athletics," said John Schael, director of athletics. "She not only coached great teams, she helped pave the way for women to excel in sports through her example and her determination."

Imergoot

Imergoot received the Rita "Slats" Meyer Moellering Memorial Award from the St. Louis Sports Commission and was named the National Association of Collegiate Women's Athletic Administrators District Five Administrator of the Year.

Before WUSTL, Imergoot taught at White Plains High School in New York from 1970-72, coaching the girls' tennis team.

She earned a bachelor's degree in physical education from Lehman College in 1969, where she lettered three years in tennis, four years in field hockey and two years in basketball. In 1970, Imergoot earned a master's degree in physical education from the University of Illinois at Urbana-Champaign.

Imergoot is survived by two children, Douglas and Jennifer; granddaughter Tamia, 9; and her sister Amy Kossak.

A memorial service has been set for 2 p.m. Sept. 13 at Graham Chapel.

Memorial contributions made be made in memory of Imergoot to the Jewish Community Center, 2 Millstone Campus Drive, St. Louis, MO 63146, Attention: Tributes.

Wilson, administrative coordinator for Olin admissions, 53

Cretta Lynne Wilson died June 28, 2009, at St. John's Mercy Hospital after a long illness. She was 53.

In 1997, she joined the Olin Business School staff as an administrative assistant in the faculty support group. In 2000, she took on additional duties assisting the director of the Boeing Center for Technology, Information and Manufacturing.

She was promoted to the position of administrative coordinator for admissions and student services in Olin's doctoral program in April 2006.

Wilson is survived by her daughter, Phoenix L. Kelly.

Donations may be made to the Crohn's and Colitis Foundation, 1034 South Brentwood Blvd., Suite 1510, St. Louis, MO 63117.

Crozier, 93

Grace Crozier, secretary/administrative assistant in the office of the dean of Arts & Sciences from 1967-1977, died July 2, 2009. She was 93.

Felix, professor emeritus of economics, 91

David Felix, Ph.D., professor emeritus of development economics and economic history in the Department of Economics in Arts & Sciences, died June 13, 2009, in Bangor, Maine. He was 91.

Born in New York City, Felix graduated magna cum laude, Phi Beta Kappa, from the University of California, Berkeley, in 1942 before enlisting in the U.S. Navy. He served as a lieutenant in the Pacific during World War II.

After the war, he returned to Berkeley, where he earned a master's degree in history and a doctorate in economics. Before joining the faculty at Washington University in 1964, he was an economics professor at Wayne State University from 1954-1964.

Felix retired from Washington University in 1988. His research interests included economic development, history and international trade and finance.

Felix served as an economic consultant to the United Nations and the International Monetary Fund. He had research appointments at Harvard University, the University of Sussex, England, and the London School of Economics. He received fellowships from the Fulbright, Rockefeller, Ford and other foundations for research in Latin America.

Steve Fazzari, Ph.D., professor of economics and a member of the department since 1982, has fond memories of Felix.

"I respected him for his intellectual integrity," Fazzari said. "I admired him for his strong work ethic and professional accomplishments. And I will miss him as a teacher, colleague and friend."

Felix is survived by his wife of 63 years, Gretchen (Schafer) Felix of Orono, Maine; two daughters; and two grandsons.

Donations may be made to the ACLU, 125 Broad St., 18th Floor, New York, NY 10004 and to The Chamber Music Society, University of Maine, 5746 Collins Center for the Arts, Orono, ME 04469.

Condolences to the family may be sent to Gretchen Felix, 9 Alumni Drive, Apt. 111P, Orono, ME 04473.

Kirk, 82

Marilyn M. Kirk, Ph.D., research associate in biology in Arts & Sciences from 1971-1995 and lecturer in biology in 1972 and '74, died Aug. 4, 2009, in St. Louis. Kirk, the wife of David Kirk, Ph.D., professor of biology, was 82.

Washington People

Plant pioneer

Blankenship unravels the mysteries of photosynthesis

By Tony Fitzpatrick

Restlessness can strike anyone, even world-renowned photosynthesis researchers.

Robert Blankenship, Ph.D., the Lucille P. Markey Distinguished Professor of Arts & Sciences, left his position as chair of chemistry and biochemistry at Arizona State University in 2006 to come to WUSTL after 21 years in Tempe.

"It surprised a lot of people," Blankenship says in his biology office at McDonnell Hall. (He has a chemistry office in the Laboratory Sciences Building.) "But we had reached a point where I considered doing something else. Our kids were grown and settled in school, so we didn't have that issue."

One day, he opened an issue of the Chronicle of Higher Education and stared at a big ad for a position in both biology and chemistry at WUSTL.

"I said, 'Wow, that sounds like me,'" he says. "I was very attracted by the opportunities here and particularly the chance to be a faculty member in both biology and chemistry because that's where I'm at in my research in both disciplines."

Blankenship advises graduate students in both departments and has set up the labs so that they do experiments in his two different laboratories. He also seeks to bring members of both departments together in various ways, most notably at a party he and his wife, Liz Dorland, host annually for personnel in both departments at their house.

"It's become sort of a tradition in just three short years," he says, chuckling.

DAVID KILPER

Robert Blankenship, Ph.D. (left), talks with Hai Yue, a second-year graduate student in chemistry in Arts & Sciences, in Blankenship's lab. "Bob brings more than deep knowledge of the field," says Christine Kirmaier, Ph.D., research associate professor of chemistry. "He brings incredible energy and enthusiasm and the ability to bring together people from a wide variety of backgrounds to work on common goals."

'I just can't let go of it'

Blankenship grew up in rural southeast Nebraska and was influenced and encouraged by his mother and his high-school chemistry teacher, Niel Tubbs, to pursue chemistry. As a fresh graduate student at the University of California, Berkeley, in the early 1970s, he chose to work in biophysical chemistry, a major strength of one of the world's best chemistry programs.

Since then, Blankenship's drive has been understanding one of the basics of life on earth: photosynthesis, the transformation of light, carbon dioxide and water into chemical energy in plants and some bacteria. The chemical reactions leading to long-term energy storage in photosynthetic systems occur in one of the most intriguing biomachines, the membrane-bound reaction center, and an affiliated number of proteins that comprise an electron transport chain. Blankenship is seeking the identity of the molecular parameters that ensure that every photon, or light packet, absorbed by a photosynthetic system leads to stable products.

"I've moved around a lot in the field in terms of organisms and questions that I deal with, but I've always maintained a tie with photosynthesis because it is such a compelling scientific system, so complex and so important that I just can't let go of it," he says. "Another thing I like about it is it's extraordinarily interdisciplinary. It's amazing the range of science you can bring to the system to try to understand it."

The evolution of life on earth was impacted by photosynthesis and other metabolic processes, such as nitrogen fixation. Blankenship has revealed the complex evolutionary histories of these metabolic processes in analyzing whole bacterial genomes. Combining genomic and molecular evolution techniques and biochemical analyses, he also has identified and characterized previously unknown enzyme complexes with novel activities.

A PARC on campus

This spring, Blankenship was rewarded for his expertise and achievements in photosynthesis when the U.S. Department of Energy announced that WUSTL would be home to one of 46 new multimillion-dollar Energy Frontier Research Centers (EFRC). As an EFRC, the University (specifically the Danforth Campus) received a five-year, $20 million award from the Department of Energy to establish the Photosynthetic Antenna Research Center (PARC). Research to be done at PARC will analyze energy forms based on the principles of light harvesting.

Blankenship, who with colleague Dewey Holten, Ph.D., professor of chemistry, spearheaded the proposal for the new center, is director; Holten is associate director. The award represents the largest such in Danforth Campus history. The center will be housed at Stephen F. and Camilla T. Brauer Hall, scheduled to open in 2010.

As director, Blankenship coordinates the efforts of 16 other principal investigators from WUSTL and around the world who will gather at WUSTL once annually at a designated date to share results and create initiatives.

PARC will explore basic science research aimed at understanding the principles of the harvesting of light and funneling of energy as applied to natural photosynthetic, biohybrid and bio-inspired antenna systems, which gather light and carry it to an organism's reaction center, where the chemistry that creates energy takes place.

"The function of any photosynthetic organism is to store solar and chemical energy," Blankenship says. "For that to happen, light energy from the sun has to be absorbed by the plant and taken in, and that happens in the antenna system.

"Think of it as a satellite dish," he says. "One of the things we're going to explore is size of the antenna in different organisms. There is some evidence for bioenergy purposes that the size of the antenna that would be best for producing ethanol or biodiesel is smaller than the natural antenna, so we'll see if we can genetically change the size of a system's antenna and investigate that."

Researchers will study antenna structures and also the design of artificial antennas to someday build systems that mimic photosynthesis.

Holten and his wife, Christine Kirmaier, Ph.D., research associate professor of chemistry, have known Blankenship for 35 years and have collaborated with him since the 1980s.

"Bob Blankenship is a tremendous colleague who is extremely knowledgeable about photosynthesis, from both physical and biological perspectives," Holten says. "He is highly regarded internationally as a top researcher in the field. We're lucky to have him here and delighted he's a friend and colleague."

Kirmaier adds: "Bob brings more than deep knowledge of the field. He brings incredible energy and enthusiasm and the ability to bring together people from a wide variety of backgrounds to work on common goals."

'Quantum beating'

Certainly, attaining PARC ranks as one of Blankenship's greatest career accomplishments, and it highlights his short three-year stint at WUSTL. But he has had numerous publications in that short span that have contributed much to energy studies.

In 2007, he co-authored a Nature paper that for the first time detected a "quantum beating" in a photosynthetic system. He contributed protein to a study performed by collaborators at Lawrence Berkeley National Laboratory and the University of California, Berkeley.

The protein, which comes from a photosynthetic bacterium that lives in extremely high temperatures, enabled the researchers to describe the quantum effect — occurring when light-induced excitations in the bacteriochlorophyl complex meet and interfere constructively, much like the interactions between ripples formed by throwing stones into a pond.

In 2008, he was principal investigator of a project that led to the sequencing of a rare bacterium that harvests light energy by making an even rarer form of chlorophyll, chlorophyll d. This type of chlorophyll absorbs "red edge," near infrared long wavelength light that is invisible to the naked eye. By doing this, the cyanobacterium *Acaryochloris marina* competes with hardly any other plant or bacterium in the world for sunlight; as such, its genome is massive in proportion to its size, comprising 8.3 million base pairs. It is the first organism containing chlorophyll d to be sequenced. Blankenship and his collaborators continue to seek the enzyme that causes a chemical structure change to make chlorophyll d, distinguishing it from primarily chlorophyll a and b but also from nine other forms of chlorophyll.

At times, Blankenship's research is "other worldly." In 2007, he co-authored two papers in the journal Astrobiology detailing the kinds of clues researchers are seeking that might tell them what life might be like on extrasolar planets. He and others are studying various biosignatures found in the light spectrum leaking out to Earth to speculate what kind of photosynthesis might occur on such planets and what the extrasolar planets might look like. The plants could be as black as eggplants, he says.

"It all depends on the planet's equivalent to our sun, the colors and intensity of light coming from it that the planet feeds off and the planet's atmospheric chemistry," he says.

It's quite possible that the spectrum of light available to organisms on extrasolar planets is different from light on Earth, and thus "far out" planets' plants would have different pigments to absorb that particular light wavelength.

Blankenship is part of a NASA working group based at the Jet Propulsion Laboratory and called the Virtual Plant Laboratory. He and other researchers are studying light coming from stars and extrasolar planets to estimate its composition.

Meanwhile, life on Earth for Blankenship will continue to involve photosynthesis and energy and collaborations.

"This (WUSTL) is a marvelous place for collaborations," he says.

Robert Blankenship

Education: B.S., chemistry, 1970, Nebraska Wesleyan University; Ph.D., chemistry, 1975, University of California, Berkeley

Family: Wife, Liz Dorland; daughter, Larissa, 27; son, Sam, 23

Hobbies: Travel, cooking, hiking and fossil collecting

Little-known fact: Appears as himself in "The Grateful Dead Movie" in a 30-second snack bar scene. He's the one who looks like the late Jerry Garcia. "People used to tell me that all the time," he says.

Two proud achievements: Elected to the Beatrice, Neb., Education System's Hall of Fame, 2008; his book, "Molecular Mechanisms of Photosynthesis," will go through a second edition soon. "It's touched a lot of students," he says.

COURTESY PHOTO

(From left) Daughter, Larissa; Robert Blankenship; son, Sam; and wife, Liz Dorland.