Personalized breast cancer treatment now possible

By Gwen Erichson

A set of 50 genes can be used to reliably identify the four known types of breast cancer, according to research conducted at the School of Medicine and at collaborating institutions. Using this 50-gene set, oncologists can potentially predict the most effective therapy for each breast tumor type and thereby personalize breast cancer treatment for all patients.

"Unlike a widely used genomic test that applies only to lymph-node negative, estrogen-receptor positive breast cancer, this new genomic test is broadly applicable for all women diagnosed with breast cancer," said breast cancer specialist Matthew Ellis, M.D., Ph.D., professor of medicine in the Division of Medical Oncology.

The study was reported Feb. 9 through advance online publication in the Journal of Clinical Oncology. Ellis' collaborators include co-authors Charles Perou, Ph.D., associate professor of genetics and pathology at the University of North Carolina at Chapel Hill School of Medicine; Philip S. Bernard, M.D., assistant professor of pathology and medical director of the molecular pathology laboratory at the University of Utah Huntsman Cancer Institute; and Torsten Nielsen, M.D., Ph.D., assistant professor of pathology and laboratory medicine at the University of British Columbia.

Breast cancer results from genetic abnormalities in breast tissues, but not all breast cancers have identical genetic alterations. Ellis and his colleagues analyzed the gene activity of more than 1,000 breast tumors to identify and validate the genetic signature of each of the four types of breast cancer.

Although the cancer types are distinguished by thousands of genetic differences, the researchers were able to narrow the list down to a set of 50 of these genes that could uniquely identify each type.

These tumor types have been previously defined and are known as luminal A, luminal B, HER2-enriched and basal-like. The latter three types are generally considered types with a poor prognosis. Another genetic test commonly used in clinical practice, OncotypeDX, does not identify all four tumor types.

"Our test is the first to incorporate a molecular profile for the basal-like type breast cancers," said Ellis, a member of the Siteman Cancer Center. "That's important, because these breast cancers are arguably the most aggressive yet the most sensitive to chemotherapy. By identifying them, we can ensure they are treated adequately."

Breast cancer experts typically also identify a fifth breast cancer type known as normal-like. The 50-gene set also recognizes the normal-like type. But the researchers found that instead of being a fifth type of breast cancer, the normal-like classification is an indicator that a sample contains insufficient cancer cells to make a molecular diagnosis and that a normal sample needs to be taken.

In this study, the researchers also compared the activity of the 50-gene set to how well 133 breast cancer patients responded to standard chemotherapy. They found that their genetic test was highly sensitive and very predictive for chemotherapy response. The test was more predictive than typically used clinical molecular markers such as estrogen receptor status, progesterone receptor status or HER2 gene expression status.

They found that luminal A was not sensitive to the chemotherapy, suggesting that patients with this good-prognosis type can forgo chemotherapy in favor of hormones.

Biologist presents 'sacred' nature of sustainability

By Rachel Shulman

Global warming and environmental sustainability are concerns that fit neatly within the precepts of religious naturalism, according to Dr. Cynthia Goodenough, professor of biology in Arts & Sciences.

Goodenough, a renowned cell biologist, is the author of "The Sacred Depths of Nature," a best-selling book on religious naturalism that was published in 1998. Religious naturalism neither requires belief in God nor excludes faith. Rather, the movement is based on what Goodenough described as "an exploration of the religious potential of nature."

Goodenough spoke on this topic at the annual American Association for the Advancement of Science (AAAS) meeting Feb. 14 in Chicago. Her symposium was titled "Towards the Science and Ethics of a Culture of Sustainability."

Like all religious traditions, religious naturalism is anchored in narratives that serve as a basis for three kinds of activities that are at the core of all religious traditions, including religious naturalism.

Steinberg Hall to be reddedicated with celebration

By Cynthia Georges

The Steinberg Hall of Art and Archaeology, a gift from Elta Eisenman Steinberg in memory of her husband, Mark C. Steinberg, formally opened its doors May 15, 1960, with a gala reception that celebrated the University as a center of arts education.

Having undergone a renovation that completes the new facilities unison the Sam Fox School of Design & Visual Arts, Steinberg Hall once again will take the spotlight at a rededication celebration Monday, Feb. 23.

The event, sponsored by the Sam Fox School and the Department of Art History & Archaeology in Arts & Sciences, will take place at 4 p.m. in Steinberg Auditorium, which will be renamed for philanthropist and visionary Elta Steinberg, who died in 1974.

World-renowned contemporary artist Fred Tomaselli, whose dazzling paintings interweave images from medical texts, catalogues, field guides, flora and fauna, will discuss his work as part of the program.

Joining Tomaselli will be WUSTL alumni James Cohen, owner of the James Cohen Gallery in New York and Shanghai; Tomaselli and Cohen will discuss the collaborative relationship between artist and gallery owner.

Mark C. Steinberg's career took him from office boy in the St. Louis brokerage firm of Albomter & Rawlings to founder of Mark C. Steinberg & Co., a brokerage firm he headed until his death in 1951.

The daughter of Aurelia Stix and David Eiseman, an owner and president of Rice-Stix Dry Goods Co. in St. Louis, Elta Steinberg was an inspirational visionary. Her devotion to St. Louis and WUSTL enriched many lives through the educational, recreational and health-care-related projects she so ardently supported.

Through the Mark C. Steinberg Charitable Trust and personal gifts, Elta Steinberg funded the Mark C. Steinberg Memorial Skating Rink in Forest Park (1957), the Mark C. Steinberg Professorship in Art History at WUSTL (1963) and the Mark C. Steinberg Biomedical Science.
Primates evolved to be social, not aggressive, Sussman tells AAAS

By NEIL SCHONHERR

Primates are social animals, but why did they become social? A new study identifies key evolutionary causes for the differences in social structure among various primate species.

Robert W. Sussman, Ph.D., professor of anthropology in the School of Arts and Sciences, addressed those questions and more in his talk, "A Comparative Overview of Social Structure Among Various Primates," during the 2006 annual meeting of the American Association for the Advancement of Science (AAAS) Feb. 15 in Chicago.

"A commonly held view is that if a species can somehow protect them from predation or from unfamiliar species, because of these pressures, they are forced to be social, but, due to competition for food resources, they must be competitive and aggressive as well. "Many theories about the evolution of primate sociality and social behavior are related to the negative idea that primates must be aggressive because they are forced to be social," Sussman said. "However, there is evidence, however, does not support this theory."

Sussman has found through his examination of primates that when the predators are viewed as a group, active social interaction increases to more than 10 percent of their average day.

"So 90 percent or more of primate behavior is maintained by more than just social pressures," Sussman said. "In examining what percentage of time a primate is actually antagonistic, we find that it's actually very low in fact, in some species it can be as infrequent as once every 175 days."

"Obviously a major aggressiveness in which the individual is injured or dies is a factor that affects the primate, but now that the evolution of a species is questioned, we are starting to study this."

Another theory on the evolution of primate social behavior, the ecological constraints model, suggests that as groups increase in size, so do the opportunities for cooperation and fighting within the group. The theory predicts a direct correlation between the number of animals in the group and the amount of energy expended by those animals.

Sussman questions how this model can explain cooperative social behavior.

"Sociobiologists would explain it in three ways," he said. "The first is kin selection. Animals aren't really altruistic; they just socialize to pass along their genes. The second is reciprocal altruism. Animals only help each other if they know they'll be helped in the future. The third is reproductive reconciliation. Because animals are forced to compete, in order to live in social groups, they must reconcile with each other."

In each of these views, Sussman said, the animal is forced to live socially. "But why did they become social?"

"That's a very hard way to think of the world," he said. He proposes an alternative theory. "None of the concepts in the previous example are actually focused on social behavior," Sussman said. "There is more altruism and cooperation in humans and primates than there is any kind of aggression."

He said animals — and humans, for that matter — benefit from being social.

"The hormones serotonin and oxytocin also play a role in social recognition and trust," Sussman said. "Oxytocin is one of the reasons for group living to be evolutionarily advantageous."

But, he said, "through evolutionary time, certain animals who benefit more by living in groups have developed — through natural selection — natural biological mechanisms that enhance sociality."

"Today, it is possible for animals to be social and even altruistic, while being used for profit, whether by selection or others," Sussman said. "Cooperation is a biological mechanism."
Looking to the future of women's health research

By Caroline Arbanas

What are your priorities for women's health research?

The National Institutes of Health (NIH) wants to know.

Washington University will host a public forum from 4 to 6 p.m. on behalf of the NIH Office of Research on Women's Health. The meeting begins to develop research priorities for the next decade.

The meeting begins with a public hearing to gather input from women, girls, health care providers, patients, community groups, advocates and other interested parties.

It is the first of several regional conferences to explore new avenues into diseases and issues that affect women.

"This is a wonderful opportunity for researchers, clinicians and the public to make a significant impact on the current state of federally funded women's health research," said L. Stanley Jr., M.D., vice chancellor for research.

The meeting includes panel discussions on how to translate unmet medical needs into new research initiatives. Additionally, the conference brings together physicians, scientists and public policy officials who will work in small groups to develop specific recommendations and priorities in new areas.

The meeting is open to the public and free. To register and find more information, visit research.wustl.edu/women's

The conference begins at 2 p.m. March 4 in the E.P. Newman Education Center on the medical campus.

By Beth Miller

Surgeon on volunteer mission treats wounded U.S. soldiers

While two weeks away from the comforts of home may seem like a long time, Patrick Geraghty, M.D., realized that his two weeks in Germany treating wounded U.S. soldiers was nothing compared to the long tours of duty faced by Geraghty, associate professor of surgery, went to Landstuhl Regional Medical Center (LRMC) at Ramstein Air Force Base in Germany Jan. 3-18 to lend his expertise as a vascular surgeon.

The Society for Vascular Surgery, of which Geraghty is a member, has coordinated volunteer vascular surgeons for two years to perform a large number of vascular surgeries in the United States.

Soldiers serving in Iraq and Afghanistan have a high rate of injuries caused by improvised explosive devices or from high-velocity crashes. Although the soldiers wear body armor, it primarily protects their torso and abdomen, leaving arms and legs exposed, according to Geraghty.

"These soldiers have multiple extremity injuries, which can be very disabling," he said. "They are really at a point where they are going to need physical therapy and rehabilitation.

Geraghty recalled treating one patient who had severe trauma to his leg that required multiple surgical debridements, or removal of damaged tissue. The patient is at the "very disabling," he said. "He's still being treated but is improving."
Speaking frankly about race and identity in America

By Barbara Rea

The inauguration of the first African-American president was a milestone in race relations, but, to most members of a minority group, its judgment that the United States is now a post-racial society is quite premature.

At 4 p.m. Wednesday, Feb. 25, in the Danforth University Center (DUC), WUSTL students and faculty will gather for a conversation about race and identity.

The Assembly Series event is free and open to the public and will take place in the DUC's Fun Room. Representatives from student groups will join Bob Hanson, associate professor of architecture and artist-in-residence in the Sam Fox School of Visual & Design Arts' College of Architecture, and Phil D., assistant professor of Arabic with a joint appointment in the Department of Asian & Near Eastern Languages & Literatures and Languages, and in the Jewish, Islamic, and Near Eastern Studies programs.

Both in Arts, Sciences, in a frank discussion designed to move ideas of race and identity forward.

The goal is to mean- ingful dialogue that will produce real insights into the experiences that members of a minority — or with non-racial identities — have in the hope that it produces a genuine understanding.

Opportunities for audience participation will be well as.

For more information on this Assembly Series program or upcoming events, call 935-4620 or visit assemblyevents.wustl.edu.

Brown Clouds, Imprinted Polymers & Big Tobacco

WASHINGTON UNIVERSITY IN ST. LOUIS

Monday, March 2

11 a.m. Environmental and Chemical Engineering Seminar Series.

"Atmospheric Brown Clouds and Their Impact on Air Quality and Human Health." Greg Carmichael, assoc. dean of chemical and biological engineering, School of Medicine. Clopton Aud., 4950 Children's Hospital Drive, 362-3540.

4 p.m. Chemistry Seminar Series.

"Nanotechnology for Cancer Diagnosis and Therapy." George M. Whitesides, professor of chemistry and chemical biology, Harvard University. Steinberg Aud. 454-7998.

Tuesday, Feb. 24

4 p.m. Vision Science Seminar Series.

Historic international justice meeting at WUSTL

By Isabella Martin

A t the 1904 World’s Fair, the Inter-Parliamentary Union proposed the establishment of a permanent international court of justice. The Assembly of the United Nations, meeting in New York in 1945, accepted the proposal. In 1948, the International Court of Justice was established. The court has since played a vital role in the establishment of international law.

Bernheimer to speak

Tales” (1998) and “Brothers and Sciences, praised “The Complete senior writer in residence in the German, Russian and Yiddish Duncker Hall, Room 201, Hurst will gather at the law school April 12-15 to begin work on a Special project focusing on Crimes Against Humanity as part of the Whitman Center’s Western Institute’s Crimes Against Humanity Initiative.

The steering committee’s members are: M. Cherif Bassiouni, J.D., professor and president emeritus of the International Human Rights Law Institute at DePaul University School of Law; Hans Corell, former United Nations undersecretary-general for legal affairs; Richard Goldstone, former judge of the International Criminal Court; and the former Yugoslav; Leon Mestrovic, president of the International Court of Justice for the Federal Republic of Yugoslavia; John Michin, LL.D., president of the International Commission for Human Rights; William Schuman, J.D., president of the Foundation for the International Criminal Court; and Members of the U.S. Congress have discussed criminal justice in the former Yugoslavia and;

A considerable body of jurisprudence has been generated in the last decade by several international criminal tribunals.

In addition to working on a draft treaty, the present committee will explore the legal, social, and enforcement issues surrounding crimes against humanity.

The second meeting of the Crimes Against Humanity Initiative will take place at The Hague in June.

The project will culminate with a global conference, at which the final draft of the multilateral treaty will be discussed and the problem of prevention as well as punishment will be taken up.

Cambridge University Press will publish the papers commissioned by the project, a full draft of the treaty and an accompanying commentary.

Bernheimer to speak to Writing Program

By Cynthia Geoghegan

F action writer Kate Bernheimer will read from her new novel, "The Complete Tales of Kinky Goldberg," Saturday, Feb. 28, at Dancker Hall, Room 201, Hurst Lounge for the Writing Program in Arts & Sciences, and the Reading Series.


"Kate Bernstein is a master prose stylist with a keen ear for the quirky and the surreal," said her publisher, David Frost of Penguin Press Writing at the University of St. Louis.

When asked why she writes, Bernstein said, "I also think fairy tales contain the secret of the world, which is that it is violent, insane, beautiful, and the hero/heroine is in the midst of it all, with no control over the world, which is in great chaos, with no sense of order or meaning."

Her new novel, "The Complete Tales of Kinky Goldberg," is a rich tapestry, characterized with patterned childhoods and the hypnotic complexity of women's imaginations.

The story is a rich fantasy, intertwined with childhood stories and the hypnotic complexity of women's imaginations. It is written in a lyrical, poetic style that is both nostalgic and disturbing.

Bernheimer is professor of English and creative writing at the University of St. Louis. She is also the author of three novels, "The Complete Tales of Kinky Goldberg," "The Complete Tales of Lucy Goldberg," and the forthcoming "The Complete Tales of Lucy Goldberg." She is currently working on a collection of short stories, "Fairy Tales from the Goon Squad."
The Center for the Humanities announces fourth class of faculty fellows.

**New master's degree in engineering offered.**

**By Tony Fitzpatrick**

The Department of Energy, Environment and Chemical Engineering has launched a new master of engineering program that not only expands on the undergraduate program but also includes development of leadership and entrepreneurial attributes.

The one-year program will train students to work in interdisciplinary fields, with a focus on chemical engineering, environmental engineering, environmental health, environmental economics and sustainable international development.

"To get the master of engineering degree in energy, environmental and chemical engineering, students can choose a pathway of specialization in specific topical areas," said Pratim Biswas, Ph.D., the Stella and Quinette Jess Professor of Environmental Engineering and chairman of the department. "We will also provide training in teamwork and collaboration and sustainable international development.

Discussions also are under way with the Olin Business School to explore collaborative opportunities for course offerings.

Biswa said the degree requires 30 credits and can be completed by students who enroll part-time but this will extend their length of study. A summer practicum worth six credits is part of the degree.

An external advisory board consisting of professionals from outside industry will advise the faculty and help the students find work and advance their careers.

Students who have completed a bachelor's degree in engineering (any discipline), physical sciences or life science are eligible to apply, and applicants can apply online. The deadline is June 1.

For more information about the program application process or for financial aid options, visit http://cem.mst.edu/masterengineering.asp.

### Government and public policy job fair Feb. 19

Representatives from regional and national government agencies will be on campus Thursday, Feb. 19, for a career fair to introduce students to Careers in Government and Public Policy.

"Making the Difference" campaign to promote careers in federal government sponsored by the Gephardt Institute for Public Service and the Career Center.

The day includes lunch with employers at noon in the Danforth University Center. Exposers will be on hand from 1 to 4 p.m. and mock interviews at 1:30 p.m. in the Career Center and a panel discussion on internships at 3 p.m. The event is free.

Participating agencies represent numerous federal, state and local government agencies, and from more than 25 agencies.

### Sacred

**The synergy between science and religion — from Page 1**

The first activity is interpretation. Goodenough said, "I have gone on enough liked this process to work with people on Sunday or Monday, something like the ancient texts" she said.

"Science inquiry is the primary tool for deriving the narrative," Goodenough said, but "the interpretive mode, in this schema, has to do with how the religious perspective fits into this narrative — theologically, arthistically and so forth.

The second activity is spiritual practice. Goodenough said that the religious community is defined as one's spiritual response to science. This reaction includes "awe, wonder, humility and gratitude ... spiritual values are in play and pray," she said.

Religious naturalists exhibit such reverence toward the earth, existence and to what Goodenough referred to as "the epic of evolution," a scientific worldview of the deep natural history of the universe. Most religiously.

The third activity, ethics, was the basis for Goodenough's presentation at the AAAS meeting. In religious ethics, he felt the understanding of humanity's impact on Earth was combined with a religious viewpoint of nature grow rise to ecosistm, a plalyery that ethically that the environment.

"Together with a cosmological perspective of religious naturalism is one based on the view that the concepts of science and evolution, this attitude is changing.

In more and more mainstream science you're seeing an increased focus on the environment and its importance, 'reinterpreted,'" he said.

This paradigm shift is due, at least in part, to a growing awareness that the older stories might not be sufficient to frame an ethical shift in the environment. The current trajectory of human life is an increasing susceptibility to natural disasters such as hurricanes, tsunamis, pest-outbreaks and diseases. The expanding human footprint is contributing to a mass extinction of species at a scale comparable to that of the end of the Cretaceous period, when the dinosaurs disappeared. And the list goes on.

Goodenough said taking a religious perspective of the earth (and of the science that elucidates the complexity of the world) might prompt us to take better care of it.

"Many of Goodenough and her colleagues were named as 'honorary lifetime achievement' 15 years ago for their role in the potential for ancient concepts and their religious and science, this attitude is changing.

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"Many of the projects we are exploring are focused on..." she said.

### Health Snapshot winners announced

**In January, the Office of Human Resources, the Office of Communications and those who participated in Your Health Snapshot, WUSTL's health risk assessment program, could enter a drawing for cash cards valued at $100, $75 and $50.**

**The January winners are:**

- Anna Blanchard, Department of Biochemistry and Molecular Biology, School of Medicine, $100.
- Michael Jameron, Internal Medicine - Cardiovascular Disease, School of Medicine, $75.
- Pat Agnew, University College, $50.

### Job information

**WASHINGTON UNIVERSITY IN ST. LOUIS**

**Calendar Submissions**


Where: Danforth University Center.

When: 1 to 4 p.m. Thursday, Feb. 19, 2015.

### Health Snapshot winners announced

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- Pat Agnew, University College, $50.
Of note

John C. Arnit, a graduate stu-
dent in history in Arts & Sciences, has received a four-year Fulbright
grant from the U.S. Depart-
ment of State for research in Lesotho. His work focuses on youth and nationalism in the town of Qunu, his ancestral home period around independence. velophone to document sources. Arnit, who is a visiting research fellow in the Institute of Southern African Studies at the National University of Lesotho during the 2008-09 academic year, will be in Lesotho until June...

Andrea F. Maclean, associate profes-
sor of physics in Arts & Sciences, has received a four-year, $1,036,560 grant from the National Institutes of Health for research titled "Central of Activi y Assembly and Cell Migration by Acti-

Eric Chiol, M.D., associate profes-
sor of surgery, has received a two-year, $275,000 grant from the National Institutes of Health for research titled "A Novel Ap-

Mark W. Smith, M.D., assis-
tant professor of medicine in the De-
partment of Medicine for research titled "Amine-Proof Transgenic Stomach: Studies to Develop Nanodiamonds." 

Samuel L. Stanley Jr., M.D., pro-

In print

Robert McCarver, the Ruth and Norman Moore Professor of Architecture and Architecture Graduate Program, is the author of "The Villa Matese of Alvar Aalto" included in the commemorative 50th issue of the magazine Home (House), which was published in January. He also wrote the introductory essay, "Common Sense: Towards an Architecture for Poetics and Practice," in "Bian Healy: Canoer/Placer" (University of Minnesota Press 2008) and a book review of "Aldo van Eyck: Writings," which appeared in the December issue of the Journal of the Society of Architectural Historians.

McFarland, professor emeritus of physical education, 84

Wayne "Pucky" McFarland, Ph.D., professor emeritus of physical education in Arts & Sciences, died Jan. 18, 2009, at Park Village Health Care Center in Dover, Ohio, after a brief illness. He was 84.

McFarland joined Washington University in 1960 as an associate professor of education in Arts & Sciences. In 1963, he became professor of education in physical education and in 1964, he was named chairman of the department of physical education in 1966. From 1964-68, he also served as WUSTL's direc-
tor of athletics.

Beginning in 1969, McFarland served as chair of education for one year and then became chair of physical education in 1974. He was named professor emeritus in 1992.

McFarland was born in New-
comester, Ohio, in 1924. After graduating from Newcomester

Glynns, founding father of the Newman Center, 94

Monagird Glynns, a Friedman Cata-

Glynns was first assigned to the Newman Apostolate at Washington University in 1950, when it was known as the Newman Club and had been meeting for two years in the bas-

Under his leadership, funds were raised to acquire a building on Skinker Boulevard, which was the original Newman Center. Glynns was continued to the Newman Center until and, in 1962, was able to purchase the Cathedral Student Center's current location on Forsyth Boulevard and construct a chapel addition on the rear of the original building. Glynns was the first of several conversions of residences for institutional use that would occur on Forsyth directly from across the University campus.

Over the years, Glynns gar-

The following incidents were reported to University Police Feb. 6-13. Readers with information that could assist in investigating these incidents are urged to call 911/9555. The information is stored as a public record in public safety awareness are available on the University Police Web site at police.wustl.edu.

Feb. 6

9:01 a.m. — A facility employee reported that a cell phone was stolen from a desk overnight.

5:17 p.m. — A person reported that a red iPod was stolen while it was being charged in the Mallinckrodt Student Center.

Feb. 7

5:05 p.m. — A student reported that her pink laptop was stolen from her book bag while she was unattended on the Danforth Campus.

Feb. 9

7:42 a.m. — A radio/charger was reported stolen from the Earth & Planetary Sciences Department.

Feb. 10

8:10 a.m. — A jacket and ID card were reported stolen
Peter MacKeith (right), associate dean of the Sam Fox School of Design & Visual Arts and associate professor of architecture, critiques a work by student Xiao Feng. "Architecture is not just a shallow representation of collections of history, nor is it simply an attempt to "build theory,"" MacKeith says. Rather, architecture "has its own substance and should invest itself in material sensibilities," he says.

Thanks in large part to those efforts, the Graduate School of Architecture & Urban Design has gained in size, from 115 students in 1999 to 220 in 2008, while its national reputation has steadily risen.

"We had a museum building of real quality," he says, "one that would suit the exhibition's specifications.

The lobbying proved successful, and MacKeith began recruiting a host of local co-sponsors. With Eric Mumford, associate professor of architecture, he also accepted an attendant exhibition, "On the Riverfront: St. Louis and the Gateway Arch," and organized an international symposium of the same title. "We wanted to heighten the civic nature of the Arch as well as the broad regional and national vision that brought it into being," MacKeith says. At the same time, the confluence of Finnish and American architectural cultures, as embodied by the Arch, "does represent something of a coming home."