Liquid pics
MS researchers safely study the central nervous system by watching water diffusion
Rite of passage  First-year medical student Krista Johnson Whitney, right, dons her white coat, a longtime symbol of the medical profession, with an assist from Will Ross, MD, associate dean for diversity, at the Class of 2013 White Coat Ceremony held on August 14 at the medical center's Eric P. Newman Education Center. Above: Leslie E. Kahl, MD, associate dean for student affairs, and Dean Larry J. Shapiro, MD, join in congratulating the 124 new students after they take the oath of professionalism the class wrote together during orientation.
A continuing need for scholarship support

Turn this card for the inspiring story of a generous legacy that still helps students at the School of Medicine.

Support for today's students means a future of beneficial care and scientific breakthroughs.

See page 36
Jackson Johnson

His generosity lives on

"Under the will of the late Jackson Johnson, the sum of $250,000 was donated to the School of Medicine, the income of which is to be used to aid worthy and desirable students in acquiring and completing their medical education."

With this brief item in the 1930 Washington University School of Medicine Bulletin, so began the endowed Jackson Johnson Scholarship Fund.

Jackson Johnson was president of International Shoe Company, the largest shoe manufacturer in the country early in the 20th century. He was elected to the Washington University Board of Trustees in 1919 and served until his death in 1929. He endowed the Jackson Johnson Scholarship Fund in memory of his son, Jackson Johnson Jr., who lost his life in "the Service of the United States during the Great War."

Coming during the Great Depression, these resources were critical in making it possible for aspiring young students to pursue their medical educations. And for over 70 years, this scholarship fund has continued to do just that. Since its inception, more than 700 young men and women have received about $1 million in financial assistance.

To maintain its reputation for excellence, Washington University School of Medicine must continue to attract the most promising and best qualified students. Many of these exceptional students will require financial assistance, and the need for scholarship support is growing faster than available resources can sustain.

To learn more about how you can make an impact, please contact the Office of Medical Alumni and Development at (314) 935-9691.

Washington University in St. Louis
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Repairing DNA

New information on mechanism could lead to better cancer drugs

Researchers at the School of Medicine have shed new light on a process that fixes breaks in the genetic material of the body's cells. Their findings could lead to ways to enhance chemotherapy drugs.

Reporting in the July 10, 2009 issue of the journal *Molecular Cell*, the research team revealed how a protein called Srs2 interferes with a mechanism for fixing broken DNA strands.

“Our findings may make it possible to uncover ways to augment the effect of DNA-damaging agents that are used for cancer chemotherapy,” says senior author Thomas E. Ellenberger, DVM, PhD, the Raymond H. Wittcoff Professor and head of the Department of Biochemistry and Molecular Biophysics. “Many chemotherapeutic agents work by causing DNA damage in cancer cells, leading to their death. But tumors can use DNA repair mechanisms to become resistant to chemotherapy by using DNA repair mechanisms to keep the cells alive. Drugs that inhibit the DNA repair process could help increase the efficiency of these chemotherapeutic agents.”

Ellenberger is also co-director of the Pharmacology Core at Siteman Cancer Center at Barnes-Jewish Hospital and Washington University School of Medicine. The facility aids in the development of anti-cancer agents.

Srs2 is a helicase molecule — a motor protein that’s able to walk or slide along a strand of DNA and remove other proteins from DNA or separate the two strands of the twisted double helix. For studies of Srs2, Ellenberger’s laboratory collaborated with Timothy M. Lohman, PhD, the Marvin A. Brennecke Professor of Biochemistry and Molecular Biophysics and an expert in the biochemistry of motor proteins like Srs2.

The biochemists found that Srs2 possesses a small arm that interacts with another protein, Rad51, and triggers a chemical reaction within the Rad51 protein causing it to fall off the DNA strand. Rad51 repairs breaks in DNA where both strands of the double helix are compromised. Without Srs2, this process can lead to shuffled DNA sequences.

“Scientists had assumed that as Srs2 moved along the DNA strand, it just pushed off everything in its path,” says lead author Edwin P. Antony, PhD, a postdoctoral research associate in biochemistry and molecular biophysics. “This isn’t the case. We showed that Srs2 has a specialized structure that allows it to interact specifically with Rad51.”

Because they now know more precisely the nature of the interaction between Srs2 and Rad51, the researchers can narrow their search for drugs that will block DNA repair by Rad51. This type of drug could make lower doses of DNA-damaging chemotherapy drugs effective in treating cancer.

“In the long-term, my laboratory will look for drug-like molecules that influence the Srs2/Rad51 interaction,” Ellenberger says. “We are using the Chemical Genetics Screening Center here at the university (htc.wustl.edu). It has vast libraries of molecules that may have the activity we want.”

Fall 2009
Gates Foundation funds major study of childhood malnutrition

Intestinal microbes, diet may be cause

Scientists who first established a link between obesity and the trillions of friendly microbes that live in the intestine now are investigating whether the organisms can contribute to the converse: severe malnutrition.

Researchers at the School of Medicine, led by microbiologist Jeffrey I. Gordon, MD, will study whether severely malnourished infants living in Malawi and Bangladesh have a different mix of intestinal microbes than healthy infants in the same areas, and whether those microbes might account for their illness. This three-year, $5.5 million project is funded by the Bill & Melinda Gates Foundation.

"This work is designed to understand the complex interplay among a child's diet and his or her gut microbial community, immune system and human genome in the development of the most severe forms of malnutrition, kwashiorkor and marasmus," says Gordon, who directs Washington University's Center for Genome Sciences. "Investigating how gut microbes contribute to malnutrition could provide a framework for developing more effective ways to treat and prevent these devastating diseases."

Severe malnutrition has long been thought to stem simply from a lack of adequate food. Scientists now understand that the condition is far more complex. Indeed, it is not uncommon for a family with multiple children to have only one child who is malnourished, even though the children eat a similar diet and live in the same household. This has led scientists to suspect that other factors may be involved. Gordon and his group theorize that an imbalance of certain types of gut microbes conspires with other factors, such as a poor diet and infection with bugs that can cause diarrhea, to trigger malnutrition.

Gordon is teaming with Washington University pediatrician Mark J. Manary, MD, the Helene B. Roberson Professor of Pediatrics, who has spent more than two decades treating malnourished children in Malawi. Gordon and members of his group are also working with members of the world-renowned International Center for Diarrheal Disease Research located in the city of Dhaka in Bangladesh.

Kharasch is interim research head

Evan D. Kharasch, MD, PhD, the Russell D. and Mary B. Shelden Professor of Anesthesiology and professor of biochemistry and molecular biophysics, has been named interim vice chancellor for research at Washington University. He succeeds Samuel L. Stanley Jr., MD, who recently left the university to accept an appointment as president of the State University of New York Stony Brook.

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 many 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 development of research policies, management of grants and contracts, continuing education of faculty and staff on research regulation, issues related to conflict of interest and research integrity, and intellectual property and technology transfer.

Kharasch has directed the Department of Anesthesiology's Division of Clinical and Translational Research since 2005. 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.
Schaal joins science advisory council

President Barack Obama has appointed Barbara A. Schaal, PhD, the Mary-Dell Chilton Distinguished Professor of Biology in Arts & Sciences and vice president of the National Academy of Sciences (NAS), to the President’s Council of Advisors on Science and Technology (PCAST).

PCAST is an advisory group of 20 of the nation’s leading scientists and engineers who will advise the president and vice president and formulate policy in the many areas in which understanding of science, technology and innovation is key to strengthening the nation’s economy and forming policy that works for the American people.

Schaal, also professor of genetics at the School of Medicine, says she is “looking forward to working with the committee and to addressing some of the challenges such as energy and environment that currently confront the United States.”

Schaal is known for applying molecular genetic techniques to the study of plant evolution. Her research investigates the evolutionary process within plant populations using a variety of techniques from field observations to quantitative genetics and molecular biology. Recent work includes collaborating with students and peers to investigate the evolutionary genetics of plants in hopes of enriching crops such as rice, the most widely used crop globally.

Non-cancerous cells may play key role in tumor formation

WU leads pediatric brain tumor study

The National Cancer Institute (NCI) has awarded a five-year, $4 million grant to researchers at the School of Medicine to use genetically engineered mice to study the origins and potential treatments of pediatric brain tumors.

David H. Gutmann, MD, PhD, the Donald O. Schnuck Family Professor of Neurology, is principal investigator of the grant, which is part of the NCI’s Mouse Models of Human Cancers Consortium.

A growing body of research suggests that the support of nearby noncancerous cells may be important to the formation and development of tumors. Gutmann and colleagues have provided proof of this idea in mouse models of neurofibromatosis type 1 (NF1), an inherited cancer syndrome.

“We’ve realized that the cancer cell is only one of many cell types involved in the creation of brain tumors, and this insight has forced us to re-examine how we approach brain tumors and other cancers,” says Gutmann, who also is director of the Washington University Neurofibromatosis Center of Excellence and sees patients at St. Louis Children’s Hospital.

“If we can better understand how cancers draw support from the surrounding environment, we can look for ways to disrupt their ability to facilitate tumor formation and growth.”

Investigators in the project include longtime Gutmann collaborator Joshua B. Rubin, MD, PhD, and Joel R. Garbow, PhD, both of Washington University School of Medicine, as well as Mark H. Ellisman, PhD, of the University of California--San Diego, and Karlyne M. Reilly, PhD, of the National Cancer Institute.

“Collectively, the range of expertise provided by these investigators puts us in a unique position to advance our understanding of pediatric brain tumor development and treatment,” Gutmann says.

WU has most “Best Docs” in Midwest

More than 350 Washington University physicians at Barnes-Jewish Hospital and St. Louis Children’s Hospital have been named to The Best Doctors In America for 2009, twice that of any other physicians’ group in St. Louis and more than any other physicians’ group in the Midwest.

Best Doctors in America, a resource for individuals and physicians to ensure the right diagnosis and treatment, uses peer-to-peer surveys to identify specialists considered by fellow physicians to be the most skilled in their fields and the most qualified for treating complex medical conditions.

To view a list of Washington University physicians named as Best Doctors in America, please visit medschool.wustl.edu.
Tumors feel deadly sting of nanobees

When bees sting, they pump poison into their victims. Now researchers at the School of Medicine have harnessed the toxin in bee venom to kill tumor cells by attaching the major component of bee venom to nanosized spheres that they call nanobees.

In mice, nanobees delivered the bee toxin melittin to tumors while protecting other tissues from the toxin's destructive power. The mice's tumors stopped growing or shrank. The nanobees' effectiveness against cancer in the mice was reported in the September 1, 2009 issue of the Journal of Clinical Investigation.

"The nanobees fly in, land on the surface of cells and deposit their cargo of melittin, which rapidly merges with the target cells," says co-author Samuel A. Wickline, MD, head of the Siteman Cancer Center's Center of Cancer Nanotechnology Excellence at Washington University. "We've shown that the bee toxin gets taken into the cells, where it pokes holes in their internal structures."

Melittin is a small protein, or peptide, that is strongly attracted to cell membranes, where it can form pores that break up cells and kill them.

"Melittin is of interest to researchers because in high enough concentration it can destroy any cell it comes into contact with, making it an effective antibacterial and antifungal agent and potentially an anticancer agent," says co-author Paul H. Schlesinger, MD, PhD, associate professor of cell biology and physiology. "Cancer cells can adapt and develop resistance to many anticancer agents that alter gene function or target a cell's DNA, but it's hard for cells to find a way around the mechanism that melittin uses to kill."

The scientists tested nanobees in two kinds of mice with cancerous tumors. One mouse breed was implanted with human breast cancer cells and the other with melanoma tumors. After four to five injections of the melittin-carrying nanoparticles over several days, growth of the mice's breast cancer tumors slowed by nearly 25 percent, and the size of the mice's melanoma tumors decreased by 88 percent compared to untreated tumors. Overall, the results suggest that nanobees could not only lessen the growth and size of established cancerous tumors, but also act at early stages to prevent cancer from developing.

"Potentially, these could be formulated for a particular patient," Schlesinger says. "We are learning more and more about tumor biology, and that knowledge could soon allow us to create nanoparticles targeted for specific tumors using the nanobee approach."

Outlook 5
Yokoyama becomes AAAS fellow

Wayne M. Yokoyama, MD, the Sam J. Levin and Audrey Loew Levin Chair for Research on Arthritis, professor of medicine and director of the Medical Scientist Training Program at Washington University School of Medicine, has been elected a fellow of the American Academy of Arts & Sciences (AAAS).

Yokoyama is internationally recognized for his research into an important component of the immune system that protects against viruses and tumors. His studies have helped show how various mechanisms license, restrain and unleash natural killer (NK) cells. His lab was the first to provide the molecular basis for a theory known as the “missing self” hypothesis.

In addition to his research, Yokoyama is the director of the Medical Scientist Training Program, a clinical attending physician in internal medicine and rheumatology, and a Howard Hughes Medical Institute investigator. He was the 2001 recipient of the Novartis Prize for Basic Research in Immunology, which is awarded only once every three years at the International Congress of Immunology.

The Academy of Arts & Sciences membership of more than 4,600 includes more than 250 Nobel laureates and 60 Pulitzer Prize winners. Its fellows are selected through a competitive process that recognizes individuals who have made preeminent contributions to their disciplines and to society at large.

International registry to track children with infantile spasms

Studying genes to improve treatments

Researchers have launched the first worldwide registry of children with infantile spasms, a collaboration between Washington University and the University of Chicago.

The registry will be used to look for similarities among children with the disorder to help lead to improved treatments, says Alexander R. Paciorkowski, MD, instructor of neurology and medical geneticist at the School of Medicine and a staff physician at St. Louis Children’s Hospital.

Infantile spasms, or West Syndrome, is a seizure disorder that begins before age 2 and accounts for about 25 percent of epilepsy diagnoses in babies under 12 months old. The spasms can have a devastating impact on development, causing difficulty in learning how to sit, crawl, walk and talk. Early diagnosis and treatment provide for the best outcomes.

In addition to the data collection, researchers plan to ask parents to volunteer DNA samples from their children with the disorder to look for genes that might be playing a role.

Paciorkowski developed the registry with Christina A. Gurnett, MD, PhD, assistant professor of neurology, pediatrics and orthopaedic surgery, Liu Lin Thio, MD, PhD, assistant professor of neurology, pediatrics and of anatomy and neurobiology and director of the Pediatric Epilepsy Center at St. Louis Children’s Hospital, and William B. Dobyns, MD, professor of human genetics, neurology and pediatrics at the University of Chicago Medical Center.

WU Physicians to treat Athletica

Washington University Orthopedics has been chosen to provide medical care for players on the new Women's Professional Soccer league team, Saint Louis Athletica. The orthopedics group also cares for the St. Louis Blues, St. Louis Rams and other sports teams.

Robert H. Brophy, MD, a former soccer player and a sports medicine specialist, will serve as head team physician. He and other Washington University Physicians will manage the care of Athletica players at the new outpatient orthopedic center in Chesterfield, as well as at Barnes-Jewish Hospital and Barnes-Jewish West County Hospital, both part of BJC HealthCare.

“Soccer players are obviously at risk for lower extremity injuries, particularly to the knee and ankle,” says Brophy. “We will be looking to emphasize injury prevention and, when injuries do occur, to get players back to peak performance as soon as possible.”
Adults with severe hearing loss benefit from pairing a cochlear implant in one ear with a hearing aid in the other, even though sound signals from each device are very different, according to a School of Medicine study published in the June 2009 issue of the *Journal of the American Academy of Audiology*.

The patients were better able to hear spoken words and to locate the direction of a sound with both devices turned on compared with either device alone. Additionally, the patients liked the fuller, richer sound they heard when using both devices.

"It is increasingly common to place cochlear implants in both ears when patients have profound hearing loss on both sides, but the majority of these bilateral implants are done in children," says lead author Lisa G. Potts, PhD, research instructor in otolaryngology. "Many adults lose their hearing as they age, and it may not be financially or physically possible for them to undergo surgery for two cochlear implants.

So it is important to know if there is a benefit to using a hearing aid plus a single cochlear implant."

Each of 19 study participants received a cochlear implant in one ear and a hearing aid for the other ear. Washington University surgeons at Barnes-Jewish Hospital performed the implantations, and the participants were seen at the Adult Cochlear Implant and Aural Rehabilitation Division at the School of Medicine for cochlear implant programming and hearing aid fitting.

Because participants were profoundly hearing impaired, the hearing aid restored only partial hearing in one ear, while the cochlear implant gave them a greater level of hearing in the other ear. In addition to the imbalance in sound levels, each device processes sound information in a unique way: a cochlear implant translates sounds into electrical impulses that directly stimulate the hearing nerves of the inner ear, while a hearing aid amplifies sounds so the ear can sense its acoustic vibrations. Specialists have questioned whether patients could adequately integrate the asymmetric signals.

The study showed that when participants used both a cochlear implant and a hearing aid, speech recognition improved by an average of 14 percent over when they used either alone. When both devices were active, participants also made fewer mistakes in determining sound direction.

Interestingly, when participants wore both devices, speech recognition and localization were equally good, no matter the direction of the sound source. That was surprising because of the lower sound correction in the hearing aid ear.

When asked about their subjective sense of how well they heard with both devices turned on, most participants said they felt they heard sound better.
CHANGING THE FACE OF MEDICINE
MEDICINE IS AN UNSUITABLE CAREER FOR WOMEN. This was once the conventional wisdom — at least among the men of the medical profession. Despite women's traditional roles as caregivers, healers and midwives, those who aspired to medicine and the health sciences faced tremendous opposition.

That was then. Although there is still progress to be made in bridging the gender gap, women are now found in every branch of medicine. They are researchers on the cutting edge of new medical discoveries, educators, surgeons, family practitioners, specialists and government officials directing the future of health care.

"Changing the Face of Medicine: Celebrating America's Women Physicians," a traveling exhibit hosted by Becker Library and the Academic Women's Network at Washington University, included the life stories of a diverse group of extraordinary women physicians from around the nation. The exhibit chronicles the stories of American women overcoming barriers to entering medicine during the course of two centuries, including trailblazers at the School of Medicine.

BY BETH MILLER
Two interactive kiosks traveling with the exhibition offered access to the National Library of Medicine's "Local Legends" web site (nlm.nih.gov/locallegends), which features outstanding women physicians from every state, including Jessie L. Ternberg, MD, PhD, professor emerita of surgery and of surgery in pediatrics at the School of Medicine, and to a web site created for the larger exhibition at the National Library of Medicine, which includes biographies on Virginia V. Weldon, MD, the first woman to serve on the administrative staff of the School of Medicine's vice chancellor for medical affairs, and of three School of Medicine alumna: Denise L. Faustman, MD, PhD, now at Harvard Medical School, the late Helen Hofsommer Glaser, MD (1924–99), and Carolyn Bauer Robinowitz, MD, now at the George Washington University 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.

The National Library of Medicine (NLM) and the American Library Association organized the exhibition with support from the NLM, the National Institutes of Health Office of Research on Women's Health and the American Medical Women's Association. The traveling exhibition is based on a larger exhibition that was displayed at the NLM from 2003–05.

"We were very excited to have this exhibit at the School of Medicine," says Dayna S. Early, MD, associate professor of medicine and past president of the Academic Women's Network. "We are very proud of our own pioneering women at the School of Medicine, and we hope that these stories will inspire young women to enter medicine and to succeed."

The School of Medicine has seen tremendous growth in the number of women students since 1970, when there were just 38 women students in the MD program, about 10 percent of all MD students. In 2009, 278, or 47 percent, of students in the MD program were women.

Nationally, between 1970 and 2006, the number of U.S. women physicians increased by more than 1,000 percent, going from 25,401 in 1970 to 256,257 in 2006, or 27.8 percent of the total physician population, according to the American Medical Association.

"This is an important exhibit because it's important to remember the history of women in medicine and that it took quite some time for women to become physicians," says Anne Carol Goldberg, MD, associate professor of medicine and president of the Academic Women's Network. "When I started medical school in 1973, 20 percent of my class was women. When I got to Washington University in 1980 to start a fellowship, there were not many women faculty. We have many more women faculty now, so it's useful for people to look back and see how things have changed over time."

The exhibit details some of the hardships the first women physicians endured. Several of the women featured recalled being told by medical school administration that by accepting them, they were displacing a qualified man. May Edward Chinn, MD (1896–1980), was the daughter of a former slave and an American Indian. She became the first African-American woman to graduate from Bellevue Hospital Medical College and the first African-American woman to hold an internship at Harlem Hospital. Since African-American physicians were not granted admitting privileges or special residencies at any hospitals, Chinn opened a private practice with other African-American physicians.

Helen B. Taussig, MD (1898–1986), known as the founder of pediatric cardiology, lost her mother when she was just 11 years old. She had dyslexia, making it difficult for her to read. While a hospital intern, she had whooping cough and lost her hearing. However, she used that to her advantage; some of her innovations in pediatric cardiology have been attributed to her ability to distinguish the rhythms of normal and damaged hearts by touch, rather than by sound.

Women physicians in the 21st century are benefiting from the career paths carved out since the mid-19th century by...
a long line of American women, including those who spent their careers at Washington University School of Medicine, such as the late Gerty T. Cori, MD (see page 12).

Ellen S. More, PhD, head of the Office of Medical History and Archives and professor of psychiatry at the University of Massachusetts Medical School, was the keynote speaker at the event kicking off the exhibit at Becker Library. The editor of *Women Physicians and the Cultures of Medicine,* More says the history of women’s struggle to take their place in the American medical profession is part of the larger story of women’s changing roles in American society.

“This exhibition is intended to bring to light the story of that struggle and to demonstrate the inventiveness that underlies women physicians’ achievements, a bravura gender performance each woman must adopt for her own intended stage, whether clinical care, neurosurgery, sex education or basic research,” More says. “Only 30 years ago, the woman who chose to become a physician, especially in a traditionally male field such as surgery, was ‘viewed as if she were performing an unnatural act.’”

While some areas of medicine traditionally attract more women, female physicians today can be found in every aspect of the profession, from basic research to surgery.

Early notes that more women physicians and female trainees have entered her field of gastroenterology in recent years. “One of the distinct advantages is that female trainees now have role models,” she says. “People tend to relate better to role models of the same gender because of similar work, family and other responsibilities.”

One of Early’s role models was Elizabeth Ann “Betsy” Garrett, MD, professor of clinical family medicine at the University of Missouri-Columbia School of Medicine. “She embodied a lot of characteristics that I wanted to develop,” Early says. “She has an appropriate balance of compassion and toughness that allowed her to be successful as a physician and an educator.”

Goldberg, who did not have many female role models when she arrived at the School of Medicine, has turned that fact into a positive. “Over the years it dawned on me that I can be a role model and a mentor for other women,” she says.

To bolster support for women faculty at Washington University, the Academic Women’s Network at the School of Medicine and the Association of Women Faculty on the Danforth Campus have joined together to initiate change. Working with the university’s Child Care Committee, the groups helped bring a new child-care facility to North Campus for use by faculty, staff and students. Opening in 2010, the center will offer care for 150 to 175 children ranging in age from 6 weeks to 6 years.

The two groups and the School of Medicine’s Gender Equity Committee also negotiated to suspend the “tenure clock” when faculty need to take time off for family responsibilities. While this applies to all faculty, it particularly affects women, who tend to be the primary caregivers for children and aging parents.

While there have been positive changes, there is still more work to be done, according to Early and Goldberg.

“Over the last few years, we have tried to make administration aware of the discrimination that many women faculty perceive and experience,” Early says. “We’ve raised awareness, but I’m not sure we’ve made significant progress.”

Goldberg notes that only about 15 percent of the School of Medicine’s full professors are women. “While that figure has increased, it’s still a relatively small number,” she says. “Things have definitely improved over the last 30 years; we are now seeing women accepted completely for their accomplishments aside from gender issues. But there are still issues that need to be dealt with.”

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**NATIONAL INSTITUTES OF HEALTH WEB SITES**

www.nlm.nih.gov/changingthefaceofmedicine

www.nlm.nih.gov/locallegends

**BOOKS ABOUT WOMEN IN MEDICINE**


THE ACHIEVEMENTS of women have marked every aspect of Washington University School of Medicine, in the excellence of its teaching, in the brilliance of its research, and in the quality of its patient care. However, there was a time when women were not allowed to contribute their skills, talents and intellects. Nor were they allowed access to the education and training needed in order to achieve their own potential. The first women to surmount these barriers played an important role, forming the past of this institution and helping shape its future. Their achievements are not just their own, but are for all who benefit from the actions and accomplishments of the school.

To learn more about the many contributions of women to the history of Washington University Medical Center, see the Becker Library's website for the exhibit "Women in the Health Sciences" at beckerexhibits.wustl.edu/mowihsp.

Extraordinary teacher

Arguably the most influential teacher in the history of Washington University School of Medicine, Mildred Trotter, PhD, introduced thousands of students to medical education in her first-year anatomy course. Trotter recognized the importance of the early days of instruction would have in molding young students into physicians. She managed to instill a love of medicine and science in her students even in a course of often overwhelmingly rote memorization.

Beyond her contributions as a teacher and researcher, Trotter was for more than half a century a model for women who followed in her path. She knew intimately the difficulties and discouragement facing the female medical students she taught: An associate professor for 16 years, she was promoted to professor of gross anatomy only after confronting her department head.

Trotter's research in physical anthropology and human anatomy contributed much of what is known today about the influence of age, sex and race on variation in bone growth. Her work in skeletal biology led to the creation of formulas to estimate stature based on the length of long leg bones, which are still used by the FBI.

Nobel prize winner, paragon of biomedical research

The first American woman and only the third woman awarded the Nobel Prize, Gerty T. Cori, MD, had wanted to study medicine since the age of 16. In 1920, she graduated from the Medical School of the German University of Prague. After two years at the Carolinen Children's Hospital in Vienna, she emigrated with husband Carl F. Cori, MD, to the United States, where he took a position at the New York State Institute for the Study of Malignant Diseases. Gerty was made an assistant biochemist and initially told not to work with her husband. Many felt a working collaboration between husband and wife would be "un-American." It was Gerty who decided the couple should direct their research to the study of carbohydrate metabolism. They came to Washington University in 1931 when Carl was appointed head of the Department of Pharmacology. Gerty was hired only as a research fellow. Together, they discovered the process by which glycogen is converted to glucose, work that led to their receipt, in 1947, of the Nobel Prize in Physiology or Medicine. Gerty was made professor of biological chemistry only after the announcement came from the Nobel Foundation.

Faye Cashatt Lewis, MD: first female graduate

Today, nearly 300 women attend the medical school, making up approximately 50 percent of the student body of the doctor of medicine and the medical scientist training programs.

To put that in perspective: In the entire history of Washington University School of Medicine, it took until 1964 (73 years) for the first 300 women to graduate from the school.

The School of Medicine's first female graduate, Faye Cashatt Lewis, MD 21, who entered in her third year, wasn't the first woman to enroll. Following an Executive Faculty vote to accept women in April 1918, that honor went to Carol Skinner Cole, MD 22, and Aphrodite Jannopoulou, MD 23.

Gerty T. Cori, MD; her Nobel medallion is at left
Eagle-eyed surgeon

As a surgeon extraordinaire, Jessie L. Ternberg, MD, PhD, professor emerita of pediatric surgery, was a role model for generations of students and residents. The patient came first, and each procedure was a work of art. Ternberg told students, “Surgeons must have the eye of an eagle, the heart of a lion, and the hand of a lady.”

With persistence and determination, Ternberg made her own path, opening new doors for women. A 1953 graduate of Washington University School of Medicine, she is a woman of many firsts: In 1954, she became the first female surgical resident at Barnes Hospital; in 1958, the first female chief resident and subsequently, the first female surgeon at the School of Medicine; in 1973, the first woman elected head of the School of Medicine’s faculty council. She also was the first woman to serve as president of the St. Louis Surgical Society.

Managing medicine: women in the administration

Having proven their abilities as teachers, researchers and physicians, there can be no denying the capabilities of women. However, even as the number of women medical students now equals that of male students, the number of women physicians advancing to positions in academic leadership remains small.

While women have led research groups, divisions and programs, no woman held a department chair at the School of Medicine without the qualifier of “acting” or “interim.”

Margaret G. Smith, MD, was the first woman to hold an administrative position, serving unofficially as chairman of the department of pathology after the death of Howard J. McCordock, MD, in the fall of 1938 until the appointment of Robert Allan Moore, MD, in July 1939.

Sarah A. Luse, MD, was the first woman to be officially named to an administrative post; in 1964, she was appointed acting head of the Department of Anatomy.

Virginia Verral Weldon, MD, was named deputy vice chancellor for medical affairs in 1983. She served in that position, and as vice president of Washington University Medical Center, until she left the university in 1989. While Weldon was the first woman to administrate in the office of the vice chancellor for medical affairs, no woman had yet been a permanent, de facto member of the Executive Faculty until after she left.

Paula J. Clayton, MD, an internationally recognized researcher in psychiatry and an expert on mania and schizoaffective disorders, was one of just four women to earn a medical degree from the School of Medicine in 1960. After 20 years as a faculty member, Clayton left Washington University as a full professor in 1980 to head the department of psychiatry at the University of Minnesota School of Medicine, becoming the first woman to chair a department of psychiatry in the United States.

Announced October, 2009: Liliana Solance-Kezel, PhD, will lead the School of Medicine’s Department of Developmental Biology effective January 1, 2010.
A safe, noninvasive method for looking inside patients with multiple sclerosis sheds light on this complex disease

More than a century after multiple sclerosis (MS) was first recognized as a distinct pathologic disorder, its hallmark continues to be its frustrating unpredictability. Francis Clark, diagnosed with the autoimmune condition in high school, has learned to live with it. According to Clark, "MS is simply a fact of life."

MS symptoms — inflammation of the optic nerve, loss of muscle strength and balance problems, to name just a few — can cause a wide range of problems. No two people have the same experience with MS and, as Clark points out, a flare-up of one or more symptoms can happen at any time, with varying recovery times.

"It seems to happen in a three-year cycle or close to it," she says of her own disease. "Sometimes I get better very quickly, and sometimes it takes a long time. It can be very frustrating, not just for me, but also for my family."

But the veil of unpredictability is finally starting to give way. Neurologists, radiologists and others at the School of Medicine have teamed up to show that an imaging technique, diffusion tensor imaging (DTI), can help assess damage to the optic nerves from MS. Now they are working to apply the same technique to other MS lesions that lead to symptoms affecting a broad range of the body. The questions they are posing about MS may one day allow better prognostic information and contribute to identifying more effective treatments.

By Michael Purdy
Normal diffusion of water

Myelin damage
Greater than normal diffusion across the fiber due to disruption of myelin that normally limits diffusion.

Axon damage
Less than normal diffusion along the long axis of the nerve fiber due to compromised axon tissue.

The flow of MS

Want to understand the consequences of multiple sclerosis? Follow the water.

The human body — like other organic life-forms — is composed mostly of water. The diffusion of that water throughout body tissue compartments can be measured with a technique called diffusion tensor imaging (DTI). When central nervous system tissues are destroyed by multiple sclerosis, this alters the normal passage of water. Using DTI to look safely inside the body, physicians and researchers can spot the disease’s damaging effects, as well as monitor the progress of beneficial treatments.

Reading telltale neural pipelines

The central nervous system, of course, is not a water conduit. But the water is there. And its flow reveals whether tissues are functioning normally or somehow compromised by a disease such as MS. DTI detects the diffusion of water in multiple directions within a three-dimensional measurement called a voxel. The voxel’s intensity shows the extent and direction of water diffusion at that location. This data can then be compared to a normal rate of diffusion as well as the preferred direction of diffusion in normal tissue of the same type.
An acute lesion indicates inflammation and blood leakage. Prognosis as yet unknown.

Tissue has been destroyed: a "black hole" has formed. Chronic problems persist due to permanent nervous system damage.

The spot is gone, which suggests tissue recovery. There is reason for optimism unless further injury occurs.

Myelin: If the axon is the wire, myelin is the insulation, protecting the neural impulse in its travel along the axon.

Pixel

Voxel

The resolution of a digital camera is measured in colored squares called pixels. DTI, by comparison, captures a three-dimensional picture element called a voxel. Just as pixels are an abstraction of the complex visual world, so too are voxels. About half a million neurons occupy the space captured in one voxel.

Without using radiation, DTI can look inside regions of the body otherwise impossible to see and difficult to biopsy without causing damage. Here, abnormal tissue of the spinal cord appears as white in the MRI lengthwise view (left) and corresponds to increased diffusion on a cross-sectional DTI view of the spinal cord (right).
Scientists believe that MS, which affects an estimated 500,000 Americans, results from misdirected immune system attacks against the central nervous system.

"For many years prior to the advent of MR imaging, MS was a disease of exclusion," says Anne H. Cross, MD, the Manny and Rosalyn Rosenthal–Dr. John L. Trotter chair in neuroimmunology and director of the John L. Trotter MS Clinic at Barnes-Jewish Hospital. "The doctor would first rule out a list of other potential diagnoses until MS was the only thing left. This would sometimes lead to misdiagnoses that made it harder to understand MS."

MRI has revolutionized the care of MS patients by allowing early and accurate diagnosis. However, standard MR imaging techniques didn't help researchers reliably make a critical distinction for understanding, predicting and treating MS: When was MS damaging axons, the fibers leaving nerve cells that carry impulses from one nerve cell to another? And when was it harming only myelin, the protective sheath around the axons?

"When an axon loses its myelin, it can still carry information," Cross explains. "It may not be able to transmit it as effectively, but it can still work. And there's evidence that many people with MS may be able to regenerate their myelin."

When an axon is lost, however, the prognosis is grim. No messages can be conveyed, and there is little evidence that the axon can regenerate.

Using a mouse model of MS, Cross collaborated with Sheng-Kwei (Victor) Song, PhD, associate professor of radiology, to see whether an experimental imaging technique using the MRI scanner, known as diffusion tensor imaging (DTI) could help to distinguish between myelin damage and axon loss. DTI uses MRI to track water diffusion in tissue.

Song and Cross reasoned that MS inflammation and the damage it causes would likely alter water diffusion in the affected tissues. Song thought a new approach to interpreting the DTI results could be particularly useful: analyze water diffusion both down the length of a nerve axon (axial diffusion) and across the insulating myelin (radial diffusion).

"We were able to show that a decrease in axial diffusion was a very good biomarker for axonal injury, and an increase in radial diffusion was a good marker for myelin damage," says Song. "And we were able to correlate axonal injury with axon damage and increased likelihood of permanent disability."

Next, Robert T. Naismith, MD, assistant professor of neurology, led an effort to apply the approach to human MS patients with inflammation of the optic nerve, which causes loss of vision, blurring or foginess and pain in the affected eye. They found that DTI could be used to predict both the severity and permanence of damage from these episodes.

Now, with support from a new National Institutes of Neurological Disorders and Stroke grant, these scientists are applying DTI to other MS questions. "The optic nerve was our proof of concept, because it's structurally a very simple tract with all the nerves going one direction, like a one-way street," says Naismith. "Now we're taking the technique into the brain and spinal cord, where there are numerous streets, including many that cross. Measuring damage and correlating it to dysfunction will be more complex as a result."

Cross, Song and others are trying to use DTI to learn more about a phenomenon informally known as "black holes": large, MS-induced lesions in the central nervous system that show up as dark spots on MRI scans.

"There's so much tissue damage that the black holes can look almost like strokes," Cross explains. "We're trying to use DTI to help us predict which lesions, at early stages, will eventually develop into black holes. Patients with that type of MS lesion may need more aggressive treatments."

Some data for the project will come from a recently completed clinical trial of a potential MS treatment that Cross conducted at Barnes-Jewish Hospital. The team is currently writing up their findings.

DTI also may help researchers understand MS at a more basic level. Robyn S. Klein, MD, associate professor of medicine, is using DTI to study a molecule her lab has linked to myelin regrowth. Her lab will block this molecule to see whether disabling the nerve cell's ability to regrow the myelin sheath leads to axonal damage. She also plans to block individual molecules involved in inflammatory processes to see whether they can prevent the initial damage that occurs during MS flares.

"Being able to study these processes in live animals with DTI is extremely powerful," Klein says. "By doing so, we can determine whether preventing early axonal injury with a drug is directly linked to eventual recovery from the flare-up."

The same principle may work in clinical trials of new drug treatments in humans. Currently, such studies must wait weeks, months or longer to determine whether a new treatment has prevented permanent disability. If DTI provides quicker and more conclusive results, it will accelerate the drug development process.

Such knowledge is power, says MS sufferer Clark, recalling the days when her disease first began to manifest and she had yet to be diagnosed. "To have the right people working to find out what's going on and to find the right way to treat MS is very helpful."
Arriving at an appropriate response to the threat of influenza

By Holly Edmiston
Headlines about influenza range from informative to downright scary. But the truth about the new H1N1 virus lies somewhere in the middle of all the hype. All influenza viruses, including the 2009 H1N1 strain, can cause significant serious illnesses: On average, 36,000 Americans die each year from flu and its complications; another quarter of a million are hospitalized. An informed, cautious approach is warranted; at Washington University and its medical center, physicians, administrators and other health professionals are working with health agencies to meet this challenge head on.

The 2009 H1N1 flu virus, which first appeared this past spring, has several characteristics that differentiate it from typical seasonal flu viruses. One is that, unlike seasonal flu, which is active when the weather is cool and dry but dies down in the warmer summer months, the new H1N1 virus remained active over the summer. The other, more significant differences are its possible scope and the portion of the population it will affect.

Because the 2009 H1N1 seems to contain some components similar to a flu virus that was circulating before 1957, people who were alive at that time and exposed to the earlier virus may have some immunity. That means that children and younger adults are the new virus’ prime targets.

How to handle the flu:
Steven J. Lawrence, MD, and David K. Warren, MD, recommend two lines of defense against the virus — germ-killing foam and vaccinations.

The 1918 Spanish flu epidemic — caused by an influenza A (H1N1) virus — killed more than 500,000 people in the United States and up to 50 million worldwide. H1N1 viruses were reintroduced into the human population in the 1970s. At the Centers for Disease Control and Prevention, Terrence Tumpey recreated the 1918 influenza virus in order to identify the characteristics that made this organism such a deadly pathogen. Such efforts aid in the development of vaccines and treatments for future pandemic influenza viruses.

Steven J. Lawrence, MD, assistant professor of medicine and associate director of emergency response planning for Washington University's Midwest Regional Center for Excellence in Biodefense and Emerging Infectious Diseases Research (MRCE), has been involved with pandemic flu preparedness since an influenza task force was established three years ago at the School of Medicine.

"Even though mortality and hospitalization rates for the 2009 H1N1 virus seem to be pretty similar to those for seasonal flu, the burden of it has shifted toward younger adults and kids," says Lawrence. "That's the big difference with HINI from a clinical standpoint."

Because the virus was clearly still causing illness during the typically dormant summer months, health professionals like Lawrence and health agencies that track influenza suspected and have now confirmed a higher number of cases occurring this fall, which is understandable as people begin to spend more time together indoors.

"We are seeing an early return of H1N1 in fairly large numbers," says Lawrence. "At this point, there is no evidence that suggests it's going to be more severe than we've seen so far on an individual basis, but since no one's seen this virus before, we do anticipate there will be more cases of flu caused by this virus than we would see in a typical year."

Those assumptions are the basis of the preparatory work being done at Washington University. Much of that work involves working closely with health care partners Barnes-Jewish Hospital, St. Louis Children's Hospital and BJC HealthCare...
to keep patients, students, faculty and staff apprised of new information about the flu and access to vaccines.

David K. Warren, MD, assistant professor of medicine, is the medical director for infection control at Barnes-Jewish Hospital. In that role, he is involved in the planning of vaccine and infection control prevention messages with the medical school community. That includes coming up with policies for handling patients who come into clinics with flu-like illness.

"The goal from our side is limiting exposure," says Warren. "That may include making sure that patients wear masks, if they have flu symptoms, as soon as they come into the medical center and that people use appropriate hygiene, such as hand washing and cough etiquette."

Warren feels that caution is reasonable, given the concerns about seeing more influenza in the community than is typical.

"One of our goals is to work closely with Barnes-Jewish Hospital, St. Louis Children’s Hospital and BJH HealthCare to make sure the information we are putting out is uniform," says Warren. "In that way, we can address patient concerns, student concerns and clinicians’ questions."

A key to keeping 2009 H1N1 at bay will be its vaccine, which became available to high-risk groups, such as pregnant women, infants and children, and people with chronic health conditions, starting in October. Another of the high-priority groups for receiving the vaccine is health care and emergency medicine personnel who have direct contact with patients or infectious materials. For that reason, School of Medicine infectious disease experts are working with local health departments to develop plans for the distribution of the 2009 H1N1 vaccine.

James P. Crane, MD, associate vice chancellor for clinical affairs and chief executive officer of the Faculty Practice Plan, says vaccination is sound medical policy. "It protects the health of our employees and their families and also protects our patients from becoming severely ill."

Other efforts to meet this year’s flu challenge are underway at the medical center: St. Louis Children’s Hospital, experiencing a high volume of patients due to flu-like symptoms, has erected two tents in the valet area of its visitor parking garage to treat emergency unit overflow patients.

The goal of all of these efforts by the School of Medicine, Barnes-Jewish Hospital and St. Louis Children’s Hospital is the same: to provide the best possible care to the patients and families we serve.

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**Making the best of the worst**

Influenza is not a subtle illness; it tends to hit hard and fast. Though a healthy person will be down with the virus for a relatively short time — 3 to 5 days in most cases — having the flu can be a truly miserable experience. While the 2009 H1N1 virus has the same symptoms as seasonal flu — fever, cough, sore throat, body aches, headache, chills and fatigue — it also may have associated diarrhea and vomiting.

**Flu prevention**

- Stay informed. Follow the latest developments from reliable sources such as the Centers for Disease Control (CDC).
- Get proper rest, nutrition and exercise.
- Practice good hand hygiene: Wash hands with soap and water or use alcohol-based sanitizers before doing any activity in which you touch your face, such as eating.
- Get both the seasonal flu vaccine and the new H1N1 vaccine, when available.
- Avoid people who are sick.

**If you have the flu**

- Do not go to work, school or any other public place and risk passing the disease on to others.
- Use cough etiquette. Cough and sneeze into a tissue, then immediately throw the tissue away and wash hands. Doing so will avoid leaving the virus on surfaces, where flu virus can live for several hours.
- Rest and stay hydrated.
- People classified as high-risk due to age or health issues should contact their health care providers to determine if anti-viral medications are recommended.

For more information, visit wustl.edu/flu.

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Gifts of a well-flavored man

Following a career "reading" young patients, teaching and administrating health care, Lawrence Kahn turned to classic literature.

BY CANDACE O'CONNOR

"To be a well-flavored man is the gift of fortune, but to write or read comes by nature." — William Shakespeare

The three witches on the stormy heath had no trouble foretelling Macbeth's kingly future. But seven or eight decades ago, those hags would have had a harder time choosing one storyline for a young Lawrence Kahn. He had a rich and complex life ahead of him.

A respected pediatrician, he eventually spent 18 years in private practice, then joined the School of Medicine full-time faculty, helping to establish an innovative health care program that was decades ahead of its time. Since his retirement, he has devoted himself to his other passion: classical literature, especially the plays of Shakespeare, which he knows to a be-all and end-all.

Personally, he is a Northerner turned Southerner who lives happily in the Midwest. With Jane, his wife of 66 years, he shares an interest in sculpture and travel, as well as three children, three grandchildren and a brand-new great-granddaughter. A courtly man, Kahn has a charming fund of stories and a sly sense of humor. There is, for example, the matter of his trademark bow tie.

"My father wore bowties very often," he explains, "and those were the ones I could borrow most easily. Of course, in pediatrics, it is an added safety measure. A four-in-hand will drop down over a baby, and he will grab it — or worse..."

A friend — fellow pediatrician and Kahn's long-ago chief resident, John C. Herweg, MD — reflects on Kahn's career, calling him a teacher, an expert on health care delivery and an all-around learned man. "Appropriate words to describe him are competence, dedication, integrity, reliability and friendliness," says Herweg. "He is a modern Renaissance man."

At age seven, Kahn and his family boarded a train in New York City, bound for their new home in Gadsden, AL, where his father was setting up a textile factory. "The next morning, I raised the shade, and there was a Southern town, with broken-down shacks, signs that said "Smoke Lucky Strike," and half a dozen small children in rags, watching the train go by. That was a culture shock."

But the family adjusted, and Kahn went on to graduate from high school at 15 and attend the University of Alabama. He wanted to be a doctor like his older brother, Stanley, MD 43, but he first spent a postgraduate year in Alabama's creative writing program while serving as teaching assistant to the well-known Shakespearean Hudson Strode. For medical school, he switched to Louisiana State University in New Orleans, where he met his wife, a social work student.

They moved to St. Louis, and Kahn did an internship at City Hospital, a charity institution and a busy place. "It was an ancient building with old gas jets on the wall, and the equipment was old, too," he says. "But I rotated through most of the services, getting the experience of delivering a baby, amputating a leg. Every imaginable thing happened there."

Next the U.S. Army snagged him for two years, assigning him to a Veterans Administration hospital in Tuscaloosa, AL, that dealt largely with neuropsychiatric problems. By then he knew he wanted to be a pediatrician when his stint was up. "I liked working with children," he says.
"I liked the idea that they have a long future. I used to say children are truly the most honest people in our society."

Alexis F. Hartmann, MD, chairman of Washington University School of Medicine's Department of Pediatrics, accepted Kahn into the postgraduate program and he stayed three years in all, as a resident and Fern Waldman Research Fellow, working in the budding field of pediatric cardiology. His mentor was renowned pediatrician David Goldring, MD, who had taught himself the specialty.

Actually, Kahn recalls, the department was then made up of giants: Drs. Gilbert B. Forbes, Jean Valjean Cooke, Gene Klingberg, Merle Carson, Donald and Jean Thurston — some of whom went on to head programs elsewhere.

Kahn loved academia, but the pay was only $9,000 per year. With a growing family, he had to look to private practice.

First, he joined the noted Central West End group headed by Park White and George Sato, then moved to Clayton to start his own practice. Years went by and the house calls, the unending well-child checks, and the sudden intensity of childhood illnesses, with their round-the-clock anxieties, all took their toll. He felt restless, and looked for a new challenge.

Lawrence Kahn, MD

On his trademark bowtie:
"Of course, in pediatrics, it is an added safety measure. A four-in-hand will drop down over a baby, and he will grab it — or worse ..."

On Shakespeare's King Lear:
"Lear peered into the abyss and discovered who he was."

But questions arose over the relative value of MCG and another newly developed health care entity, the Independent Practice Association (IPA). In 1985, amid a dispute about MCG's structure and future, Kahn left the program. Soon the IPA died, as did MCG, though the pediatric portion still thrives today.

Kahn, who had also inaugurated a successful nurse practitioner program, continued for a time to lecture in health care administration. He retained a strong interest in health care reform, writing newspaper columns in the 1990s favoring — as he still does — a more equitable, cost-effective system with salaried physicians, coverage for all and a markedly less influential insurance industry.

But Kahn also returned to his literary roots, especially after a new Washington University program — the Lifelong Learning Institute (LLI) — began offering peer-learning classes to seniors in 1995. "LLI is a delightful way for people who don't just want to smell the roses to keep active intellectually," he says.

Over the years, he and his wife have covered many writers — Virgil, Dante, Proust, Faulkner and the Bloomsbury Group, among others — enrolling overflow classes for a complete cycle of Shakespeare's plays. His favorite? King Lear. "Lear peered into the abyss and discovered who he was," says Kahn.

As Kahn looks at his own life to date, he is grateful to the university for his education and many varied opportunities.

"Washington University is one of the most remarkable institutions in the country," he says. "It allowed me to have an unusual and very interesting medical career and made a wonderful retirement available to me."

Want to do more than just smell the roses?

The Lifelong Learning Institute at Washington University offers a wide variety of courses that emphasize peer learning and active class participation by senior adults. Study groups are noncredit; there are no exams, no grades. Nevertheless, this learning community takes its responsibilities seriously, and student participation is vital. To learn more about the Lifelong Learning Institute, please visit: lli.ucollege.wustl.edu.
They trekked the globe, cameras in hand, and forged a bond through photography. Now the physician's son is following his dad's footsteps into medical school.

LIKE father, LIKE son

Things you can't see on the surface are Edward Geltman's specialty. His patients may feel ill, though not always. But deep within, their hearts may be faltering. Through a series of questions, diagnostic tests and imaging systems, a cardiologist can see the unseen, can fathom the workings of a muscle so vital that our lives depend upon its unconscious activities. The intensity of that inner vision, a capacity to see beyond the surface, informs Geltman's avocation, a thread that has run throughout his professional and family life.

An exhibit at the Farrell Learning and Teaching Center this summer showcased the photography of cardiologist Edward M. Geltman, MD, professor of medicine, and his son, Joshua, a 2008 graduate of the Massachusetts Institute of Technology who now works as a research associate at the Joslin Diabetes Center, an affiliate of Harvard Medical School. Their photos depict a range of people, architecture and nature scenes.

The father-and-son duo have been traveling together on "photo safaris" for more than two decades. Edward began taking photos as a medical student living in New York City. As his career in cardiology progressed, he carried a camera on his travels to medical conferences around the world, finding small windows of time between meetings to photograph the local landscape.
Edward Geltman’s image of a boat in Pamet Harbor MA, is Josh’s favorite among his father’s photographs: “I think the image itself is incredibly striking in its composition and its subtle warmth.” The elder Geltman planned the shot in advance to ensure he was at the water at the right time of day to capture the image’s evocative mood.

An observant Joshua followed in his father’s footsteps at a young age. “I grew up seeing my dad taking photos, and I naturally wanted to emulate him,” says Josh. “I would follow him around with a disposable camera (or my mom’s camera, which I had discreetly borrowed), and I would try and figure out what he was photographing and take the same picture.”

That family tradition has continued into Josh’s adulthood. And even though Josh has developed his own unique vision, both he and his father are often drawn to similar subject matter.

“It has often been difficult to tell our work apart,” says Edward. “We walk the cities, marshes and beaches of America and a number of international destinations together, pointing out interesting potential images to each other. Afer a year or two, we began photographing each other for the first image of each roll of film to help us identify the photographer for any given sequence.”

But while Joshua and his father share similarities of interest, the end results of their photo shoots can be quite different, says proud wife and mother Nancy Geltman.

“My son incorporates more people in his photos and they’re often very touching,” says Nancy, a 1977 graduate of Washington University’s George Warren Brown School of Social Work and a past president and 15-year member of its alumni board. “Edward can also do that, but he seems more interested in light and composition.”

So much so that Nancy says she often had to insist on having some simple family snapshots taken when they travel together. “For me, photographs are memories of places and things; for my husband and son, it’s art.”

Edward comes by his interests in art and science naturally. He grew up in a home where art and culture were valued, and as a child, he often spent Saturdays in his father’s diagnostic medical laboratory. He eventually studied biology at the Massachusetts Institute of Technology and earned a medical degree from New York University.

It was while living in New York that Edward first started to carry a camera with him. Completely self-taught, he was intrigued by the city and its inhabitants. After he and Nancy married, they lived in Texas for a few years before settling in the Midwest. In both locations, and on subsequent family vacations after Josh was born, Edward managed to find interesting things to photograph.

Years later, when Josh showed an interest in science, his parents encouraged him, and they made it a part of their family life to visit art galleries and museums.

“Edward provided a window to the art world for Joshua from an early age; he wanted art to be a fun experience for him,” says Nancy. “My husband and son are both very goal-oriented, and they are each other’s biggest fans. They have a genuine respect for one another and cheer each other’s accomplishments.”

Soon the Geltmans will be proud of their son for yet another accomplishment: He is currently applying to medical schools, with Washington University at the top of the list. For his part, Joshua says he would love to be back in St. Louis.

Wherever Josh studies medicine, he won’t repeat some of his dad’s medical school experiences. Back in those days, Edward spent many hours fumbling with film canisters in the dark, developing his own prints of photos shot on campus. Josh, by comparison, is all digital. Some traditions don’t last.
George W. Prothro's first trip was to the Chicago World's Fair in 1933. His uncle drove the 11-year-old to the Midwest from Clovis NM. "Back then, we drove through the heart of every little town," says Prothro, MD 45. "The different places and faces were fascinating, and they still are. I love visiting with people everywhere; we all share the same hopes and dreams." Since that initial trek, Prothro has visited every U.S. state and traveled to 150 countries and every continent but Antarctica.

Prothro also found time for what he considers three careers after graduating from the School of Medicine. He practiced pediatrics in his hometown for 17 years before serving as director of a county health department in Oklahoma. In that role, he spearheaded the first county program in the nation that transfers unused prescription medication from long-term care facilities to area indigent patients. He has remained involved in the program since his retirement through a group called the Concerns of Older Tulsans, otherwise known as COOTS.

As a medical student, Prothro remembers the lack of air conditioning during St. Louis summers and how hard he studied. But he says he had the best teachers and owes all of his success to the School of Medicine. "It was a fantastic experience. Washington University is one amazing school."

To show his gratitude, Prothro has supported a number of medical student scholarships. "Washington University is my life and my love, and I want to be able to repay what the school gave me," he says.

Prothro knew at a young age that he wanted to become a physician. He was greatly influenced by a movie about a boy who became a doctor and found a cure for his ailing mother. "I never had a desire to be anything else, but many times along the way I wondered if it was going to be possible, financially and otherwise," he says.

During the Dust Bowl of the 1930s in New Mexico, Prothro's mother taught piano lessons from morning until night six days a week. She traded the lessons for milk, sewing and other services. His father was in the insurance business.

"They were very religious and good neighbors," he says of his parents. "They helped out everyone."

After graduating with a bachelor's degree from the University of New Mexico, Prothro applied to Baylor College of Medicine, Washington University and a few other schools. He was elated when accepted at Washington University School of Medicine.

To help pay for his tuition, he worked as a resident assistant for junior high boys at Central Institute for the Deaf (CID) on nights and weekends. Prothro met his first wife, Anna Lark, at CID, where she was a nurse at the infirmary.
But, by the end of his first year of medical school, he was running out of money. Already in the U.S. Navy Reserves, Prothro joined the V-12 program, which provided a tuition stipend to medical students. In exchange, they entered active duty for two years upon graduation.

Following internships in Lincoln NE and San Diego CA, Prothro served at a U.S. Navy Seabee base at Port Huenene in California. He eventually was transferred to a Veterans Affairs Hospital in Augusta GA.

He subsequently took courses at Denver Children’s Hospital and at the University of Texas Department of Pediatrics before returning to Clovis NM to start a pediatric practice, the only such specialty within 200 miles.

“I loved every minute of it,” he says. “The typical day would start with a few house calls and then hospital rounds and then back to the office. I also made more house calls in the evenings.”

Later in his career, Prothro became interested in public health and was named the public health officer for a four-county district in New Mexico. He went on to earn a master’s degree in public health from the University of North Carolina, Chapel Hill, before becoming director of the Tulsa City County Health Department in Oklahoma.

In the mid-1990s, Prothro came up with the idea to transfer the vast quantities of unused, unexpired individually packaged medications from long-term care facilities to the Tulsa County Pharmacy. In 2004, Tulsa County began recycling unused medications to benefit the less fortunate.

“We have transferred $5 million in unused prescriptions to the indigent,” he says. “I’m very proud of this program.”

Prothro and Anna Lark were married for 50 years until her death. Their son, George, passed away last year, and their daughter, Karen, lives near Prothro in Tulsa. He has been married to his second wife, Joy, for the past 15 years.

As he looks back on his life and career, Prothro is extremely grateful to the School of Medicine for all that he’s been able to accomplish.

“Washington University School of Medicine has done so much for me and my family,” he says. “I’ve also been able to help people as a pediatrician, the population in general as head of a health department, and many others through the drug recycling program.”
Professorships: Commitments to academic excellence

The 2008–09 academic year concluded with a trio of School of Medicine faculty members being formally honored with endowed professorships. Gerald W. Dorn II, MD, Kelle H. Moley, MD, and Brad W. Warner, MD, were each recognized for their outstanding contributions to their respective fields. The School of Medicine also celebrated the exceptional generosity and dedicated leadership of Philip and Sima K. Needleman, James P. Crane, MD, and Jessie L. Ternberg, MD, PhD, the individuals for whom these professorships were named.

Brad W. Warner, MD
The Jessie L. Ternberg, MD, PhD, Distinguished Professor in Pediatric Surgery

Jessie L. Ternberg, MD, PhD, and Brad W. Warner, MD, share a moment during the inaugural installation of the professorship named in Ternberg's honor. Among many other achievements, Ternberg was Washington University School of Medicine's first female surgeon.

Kelle H. Moley, MD
The James P. Crane Professor of Obstetrics and Gynecology

Kelle H. Moley, MD, stands with James P. Crane, MD, at the professorship installation ceremony celebrating Crane's remarkable career.

Gerald W. Dorn II, MD
The Philip and Sima K. Needleman Professor of Medicine

Gerald W. Dorn II, MD, right, with Philip and Sima K. Needleman. The installation lauded Dorn for his academic accomplishments and honored the Needlemans for their continued loyalty and dedication to Washington University.

Strong annual fund will have immediate impact on success

The loyalty and generosity of alumni, faculty and friends of the School of Medicine continued to shine brightly during the 2008–09 academic year. Contributions to the Annual Fund remained strong due in part to tremendous participation from Eliot Society membership, 2009 Reunion classes, and Scholars in Medicine donors.

The 2008–09 Annual Fund resulted in total gifts exceeding $2.7 million — representing a 9 percent increase in revenue over the previous year. More than 4,650 alumni and friends contributed to this exceptional Annual Fund total.

The Annual Fund is critical to the ongoing success of Washington University School of Medicine and has an immediate and direct impact. The support of alumni and friends positively affects the breadth and scope of academic programs, research initiatives and training programs throughout the School of Medicine.

Most important, the Annual Fund touches the lives of medical students in myriad ways — through scholarships, student-run projects and initiatives, and innovative learning opportunities.
1930s

W. Russell Smith, MD 33
Smith is retired and lives in Carthage MO. His community built a new facility this year, McCune-Brooks Regional Hospital, and the city named the street on which it is located Dr. Russell Smith Way. He sends best wishes to all.

1940s

Howard S. J. Walker Jr., MD 41
Walker resides in Mobile AL. He recently lost his wife to a neurodegenerative disease that lasted 22 years. His second son, surgical oncologist Gaylord T. Walker, MD 78, died in September 2007, two years after being diagnosed with ALS. Walker enjoys spending time with his grandchildren. He still drives, does yard work and loves his woodworking shop. He attends a hospital lecture once a week.

Manly Utterback, MD 42
Utterback enjoys a quiet life at the Sunrise Senior Living Retirement Home in Rancho Mirage CA. He sends his regards to all.

Wilbert E. Hieb, MD 44
Hieb is retired and lives in Brookings SD. He enjoys his life and very much misses the challenges of daily medical practice.

Gary B. Wood, MD 45
Wood resides in Wichita KS. A widower for several years, he feels blessed to have an attentive family and many friends. He works as an assistant counselor at Kansas Vocational Rehabilitation Services in Wichita, where he creates plans for new occupational training and/or placements compatible with the patient's capabilities. He also enjoys volunteering for the Red Cross and playing golf.

Carlyle A. Luer, MD 46
Luer resides in Sarasota FL with his wife of 63 years, living in the same house where they raised their five children. He enjoys spending time with his 12 grandchildren and one great-grandson. About 30 years ago, he began dabbling in botany. Now associated with the Missouri Botanical Garden, he publishes regularly on orchids.

1950s

Theodore "Ted" Merrims, MD 54
Merrims and his wife, Saruth, recently celebrated their 54th wedding anniversary. They have four daughters, three granddaughters, one grandson and one great-grandson. Merrims is retired and has been living in a nursing home for the past year. He enjoys watching football and baseball and some reading.

William C. Barrette, MD 55
Barrette was recently honored by his wife, Mary Wagner Barrette, with a contribution to the Orthopaedic Resident Education Fund in celebration of his 80th birthday. Barrette retired in 1997 after a 35-year career in orthopaedics at Sequoia Hospital in Redwood City CA. One year later, he was asked to continue surgery and, for the past five years, he has assisted with hip and total knee replacements at Stanford University Hospital and hand surgeries at Waverly Surgery Center. He has many hobbies, including travel, reading, jogging and swimming. He also is a lifelong philatelist and photographer and enjoys spending time in his lush gardens.

Arnold M. Goldman, MD 59
Goldman retired in June 1999. He keeps busy with many volunteer jobs such as mentoring second-grade students, working for the Better Business Bureau and heading up the archives committee at his old high school. He works out regularly and attempts to stay both healthy and busy.

1960s

Edward G. Allen, MD 64
Allen is retired and lives with his wife in Belgrade MT. Their family continues to grow; his five children and 14 grandchildren live in Belgrade or close by. Allen feels very blessed. He remains in good health and is very active in the outdoors.

John F. Bigger, MD 64
Bigger, who resides in North Augusta SC, retired from his ophthalmology practice in 2005. He is active in volunteer work with local arts groups.

George R. Harper, MD 64
Harper is retired and resides in Tacoma WA. He and his wife, Jodie, enjoy riding their tandem bicycle for long distances. They have ridden the entire perimeter of the United States — more than 10,000 miles. Their credo: "If you don't like where you are, pedal." Harper is working on a book, Tandem Dreams (and Nightmares).

1960s

Eugene L. Nagel, MD 59
Nagel retired in 1996 from anesthesiology and emergency medicine and resides in Winter Haven FL. He worked at UCLA from 1974–76 and also was chairman of the Department of Anesthesiology at Johns Hopkins University from 1976–80. He has three children and enjoys travel, golf and yard care.

Grateful scholar

Dr. J. Roger (LA 49, MD 53) and Mrs. Jan (LA 50) Nelson with Ronald (Luke) Rebenitsch, MD 09. Rebenitsch graduated in May and is spending his transitional year at Sacred Heart Medical Center in Spokane WA. He will then move into a residency in ophthalmology at the University of Missouri–Kansas City.
**1970s**

**Janie Cox, MD 73**
Cox resides in Portland OR. She is retired and enjoys spending time with her children, as well as hiking and camping.

**James Seegers, MD 73**
Seegers is retired from general surgery and enjoys pursuing other interests, including developmental real estate and banking. He travels frequently with his wife; favorite destinations have been Liberia, Africa, and Thailand, where they were able to do volunteer medical work.

**Leslie Fishman, MD 79**
Fishman practices pediatric medicine. He lives in Vail CO with his wife, Susanne, and their two daughters.

**1980s**

**Jon Jantz, MD 83**
Jantz left a large, multispecialty clinic to start his own pediatric clinic. He resides in North Newton KS with his wife, Sue. In his spare time, he enjoys playing with his children, running, swimming and guitar.

**David M. Melamed, MD 83**
Melamed, who resides in Chicago IL, is a dermatologic surgeon in private practice. He enjoys attending the opera, rowing and baseball.

**Ellen Ann Brammer Morrison, MD 84**
Morrison lives in Greenwich CT with her husband, David. She is a clinician and educator in the HIV program at Columbia University. She enjoys classical music, reading, writing, skiing and cooking.

**1990s**

**Joseph Marceny, MD 94**
Marceny did his pediatric residency at St. Louis Children's Hospital, then returned to Denver CO. He married in 2000 and joined a practice with two other doctors. He has two children, ages 5 and 6. He enjoys brewing English ales, skateboarding and playing bluegrass guitar.

**Maureen Farrell, MD 99**
Farrell, her husband, Rich, and their two children just finished their first year living in southern Spain. They have enjoyed visiting many countries and living the European experience. They expect to return to the United States next year.

**2000s**

**Alyssa Browning, MD 04**
Browning resides in Nashville TN. She finished her internal medicine residency at Vanderbilt University and is doing research on the effects of aspirin on platelets. She will start a cardiology fellowship at UC Davis in Sacramento CA next summer.

**Justis Ehlers, MD 04**
Ehlers is a fellow at Duke University. He resides in Durham NC.

**Celeste Chu Kuo, MD 04**
Kuo is working at Healthcare for Kids, a clinic for Medicaid patients in St. Louis MO. Her husband, Elbert, is busy with his cardiothoracic surgery fellowship at Barnes-Jewish Hospital. They have one son, Tyler.

**Amy McMullen (Slansky), MD 04**
McMullen is in her second year of a hematology/oncology fellowship at Stanford University School of Medicine. She enjoys being back in California!
Elvera C. Guebert, PT 47, NU 51
Guebert died on July 7, 2009, at the age of 88. She was a retired lieutenant commander of the U.S. Navy Nurse Corps and a physical therapist for the Special School District in St. Louis MO. She was past president of the Randolph County Historical Society and a member of St. Peter United Church of Christ in Red Bud IL. By her request, Guebert’s body was donated to Washington University School of Medicine.

Virginia M. Barritt, NU 48
Barritt died on Feb. 15, 2009. She graduated from Washington University School of Nursing in 1948 and raised her family just outside Washington DC. According to her family, she was passionate about political issues at both the local and national levels.

Martha Mae Lasche, OT 50
Lasche died on April 24, 2009, in Seattle WA. After practicing occupational therapy for several years, she became an employee of the U.S. Army at the outbreak of World War II. She later joined the United States Public Health Service (USPHS) and retired in 1976 after serving on active duty for more than 18 years. During her last assignment with USPHS, she served as the chief occupational therapist and clinical training director at the USPHS Hospital in Seattle. For the last 12 years of her life, Lasche resided at Horizon House in Seattle.

Robert C. Ahlvin, MD 54
Ahlvin, of Sikeston MO, died on May 18, 2009. He was a surgeon, physician and pathologist and had practiced at Washington University School of Medicine. He was chief of pathology at Barnes-Jewish Hospital and at Missouri Delta Medical Center in Sikeston. He is survived by his wife, Sally, and children Paul, Mark and David Ahlvin and Elizabeth Shell, seven grandchildren and four great-grandchildren.

Ralph R. Edminster, MD 62
Edminster died, surrounded by family, on April 9, 2008, at the Hospice House of Mid-Michigan. He was 72. After completing an internship and residency at Butterworth Hospital in Grand Rapids MI, he joined the pathology department at Sparrow Hospital in Lansing, where he practiced until 1982. He also was on the faculty at Michigan State University. In 1982, he joined the St. Lawrence Hospital Pathology Department in Lansing. He served as the medical director of laboratories at St. Lawrence Hospital. He eventually returned to Sparrow Hospital as a pathologist and medical director of Sparrow Regional Laboratories. Following his retirement in 2001, he continued his active involvement with the General Tumor Board and the Gynecologic Tumor Board at Sparrow Hospital.

Louise W. Barcus, OT 63
Barcus, a resident of Morrow Bay CA (formerly of Louisville KY), died on Jan. 23, 2009. She spent her life in service to others as an occupational therapist.

James (Dave) Emerson, MD 66
Emerson died on April 16, 2009. Following an internship and first-year residency at Barnes Hospital in St. Louis, he completed a residency and chief residency in general and vascular surgery at Shands Teaching Hospital in Gainesville FL. He served in the U.S. Army from 1971–73, then established a private surgical practice at Mease Hospital in Dunedin FL. In 1995, Emerson and his family relocated to Sterling IL, where he continued his surgical practice. He returned to Palm Harbor FL in 2003 and established a practice at Helen Ellis Hospital in Tarpon Springs FL.

Alumni/Faculty Award honoree
Emily L. Smith, MD 68, assistant professor in the Department of Radiology, receives her Alumni/Faculty Award from Dean Larry J. Shapiro, MD. Smith was selected to receive the award by the WUMC Alumni Association for her outstanding professional accomplishments as a faculty member and for her loyalty and dedication as an alumna of the School of Medicine.

Philip R. Dodge, MD
Dodge, one of the founders of pediatric neurology and head of the Department of Pediatrics for 21 years, died on Aug. 30, 2009. He was 86. A professor emeritus of pediatrics and neurology and a lecturer at the School of Medicine, Dodge’s leadership brought both the department and St. Louis Children’s Hospital to international prominence for clinical care, teaching and research. He trained and mentored most of the academic pediatric neurology leaders in the United States during the past four decades. Prior to his appointment at the School of Medicine, Dodge was an assistant professor of neurology at Harvard Medical School and director of the pediatric neurology program at Massachusetts General Hospital. A Massachusetts native, he earned a medical degree from the University of Rochester in 1948. He completed an internship at Strong Memorial Hospital in Rochester NY, residency training at Boston City Hospital and teaching fellowships at Massachusetts General Hospital. He spent six years as a major in the U.S. Army, serving as chief of the neurology services in Tokyo, Fort Campbell KY and Hawaii. He is survived by two daughters—Susan Dodge-Peters Daiss of Rochester and Judy Speck of St. Louis, a senior research technician in the Department of Otolaryngology—and four grandchildren.
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A gathering of medical students in the Farrell Learning and Teaching Center represents the diversity of today's aspiring physicians. To learn more about how women overcame prejudices and discrimination in medicine, please turn to page 8.