Exemplary professors at the School of Medicine were honored Nov. 22 at the Eric P. Newman Education Center with the presentation of the annual teaching awards. First- and second-year medical school classes each year select a Professor of the Year and a Lecturer of the Year, and designate a number of Distinguished Teaching Awards. This year’s winners, from left, were Elaine Davis, PhD, and Steven L. Carroll, MD, PhD, who were named Lecturers of the Year; and Scot G. Hickman, MD, and Dana R. Abendschein, PhD, who were named Professors of the Year. In addition, 17 professors received distinguished teaching awards.
Researchers Engineer Bacteria that Produce Useful Enzyme

A deep-etch electron micrograph shows a blood cell beginning to eat a plastic bead, from an experiment modeling bacterial phagocytosis conducted by John Heuser, MD, professor of cell biology and physiology. The cell was beginning to grow a 'flap' of membrane that eventually would have encompassed the bead, had the cell not been frozen and freeze-dried in preparation for this photo. For more on this special preparation technique, see page 20.

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The study of medical ethics helps students recognize and deal with patient care dilemmas.

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An electromechanical patient provides real-life medical conditions and complications for trainees and experts alike.

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Scientific images produced by John Heuser, MD, capture fleeting cellular processes for viewing by electron microscope.
New Appointments For Alpers And Li

DAVID H. Alpers, MD, professor of medicine and director of the division of gastroenterology for 27 years, has been appointed to a new vice chairmanship in the Department of Medicine. His position as director of the division of gastroenterology will be assumed by Ellen Li, MD, PhD, associate professor of medicine and of biochemistry and molecular biophysics.

Alpers and Li will serve as codirectors of gastroenterology during a transition period that will end on July 1, 1997.

Alpers, who joined the faculty in 1969 as an assistant professor, became a full professor in 1973. He is a former director of the American Gastroenterological Association's Undergraduate Teaching Project and twice has been elected outstanding clinical teacher by the Department of Medicine house staff.

In his new position, Alpers will continue to conduct research on the gastrointestinal system. The projects he heads may contribute to the development of oral peptide absorption and to understanding the interaction between the contents of the intestinal lumen and the surface mucosal cells.

Li joined the faculty as an assistant professor of medicine in gastroenterology in 1986 and was made an assistant professor of biochemistry and molecular biophysics in 1987. She has been an associate professor in both departments since 1992.

Li's research focuses on the structure, function and regulation of vitamin A-binding proteins in the intestine. In addition, she is interested in studying host-microbial interactions, focusing on the human intestine parasite Entamoeba histolytica, which causes amebic dysentery and amebic liver abscesses.

Li is a former Lucille P. Markey Scholar and a winner of the National Institutes of Health's Career Development Award, the GRG-AGA Young Investigators Award and the Burroughs Wellcome Fund Toxicology Scholar Award.

New Editor For Outlook

OUTLOOK, the School of Medicine's quarterly magazine, has a new editor. Kleila Carlson, who has been associate editor for the past three years, moves into the position, assuming responsibilities previously held by Steve Kohler, who directs the division of medical publications.

Carlson, a writer and editor with more than 10 years' experience, says she expects the periodical to undergo changes in the future.

"We have recently launched a readership survey, and after we review what our readers want, we will be planning and implementing changes to Outlook that reflect those expectations," she says.

Carlson joined the Office of Medical Public Affairs, which produces Outlook, as a medical news writer in 1990. Prior to that, she was a news and medical reporter at The Hutchinson (KS) News.

Carlson received her bachelor's degree in journalism from Kansas State University.

Cryer To Preside Over ADA

PHILIP E. Cryer, MD, Irene E. and Michael M. Karl Professor of Endocrinology and Metabolism and director of the division of endocrinology, diabetes and metabolism, has been elected president of the American Diabetes Association (ADA).

Cryer, who also is director of the General Clinical Research Center at the School of Medicine, has been an active volunteer for the ADA since 1975. Prior to his election as national president, he served as president of both the Missouri affiliate and the St. Louis chapter of the ADA. He also served on numerous national committees and was the editor of Diabetes, the association's leading scientific journal.

In 1994, Cryer received the Banting Medal for Scientific Achievement. The award is the highest scientific award given by the ADA and is presented annually to an individual who has made significant, long-term contributions to understanding diabetes, its treatment and prevention.

Cryer is the first person in the ADA's 56-year history to receive the Banting Medal, serve as editor of Diabetes and be elected president of the organization.
Cicero To Oversee Research

Theodore J. Cicero, PhD

THEODORE J. Cicero, PhD, associate vice chancellor for animal affairs and associate dean at the School of Medicine, has been appointed vice chancellor for research at Washington University.

In his new role, Cicero will help formulate and develop research initiatives and will serve as a key liaison with federal, corporate and foundation sponsors of research. In addition, he will have administrative responsibility for the Research Office, a service center that assists faculty seeking research funding from government, private and corporate sources and that attunes faculty to potential connections between their own discoveries and opportunities for technology transfer.

Cicero's area of expertise is the interaction between drugs or abuse and the endocrine system in mammals. Most recently, he has been involved in researching the effects of opiates and other abused drugs on the male and female endocrine systems and what role those changes play in the nature of drug addiction.

Cicero, who also is a professor of psychiatry and of anatomy and neurobiology at the medical school, will continue to oversee research activities involving animal models and to supervise the division of comparative medicine.

Institute Of Medicine Taps Atkinson, Olney

JOHN P. Atkinson, MD, professor of medicine and of molecular microbiology, and John W. Olney, MD, professor of psychiatry and neuropathology, have been elected to the prestigious Institute of Medicine of the National Academy of Sciences.

Atkinson is renowned for his research into the structure, function and genetics of the complement system, a group of proteins critical to the immune response. Complement proteins help the body recognize and destroy foreign tissues. Deficiencies in the complement system can lead to diseases such as systemic lupus erythematosus.

Atkinson, who has received several awards for teaching and for his research, joined the faculty as an assistant professor of medicine and head of the division of rheumatology in 1976. He became a full professor in 1984 and served as chairman of the Department of Medicine from 1992 through 1996.

Olney is known for pioneering work that helped to establish glutamate as a major neurotransmitter in the brain. In the early 1970s, after discovering that glutamate can kill nerve cells in the brain by over-stimulating them, Olney coined the term "excitotoxicity." He also hypothesized that glutamate excitotoxicity might play an important role in neurodegenerative diseases.

Today, it is believed that the excitotoxic mechanism may contribute to nerve cell degeneration in chronic disorders such as Alzheimer's disease, Huntington's chorea, amyotrophic lateral sclerosis (Lou Gehrig's disease) and AIDS dementia.

Olney came to Washington University as a resident in psychiatry in 1964. He joined the faculty as an instructor of psychiatry and became a full professor in psychiatry and neuropathology in 1977.

Student Pens A Winning Essay

THIRD-year medical student Nancy Chen has received the Osler Medal from the American Association for the History of Medicine.

Chen received the award for her 9,000-word essay titled, "The Doctor and Patient in the U.S. Civil War." In it, she explored the effects of wartime medicine on the physician-patient relationship. Kenneth Ludmerer, MD, professor of medicine and professor of history on the Hilltop Campus, and Stephen S. Lefrak, MD, professor of medicine and assistant dean for the Humanities Program in Medicine, assisted Chen in preparing the piece.

The contest recognizes the best unpublished essay on a medico-historical topic written by a student enrolled in a school of medicine or osteopathy in the United States or Canada. First awarded in 1942, the medal commemorates Sir William Osler, who stimulated an interest in the humanities among medical students and physicians.

Chen, who plans a career in pediatrics, received her undergraduate degree in history and science at Harvard University.
Medical Center Gets A Makeover

BJC Health System and the School of Medicine have launched an extensive makeover of the Barnes-Jewish physical plant that will change the way health care services are organized and delivered at Barnes-Jewish Hospital and the Medical Center.

When the plan is fully implemented, all outpatient diagnostics, testing and education, as well as short-stay inpatient services, will be located on the north side of the Medical Center. All high-intensity, complex medical and surgical cases and related care will be delivered on the south end. The plan calls for the construction of four medical buildings, two parking garages and an addition to an existing building. Eventually seven older, inefficient buildings that cannot be updated will be removed.

The major projects in the next three years include:

- An ambulatory care center to provide a single location for outpatient surgical and diagnostic testing services and physician consultations;
- A cancer care center to provide clinical services, educational resources and leading-edge clinical research for the prevention, diagnosis and treatment of cancer;
- An emergency, urgent care and trauma area to consolidate the services now provided into one well-marked, accessible facility.

Other elements of the long-term plan include relocated and redesigned operating room facilities, new neurosurgical suites, cardiac and vascular diagnostic and testing suites, an inpatient radiology facility, a consolidated medical laboratory, and amenities such as dining and parking facilities.

The project, which is subject to regulatory approvals, has been approved by the boards of Barnes-Jewish Hospital and BJC Health System and has been endorsed by the School of Medicine, the system's medical research and teaching partner.

The $225 million project is slated to begin in spring 1997. The plan will be financed through existing capital and ongoing operating revenues and will reduce operating costs by $20 million per year when completed.

Evens Celebrates 25 Years As MIR Director

A scientific symposium, lecture and reception in September highlighted the 25th anniversary of Ronald G. Evens, MD, as director of the Mallinckrodt Institute of Radiology at Washington University.


Evens, who is the Elizabeth E. Mallinckrodt Professor and head of the Department of Radiology at the School of Medicine, joined the staff of MIR in 1970. Under his leadership, the institute has undergone major expansion and is now one of the largest academic radiology departments in the country, with responsibility for more than 500,000 radiologic examinations annually.

Evens has been a leader within and outside of the Medical Center including serving as president and chief executive officer of St. Louis Children's Hospital from 1985-88. Recently, he was installed as chairman of the Board of Chancellors for the American College of Radiology (ACR). The ACR works to promote the advancement of radiology, improve radiologic services for patients and study the economic aspect of radiology.

Clarification

The caption that appeared in the fall 1996 issue of Outlook with a photograph of Louis Sullivan, MD, presenting grand rounds was incomplete. It should have stated that Sullivan was the Robert J. Glaser Visiting Professor.
Mad Scientists Network On WWW

WHAT is the purpose of the Adam's apple? What makes cats purr? How does a one-way mirror work?

To find answers to these questions and more, contact the MAD SCIENTIST NETWORK web site at http://medinfo.wustl.edu/~ysp/MSN/MAD.SCI.html. The site is the brainchild of Lynn Bry, an MD/PhD student at the School of Medicine. It is an interactive 'ask a scientist' interface staffed by scientists actively engaged in science education and research at institutions around the world. Anyone with access to the World Wide Web can submit a question to be answered by members of the network.

Questions are reviewed by project managers Bry or Joe Simpson, who also is an MD/PhD student, or one of six other medical students or PhD students. After they are screened, questions are directed to a specific scientist to be researched and answered. Questions have been answered by those in the U.S., Britain, Japan, Israel, France, Germany, South America, Australia, New Zealand and Canada.

Simpson says between 20 and 30 questions a week come in and that about 80 percent of them can be answered. "Some are very difficult and some are probably just unanswerable," he says. Such as 'What was the lifespan of a dinosaur?' or 'What would a world with a fractional, negative or complex (imaginary) number of dimensions be like?'

Simpson says 1,000 questions have been answered since the site first became accessible; some 200 await a reply. On average, it takes about eight days for a response.

To shorten the response time, Simpson says the group hopes to install an automated response system that hunts for key words and provides a stock answer. Improving the present software also would cut the time it takes to search the archive, which stores all of the 1,000-plus questions.

Lecture Series Honors Homer G. Phillips Hospital

WILLIAM E. Smiley, MD, a longtime St. Louis physician, was the honoree at the inaugural Homer G. Phillips Lecture Series in October sponsored by the School of Medicine. Smiley, 83, is a former instructor in clinical obstetrics and gynecology at the School of Medicine. He completed his residency at Homer G. Phillips and was one of the first physicians to be employed there full time. Smiley is currently on the staff of St. Louis Regional Medical Center's ambulatory care division. The lecture series highlights the achievements of medical practitioners at the now defunct Homer G. Phillips Hospital in the City of St. Louis.

A Lifetime Of Achievement

Helen E. Nash, MD, professor emeritus of clinical pediatrics, left, received the Lifetime Achiever Award at the ninth annual Salute To Excellence Scholarship Awards Banquet sponsored by the St. Louis American in September. Known for her efforts to improve the health of children, Nash was in private practice in the City of St. Louis from 1949 to December 1993. She has been affiliated with the School of Medicine for 47 years.
Eluding The Cancer Watchdog

Immunology and cancer researchers at the School of Medicine have identified two ways that cancer cells escape detection by the immune system. Both scenarios involve a watchdog protein in the immune system called interferon-gamma which, when muzzled, allows certain forms of cancer to grow and spread.

The initial work, conducted by Anand Dighe, MD, PhD, and Medical Scientist Training Program students Dan Kaplan and Vijay Shankaran, involved a live model for studying an immune system function known as tumor surveillance. Researchers now know that the watchdog protein interferon-gamma helps provide eyes and ears for the tumor surveillance system. Their research sheds new light on the body's early warning system that guards against cancer.

Interferon-gamma is a type of common immune system component called a cytokine. Cytokines work outside of cells and are important for controlling the body's inflammatory and immune responses, which have major roles in clearing infections. Scientists are beginning to understand how these responses also clear some cancer cells as they develop in the body, offering a measured level of immunity to cancer. Of course, such immunity can be sidestepped in many ways by cancer cells, but interferon-gamma is clearly an important factor that alerts the immune system to the presence of certain types of cancer cells, says Robert D. Schreiber, PhD, Alumni Professor of Pathology.

The scientists identified two ways, one genetic and one acquired, by which tumors become resistant to rejection and proliferate, in part, because the immune response has been silenced.

Oral Insulin As Prevention

Researchers at the School of Medicine are participating in a national clinical study to determine if taking an insulin capsule can prevent or delay Type I diabetes, also called insulin-dependent or juvenile diabetes.

Each year, 11,000 new cases of Type I diabetes are diagnosed in children and teenagers, making it the second most common chronic disease after cancer in U.S. children.

The oral insulin intervention is the second component of the Diabetes Prevention Trial-Type I and is designed for people at moderate risk for developing diabetes. Neil White, MD, associate professor of pediatrics, is principal investigator for the St. Louis study site.

The first component, the insulin injection intervention, was launched in February 1994 by the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) of the National Institutes of Health. The injection phase is ongoing and enrolls volunteers at high risk for developing diabetes.

People with Type I diabetes do not produce insulin, a hormone that regulates how cells get energy from food. T cells produced by the body's immune system may mistakenly destroy insulin-producing cells. As a result, sugar builds to dangerous levels in the blood, damaging the eyes, kidneys, nerves, heart and blood vessels. Without daily insulin injections, people with Type I diabetes lapse into a coma and die.

Researchers now know that Type I diabetes develops over several years and that symptoms of the disease do not appear until most of the insulin-producing cells have been damaged. Researchers theorize that giving people insulin before they develop the disease may stop the body's immune system from destroying insulin-producing cells.
**Clingy Bacterium Causes Infections**

THE bacterium that causes most urinary tract and kidney infections uses its attachment to human cells to trigger the production of a protein it needs for survival, researchers here have found.

Bacteria encounter a variety of environmental conditions inside the human body. To survive and thrive, they must suddenly switch on genes that adapt them to a new environment, says Jian Ping Zhang, MD, postdoctoral fellow and lead author of a paper in the August 30 issue of the journal Science.

Urinary tract infections account for 5.2 million visits to physicians each year, mostly by women. An additional 100,000 Americans are hospitalized every year for kidney infections. *E. coli* is the culprit 90 percent of the time, and antibiotics are the treatment of choice. But with the rise of antibiotic resistance, new drugs must be developed.

Research in the laboratory of Scott J. Hultgren, PhD, associate professor of molecular microbiology, has revealed how *E. coli* can cling to cells in the urinary tract without getting washed away by the flood of urine. Unlike *E. coli* in the gut, the strain that invades the urinary tract is covered with hair-like structures called pili. A sticky protein at the tip of each pilus allows the bacterium to get a firm grip.

Zhang examined transcripts of genes before and after attachment.

Several genes were activated, he found, including one for a protein of unknown function. This gene, which the researchers later named ariS (attachment and iron regulation sensor), became active only when the tips of pili attached to receptors for their sticky protein.

Zhang says that knocking out this sensing mechanism might eventually lead to new treatments for kidney and urinary tract infections.

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**Curtailing Spinal Cord Injury**

RESEARCHERS at the School of Medicine have discovered a new cause of the damage that follows injury to the spinal cord. Using rats, they also found a way to protect the spinal cord from the damage and showed that the animals benefited from the treatment.

About 200,000 Americans have spinal cord injuries, and there are an estimated 7,600 to 10,000 new cases each year.

The researchers observed a small area of damage immediately after rats suffered mild injury to the spinal cord. A cavity appeared in the cord a week later due to the death of nerve cells that were healthy immediately after the impact. Over the next three weeks, the cavity enlarged as even more cells died.

A related study pointed to cell suicide, or apoptosis, as the cause of this delayed damage. A group led by Dennis W. Choi, MD, PhD, Jones Professor of Neurology and head of the Department of Neurology, injected some of the rats with a substance called cycloheximide five minutes after the impact and then every third day for four weeks.

Cycloheximide was known to inhibit apoptosis of cultured nerve cells by preventing them from making new proteins.

The untreated rats suffered hind-limb paralysis. But the rats that received cycloheximide were able to use their hind limbs in walking. Four weeks after the injury, researchers found that the cycloheximide-treated rats had retained twice as much healthy tissue around the injured area as those that went without treatment.

"These findings support the suggestion that apoptosis makes an important contribution to cell death and loss of function after spinal cord injury," says Choi.

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**To Learn, Share and Live**

A PROGRAM to educate older women about breast cancer screening called Learn, Share and Live is being sponsored by the School of Medicine.

The community breast cancer education campaign is targeted to elderly, inner-city women, says Celette Sugg Skinner, PhD, who is the project's principal investigator. In addition to providing education about breast cancer screening, the program addresses fears and dispels deep-seated myths about the disease. Learn, Share and Live promotes awareness and discussion about breast cancer and emphasizes screening procedures, such as mammography, through small discussion groups led by trained participants. It is part of a study of compliance with breast cancer screening procedures that is supported by a grant from the National Cancer Institute.

Learn, Share and Live is co-sponsored by Grace Hill Neighborhood Services, a community service organization in St. Louis.

Breast cancer is the most common form of cancer in American women. There are more than 160,000 new cases reported each year and more than 40,000 annual deaths from the disease.
Medical Ethics Courses Help Students Confront The Dilemmas Of Patient Care

Third-year medical student Chad Rammohan is currently following a patient diagnosed with metastatic cancer. The 35-year-old man is the victim of a catch-22 — the chemotherapy he has been undergoing to slow the spread of disease has triggered renal failure.

Now Rammohan must help decide whether to dialyze his patient. The treatment would prevent immediate renal failure, but it is likely the patient will live less than six months before succumbing to the cancer, even with continued chemotherapy. If he is not dialyzed, however, complete renal failure could occur in as little as two weeks.

It is a difficult situation that is further complicated because the patient is mentally retarded and has limited capacity to make medical decisions. Rammohan is waiting on test results from the patient’s latest CT scan which will show if the cancer has been slowed by the chemotherapy or is continuing to spread. After review, the attending physician and Rammohan will meet with the patient and his mother to discuss the options and decide which course of action to pursue.

"The most frustrating aspect of ethical decision making is thinking you never have enough information," says Rammohan. "With everything else, there are parameters. With ethical decisions, it never ends up being that clear."

Human values can cloud issues like the one Rammohan now faces, but they distinguish clinical medicine from the basic sciences, says Stephen S. Lefrak, MD, professor of medicine and assistant dean and director for the Humanities Program in Medicine at the School of Medicine. Such issues also demonstrate why an education in medical ethics — part of the humanities program — is critical to students’ development as physicians, says Lefrak.

"Students must have some matter of self-analysis: ‘If I believe, why do I believe? If I have this opinion, what are possible other opinions? What are the strengths and weaknesses of my arguments?’” he says.

"Just knowing what the
 diagnostic tests are, what the disease is and what the treatment options are does not make one a physician," he continues. "What makes one a physician is knowing how and when to utilize all of those options and understanding the fact that medicine is value-based as well as scientifically based."
The Deliberative Process

to that end, Washington University offers its medical students a variety of courses that deal with the issues of bioethics.

"We want the graduates of our medical school to have the same level of confidence in the ethical doctor-patient domains as they do in biological sciences and clinical medicine," says Thomas H. Gallagher, MD, assistant director for the humanities program in medicine.

Gallagher, who also is an instructor in medicine, believes that teaching biomedical ethics to aspiring doctors is as important as their training in the basic sciences. The first hurdle he often faces when instructing first-year medical students is convincing them that this is so.

"Everyone who comes into medical school is ready to learn about anatomy and biochemistry," says Gallagher. "It's difficult to get students to stop and think about bioethics issues."

Chad Rammohan admits he thought the ethics courses taken early in his medical training were not as important as his other classes. "I spent most of my time thinking about the basic sciences - I didn't even consider all of the other types of things that become part of a medical education. But when I look back at it, ethics ends up being more and more important."

Like the general population, incoming students are skeptical about bioethics, says Gallagher. "People are skeptical because they think that ethics is about morality or conscience - that it's an innate sense of right and wrong present at birth, and that it cannot be taught," he says. "Bioethics is different from morality or conscience - we look at it as a process of deliberation and discussion, a way of thinking about some of the dilemmas that emphasizes how one can analyze and discuss these issues."

Focusing on ethical issues as matters of morality can lead one to view ethics as nothing more than personal opinion, says Gallagher. "We communicate to the students that their opinions are valuable, but what we're really interested in doing is getting them to the point where they can articulate some of the arguments for and against some of the practices they are likely to encounter, and then come to a conclusion about which arguments are the most compelling, and why," he says.

To illustrate his point, he uses the example of Jehovah's Witnesses who believe that blood transfusions are prohibited by the Bible. Patients of this faith will refuse a transfusion on religious grounds, though refusal may mean certain death, says Gallagher. "Students feel this is obviously wrong. They'll ask 'How can you refuse something that's life sustaining?' The key is to get students to step back and analyze the situation as an ethical dilemma, rather than as an issue of their opinion about what's right and wrong," he says. "In doing so, we're able to open up discussion about important physician-patient issues."

Gallagher says the relationship between physician and patient is at the core of all issues involving bioethics. While many of the ethical dilemmas faced by today's physicians are recent in origin - such as those related to the development of ventilators or kidney dialysis machines - core issues, such as patient confidentiality, have remained constant.

"We want students to focus on why the doctor-patient relationship is so different from any other relationship in society, and on what sorts of obligations it confers on them," says Gallagher.

Third-year medical student Kelly Klingler, above, says that bioethics coursework has helped her realize the many and varied considerations involved in providing patient care.
Gallagher says a common misconception among students is that ethics and the law are one and the same. "The law often establishes a minimum standard of conduct, above that it gives doctors a huge amount of discretion as to how to behave," he says. "Oftentimes, the law doesn't offer any particular guidance on ethical issues. The student who thinks all he or she needs to know is what the law says is missing out on a big piece of how ethical decisions are made."

Prior to beginning their third year of study, students attend an orientation designed to alert them to some of the common dilemmas they will face during their clinical clerkships. One of the first ethical questions students must face as they begin clinical practice is what information to share with patients — Should I introduce myself as a student or doctor? Should I tell a patient I'm performing a procedure for the first time? What do I do when I make a mistake?

Finding ways for students to apply the knowledge they have gained in lectures and conferences is another challenge. Unfortunately, says Gallagher, students and residents get fewer opportunities to perform bioethics-related skills under supervision than they do other types of skills.

"It's a challenge to figure out how to help young doctors actually conduct difficult discussions, such as when to withdraw a ventilator, with patients and their families," he says. "It's difficult to have discussions about practical ethics with students when they haven't seen any patients yet and the complexities of situations aren't readily apparent. Many of the ethical dilemmas that we talk about become more clear after students have had some patient care experience."

Third-year medical student Kelly Klingler understands now that part of practicing medicine is learning to let go — that in order to learn about medicine, students must, in a sense, put aside their personal beliefs. Klingler recently agreed to keep a diagnosis of cancer from a patient. The patient's family members feared the information would devastate the woman, so Klingler and the clinical team she works with honored their wishes.

Klingler says she was uneasy about skirting the patient's autonomy, but that as a physician-in-training she is learning to live with such mixed feelings.

"Medicine is not nearly as simple as understanding a disease — you're dealing with a person, a culture, a patient and a family," she says. "More and more as physicians we are confronted, especially in our multicultural society, with different viewpoints on how to approach illness. It is important for us to understand how to respect patient and family wishes and at the same time make ethical medical decisions."
the ADAPTA

A CLINICAL SIMULATION CENTER for CRITICAL EVENT TRAINING
In the vernacular of the operating room, the patient is “crashing.” Blood pressure drops, and the lines on the monitor start to look more like Kansas than the Himalayas. Medical students rush their efforts to determine what has gone wrong and correct it. Chaos reigns.

The experienced physician responsible for educating the students should step in and take over. But instead, he has calmly gone to answer a page, leaving the students to resolve the crisis.

Why? Because he knows that this patient, which responds like a human in almost every way, never was alive. The patient in trouble is a clinical simulator — lifelike, but really a collection of sophisticated computer hardware and software operating a soft-skinned mannequin.
Alex S. Evers, MD, head of the Department of Anesthesiology and one of the Clinical Simulation Center's principal sponsors.

"Real beginners can get valuable experience on the simulator without concern for compromising the quality of patient care. This is the way training will occur in the future."

the PLAN
A joint project of five entities: BJC Health System, Washington University School of Medicine and its departments of anesthesiology, pediatrics and surgery, the Clinical Simulation Center is under the direction of Murray, associate professor of anesthesiology. Each of the five sponsors sees benefits in the simulator available in no other way.

The electromechanical patient can simulate care situations experienced in the surgery suite, the ICU and the emergency room. It can be programmed to recreate scores of scenarios, including power outages and equipment failures. Any scenario can be repeated until users learn to react in the most appropriate way.

A problem posed by the simulator can be as straightforward as the misplaced endotracheal tube or "a combination of critical problems that makes it impossible even for those of us running the simulator to predict what will happen," according to Murray.

For anesthesiologists, a big advantage offered by the simulator is its ability to serve as a physiology and pharmacology model. "We can program the condition of a real patient and our anesthesia plan, then see the effects of that plan," says Murray. The simulator can play the role of a patient with medical conditions and complications, not just a normal, healthy person. "It is more likely to be correct than an anesthesiologist's experience, particularly when that experience is limited," Murray says.

For health care professionals of every description, Evers also sees the simulator's potential as a method for ascertaining and documenting competence. "How do you know someone is competent in a vitally important role? The simulator could provide a way to demonstrate and monitor the quality of care being delivered," he says.

But the emphasis is on education and training. According to Murray, the delivery of sedative and narcotic drugs outside the operating room is increasing rapidly as health care changes. That requires more personnel trained in the administration of anesthesia. Many procedure rooms and clinics throughout the BJC system — endoscopy rooms, interventional radiology suites and others — employ anesthetic medications. "All of those who work there need training," Murray says.

As an example of the machine's flexibility, a date has been scheduled for a visit from attorneys concerned with risk management in hospitals. "The simulator will allow them to see how things happen in the operating room and what the devices are," Murray says. "It won't, however, provide certainty about what would happen in every case." So it is not, in effect, an expert witness.

the MACHINE
Installed in an actual operating suite remodeled by BJC, the simulator is located "right where the teachers are," Evers says. "That way, instructors can schedule time without having to leave the floor." The entire center comprises 2,000 square
The simulator’s operating room is wired with inconspicuous video cameras and microphones to record events that occur there. Adjacent to the operating suite is a conference room with playback capability. The operator’s console sits behind a large panel of one-way glass; the instructor can observe the activity and introduce new elements at any moment.

Remote playback of activity in the room lets the simulator function as a training device for complex situations and group behaviors, where interactivity is crucial to a positive result, Evers says. Such crisis management training is invaluable but has been hard to find, principals say.

“How well did the group use the available resources? Once the trouble was identified, did the group carry out the steps to correct it? Did the leaders lead? Did they call for appropriate help? These are the kinds of questions the simulator allows us to ask and answer,” Murray says.

The device was constructed and installed by CAE Electronics, Inc., which calls it SAM, for Simulated Anesthesia Mannequin. CAE, which currently holds 60 percent of the world’s flight simulation market, traces its roots to inventor Ed Link, developer of the first flight simulator. Today, its machines can so fully train a pilot that only a check flight is required in the actual aircraft before certification. Because the same sort of life or death decision-making is required of pilots and operating room personnel, the technology makes the transition particularly well, according to Joe Huse of CAE.

The mannequin “does everything but sweat,” Huse says. The simulator’s real-time computer system is controlled via a graphical interface to manage the full-body mannequin that features breathing sounds, a full set of pulses, motors to operate a thumb twitch and chest expansion, CO₂ exhalation and the standard hookups for blood pressure, EKG and ECG monitors. The mannequin records a temperature and can bleed, though no red liquid accumulates on the floor. No hospital equipment was modified to work with the simulator, so the room and its accouterments are identical to what is used every day.

The software at the heart of the simulator provides 20 predefined patients that range from a normal, healthy male to a morbidly obese patient with severe coronary problems. The operator can add any of 30 critical events that make the situation abnormal to the clinician. Additional scenarios can be created by the operator in real time or stored to run repeatedly for training, Huse says.

On one day, the simulator might play the part of a patient in an operating suite for an appendectomy, with first-year medical students involved. On the next, it might have been in a violent car crash, suffering multiple fractures and cerebral hemorrhage that test the skills of emergency room personnel. On a third day, it might be confounding the most experienced anesthesiologist with a rare display of malignant hyperthermia, when suddenly the lights go out.

But it always behaves realistically and gives selflessly to the education and training of health care professionals without suffering pain or registering complaints. When next the doctor, nurse or technician sees a similar urgent medical situation with a real patient, the problem will seem routine.
Researchers Make Connections Between V(D)J Re...
“SCID patients suffer recurrent infections, and without a bone marrow transplant they usually die of overwhelming infection within the first year or two of life,” says Michael R. Lieber, MD, PhD, associate professor of pathology, medicine and of biochemistry and molecular biophysics. By studying a process called V(D)J recombination, a mix-and-match genetic lottery that occurs in the development of functional immune cells (B cells and T cells), Lieber, graduate student George Gauss, and their collaborators at the University of Ulm in Germany recently identified a cause of the most devastating form of SCID. Their results, which were published in the Oct. 4, 1996, issue of the journal Science, are the first to shed light on B-SCID, a disease in which patients have no mature B cells or T cells.

The work promises to demonstrate the role V(D)J recombination plays in certain diseases by uncovering the ways in which the process fails.

“We are finding out which enzymes mediate V(D)J recombination, what the enzymes do and how they do it,” says Lieber. “We also are identifying the genes that encode the enzymes for the various steps.”

V(D)J recombination works like a numbers game in a kind of genetic lottery in which B cells and T cells create receptor genes.
Receptors are generated by the billions in the immune system because they must span the spectrum of potential disease-causing antigens. The "chances" in the lottery are genetic segments that are grouped into three categories: variable (V) subexons, diversity (D) subexons and joining (J) subexons.

The immature B cell or T cell selects one genetic segment from each of the three types at random, then excises the intervening DNA and reconnects the segments. This basic recombination process occurs twice along the antigen receptor gene at both the heavy and light chain loci, which further increases the diversity of possible genes. In the end, when the lottery is complete, the B-cell or T-cell is mature and fully functional.

**Detecting RAG Gene Defects**

When Lieber and his colleagues began their work in 1992, only two genes required for V(D)J recombination were known — the recombination-activating genes, RAG-1 and RAG-2. The RAG genes act together to cut the DNA in V(D)J recombination. Without the RAG genes, there can be no genetic recombination, no mature lymphocytes and, consequently, no immunity.

"Naturally, we decided to investigate V(D)J recombination," Lieber says. "Since the process is fundamental in the development of both B and T lymphocytes, defects in the genes that regulate V(D)J recombination would almost certainly cause B-SCID."

Epidemiological studies were performed by Lieber's collaborators in Germany. To find out how frequently RAG mutations occurred, the researchers examined three groups of people: one with B-SCID, one with B+SCID (who have detectable B cells in their peripheral blood stream that allay the disease by secreting antigen receptors) and healthy subjects.

The researchers used wild-type RAG genes — that is, the RAG genes most commonly found in nature — as their standards of comparison. They found that six of the 14 B-SCID patients had mutations in either one or both of their RAG genes.

The pie chart provides a break down of the known genetic causes of severe combined immunodeficiency, or SCID. The defects in the RAG genes identified by Michael R. Lieber, MD, PhD, and graduate student George Gausa, cause an estimated 14 percent of all B-SCID cases.

The top line represents a region of human chromosome. In the immune system, this chromosomal region undergoes V(D)J recombination, forming the coding joint and the signal joint. Formation of the coding joint is essential for proper immune system development.
RAG genes, while the RAG genes of all other subjects matched the wild-types.

Since mutant genes are not always defective, Lieber and Gauss tested them to see whether they were faulty. They spliced the mutant genes into rings of DNA called plasmids and transferred the plasmids into human fibroblast cells. Conveniently, fibroblasts do not perform V(D)J recombination and do not express their own copies of the RAG genes. Therefore, the mutant RAG genes could be tested without contamination from the host cell.

Lieber and Gauss found that all but one of the mutant genes were defective — that the enzymes encoded by the genes failed to cut the DNA at a significant level compared to the wild-types. The one functional mutant gene was a viable variation on the wild-type called a “functional polymorphism,” and therefore was not responsible for the patient’s SCID. However, the patient with that gene had candidate mutations in both RAG genes, and the other gene was the defective one.

Lieber says the results suggest that nearly half (six out of 14) of the cases of B-SCID are caused by RAG defects; the finding also may point toward improved treatments for SCID.

Bone marrow transplantation, which is currently the only known treatment for the disease, is risky. Suitable donors are often difficult to find, and even when one is found, the recipient is often attacked by the functional immune cells in the donor’s graft — a syndrome called graft vs. host disease. SCID patients with known genetic defects such as RAG may be able to avoid such complications in the future with the development of gene therapy.

"SCID patients are perfect candidates for gene therapy," Lieber says. "Since they have defects in only one gene, they would receive one of the cleanest cures. Now it’s just a question of developing a reliable technique of excising the defective gene and wiring a good copy into the DNA."

While other researchers work on the development of gene therapies, Lieber and Gauss continue to delve into the specifics of the observed RAG defects. Why do the mutant RAG genes fail? Does the mutant protein perform the expected function? Do the proteins function at the appropriate rate? These are the questions to which they now seek answers.

Recombination And Cancer
Since Lieber, Gauss and the German team began their research, much progress has been made in understanding the way V(D)J recombination works. Scientists have isolated and sequenced two more genes that are required for V(D)J recombination, called DNA-PK and Ku. Lieber’s lab also has tentatively identified the gene that completes the last step of the recombination process.

Lieber says it is likely that defects in these genes and related genes that have yet to be discovered will explain the remaining cases of B-SCID. The German group currently is looking for mutations in the Ku genes of SCID patients, and they plan to start working on DNA-PK soon.

Meanwhile, Lieber, Gauss and others in the lab look for connections between recombination and a much more common and devastating disease — cancer. "The recombination process is a kind of genetic gymnastics," Lieber says. "We think mistakes occasionally are made that cause cancers of the immune system called lymphoid leukemias and lymphomas."

B cell follicular lymphoma, Burkitt’s lymphoma and other lymphomas are caused by the translocation — the abnormal rearrangement of genetic segments within the genome — of certain genes into the antigen receptor gene in B cells. By showing how V(D)J recombination works, Lieber and the members of his lab hope to uncover the ways in which the process is susceptible to these highly lethal mistakes.

"With our current pace of rapid discoveries, we hope to make progress on these malignancies of the immune system also," says Lieber.

Editor’s note: Debra Daugherty, PhD, is a freelance writer based in St. Louis.
"Quick-freeze, deep-etch" electron microscopy is a research tool synonymous with John Heuser, MD, professor of cell biology and physiology at the School of Medicine. Nearly two decades ago, he began to develop this unusual method of photographing living cells and their contents in the electron microscope.

Heuser uses "quick-freezing" to capture many cellular events that are unusually fleeting, like muscle contraction or nerve transmission; he uses "deep-etching," which is...
basically a type of freeze-drying, to bring the events into view in the electron microscope. To finally photograph them, he replicates his frozen samples with thin coatings of metallic platinum which recreate lifelike, informative 3-D images.

The microscopic images he creates — some of which are reproduced on the following pages — are featured in medical textbooks and scientific journals the world over.

Heuser's freezing machine is the key to his technique. It is a device that he has struggled to perfect throughout his research career, spanning nearly 30 years. Today, the machine looks like a small printing press, at the top of which biological samples are mounted. Within its heart is a 99.999 percent pure copper block, designed to maximize the withdrawal of heat from living biological samples. This is accomplished by chilling the metal block to an extremely low temperature, some minus 459 degrees Fahrenheit. To reach this temperature, the block is blasted with cryogenically liquefied helium gas, itself only 4 degrees warmer than absolute zero (the temperature of deepest outer space). In operation, whatever biological sample has been mounted on the top of

ABOVE INSET: A freeze-etch electron micrograph reveals tiny fat bubbles, called liposomes, that are now commonly used in cosmetics, as well as in medical research aimed at improving the delivery of drugs to sick or cancerous cells.

BACKGROUND: The image shows the first craters ever found on the surface of a nerve cell at the critical moment of intercellular communication. Persisting for only a few thousandths of a second, these so-called exocytotic openings in the surface of the nerve allow chemical transmitters to flow out and excite neighboring cells. Capturing this brief structural change is regarded as one of Heuser's major contributions, a result of collaborations that brought together his technique of quick-freezing with other researchers' techniques for studying brain electrophysiology.
The interior of a liver cell shows the many honeycomb buds that such cells create on their surfaces as they take in the noxious substances that they filter from blood. Looping among these so-called clathrin-coated buds are supporting filaments.

Heuser's freezing press is abruptly dropped down onto the ultra-cold copper block with a resounding slam. Despite this seemingly crushing blow, the sample remains undisturbed because its freezing occurs as fast as the speed of sound travels into it.

"This method of arresting biological change is like using a stroboscopic flash to catch an action photograph," says Heuser. "Like a strobe, it stops the biological event in midstream, freezing it in roughly one ten-thousandth of a second."

Because a frozen sample cannot be visualized directly in the electron microscope without melting it, Heuser next makes a 'replica,' or copy, of the sample while it is still frozen by depositing an extremely thin film of metallic platinum onto its surface. The platinum molds snugly against the surface contours of the sample, creating a topographic-map-like rendering of its surface. The replica then can be viewed in a standard transmission electron microscope and lasts forever. Although they appear thin and airy-looking to the eye, the final photomicrographs, which are obtained at magnifications typically as high as 300,000x, portray a world of detail and three-dimensional relief that reaches the molecular level, the fundamental level of biological architecture.

To enhance his replicas' surface relief, Heuser often.
RIGHT: The image provides a deep-etch view of the interior of a cell lining the inner surface of the gut. Food absorption is aided by the many narrow surface-projections that extend into the gut (upper right corner). The projections are supported by dense bundles of actin filaments inside them, as well as by faster, tangled vimentin filaments deeper inside the cell (lower left).

BELOW: A thin slice through an average white blood cell reveals a portion of its dark nucleus (upper right) and the curled array of membranes that form its export-center (its so-called Golgi apparatus). Here the Golgi is partially filled with darkly stained antibodies that the cell will secrete in its fight against infection.

Other electron microscopists use more traditional treatments and preparations for electron microscopy, such as chemical fixation, which is comparable to "embalming" biological samples. Heuser says that these techniques damage samples and are so slow to act that they defeat his attempts to look at biological processes that happen very quickly.

Since his studies center mainly around understanding brain function, Heuser needs a much more rapid method of structural arrest. In fact, by quick-freezing frog muscles within which tiny motor nerves excite contraction, he and colleagues in San Francisco demonstrated how nerve cells communicate with their environment by explosively secreting excitatory chemicals into their environment that diffuse away and affect neighboring cells. But this tiny explosion, or expulsion, of chemical takes only about a thousandth of a second to occur.

"We had to develop a freezing method that would be faster than this event, or we'd never be able to capture it and see it in the electron microscope," says Heuser. "That's how I got pushed into developing a freezing machine."

Through the years, Heuser has continued to improve his freezing techniques. He estimates that more than 100 laboratories worldwide have acquired copies of his equipment and are attempting to perform the technique of quick-freeze, deep-etch electron microscopy. However, because the process remains "a little tricky," a stream of interesting samples involving all facets of medical research continues to pour into his laboratory, and Heuser continues to prepare deep-etch images for other researchers throughout the world.
Taking A Stand On U.S. Health Care Policy

by David Shih WUMS II

I SPENT this past summer in Washington DC as part of the American Medical Student Association's Washington Health Policy Fellowship Program. Fifteen medical students were selected from a national applicant pool and then placed in congressional offices, public health advocacy organizations, federal agencies and research institutes.

I was placed at the Agency for Health Care Policy and Research, a federal agency charged with performing health services research. I took on the controversial and timely topic of medical savings accounts (MSAs). I focused my analysis on the nonelderly private insurance market. At the time, the Kassebaum-Kennedy bill was being debated in Congress. The bill, signed in September by President Clinton, attempted to provide employees with greater insurance portability by limiting the use of pre-existing medical condition clauses in health insurance plans. Republicans wanted amendments to allow for MSA tax deductions, which was a particular bone of contention between the two political parties.

Traditionally, the health insurance purchased through employers has been a form of untaxed employee compensation; it is not included in gross income calculations. As a result, workers encouraged their employers to purchase comprehensive low-deductible insurance plans. Individuals who must pay for health care expenses out of pocket — such as the self-employed, service industry workers and small business owners/employees — are at a tax disadvantage compared to those then have the incentive to ask their employers to purchase less expensive, high-deductible insurance and deposit the premium savings into a medical savings account. Health care costs up to the insurance plan's new higher deductible could then be paid tax-free from the employee's MSA.

It has always been legal to set up a savings account from which individuals could earmark funds toward health care. However, in the past there were no federal tax incentives available for doing so. Most MSA proposals require that the individual purchase a high-deductible insurance plan as a contingency for catastrophic illness and recommend taxes and penalties on non-health care MSA expenditures to provide incentives for using the funds exclusively for health care expenses.

I tried to design a compromise proposal of my own based on both policy and political considerations in as objective a manner as possible. I did this by reviewing the health economics literature and then meeting with various legislators and interest groups on both sides of the issue. Advocates of medical savings accounts argue that they provide incentives to slow the growth of...
I tried to design a compromise proposal of my own based on both policy and political considerations in as objective a manner as possible.

A common criticism of MSAs is that they merely create a tax shelter for the wealthy. Although they are nominally known as medical savings accounts, there is little mention of how to restrict the manner in which MSA funds may be invested. As a result, the affluent can direct the funds toward high-risk, high-yield ventures using the MSA as a tax-shield, and gain a tremendous tax advantage. The purpose of an MSA tax deduction is to encourage people to purchase health care frugally. MSAs were never meant to be general growth and retirement funds. The dollars that are put into an MSA would otherwise have contributed to low-deductible insurance premiums.

For these reasons, I recommended that insurers enrolled under an MSA plan be permitted to invest those funds only in ventures with comparable security to that of an insurance company. In other words, as long as an entity guarantees the MSA to the equivalent standard of a health insurance company guarantee, the funds may be invested in any way that the individual sees fit. This would curb the return on MSAs, reducing the inequalities of the tax shelter. It is justified since the MSA should be at least as risk-free as a health insurance plan.

There is concern that MSAs will discourage patients from seeking necessary or preventive care in hopes that they will be able to keep the money left over in the MSA at the end of the year. I suggested that a set-aside spending allowance be included as a requirement for catastrophic insurance to be MSA-eligible. This feature would work by providing each enrollee with a fixed dollar amount paid through premiums each year which he or she can use as first-dollar coverage on any preventive service. If the enrollee did not use the allowance by the end of the year, the sum would not roll over to the next year. The use-it-or-lose-it nature of the proposal would encourage patients to seek preventive services they were interested in.

Ultimately, I concluded that MSAs could be somewhat useful for health care financing under certain conditions. However, they would by no means serve as a panacea for the ills of the American health care system.

Editor's note: David Shih is from Lake Forest IL, and hopes to study health economics next year at the University of York in England. He plans to submit part of his paper to the Journal of the American Medical Association, in response to an article it published last June which looked at adverse selection with MSAs.
Securing A Society Of Sound Medical Health

by Will R. Ross, MD

Concerns with access to quality health care routinely cross racial, cultural and socioeconomic divides, but they are most stridently expressed in defense of society’s most vulnerable: our children and elderly, the indigent and the uninsured. These concerns are heightened with increasing discussions of federal limits in the growth of Medicare and Medicaid, constraining some of society’s most effective safety net programs. Medicare cutbacks of $100 billion or more over the next seven years have been discussed, while reductions in Medicaid of $50 billion over seven years are probable.

Reductions in funding for Medicaid without commensurate increases in medical insurability could leave many women out in the cold, according to the new Commonwealth Fund report titled, “Medicaid’s Role in Insuring Low-Income Women.” The report states that even with continued Medicaid funding, almost one-third of low income women are uninsured, and nearly two-thirds of women leaving Medicaid become uninsured. Such reports question our commitment to provide security to the weakest members of society. Of the relevant stakeholders in the current debate on health care reform, politicians, medical institutions and health care professionals are distinctly more visible. It is the last of these that are governed by a code of ethics which ostensibly links their actions to society’s achievement of sound medical health.

While it is imperative to constantly challenge our government to restore a sense of security to the providers acknowledge the social and economic ills affecting an at-risk population and engage in comprehensive treatment plans that encompass social, economic and medical remedies.

The social ills afflicting minority communities are many. A reflection on these manifold problems identifies the root cause of poverty and feelings of powerlessness. In August 1985, the report of the Secretary’s Task Force on Black and Minority Health noted that minorities experienced approximately 60,000 “excess” or preventable deaths annually. The major contributors to the disparity between black and white death rates identified in the report were cancer, cardiovascular disease, stroke, diabetes, chemical dependency, homicide and infant mortality.

The issue of poverty, powerlessness and poor health interrelate in the inability of the poor to purchase health care in a system rooted in free enterprise. One-third of all black households have incomes below the poverty line, and almost half of all black children live in these families. More than 60,000 African American children live in poverty in the St. Louis metropolitan area. Of the estimated...
40 million Americans without health insurance, blacks account for 10 percent of the total. In practical terms, one out of three blacks has no health insurance, and two out of three blacks have inadequate insurance. In Missouri alone, an estimated 600,000 residents lack health insurance, including 160,000 children.

Though improved, health status disparities between blacks and whites are still glaring. The U.S. Department of Health and Human Services reports that infant mortality is two-to-three times higher in blacks than whites, which holds true in the most recent Missouri Vital Statistics Data, from July 1996.

Out-of-wedlock pregnancies perpetuate the cycle of poverty and poor health. As cited in the March 1996 St. Louis Urban League Report, "State Of Our Children," the birthrate among African American females ages 15 to 19 was 135 per 1,000 — almost three times the birthrate among white American females in the same age group. In 1993, almost 98 percent of African American teenagers were unmarried at the time they gave birth. According to the 1991 Project Respond report, about 60 percent of teenage mothers come from families with incomes of less than $14,800 per year.

In general, compared to white patients, minorities report more difficulties getting into the health care system and greater dissatisfaction with the medical services rendered. A detailed national survey conducted for the Commonwealth Fund found that minority Americans do not enjoy equal health opportunities. Thirty-one percent of minority Americans aged 18 to 64 do not have insurance, compared to 14 percent of white adults in the same age group. Minority adults were nearly twice as likely to have "very little choice" or "no choice" in where they receive health care, with 29 percent of minority adults saying they have limited choices about where to get health care, usually because they lack insurance, are Medicaid recipients or are unable to pay. This compared to 16 percent of white adults. Preventive care also was received less frequently by minorities. Twenty-nine percent of minority adults did not receive blood pressure tests, pap smears or cholesterol readings.

The unacceptable health status of minorities can only be corrected by those who accept the principle of social accountability and move expeditiously to inject relevance, cost-effectiveness and equity into the current health care delivery system. A multifaceted approach to accomplish these ends involves:

- Improving access to health care and reducing its cost;
- Promoting individual responsibility for seeking primary preventive health care and urging less dependence on expensive emergency care;
- Increasing the number of minority and other culturally sensitive primary care physicians and specialists, and recruiting them to urban and medically-underserved areas;
- Increasing the awareness of health problems in minorities and focusing more on preventive medicine;
- Providing clinical outreach services and public/private partnerships of safety net institutions in medically-underserved areas;
- Recruiting culturally sensitive physicians to large urban areas is increasingly difficult. About 40 percent of underrepresented minority graduates indicated that they planned to practice in a health service shortage area. However, the American Association of Medical Colleges (AAMC) 1995 Report on Minority Student Facts showed that in the past decade the number of underrepresented minority graduates has increased only marginally to 1,427 from 1,224. In the academic community, less than 4 percent of full-time faculty are from underrepresented minorities.

This leads to an important question: How do we increase the awareness of health problems in a group of people that has not had uniform access to basic health care and that has few culturally sensitive individuals to deliver that care? Several ongoing initiatives address this point, including the AAMC's project 3000 by 2000 which focuses on increasing the number of underrepresented minorities entering the medical profession, as well as the National Health Service Corps Scholarship Program and Missouri's PRIMO program which rewards those who practice in underserved areas with loan forgiveness and yearly stipends.

As a medical community, we must begin to realize and appreciate the wealth of professional talent and untapped role models that can be used to address the myriad problems in our health care delivery system. The stalwart group of dedicated health care providers America has always relied upon is still in the trenches. Now is a time for their greater visibility and the even greater commitment of our profession as we endeavor to address the many health care inequities in our community and our country.

Editor's note: Will R. Ross, MD '84, is associate dean and director of Diversity Programs at the School of Medicine.
Second Century Award Winners Honored

The Second Century Award celebrates the advent of the second hundred years of excellence in research, teaching and patient care at the School of Medicine. The awards for 1996 were presented at a gala dinner held at St. Louis' Ritz-Carlton Hotel on Oct. 4. Honorees for the year were William H. Danforth, MD, Irene E. Karl, PhD, and Michael M. Karl, MD, and David M. Kipnis, MD.

"Though pursuing very different career paths, this year's Second Century awardees have held to and espoused highest academic principles, having held a major and doubtless lasting impact on the institution and far beyond, and are extremely successful," says William A. Peck, MD, executive vice chancellor for medical affairs and dean of the School of Medicine.

William H. Danforth, MD, is chairman of the board of trustees of Washington University and co-chairman of the board of Barnes-Jewish Hospital. He served for 24 years as chancellor of the University, retiring from that position in 1995. Prior to becoming chancellor, he spent six years as vice chancellor for medical affairs and president of Washington University Medical Center.

Danforth, who was appointed professor of internal medicine in 1967, was named chancellor of Washington University in 1971 and became one of the country's most respected academic leaders. During his tenure, the university attained national and international recognition, greatly increased the number of student applications, enjoyed a significant growth of the University endowment and saw the construction of many new facilities.

Irene E. Karl, PhD, research professor of medicine, and Michael M. Karl, MD, professor of clinical medicine and former director of clinical affairs in the Department of Medicine, have been esteemed faculty members at the School of Medicine since 1959 and 1950, respectively.

Irene Karl holds a doctorate in biochemistry from the University of Wisconsin and is known as an authority on muscle metabolism. She has published more than 100 papers in prestigious peer-reviewed journals and is currently doing research in the area of sepsis. She is a member of Phi Beta Kappa and Sigma Xi honorary societies and a number of professional organizations.

Michael Karl received his MD degree from the University of Louisville. After residency at St. Louis City Hospital and a fellowship in cardiology at Washington University, he began practicing in 1946, the same year he introduced needle biopsy of the liver. A diplomate of the American Board of Internal Medicine, Karl is also a member of the Institute of Medicine of the National Academy of Sciences and a Master of the American College of Physicians.

The Irene E. and Michael M. Karl Professorship in Endocrinology and Metabolism and the Michael and Irene Karl Lectureship, part of the Masters of Medicine Series, are named in their honor.

David M. Kipnis, MD, is Distinguished University Professor of Medicine and professor of molecular biology and pharmacology at the School of Medicine.

Kipnis came to Washington University in 1955 and joined the faculty upon completing an American College of Physicians Research Fellowship under Nobel laureate Carl F. Cori, MD.

From 1973 to 1992 he served as chairman of the Department of Medicine, during which time he led the department to a reputation as one of the world's foremost academic centers for clinical training and research.

He helped to craft and still directs the Washington University/Monsanto Biomedical Research agreement, the largest corporate/university research collaboration in the country and the source of nearly $100 million in research funding.
**Dates Set For Medical Alumni Reunion**

R EUNION class chairmen and alumni relations staff are busy with plans for the annual reunion May 8-10, 1997, which will begin with registration at noon on Thursday, May 8, in the Eric P. Newman Education Center. Among the activities will be scientific sessions each day featuring a number of speakers from reunion classes. The welcoming cocktail party will be held on Thursday night; the individual class dinners on Friday night and the alumni awards banquet on Saturday night. The reunion hotel will be the Ritz-Carlton in Clayton. Registration materials with a detailed schedule will be mailed in January.

Reunion class chairmen are:

- **Class of 1937:** Robert C. Kingsland, MD, social and gift chair
- **Class of 1942:** Robert Royce, MD, social chair
- **Class of 1947:** Aza Jones, MD, gift chair
- **Class of 1952:** Roger Gendron, MD, social chair
- **Class of 1957:** Jack Kayes, MD, social chair
- **Class of 1962:** Gerald Medoff, MD, social chair
- **Class of 1967:** Ira J. Kedner, MD, social chair
- **Class of 1972:** Albert Van Amburg III, MD, social chair
- **Class of 1977:** Harlan Muntz, MD, social chair
- **Class of 1982:** Barbara Herrick, MD, social chair
- **Class of 1987:** Laura Beinert, MD, social chair
- **Class of 1992:** Gregory Barr, MD, gift chair

**Rappaport Issues Challenge To 1997 Reunion-Goers**

T O encourage participation in the School of Medicine Annual Fund, Allan H. Rappaport, MD '72, JD, has initiated the Rappaport Challenge and will match all gifts from alumni celebrating a reunion in 1996-1997 on the following basis: All gifts to the Elliot Society will be matched $2-for-$1; all other gifts will be matched $1-for-$1.

The Rappaport Challenge will match gifts according to these terms up to a total of $100,000 in matching funds.

Dr. Rappaport, who is active on behalf of Washington University as a volunteer in the San Francisco Bay area, is a longtime member of the School of Medicine’s Elliot Society. He is the founder and chairman of National Emergency Services (NES), headquartered in Tiburon CA, a firm that is responsible for staffing more than 300 hospitals and military facilities in the United States, Europe and Central America.

For more information on the Rappaport Challenge, contact the Office of Alumni and Development Programs, Campus Box 8509, 4444 Forest Park Ave., St. Louis MO 63108-2259 or call (314) 286-0086.

**New Scholarship Fund Established**

A NEW foundation that will support scholarships for medical students pursuing careers in internal medicine or family practice recently has been established at Washington University.

The new Dr. Lee B. Harrison and Virginia G. Harrison Memorial Student Fund will provide an estimated $150,000 per year for medical student scholarships. The Harrisons established the Dr. Lee B. and Virginia G. Harrison Trust, which, upon their deaths, provided for the creation of two foundations: the student scholarship fund and the Dr. Lee B. Harrison and Virginia G. Harrison Memorial Medical School Fund, a smaller foundation that will support curriculum development at the School of Medicine.

Scholarship recipients will be selected annually by an awards committee composed of William A. Peck, MD, executive vice chancellor for medical affairs and dean of the medical school; John P. Atkinson, MD, professor of medicine and molecular microbiology; and Alison J. Whelan, MD, assistant professor of medicine.

Lee B. Harrison received his MD degree from the School of Medicine in 1927. In 1932, he became an assistant in clinical medicine and also served as an instructor in emergency medicine. He had a private practice in internal medicine for 47 years. He died in 1990; his wife, Virginia G. Harrison, died in 1995.
Class Notes

'20s

Gretchen Tanner Suggs, NU '27, writes that she still lives alone at age 90. She spent 60 years in nursing, mostly pediatric, and had wonderful experiences and much satisfaction in her career.

'30s

Ruth Danielsen, NU '34, at age 85 says she doesn't get around much any more, but thoroughly enjoys Outlook and loves to keep up with all the latest in medicine.

Edgar L. Engel, MD '36, retired in 1985 at the age of 77, and his son, Edgar L. Engel, Jr., MD '82, took his place at OB & GYN Associates, Inc., in Evansville IN.

'40s

M.D. Bishop, MD '40, and his wife, Norma, have six children, 11 grandchildren and three great-grandchildren. They are retired and live in Ferguson MO with four dogs.

Renate (Liebmann) Vambery, OT '40, has retired in Chicago and writes about retirement, health care and the Holocaust, and is involved in social justice causes.

Hugh E. Stephenson, Jr., MD '45, was appointed curator of the University of Missouri Systems by Governor Mel Carnahan in June 1996.

Richard Tucker, DMD '46, has been named 1996 Distinguished Alumnus by the Washington University Dental Alumni Association. He has a private practice in Ferndale WA, where he is working to perfect and innovate gold-casting procedures.

Mary R. Devous, NU '48, enjoys retirement in Arizona. She loves having the opportunity to travel and looks forward to the next reunion of the Washington University Nursing Class of April 1948.

Georgia Lee Miller Johnson May, OT '48, writes that since the death of her husband, Dr. Rollo May, she has been active on the board of trustees at Saybrook Institute, which he founded with Abraham Maslow, Carl Rogers and others of the original Humanistic Psychologists. She is also on the advisory board of the Rollo May Center for Humanistic Studies and has a private practice in Tiburon CA. She is the mother of three and grandmother of eight.

'50s

Mildred Ramsey, PT '50, was the national winner of the Colonel's Way Award for community services. She lives in Hawaii.

James H. Dunley, MD '51, retired after 40 years from his practice at the Fairfield Clinic, Fairfield IA. He has been involved in family practice, surgery and anesthesiology and was clinical assistant professor at the University of Iowa School of Medicine.

Samuel E. Guyer, DMD '52, received the George H. Moulton Award for Outstanding Achievement in the Art and Science of Fixed Prosthodontics from the American Academy of Fixed Prosthodontics. Guyer, who was a member of the Dental School faculty for more than 30 years, served as clinic director of the school, chairman of the Department of Restorative Dentistry and professor of crown and bridge prosthodontics. He resides in Chesterfield MO.

Edgar Draper, MD '53, is professor emeritus at the University of Mississippi, Jackson. He feels good and his new hobby is "birding." He has converted his patio to an outdoor aviary. He also enjoys duplicate bridge.

Muriel MacKallor, OT '53, has moved to El Granada in northern California. She works at Arthritis Center Mills-Peninsula Health Services.

'60s

Ulrich B. Jacobsohn, MD '54, became a diplomate of the American Board of Psychiatry and Neurology with special qualifications in forensic psychiatry on July 1, 1996.

Harriet S. Kaplan, MD '56, received the 1996 Silver Knight of Management Award from the Harbor-UCLA chapter of the National Management Association. The award is the highest honor presented by an NMA chapter. Kaplan, who is in private practice, is an associate clinical professor of psychiatry at UCLA School of Medicine and chairs the board of directors of the Harbor-UCLA Research and Education Institute (REI) in Torrance CA. REI manages more than 400 research and education grants and contracts designed to advance the health and quality of life for people worldwide.

Frederick H. Taylor, HS, retired Nov. 1, 1995, after a 41-year career in thoracic-cardiovascular surgery in Charlotte NC. He moved to St. Simons Island GA and is busy with golf, ceramics and sculpture.

Judith A. Barker, PT '60, and her husband enjoy their two granddaughters, Olivia Kate, 20 months, and Sarah Elizabeth, 17 months. They enjoy bicycling and have just purchased a tandem bicycle.

William Gondring, MD '62, began the Heartland Honduras Foundation for the medical clinic in Yoho Department of Honduras in August. He treats patients at Santa Lucia, Coyoito and San Isidro. This was done under the combined auspices of the Jesuits parish and the Honduran government.

John D. Rich, MD '62, was elected president of the Aurora-Adams County, Colorado Medical Society for 1996.

Robert Palmer, MD '64, is chief of staff at St. Mary's Medical Center in Walla Walla WA. He moved into a new home in August.
and is looking forward to retirement in a few years.

Edward R. Ragsdale, MD '64, has passed the examination of the American Board of Radiology for the Certificate of Added Qualifications in Neuroradiology. He currently serves as department chairman for medical imaging at Alton Memorial Hospital and as medical director of the Twin Rivers MRI Center in Alton, IL.

David Dunner, MD '65 has been named editor-in-chief of Comprehensive Psychiatry, effective Jan. 1, 1997.

Sara Battersby Hall, OT '69, is a certified hand therapist and is working full-time. She collects textiles and beadwork and restores old Indian beadwork. She has two teenage boys, and she and her husband are avid golfers.

'70s

Leslie Denbo Perlman, OT '70, is a partner with Western and Southern Preferred Cos., an international insurance marketing company.

William G. White, MD '73, is still in solo family practice, including home births. He enjoys singing in a chorus. His son, Paul, entered WUSM this year. Dr. White has fond memories of his classmates and of the University of Tennessee.

William W. Foresman, Jr., HA '74, moved his company, Vision-Will, to Woodcliff Lake, NJ, where he is managing director of Marc Physical Therapy Sports Medicine. He is also regional manager of northeastern states for TVC, an orthopaedic product-based company in Tampa, FL. He and his wife, Patrice, had their third child last November, a son, John Landrum.

'80s

Bonnie S. Hillsberg, HA '82, has received the doctor of chiropractic degree (DC) from Life College School of Chiropractic in Marietta, GA.

Patricia Lynn Roth-Gouldy, HA '83, was named "Member of the Year" by the Grand Prairie, TX Chamber of Commerce.

Erik Stene, MD '83, is medical director for the anesthesiology department at Children's Health Care Minneapolis, where he has practiced pediatric anesthesia for the past nine years. His wife and three daughters are doing well.

Michael R. Earnshaw, HA '84, retired from the U.S. Air Force on Dec. 1, 1995, and now works for Foundation Health as the area director, coastal region 10 in Vacaville, CA.

John Meredith Chamberlain, HA '85, and Debby, Jason, 13, and Frankie, 8, relocated to Odessa, TX, where John is chief operating officer at Medical Center Hospital.

Robert N. Klein, HA '86, was promoted to chief executive officer for Columbia South Pittsburg Hospital in South Pittsburg, TN, near Chattanooga.


James A. Humphrey, HA '87, and his wife, Loraine, celebrated the birth of their second child, Rachel Lauren, on May 9, 1996.

Christine S. Kushner, PT '87, reports the arrival of Megan Elizabeth, born on April 7, 1995.

Danielle J. Hrovat, PT '88, has three children, Peter, 3, Veronica, 2, and Mark, 7 months. She enjoys being a stay-at-home mom. Her husband, Dan, recently was promoted to major, which likely will mean leaving Colorado, their home of three years.

Michele Perkins, PT '88, announces their new addition, Kimberly Ann, born March 19, 1995, joining her brother Joshua.

'90s

Angela Pisel, OT '88, reports the birth of their second child, Lukas Joseph, on Nov. 28, 1995.

Jane Schleicher Lackner, OT '89, announces the birth of Michelle Christine on March 27, 1996. She joins Sam, 2.

Leonard Cohen, MD, HS, was promoted to associate clinical professor of medicine at the University of Connecticut School of Medicine. He is also a senior attending at St. Francis Hospital in its division of allergy and immunology.

Simone Cummings, HA '91, is currently working on a PhD in health policy and administration at the University of North Carolina at Chapel Hill.

David E. Alligood, HA '93, is director of patient financial services at Cullman Regional Medical Center in Alabama.

W.M. (Trey) Long, III, HA '93, has moved to Dallas and is a regional contracting manager for Managed Care Services for Texas Oncology, PA.

Sarah E. Steffee, HA '93, is the administrative director of Ambulatory Services at Texas Children's Hospital in Houston.

Cindy A. Cunningham, OT '94, is currently specializing in spinal cord injury rehabilitation at Memorial Medical Center in Springfield, IL.

Adam Gerber and Margaret Poulos, both MD '90, have moved with their daughters, Erica and Anna, to Orlando, FL. They hope classmates will contact them if they are in the Orlando area.

Joel Stuart Solomon, MD '93, says he is alive and well. He just moved to Texas to start plastic surgery training. The boots and bolo tie are on order.

Gretchen Kiener, OT '95, is a staff occupational therapist at Medical Center Hospital in Odessa, TX.
Vinay Puri, MD, HS '95, is an assistant professor in the Department of Pediatrics and Neurology at Kosair Children’s Hospital in Louisville KY.

Mary (Vogt) Ryan, PT '95, married Joseph M. Ryan on Dec. 29, 1995. They reside in Boston, and Mary is employed at Massachusetts General Hospital.

**IN MEMORY**

Thomas J. Hartford, Jr., HA '58, died Dec. 1, 1995, at his home in Santa Fe NM. He was an adjunct professor in the Health Administration Program for more than 15 years. From 1964 until his retirement in 1989, he served as administrator of St. Mark’s Episcopal Hospital in Salt Lake City. He is survived by his wife, Jane; a daughter, Jane Anne; a son, Thomas James III, and two grandchildren.

Reese Potter, MD '35, died on July 31, 1996, at the age of 88. He was assistant professor emeritus of clinical psychiatry at Washington University. Dr. Potter suffered from Parkinson’s disease. He spent 40 years in private practice in St. Louis.

Maj. Gen. (Ret) Oscar Elliott Ursin, MD '36, died in San Antonio on Aug. 13, 1996, at the age of 86. One of the Army’s leading medical authorities, he served 32 years in the U.S. Army Medical Corps in the U.S. and overseas. He received many military decorations including the Distinguished Service Medal, the Bronze Star Medal and the Army Commendation Medal with three Oak Leaf Clusters. He was preceded in death by his wife, Faythe Elizabeth (Jerry), and a son, Nikolai. He is survived by daughters, Carolyn and Marya, and two grandchildren.

Anna Elizabeth Dueker, NU '38, died in St. Louis on Oct. 4, 1996, at the age of 79. During her nursing career she worked at Barnes Hospital and the Visiting Nurses Association of St. Louis. She is survived by four children and five grandchildren.

Samuel P. Martin III, MD '41, died of lymphoma in Gainesville FL, on May 2, 1996, at the age of 80. He was emeritus professor of medicine and health care systems at the University of Pennsylvania School of Medicine. During his years at Pennsylvania, he was executive director of the Leonard Davis Institute of Health Economics, chairman of the Health Care Systems Unit of the Wharton School, and founding director of a scholar’s program for fellowship training in the social, behavioral and management sciences for board-certified physicians. His second wife, Dorothy Everett Martin, preceded him in death in February 1996. Dr. Martin’s survivors include three children, Drs. Samuel P. Martin IV, William B. Martin and Celia Martin; five grandchildren, and his first wife, Ruth Campbell Martin.

Russell L. Herdener, MD '42, died on Oct. 2, 1993. He had been a general surgeon in Vancouver WA.

George S. Loquvam, MD '42, a retired pathologist, died on July 11, 1996, at home in Talent OR.

Carl Goetsch, HS '43, an emeritus Berkeley CA gynecologist and obstetrician, died on July 3, 1996. Widely recognized for his clinical judgment and his surgical skill, he was in the forefront of the natural childbirth movement, championing practices such as rooming-in, breast feeding and allowing fathers in the delivery room. He retired from private practice and the faculty at UCSF in 1981, but continued his work with the Alzheimer’s Services of the East Bay, which he and his wife, Anne Tompkins Goetsch, MD '41, helped establish. In addition to his wife of 52 years, Dr. Goetsch is survived by four children and seven grandchildren.

Robert J. Mueller, MD '36, a well-known psychiatrist and neurologist, died in St. Louis on Sept. 29, 1996, at the age of 84. He had a private practice for 55 years at the Hampton Village Medical Center at Hampton Ave. and Chippewa Street. He is survived by his wife, Elizabeth, of Frontenac; a son, Jack; daughters, Carolyn and Patricia; and eight grandchildren and two great-grandchildren.
Stalactite-like images were created from an electron micrograph of a bundle of sperm tails that was frozen and then "fractured." The image is from a deep-etch electron microscopic study that John Heuser, MD, is conducting with his wife, Ursula Goodenough, PhD, professor of biology on the Hilltop Campus.
The changing face of Washington University Medical Center and Barnes-Jewish Hospital will become evident in the coming months as construction for the campus integration plan begins. Phase I of the proposed development, slated to begin in spring 1997, will involve the demolition of three existing structures: the Jewish Hospital garage, the Central Medical Building and the Newman Center building. This area will be the focus for a new entrance to the North Campus facilities, above which will rise the new six-story ambulatory care facility. For more on the campus makeover, turn to page 4.