Williams named to new Thomas professorship

Washington University's Chancellor Edward S. Macias, Ph.D., announced Monday, Sept. 1, that he is naming two University faculty members to the Thomas professorship in the Arts and Sciences, and Marcus E. Kling Professor of Modern Letters in the School of Medicine, as the first recipients of the new awards. The awards will honor their accomplishments and give them an opportunity to reflect on their work at this stage of their professional lives.

The University community is welcome to attend the event, which begins at 4 p.m. in the Eppley Alumni Center. A reception follows the presentations. "This is a celebration for the entire University community," said Chancellor Mark S. Wrightson. "The achievements of these distinguished members of our faculty are not only remarkable achievements in their own disciplines but in a very real way exemplify the hard work and accomplishments of people all across our campuses."

High rates of mental disorders found in Oklahoma City survivors

A new study by researchers at Washington University in St. Louis found that nearly half of the Oklahoma City bombing survivors surveyed 10 years after the explosion had at least one mental disorder. In addition to PTSD, the most common diagnoses were major depression, social phobia, generalized anxiety disorder, and substance abuse disorders.

Fractions of the human brain can be seen for the first time with advanced imaging technology in the 1997 Nobel Prize in Physiology or Medicine for their pioneering research on the connections of animal starch into sugar.

The service project, a three-hour initiative designed to introduce hundreds of freshmen to be part of 'Service First'

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Arnold Strauss elected chair of Faculty Senate Council

Arnold Strauss, M.D., Alumni Professor of Pediatrics and professor of molecular biology and pharmacology, has been elected chair of the University's Faculty Senate. The Council brings together 15 representatives from the University's eight schools and from the Faculty Senate, which is comprised of all members of the faculty. It serves as liaison between the University administration and the faculty on a broad range of issues touching virtually all aspects of campus life. Strauss is director of the Division of Pediatric Cardiology. His research focuses on how defects in particular proteins or enzymes involved in the breakdown of fatty acids cause disease. These enzyme deficiencies in humans are a major cause of Sudden Infant Death Syndrome.

This tragic event was extremely severe both in scope and intensity.

researchers surveyed 1,400 incoming students. Whether it's planting trees, painting signs and fences, gardening or picking up trash, upward of half of the University's freshmen are expected to participate in Service First, a new first-year students to community service projects in the St. Louis community experience. On Sept. 5 — the Sunday before Labor Day — students will participate in community beautification projects along three iconic scenic trails in the St. Louis area. The service project, a three-hour initiative designed to introduce hundreds of freshmen to be part of 'Service First', a new partnership between the University administration on the one hand and the faculty on the other. "It's the best route to Children's Place."

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Asteroids as namesakes
Croaz, Walker receive singular distinction

In a singular honor, Ghislaine Croaz, Ph.D., professor of earth, planetary sciences and Robert M. Walker, Ph.D., the McDonnell Professor of physics, both in Arts and Sciences, now have asteroids named for them.

Croaz’s asteroid is named (7123) Croaz — 1896 CN. Walker’s is (6372) Walker = 1986 DG. The discoverers of these bodies are famous astronomers — Carolyn Shoemaker and David J. Tholen. Shoemaker, who sent University scientists were told to name the asteroid that bears her husband’s name, Croaz.

For more information, call 314-935-6603 or by e-mail, betsy_rogers@aismail.wustl.edu.

Help for Turkey
The Turkish Student Association is mounting a campuswide appeal for donations to help Turkey in the wake of last month’s massive earthquake.

Confirmed deaths from the quake now stand at 13,000; estimates of those buried in the rubble of their homes are as high as 45,000. The quake destroyed some 125,000 buildings and left hundreds of thousands of people homeless in several industrial cities. Fifty percent of the nation’s industrial input comes from the affected area, and total damage is estimated at about $4 billion.

The Red Cross fund its relief efforts.

Getting in shape
Fall classes at the Athletic Complex are now in effect, making the gymnasiums, pool, track, tennis center and weight room available to all fall-full time faculty and staff. Faculty and staff may purchase memberships for

Public interest law
in fall series spotlight

The theme will continue into the evening, when the Service First fair will feature about 50 booths, provided by various campus service organizations and local and national agencies. "People can ask students what they do and how they’ve affected current issues and what the future might hold for different positions that need to be filled," said event organizer Stephanie Kurtzman, coordinator for campus programs and community service. At the same time, the fair will provide them with social outreach and employee information, and be a new avenue for students who may want to hear or speak with representatives.

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Campus quiz: People pass under this graceful ornamentation as they enter which Hilltop Complex building?

Friends of the University of St. Louis, 8:30 a.m. and 4:30 p.m. Monday through Friday. For more information, call 935-3220.

sponsors and children with whom they live; daily passes for guests are also available.

Members of the University’s sports teams are instructed in cardiovascular exercise and conditioning. The sports training center is at the McWilliams Fitness Center, which features Nordic Tracks, treadmills, bikes and step climbers. Memberships are available at the main office of the Department of Athletics between 8:30 a.m. and 4:30 p.m. Monday through Friday. For more information, call 935-3220.

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Scientists discover how microbe talks to mouse

By Lindy Sagen

A new imaging technique discovers abnormalities in brain's tiny vessels missed by common tests

By Barbara Rodriguez

Putting a new twist on an imaging technique, researchers now are able to identify telltale signs of blood vessels in the brain that usually are missed by traditional imaging tests. The results might lead to more appropriate treatment of children and adults affected by these rare malformations, which can cause seizures, strokes and other neurological problems if left untreated.

The brain relies on a dense network of arteries and veins to remain healthy. The arteries bring oxygen to fuel neural activities, and the veins remove waste products from the brain. There are people with webs of abnormal blood vessels in the brain that can grow larger with time, or they can rupture, sending these masses as they age. It is unknown how common the masses are because they are difficult to image and are rarely discovered until they produce neurological problems by leaking or pressing on brain structures.

Using a variation of traditional magnetic resonance imaging (MRI), School of Medicine researchers were able to obtain detailed information on blood vessel malformations in nine of 10 patients suspected of having the abnormalities. Traditional MRIs cannot detect such vessels in only seven patients and failed to provide sharp enough images to detect the extent and location of these masses.

Benjamin C.P. Lee, M.D., associate professor of pediatrics and radiology, was lead author of the study, published in the August issue of the American Journal of Neuroradiology. He also is a diagnostic radiologist at St. Louis Children's Hospital. The variation of MRI used in the study was developed by a team of investigators at the medical school's Mallinckrodt Institute of Radiology.

The new imaging method is an offshoot of functional MRI also developed at the medical school, functional MRI highlights increased levels of oxygen in vessels within active regions of the brain. By processing computer data from this technique slightly differently, investigators in the radiology department developed the blood oxygen level-dependent (BOLD) technique, which they named "high resolution BOLD venography" (HRBV).

"Potentially, you could use HRBV's very low oxygen concentrations, HRBV visualizes veins and minute vessels called capillaries that connect arteries to veins," he said. "This technique is so sensitive to the low oxygen content that it can pick up a signal that is smaller than the resolution of its images," Lee said. The structures also have low brightness, a feature that is hard for other techniques to pick up.

The researchers used HRBV in the study to view capillary The paradigm might apply to other networks of vessels leaving a tumor, or even tumors elsewhere in the body. By detecting very low oxygen concentrations, HRBV visualizes veins and minute vessels called capillaries that connect arteries to veins. "This technique is so sensitive to the low oxygen content that it can pick up a signal that is smaller than the resolution of its images," Lee said. The structures also have low brightness, a feature that is hard for other techniques to pick up.

HRBV also might one day provide a new way to image brain tumor activity, Lee said. Active regions of tumors are likely to have more vascularity to carry away wastes than inactive regions. By visualizing the entire network of veins leaving a tumor, the new imaging method could help guide the biopsy tools used to collect samples of tumors.

Try ride sharing or biking to work

Did you know that ride sharing once a week can save you up to $600 a year on gas, insurance, parking fees and wear and tear on your car? By highlighting the merits of ride sharing, the Washington University Medical Center Transportation Management Association (TMA) is sponsoring RideShare Week Sept. 13 through 17. During this week, the TMA is urging medical center employees to try an alternative to driving alone at least once. It suggests carpooling, catching MetroLink, telecommuting or biking. To receive a pledge card or for more information, call 717-0706.

School of Medicine offers mini-surgical school

Here's another chance to pursue your dream of going to medical school. Due to high demand, Washington University's Mini-Medical School is being repeated this fall from Sept. 28 through Nov. 16. The eight-week course is open to University of Washington students, employees, and the general public. It is taught on Tuesdays from 7 to 9 p.m. at the P. E. Newman Education Center, 320 S. Eddy Ave.

Enrollment this fall will be limited to 110 participants, who will be chosen from a waiting list. Medical school professors teach the sessions, which include lectures on various diseases in addition to some hands-on training. Attendees learn operating-room protocol and practice suturing techniques, tour the Genome Sequencing Center and guide minimally invasive surgical instruments using laparoscopic simulation.

Information is presented in an easy-to-understand, informal style, and there are no exams. Students are able to talk with faculty after lecture refreshments are provided.

The fee to attend mini-medical school is $65. In the spring, it will be offered again as a self-paced advanced course for those who completed the first mini-medical school. For more information or to be placed on the waiting list for future courses, call 362-9383.

Medical School faculty receive grants totaling $5 million

Numerous School of Medicine faculty members recently received $1 million or more of public funding. The grants include:

- Robert P. Mccan, Ph.D., the Alzheimer's Disease Professor and Cell Biology and Physiology professor, has received a five-year $7.2 million grant from the National Heart, Lung and Blood Institute to study how blood vessels develop in the lungs. The research might lead to treatment of high blood pressure in the lungs, a frequent cause of pulmonary hypertension.
- Rachel O. Wong, Ph.D., assistant professor of anatomy and neurobiology, has received a four-year $1.1 million grant from the National Eye Institute to examine eye development.
- Samuel H. Speck, Ph.D., professor of pathology and of microbiology and molecular genetics, has received a five-year $1.2 million grant from the National Institute of Neurological Disorders and Stroke. He will study how the Epstein-Barr virus causes long-term infections in people.
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**Exhibitions**

**Grotesques Glass Graham: Marriage of Exhibitions**

4:15 p.m. Conceit. 8 p.m. WU Chamber Orchestra. 8 p.m. Football. Men's soccer vs. U. of Notre Dame. 7:30 p.m. WU Invitational. 9 a.m. Obstetrics and Gynecology Grand Rounds. 4:15 p.m. Philosophy colloquium. Thursday, Sept. 9

**Film**

**Friday, Sept. 3**

7 and 9:30 p.m. Filmboard Feature Series. "I'm Your Man." (Also Sept. 8.) Olin Library. Room 100 Brown Hall. 935-5983.

2:00 p.m. "Ceramic Studio." (Also Sept. 6.) Barlow Hall, 4th floor, Olin Library. Room 100 Brown Hall. 935-5983.


**Saturday, Sept. 4**

3:00 p.m. "The Animal inside." Olin Library. Room 100 Brown Hall. 935-5983.

**Sunday, Sept. 5**

4:00 p.m. "The Jewish Vortex." Olin Library. Room 100 Brown Hall. 935-5983.

The season concludes April 26-27.

For more information, call 935-5715.

**Lectures**

**Wednesday, Sept. 8**


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**Reading series**

**Offerings are lyrical, historic, harrowing, humorous.**

**BY LAMOTT**

**A**

m, much like the Devil, resides in details, in the specific phrases, materials and instruments an artist chooses to house that fragile and elusive beast, inspiration. Imagine what we might learn tuning a fortepiano with Mozart’s own tuning point with Titian, or listening to the cadence of Shakespeare’s voice, actuating the opportunity for thinking provided by the International Writers Center’s Reading Series, now in its seventh year. Presented by the University’s International Writers Center in Arts and Sciences, the program brings some of the world’s finest poets and fiction writers to St. Louis audiences, readings vary as varied as their works — lyrical, historic, harrowing and humorous.

The 1999-2000 season opens Oct. 5, with American fiction writer Rickil Dukornet, author of a trilogy on the elements — the novels: "The Stain," "Eating Fire," "The Fountains of Nepturn," and "The Jade Cabinet"— as well as "The Complete Butcher’s Tales," "Shphonot in Dreamland." "The Word Desire" and "The Pan-Maker's Inquisition." Author Amy Tan calls Dukornet "...a moral sensualist, a writer's writer, a master of language — a unique voice." Dukornet was a finalist for the National Book Critics Circle Award in 1994 and holds a B.A. from the Lannan Literary Fellowship in 1993. She has lived in North Africa, South America, Canada and France and is currently professor of the School of Literature at the University of Denver. She will be introduced by Carl Phillips, associate professor of English and American studies, both in Arts and Sciences.

On Jan. 25, 2000, the series will present fiction writer Caryn Phillips, who was born in St. Kitts and the West Indies in 1965. Her short story collections include "Ocean of Words," winner of the PEN/Hemingway Award for Fiction, and "Under the Red Flag," for which he won the Flannery O'Connor Award for Short Fiction. He also has published two books of poetry, "Between Sciences" and "Facing Shadows," as well as the novel, "In the Pond and Waiting." James Carroll writes that Phillips is "...as beautiful as a Boston Glober," said, "...trains evocative, a particular life in China, yet states his characters intimately. In this way, literature as a means, an end, every time, is the only political function of art." Phillips is the recipient of three Pushcart Prizes and a Guggenheim Fellowship and currently teaches English at Emory University in Atlanta. He will be introduced by Carl Phillips, associate professor of English and American studies, both in Arts and Sciences. Phillips will be introduced by Carl Phillips, associate professor of English and American studies, both in Arts and Sciences.

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Need a rental car? Check out University's new Enterprise deal

BY CHRISTINE FARMER

Faculty, staff and students can now take advantage of a new partnership between the University and Enterprise Rent-A-Car to rent vehicles at a discounted rate for business and personal use in the St. Louis area.

"It's a non-exclusive agreement with Enterprise and other agencies, but the negotiated prices with Enterprise are significantly less than prices quoted at other agencies," said Mark Siedband, director of operations.

Discounted corporate use ranges from $25.20 for a subcompact car to $52.50 for a luxury car to get to and from campus. Enterprise offers rates of 862-4466 and use the University's corporate rate code 998 for business travel. For personal use, the rate code is GEO 999.

"We've really excited about this partnership with Enterprise," Siedband said. "Students will have more travel options, since 18-year-olds can rent vehicles, and faculty members have already taken advantage of the agreement for field trips and other academic functions. Moreover, Enterprise will deliver vehicles to campus for free.

The partnership also can help save the University money depending on the distance traveled. "If it would cost the University less for an employee to rent a vehicle from Enterprise rather than receiving reimbursement for the use of a personal vehicle at 31 cents a mile, some travel is allowed," Siedband said.

There is a restriction for faculty, staff and students renting 15-passenger vans. Vans are very large and driving them is unlike a driving a regular vehicle, a brief safety session is required before rental. Safety coordinator Paul Langard conducts the sessions, and appointments can be made by calling him at 935-5699. Fleet members are prohibited from driving 15-passenger vans.

For more information about the agreement, call Siedband at 935-8667.

Public, professional issues topics of lectures

Josephine Nieves, executive director of the National Association of Social Workers (NASW), will discuss what the future holds for the ever-changing social worker profession at 1:10 p.m. Sept. 16 in Brown Hall Lounge, at the George Warren Brown School of Social Work.

The presentation is part of the school's fall lecture series, which also includes discussions by William H. Danforth, Washington University chancellor emeritus; Charles Bordui, professor of psychology at the University of Missouri-Columbia; Ernesto Cortes Jr., director of the Texas Industrial Areas Foundation; and Connie Vance, dean of the School of Nursing at the College of New Rochelle, New York.

All series lectures are free and open to the public. They take place in the lounge at 1:10 p.m. in Brown Hall Lounge. The speakers and their topics are:

- Sept. 16: "Continuities and Changes in a Dynamic Profession," by Josephine Nieves, Ph.D., DSW, executive director of NASW, the largest organization of professional social workers. A staunch advocate for the well-being of individuals, families and communities, the 155,000-member organization works to promote and protect the practice of social work.
- Oct. 21: "Lessons from the Desegregation Experience: Issues in Community Development," by William H. Danforth, vice chairman and retired chairman of the University Board of Trustees and chancellor emeritus. After 24 years as chancellor of the University, Danforth agreed in 1996 to serve as court-appointed mediator on the long-running St. Louis public school desegregation lawsuit. He recently helped settle the tumultuous case.
- Nov. 11: "The Promise of Multisystemic Treatment: New Directions for Clinical Practice," by Charles Bordui, Ph.D., a member of the psychology faculty at the University of Missouri-

Sports Section

Men's soccer hosts MacMurray opener

The men's soccer team had the honor of opening the 1999-2000 athletic season yesterday.

MacMurray College at 7 p.m. Wednesday, Sept. 1, at Francis Field. The Bears, 1-1-2 and third in the NCAA Division III tournament qualitative in 1998, struggled to score goals last season but advanced to the postseason for the 15th time in school history with the help of a stingy defense.

WU will host a 6-4 campaign last season, return 58 athletes to a successful season that ended with an NCAA tournament appearance.

The football team kicks off its 1999 season with a home game against Amherst College on Saturday.

The right foot of sophomore forward Casey Lien is an explosive weapon in the Bears' men's soccer arsenal. Lien drilled a team-high 10 goals in 1998.

WU's men's and women's cross country teams open the 1999 season at the Southern Illinois University-Edwardsville Invitational at 5 p.m. Saturday, Sept. 4.

The men's team returns six of its top eight runners from a team that finished just one point shy of qualifying for the NCAA West Regionals. Leading the way are All-America honoree Nathan Herschberger, who also qualified for nationals. The youthful team is looking to build on the success of last year.

Women's soccer opens

The women's soccer team begins its second decade of play in 1999 aiming to capture a first-ever NCAA Division III national championship. WU returns nine starters from the 1998 squad that tied a school record for wins with a 17-3-1 record, advanced to a second-consecutive NCAA tournament quarterfinal and amassed nearly every offensive school record.

The Bears set new marks for goals, assists and points and established a record 12-month winning streak in the process. Not to be outdone, the Bear defense tied the school record for shutouts in a season with 11. WU will take on Carroll College at 5:30 p.m. Friday, Sept. 3, following by a matchup with Anderson University at noon Saturday, Sept. 4.

Cross country opens at Edwardsville meet

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Tomorrow's leaders
Freshmen Michael Radine and Yasmin Hakim take part in orientation events for the new Washington University International Leadership Program in Arts and Sciences. As part of orientation, the incoming students "played World Game," in which each player represents a part of the planet's populace. The objective was to assess their situation, make realistic trade-offs through trading and purchasing, solve their region's problems by interacting with each other and identify the best solutions for local and global problems.

William
Respected scholar named to chair — from page 1

in medieval studies from the same institution in 1974. She joined the Washington University faculty in 1975 as assistant professor of Germanic languages and literatures and of comparative literature; she was named associate professor in 1981 and professor in 1986.

In 1989, Williams was named associate provost, a position she held until 1995, when she became associate vice chancellor. In 1997, she was given the additional title of special assistant to the chancellor for academic affairs. A scholar of the early modern period (1450-1700), she has taught undergraduate and graduate courses on a broad range of topics in language, literature, and culture. As part of her recent research, Williams has been interested in the relationship between magic and witchcraft and juridical and political power in German and French texts from the Middle Ages to the 17th century. Her 1995 book, "Defining Dominion: The Discourses of Magic and Witchcraft in Early Modern France and Germany" (paperback 1999), was translated into German and published in 1998. She has co-edited four volumes and published over 40 articles in books, journals and reference works.

Williams has been a visiting lecturer/professor at the University of Lancaster in Switzerland and at the University of Tübingen in Germany. She was named a fellow at the Institute for European Cultural History at the University of Augsburg, Germany. She has held research awards from the Herzig-August-Bibliothek, Wittenbittel, Germany; the National Endowment for the Humanities, and the German Academic Exchange Service. A recipient of a Fulbright Senior Research Grant, she also has received grants from the West German government, the Center for Information Research in St. Louis and the Missouri Humanities Council.

From the beginning of her career at the University, Williams has been an active participant, contributing to its development programs. She was chair of the Department of Germanic Languages and Literatures from 1986 to 1987 and from 1988 to 1992 and as director of the Graduate Program in German from 1997 to 1999. She also has served on various committees of the Medieval and Renaissance Studies and Linguistics Studies programs in Arts and Sciences and was chair of the Year Abroad Task Force which recently completed its work.

She was instrumental in establishing the International Writing Program and in executive committee she currently serves on.

The Thomases are both enthusiastic University supporters. Barbara distinguished Arts and Sciences alumnus who graduated in 1976 with a degree in drama. Following several acting jobs, a year of graduate work in drama and a graduate degree in business, she entered the corporate world and is now senior vice president and chief financial officer of Time Warner Sports/ESPN Sports. She credits her undergraduate work in Arts and Sciences for her success in the business world, citing the critical thinking and problem-solving skills she learned in math, English and foreign language courses, as well as the confidence, self-esteem and teamwork developed in her performing arts courses.

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Oklahoma
Disorders frequent in wake of blast — from page 1

Atrophic epidemiologists Lee N. Robins, Ph.D., professor of community health sciences at the University of Alabama at Birmingham, and William H. R. Sommers, Ph.D., professor of psychiatry and behavioral sciences at the University of Washington in Seattle, came to the mental health community's attention when they wrote a 1981 paper, "Post-traumatic stress disorder: a clinical and research overview." Sommers was director of the National Institute of Mental Health at the time. From 1980 to 1986, Sommers was principal investigator of a study that tracked 182 survivors of the 1981-1982"wars in war-torn El Salvador and found that 87 percent were in some way disturbed by the war, and 82 percent reported seeing someone injured or killed. About 66 percent reported they were thinking about death at the time of the explosion, and 46 percent said they were living with a family member or friend. Of the 182 survivors, 44 percent knew someone who was injured or killed in the bombing. The survivors weren't much better off after an average of six months than they were immediately after the event. Post-traumatic stress disorder in the classic psychiatric disorders was seen in disaster survivors, and some symptoms occur in just about everyone, but an official diagnosis of PTSD requires several problems.

First, a person must be exposed to an event that threatens life or limb an accident, explosion or some other threatening circumstance. After exposure to such an event, mental health professionals look for three groups of symptoms that comprise PTSD. The first group involves intrusive distressing recollections — these include flashbacks and nightmares about the event. Another group involves avoidance and numbing — symptoms include feeling jumpy, having trouble sleeping or being startled easily. The final group involves avoidance and numbing symptoms as well but the person thinks about an event, feeling distant and feeling numb, isolated from people. For an official diagnosis of PTSD, those survivor's symptoms must last for at least a month and cause distress or problems in daily life. The study also found that without avoidance and numbing, the nearly universal PTSD symptom of sleep disturbance of re-experience and hypervigilance were not necessarily associated with PTSD. Although survivors with those symptoms might not experience one another, re-experiences, hypervigilance symptoms also are common.

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Almost half (46 percent) reported that someone stole his computer, her identification and a wallet, containing $29, an ATM card, her driver's license, a credit card and $1 of cash. She reported a total of $150 missing. University Police also responded to Aug. 23-29.

This release is provided as a public service to promote safety awareness and is available upon request.

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"We're planning to focus on the employees who have not received a Mecklenburg County employee ID card, her identification and a wallet, containing $29, an ATM card, her driver's license, a credit card and $1 of cash. She reported a total of $150 missing. University Police also responded to Aug. 23-29.

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Peter MacKeith appointed assistant architecture dean

Peter MacKeith, former director of the international Master Progam in Architecture at the Helsinki University of Technology in Finland, has been named assistant architecture dean at Washington University in St. Louis.

In addition to his tenure at the Helsinki University of Technology in Finland, MacKeith served as assistant and associate professor of architecture at University School of Architecture; and as an assistant professor at the Faculty of Architecture at the University of Ljubljana in Slovenia.

"We are fortunate that Peter has agreed to become our "dean," said Cynthia Weese, FAIA, dean of the School of Architecture. "His breadth of knowledge and administrative and academic experience will make a significant contribution to our work with the international Master Program in Helsinki as well as with Yale and the University of Virginia. His background as an international designer and eminent scholar of Finnish architecture also make him the perfect person for our school and for St. Louis." MacKeith received a bachelor's degree in architecture from VTT Technical Research Center in Finland. He received a master's degree in architectural engineering from the Helsinki School of Technology and a doctoral degree from the University of Technology at Helsinki. MacKeith was a Fulbright scholar in 1967 and served as a visiting professor at the University of Tennessee in 1969-1970.

MacKeith is the author of numerous books and articles, and he has been a visiting scholar at the University of Oklahoma, the University of North Carolina, and Harvard University. He has been a member of the American Institute of Architects since 1949 and is a member of the Finnish National Academy of Architecture. He has been a member of the Finnish Academy of Sciences since 1966 and a member of the Finnish Academy of Sciences since 1966. He is a member of the Finnish Academy of Sciences since 1966 and a member of the American Academy of Arts and Sciences since 1966.

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Mastering mysteries of molecular machines

Gary K. Ackers, Ph.D., biophysicist and banjo picker, leads field in study of hemoglobin

By Linda Sage

B

age 12, Gary Ackers had his career figured out. He didn't just want to be a scientist. He wanted to uncover the most basic rules of life - the molecules that control biological processes. He had been interested in biology since he was a child, checking out live potatoes, snakes and snakes from an animal "scatology" library at a local museum. Then a book by Henry Ford taught him that snakes, skunks and the like ran on biophysical principles.

Gary K. Ackers, Ph.D., biophysicist and banjo picker, is now a professor of biochemistry and molecular biophysics at the School of Medicine. As well as reducing organisms to their basic components, he reduces the components as well. "The fundamental realization that has emerged from my work is that large biomolecules, operate according to specific codes that are not unique to the system at many sites rather than into the whole molecule," he said. This now widely accepted principle has provided a new way of understanding the workings of molecules such as hemoglobin, the red protein that Ackers has studied for more than two decades.

Ackers was living near the animal lending library in Oakland, Calif., because his father had found work in a World War II munitions factory. The family had left Kansas after his mother's father retired, sold his farm and drinking the proceeds among his eight children.

In Oakland and later Berkeley, the budding scientist haunted bookstores and got to know biologists at the University of California. His passion for science increased in 1953, when the discovery of the structure of DNA showed that chemistry and physics can explain even the most fundamental processes of life. The next year, the 14-year-old Ackers accepted bacteria from Calitogen's scalding springs, showed that its growth rate was a function of temperature and calculated how much energy was needed to start the reaction that limited this rate. This precocious probing earned him the coveted prize in the Bay Area Science Fair and fourth place in the national competition.

By age 18, Ackers was majoring in chemistry and mathematics. During summers, he worked in the U.S. Department of Agriculture's Plant Virus Laboratory in Beltsville, Md. To determine

bimbing of a third. In this particular system, in a bacterial virus called lambda, the researchers uncovered cooperative interactions between 40 combinations of tetracyclines.

In the late 1980s, Ackers began to establish an Institute for Biophysical Research on Macromolecular Assemblies at Johns Hopkins Science Foundation grant to train graduate students and postdocs in this field. But when a new building didn't materialize, Ackers decided to leave.

He joined Washington University in 1989 as the Raymond H. Witcover Professor of biochemistry and molecular biophysics. This department has a long and distinguished history that includes the 1947 Nobelist Carl and Gerty Cori.

"It has been a remarkable transformation of need an infusion of molecular biophysicists, however, said Carl Freedman.

"He has devoted his life to figuring out how things work. He's a visionary whose plans go far beyond where the field stands today."

Paul J. Darling III

Gary K. Ackers, Ph.D., professor of biochemistry and molecular biophysics, and his wife, Jo M. Holt, Ph.D., research assistant professor of biochemistry and molecular biophysics, examine a model of hemoglobin in their new laboratory space in the medical school's South Building.

Hemoglobin still looms large in Ackers' vision. But he's more interested in understanding how things work than in practical applications. When he began to study hemoglobin in the 1970s, people hoped it could become a blood substitute. "But that idea has taken a real beating," Ackers explained. "Recent discoveries have shown that exposing the naked molecule to the capillaries messes up both the hemoglobin and the physiology of the microcirculation."

"Hemoglobin is a useful model for large biomolecules. This fancy machine, which pick up oxygen in the lungs and release it to tissues, has 576 amino acids and 12,000 atoms. These build blocks make up four subunits, two alphas and two betas. Each half of the molecule has one of each kind.

All four subunits can bind oxygen. However, hemoglobin's affinity for oxygen is 30 times greater in your lungs than in your big toe. So this molecular chameleons can "pick up oxygen in place and give it away in others."

Scientists used to think that this changing affinity for oxygen day to day depended on the number of molecules hemoglobin had bound. But studies by Ackers and others show that affinity depends on the details of the site that gets occupied - as the molecule makes each oxygen atom, it progressively changes shape. These sites can communicate with each other, Ackers said. "So we wanted to learn more about these communications."

Finding the switch

Some scientists thought the molecule changed shape because its halves rotated. Others thought it was because the individual subunits changed shape, affecting their neighbors' ability to grab oxygen.

In the mid-1980s, Ackers obtained evidence for both types of change and showed the rules that govern the switch between hemoglobin's two stable states. His widely accepted model - the "two-state model Rule - includes eight intermediate states between the oxygen-free and fully oxygenated forms of the protein.

He now wants to know which of hemoglobin's structural features are responsible for these transitions. His long and distinguished history that includes the 1947 Nobelist Carl and Gerty Cori.

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Ph.D., the Alumni Professor and interim head of biochemistry and molecular biophysics. During Ackers' years as chair, he hired 10 new faculty and established a biophysics training program. "Gary seemed to have that unique ability to identify and hire outstanding faculty along with a sense of purpose of what would be important for our department in the years to come," Frieden said. "Consequently, we now have a nationally recognized and wonderful group of investigators. It has been a remarkable transformation and, for me, a pleasure to watch."

A patient mentor

Ackers stepped down in 1996 because he wanted more time for research and teaching. Paul J. Darling III, who is writing his doctoral thesis, said Ackers was a patient mentor who creates an atmosphere that allows people to achieve their dreams. "And he has devoted his life to figuring out how things work," he added. "He's a visionary whose plans go far beyond where the field stands today."

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