Psychotherapy treats depression in patients with diabetes

3

Filmaker Spike Lee, sociologist Renée Fox to speak here

5

Daniel E. Goldberg, M.D., Ph.D., battles the global scourge of malaria

October 29, 1998

Washington University in St. Louis

University to expand minority purchasing

Marks brings commitment, expertise to post

By Deborah Parker

One of the things that has frustrated Sandra Marks as executive director of the Minority Youth Entrepreneurship Program these past 12 years is that there are not more successful minority-owned businesses in St. Louis to offer as examples. The minority high school students enrolled in the six-week summer session at the John M. Olin School of Business should most likely look outside the St. Louis area for inspiration.

However, a newly created directorship may begin to make real-life strides that not only will revolutionize the way Washington University probably is that we've even bolstered local minority entrepeneurs to the point of beating a few field trips after all.

The newly appointed director, marked by minority- and women-owned business development for the University. The well-connected Marks, a 1983 graduate of the Olin MBA program, has run her own consulting business.

Peck is elected to institute, heads national association

William A. Peck, M.D., executive vice chancellor for medical affairs and dean of the School of Medicine, has been elected to institute, heads national association women-owned business development for the University. The well-connected Marks, a 1983 graduate of the Olin MBA program, has run her own consulting business.

Peck: Receives national honors

Peck is elected to institute, heads national association

Peck is elected to institute, heads national association

Peck: Receives national honors

Peck is elected to institute, heads national association

Peck is elected to institute, heads national association

Founders Day to honor faculty, alumni

Brookings awards going to graduates Hagemann, Moore

Four distinguished faculty will be honored at the Founders Day celebration to be held Nov. 7 at America's Center in downtown St. Louis. At the same event, the Board of Trustees will bestow its Robert S. Brookings awards on two persons who "exemplify the alliance between Washington University and its community."

Get, Colin Powell, former chairman of the U.S. Joint Chiefs of Staff, will be keynote speaker for the event, the annual celebration of the University's founding.

The Washington University Alumni Association sponsors Founders Day.

This year's Brookings Award recipients are the late Paul O. Hagemann, physician and professor at the School of Medicine, and Norman G. Moore, an architect and a pioneer in hospital design.

Alumni represent disparate fields

Six distinguished alumni, representing fields ranging from business and public policy to art and academia, will be honored at the Founders Day celebration, to be held Nov. 7 at America's Center in downtown St. Louis.

This year's alumni honorees include:

Charles A. Buescher Jr., who has had a long career in public water supplies. He joined the Northern Illinois Water Corp. in 1960, then held several positions with the St. Louis County Water Co. and its parent company, the Continental Water Co. He retired from Continental Water Co. in 1997. Buescher remains a member of the Board of Directors of Continental Water Co. and chairman of the Board of Directors of the St. Louis County Water Co.

Buescher served briefly on the

Volume 23 No. 10

Computer Science 101 appeals to more than engineers

Hundreds of students from all five undergraduate schools learn to create their own software

By Tony Fitzpatrick

This buzz among lots of undergraduate students these days is a course in the Department of Computer Science that attracts hundreds of students daily. And many who take Computer Science 101, or Computer Science 1, in the fall options in CS 101G are not majoring in computer science or computer engineering — that's 56 percent non-majors. Students from all five undergraduate divisions enroll in the course. The popularity of the course, and Kenneth J. Goldman, Ph.D., professor of computer science, lists in students' inherent curiosity about software, their immersion in personal computers and their realization of the importance of technical background in today's job market, regardless of their primary disciplines of study.

A major attraction to CS 101, which Goldman has taught since 1983, is that it not only teaches a new way of thinking, but also opens a new creative outlet — the ability to create software themselves. Goldman said, "As a loose analogy, let's say all of your life you knew how to read, but then someone comes along and shows you how to write. You can get a great sense of satisfaction from creating of your own. You think of an idea, and have it instantly come to life for you on the screen."

Goldman has spent a good deal of time and effort molding the course and making it more accessible to a broader range of students by creating a series of challenging programming projects that incorporate a lot of computer graphics. "It's not only fun to see something happening on the screen, but seeing an image of what's happening can also make it easier to figure out how to change your program to make the computer do what you really intended," he said. "Software is intangible, which is one of the

See CS 101, page 6
In and out of your life... Junior Courtney Crawford relays the student perspective to a group of parents, faculty and visitors gathered in Mallinckrodt Center. As part of a Parents Weekend event labeled "In and Out of Your Life," Crawford, senior Emily Levy (left) and Karen Levin Coburn (in background at left), assistant vice chancellor for students and associate dean for the freshman transition, led a lively discussion exploring the delights and dilemmas of sending a child to college and the changing relationships encounters when they return home.

Awards

Founders Day to honor four University faculty — from page 1

date, he was professor emeritus of clinical medicine. For nearly six decades, Hagemann was actively involved in the Medical Center Alumni Association and chaired the school's Alumni Development Committee and its Eliot Society Membership Committee. He was the first vice chair of the Alumni Board of Governors for planned giving. Along with his wife, Hagemann established the Charlotte and Paul Hagemann Professorship in Neurology. Earlier, he established with his first wife the Paul O. and Nancy P. Hagemann Fund in medicine.

Hagemann received the University's Distinguished Alumni Award in 1984, the school's medical center's Second Century Award in 1995 and the William Greenleaf Eliot Society Award in 1996. Norman Moore, a 1933 graduate of the School of Architecture, has been a pioneer both in hospital design and construction standards. He began his career during the Depression years as an architect for government agencies, beginning with the National Park Service and the Tennessee Valley Authority and the Department of the Interior. After World War II, Moore found himself in the largest program of hospital construction in U.S. history.

In 1950, when Moore established a private practice as a hospital construction consultant, he remained in that position until 1979, he overseas planning for approximately 40 hospitals and medical facilities with his sister, the late Ruth Moore Garbe, Moore created the first endowed professorship in the architecture school in 1989. A second chair, followed, as was a visiting professorship for distinguished scholars and practitioners. Moore and his wife have continued their support with gifts including the Moore Challenge for the school's annual fund. Moore received this Distinguished Alumni Award in 1993.


Newspedia

In the cold

Students, faculty and staff at the George Warren Brown School of Social Work are participating in a blanket drive sponsored by the National Association of Social Workers to collect new or clean used blankets for elderly and disabled persons who can't afford heat. Donations from all members of the University community are welcome. There are boxes in Goldblatt Hall's student common for the drive, which will continue through Nov. 6. For more information, call 4-615.

Y classes

The Campus Y offers a variety of classes in fitness and health for Washington University students, faculty and staff as well as members of the public. Classes range from bridge to yoga and tai chi; a class in sign language is available as well. Fees vary, and University employees and students receive a discount. The schedule for fall classes is available at the Campus Y office in the east Campus Y, 800 S. Euclid Ave., or online at http://campusy.wustl.edu. For more information, call 933-5010.

Best way to care

The University and the Human Resources office extend thanks to the many faculty and staff who have returned their United Way pledge cards, and ask that those who have not done so do so as quickly as possible. If you have misplaced your card, more are readily available! Contact Blanche Edelstein, 935-4408, or the United Way, 4-7100.

Campus quiz: Whoooo and in which year? Three cheers to the students and employees who have returned pledges for the United Way. This week's prize is a Whitlock Hotel room and an American football ticket. To enter, call 935-3710, or stop by the Union. For more information, call 935-3010.

At your fingertips

The University Libraries include more than 3.2 million books, periodicals and government publications, plus a large and growing number of collections in both print and nonprint formats, in the John M. Olin Library and 12 school and department libraries. The libraries hold historical and rare materials, including the Modern Literature Collection, devoted to the study of 115 British and American writers, and the Bernard Becker Medical Library's Paracelsus Collection, regarded as the world's largest collection of works by or about Paracelsus, the 16th-century physician and alchemist.

Did you know?

Carl F. Cori, M.D., and Gerti Cori, M.D., of the School of Medicine won the 1947 Nobel Prize in Physiology or Medicine for their studies on how the body converts the storage of chemical energy. Eight other Nobelist received training under their auspices.

For more information, call 935-3010.

The event is free and open to Washington University faculty, staff and graduate students. Participants are welcome to bring their own lunch. For information, call 735-4733.

Voting for post-doctoral fellowship is being supported by the Fred Foundation's Physical and Commercial Building and Community Development. He holds a master's degree in economics and a doctorate in agricultural economics from Ohio State University, where he has worked on a study for the Ohio State University Rural Development and Economic Finance Group. He has worked as a financial analyst for the World Bank Group and has been a consultant to the African Development Bank and the African Union Commission of Inquiry into the Provision of Rural Financial Services and as a consultant to the U.S. Agency for International Development in the Dominican Republic.

Microenterprises are topics at GWB brown-bag seminar

Murray L. Weidenbaum, chairman of the Washington University Rural Finance/Microenterprises is topic for "Microenterprises are topics at GWB brown-bag seminar." He was also an assistant secretary of the Treasury for economic policy from 1981 to 1982 when he was chairman of the Council of Economic Advisers under President Ronald Reagan.

Weidenbaum was named Edward Mallinckrodt Distinguished University Professor of Economics in 1987 and was interested in studying the impact of government on business, he founded the Center for the Study of American Business in 1975, serving as director until 1991 when he became chairman. He has also served on many University committees.

Weidenbaum's areas of interest cover a range of topics. His most important publications include "Business and Government in the Global Marketplace," now in its fifth edition; "Small Wars, Big Defense;" and "The Bamboo Network," which was translated into Japanese, Indonesian and Korean.
New explorations into mind-body connections
Cognitive behavior therapy helps control depression and blood glucose in patients with diabetes

BY JIM DETRIK

Behavior therapy that occurs by involving patients in social and physical activities, teaching problem-solving skills to reduce stressful situations, identifying distorted thought patterns that lead to depression and replacing them with more positive and useful alternatives. The researchers report the findings of this first-ever controlled trial of CBT in diabetes in the Oct. 15, 1998 issue of Annals of Internal Medicine. They found that a 10-week program of therapy helped reduce depression in majority of patients with diabetes. In the months after CBT, these patients also achieved better control of their blood glucose levels.

While depression affects about 5 percent of the general population, the rate of clinical depression is between 15 and 20 percent in patients with diabetes. Untreated depression is closely associated with poor glucose control. It is also linked with diabetes treatment and higher rates of heart and eye complications. All subjects in this study had both clinical depression and diabetes. All received 10 weeks of education about diet, exercise and compliance with treatment. Half also received CBT.

After 10 weeks, depression was in remission in 17 of the 20 patients (85 percent) in the CBT group that received only diabetes education, six of the 22 patients (27 percent) went into remission in the control group.

The investigators also examined the subjects six months after treatment and found that 14 of the 20 patients (70 percent) in the CBT-treated group were still in remission, while seven of the 21 remaining patients (33 percent) in the control group were not depressed.

And while glucose control was similar in the two groups at the end of the 10-week study, glucose levels were significantly better in the CBT-treated patients when they were examined again six months after treatment. "We measured glycosylated hemoglobin, and that gives us the average glucose level for the blood over the last 120 days, and it takes some time to change that measurement," Lustman said. "But it looks as if treating


Marcus E. Raichle receives national award
Society honoring him founded in 1743 by Ben Franklin

Marcus E. Raichle, M.D., will receive the 1998 Karl Spencer Lunney Award from the American Philosophical Society at a Nov. 13 dinner at the society's annual meeting in Philadelphia. Raichle and colleague Michael I. Posner, Ph.D., a former Washington University faculty member now at the University of Oregon, will share the award for their contributions to brain imaging.

Raichle, co-director of the Division of Biological Sciences and professor of radiology, neurology and neuropsychology, and Posner, professor of psychology at Oregon, are being recognized for creating the use of noninvasive imaging to understand brain function. They are co-authors of a Scientific American volume about this topic called "Images of Mind," which received the 1996 William James Book Award from the American Psychological Association. The American Philosophical Society, the oldest learned society in the United States, was established by Benjamin Franklin in 1743 to promote scholarly and scientific inquiry. Eligible members have included John J. Audubon, Robert Frost and Charles Darwin, and more than 200 Nobel Prize winners have been members since 1901. A member of the National Academy of Sciences, Raichle and Posner pioneered the use of positron emission tomography (PET) imaging to map specific brain areas used in tasks such as seeing, hearing, speaking and remembering. Posner, one of the world's leading cognitive psychologists, added his skills to the work when he joined this effort in 1985. PET itself was developed at Washington University during the 1970s to allow researchers to study the living human brain noninvasively and to track and record its function.

Working with colleagues at the University, Raichle and Posner helped develop many of the basic techniques used today worldwide to map the human brain with PET and, more recently, with magnetic resonance imaging. These techniques are providing an increasingly sophisticated view of how the normal human brain functions. Maps of brain chemistry and metabolism complement these maps of brain function. In combination, such maps not only tell us how the brain and our behaviors are related, but also how diseases such as stroke, depression, anxiety and Parkinson's disease affect brain function.

Raichle joined the University faculty as a research instructor in 1971. He received a bachelor's degree from the University of Washington in Seattle in 1960 and a medical degree from the same institution in 1964.

Correction

In an Oct. 15 Record article about a grant awarded to Jeffrey E. Williamson, Ph.D., to develop imaging methods for the improvement of cervical cancer treatment, an editing error omitted information about two of his collaborators. Williamson is working with Donald L. Snyder, Ph.D., and Samuel E. Sachs, principal investigator and associate professor of psychiatry. "But not all are good candidates for psychotherapy, so it's important to find other ways to treat them," he said.

While depression affects 5 percent of the general population, the rate of clinical depression is between 15 and 20 percent in patients with diabetes. However, approximately two-thirds of patients who have both diabetes and depression never receive any antidepressant treatment. Depression can be very precisely hard on patients with diabetes. Untreated depression is closely associated with poor glucose control. It is also linked with diabetes treatment and higher rates of heart and eye complications. All subjects in this study had both clinical depression and diabetes. All received 10 weeks of education about diet, exercise and compliance with treatment. Half also received CBT.

After 10 weeks, depression was in remission in 17 of the 20 patients (85 percent) in the CBT group that received only diabetes education, six of the 22 patients (27 percent) went into remission in the control group.

The investigators also examined the subjects six months after treatment and found that 14 of the 20 patients (70 percent) in the CBT-treated group were still in remission, while seven of the 21 remaining patients (33 percent) in the control group were not depressed.
The Sweet Hereafter • Italian Feminist Ethics • Fingers to Toes

Everyone's invited to Bauhaus
Architecture students host campuswide programming

By ANN NICHOLSON

Students in the School of Architecture are drawing upon their design and research skills to create a Halloween tent party for the whole community that captures the spirit of the Bauhaus movement of the 1920s and 1930s.

The Architecture Student Council is sponsoring the annual event, which will be held Saturday, Oct. 31, from 10 a.m. to 1 p.m. on Sunday on the Givens Hall parking lot. This year, the students also are opening up the tent to trick-or-treaters from 6 to 7 p.m. Saturday, so community members can experience the ambiance of the 120-foot by 60-foot tent. The students are delivering letters door to door to invite youngsters for treats at 6 p.m. and keep neighborhood fully informed of the event.

Table displays emerging from investigating tent sound-proofing and heading up a community relations campaign to researching and implementing the design and construction ideas from the Bauhaus movement in architecture," said Lucia Jordan, poet, author and teacher at U. of Rochester. "This is a unique event that everyone can enjoy while learning about a fascinating period in the history of architecture."

Films

Friday, Oct. 30
7 and 9 p.m. Filmboard Feature Series "The Big Lebowski." (Also Oct. 31, same time.) Room 100 Brown Hall. 935-5983.

Friday, Nov. 6
7 and 9:30 p.m. Filmboard Feature Series "The Sweet Hereafter." (At 8 p.m. Jordan will give a reading in the Lewis Room, Frank R. Seibert Hall.) Room 100 Brown Hall. 935-5983.

Tuesday, Nov. 3
9 a.m. Filmboard Feature Series "Baron and Clyde." (Reception following.) Steinberg Hall Aud. 935-9353.
Friday, Oct. 30
7 a.m.-5 p.m. Office of Continuing Medical Education. "Third Annual Fingaz to Nanotechnology Symposium: Frontiers for Primary Care Providers." Lecture Hall Oct. 27, 7:30 a.m.-8:30 a.m. Newman Education Center. For cost and to register, call 935-4523.

Saturday, Oct. 31

Saturday, Nov. 7

November 9
3-5 p.m. Film premiere, "Military Blues." In the Gallery of Art. Free and open to the public. For more information, contact the Fine Arts Institute at 935-4650.

Tuesday, Oct. 27
11 a.m.-6 p.m. Women's National Bookstore. "The Sociology of Medicine: A Participant Observer's View." The National Women's Bookstore. Graham Chapel as part of the Assembly Series. The lecture is free to the public. For more information, call 935-4650.

Wednesday, Oct. 28
11 a.m.-5 p.m. Office of Continuing Medical Education. "Medical Ethics." "Genetic Analysis of Zebrafish Pigment." Children's Research Hospital. Eric P. Newman Education Center. For cost and to register, call 935-4650.

Saturday, Nov. 1
11 a.m.-2 p.m. Women's Club fall luncheon. "The Public and Medical Research." Givens Hall parking lot. 935-4523.

Tuesday, Oct. 3
5-7 p.m. "Third Annual Fingers Without Borders "Fingers on the Screen." Lecture and exhibition. For more information, contact the Office of Continuing Medical Education at 935-4523.

Wednesday, Oct. 4
11 a.m.-5 p.m. Office of Continuing Medical Education. "Genetic Analysis of Zebrafish Pigment." "Politics and Public Policy in the New Millennium." For more information, contact the Office of Continuing Medical Education at 935-4523.

Thursday, Oct. 5
11 a.m.-6 p.m. "Third Annual Fingers Without Borders "Fingers on the Screen." Lecture and exhibition. For more information, contact the Office of Continuing Medical Education at 935-4523.

Friday, Oct. 6
11 a.m.-2 p.m. Women's club fall luncheon. "The Public and Medical Research." Givens Hall parking lot. 935-4523.

Saturday, Oct. 7
11 a.m.-5 p.m. Women's club fall luncheon. "The Public and Medical Research." Givens Hall parking lot. 935-4523.

Saturday, Oct. 8
11 a.m.-2 p.m. Women's club fall luncheon. "The Public and Medical Research." Givens Hall parking lot. 935-4523.
Course attracts students from all schools

— page 1

tings that can make computer science more photogenic. "If you look at a page of program text, an error may not jump out at you unless you incorporate graphics, the software is not as physically more tangible. You see the results and can correct mistakes more easily."

While students have fun and find classes enjoyable in developing software, the course is very demanding both from a mental and intellectual standpoint. Students attend a weekly 90-minute laboratory and tutorial session. Adding the programming projects to the class schedule makes the work even more difficult in just a week as well.

This semester, 16 undergraduate teaching assistants (TAs) help students in the seven lab sections, which are further subdivided into two or three groups per section. TAs also have evening and weekend hours to assist students.

Being a junior chemistry major in Arts and Sciences, is head teaching assistant for CS 101. He's seeking a computer science degree and has hopes of getting a master's in computer science as well, all within four years.

"This course is designed for six to 10 students per section, and an effort is made to ensure that the joy is found in his role."

"I get a charge out of seeing that light bulb go on in students' heads when they understand something that baffled them before," said Amia. "I've been planning to do computer science for some time to go on and become a college professor myself, and I feel that I'm getting work with a lot of students is exquisite."

Graduate teaching assistants are the main goal in teaching CS 101 to help students develop their thinking.

"The course teaches you to think about problem-solving in a different way," said Amia. "A big part of this is learning how to reflect on your own thought processes. You have to be able to articulate how you would go about doing it yourself as well as how to learn how to break down a problem. You have to break it into smaller pieces and then learn how to describe each piece so that the computer can understand the instructions. When students develop their thinking skills to the point that they can start with an abstract piece of information and put it into a running program, it opens up a whole new world for them.

Peck Receives national distinctions

— page 1

civilian medical response to chemical or biological terrorist incidents and prevention of perinatal transmission of HIV.

Peck becomes chair of the AAMC at the association's 109th annual meeting, to be held Friday through Thursday, Oct. 28-Nov. 5, in New Orleans. He previously served as co-author of the AAMC's Council of Deans; he has been a member of the AAMC's Executive Committee and of special committees convened to explore specific issues related to biomedical research; and a medical schools and teaching hospitals. A nation's first medical schools, the 125 accredited U.S. medical schools, the 5,000 U.S. medical schools, more than 300 major teaching hospitals and health systems, 55,000 academic and professional societies and the nation's medical students and residents.

Peck is an internationally recognized expert on bone metabolism and disorders. He developed the first method for directly studying the structure, function and growth of bone cells. This discovery led to research by which certain hormones regulate bone cell growth and activity, and he has reviewed articles in the osteoporosis. Peck was the founding president of the National Osteoporosis Foundation (NOF) and a past president of the American Society for Bone and Mineral Research. He is a member of the American Society for Clinical Investigation and the Association of American Physicians. He has served on numerous academic society committees, national and international scientific panels, medical journal editorial boards and pharmaceutical company advisory boards. He also serves on the executive board of the Duke Cancer Institute and on the board of Research America, a national non-profit organization that promotes medical research. Peck received his undergraduate degree from the University of Michigan, a master's degree in medicine from the National Institutes of Health, Career Program Award, a Food and Drug Administration Commissioner's Award and the NOF's Founders Award. He is a fellow of the American Association for the Advancement of Science. He also has appeared as a spokesperson for science on local and national media, including the "McNeill Lehrer Report," "Good Morning America" and "CBS Morning News."

Born in New Britain, Conn., Peck graduated from Harvard College in 1965 with a degree in biochemistry. He obtained a medical degree in 1969 at the University of Virginia School of Medicine, where he was admitted to Alpha Chi Rho, an honorary medical society. After a residency and fellowship at Harvard Medical School, he spent two years as a clinical associate at the National Institutes of Health.

He served on the faculty of the University of California Medical School of San Francisco for 11 years before joining Washington University in 1972. He is a past president of the American Society for Bone and Mineral Research and a former director of the Simon Professor of Medicine. He became dean of the School of Medicine and a major leader in medical affairs and president of Washington University Medical Center in 1989, becoming executive vice chancellor for medical affairs in 1993.
Clay named head of Olin reference department

Professor of Law

Clay named head of Olin reference department at Washington University in St. Louis.

Clay served as the interim head of the Olin Library Reference Department for a year and a half before being named the permanent head.

Clay has been a part of the Washington University community for over a decade, having joined the faculty in 2015.

Clay is known for his dedication to the library and his commitment to providing exceptional service to the students and faculty.

Clay's appointment follows a national search for the position and is a testament to his qualifications and experience.

Clay is looking forward to continuing the work of the Reference Department and furthering its mission.

Clay's appointment has been welcomed by the library community and is seen as a positive development for the university.

Clay has previously held positions at the University of Michigan and the University of Chicago.

Clay is also a member of several professional organizations and has contributed to the field of librarianship through his research and publications.

Clay's appointment is expected to take effect immediately.

Clay is a graduate of the University of Michigan and holds a Ph.D. in Library and Information Science.

Clay has been recognized for his contributions to the field of librarianship and has received several awards and honors.

Clay is married to Dr. Jane Doe and they have two children, John and Mary. They reside in St. Louis, Missouri.
What do you do when a parasite that's invisible to the naked eye has felled efforts to eradicate it for centuries? If the bug causes malaria, a killer of two million worldwide each year, and your name is Daniel E. Goldberg, M.D., Ph.D., you do everything you can to stop the parasite in its tracks.

Goldberg, professor of medicine and of molecular microbiology and a Howard Hughes Medical Institute investigator, has gained international recognition for his work on how the malaria parasite survives in humans. He also directs the Medical Scientist Training Program, one of the country's largest M.D.-Ph.D. programs to develop the next generation of medical researchers.

His own interest in malaria began when he was an M.D. Ph.D. candidate at the School of Medicine in the early 1980s. Studying carbohydrates — sugars — in the lab of Stuart A. Korf, M.D., professor of medicine and of biochemistry and molecular biophysics, he came across an article about the malarial parasite Plasmodium falciparum. "The article described the parasite's ability to invade human red blood cells by sticking to sugar-coated proteins on the cell's surface," he said. "I thought that was a fascinating interaction, and that led me to read more about malaria."

Goldberg's lab

The chronic disease causes periodic waves of fever and chills that occur when the parasites break out of red blood cells into the tissue. In Unigold's medical school days, it was still unclear how antimalarial drugs such as chloroquine work, or what tricks the parasite uses to survive and multiply inside red blood cells. "This was one of the most important diseases in the world," Goldberg observed, "and there was little research being done on it."

Understanding the malarial parasite is a worldwide concern because certain strains are becoming resistant to chloroquine-like drugs. Even in the United States, where malaria is kept at bay by about a million people a year bring the disease back from travel overseas.

Goldberg decided to learn more about the parasite's activities inside red blood cells in hopes of fostering efforts to develop new antimalarial drugs.

Huge impact

This was no small task because the parasite is difficult to work with, said Goldberg, whose lab studies antimalarial drugs at The Catholic University of America in Washington, D.C. "Dan accepted the challenge because of its importance and a hunch that his findings will have a huge impact on fundamental lines," Rathod said.

The red blood cells Goldberg studies normally carry oxygen to our tissues. But for the parasite, they serve more as a sit-down dinner. Once Plasmodium attaches to a red blood cell, it pushes its way inside. The parasite then takes "in the cell's internal fluid, which is chock-full of hemoglobin, the oxygen-binding protein. The bug transmits the hemoglobin into structures called food vacuoles where it degrades it to create amino acids needed for making new parasites. Researchers know Plasmodium used proteins called proteases to degrade hemoglobin. But it was difficult to tell which proteases play this role. Goldberg set out to find the needle in this biochemical haystack. After graduating from the medical school, he completed a residency at Brigham and Women's Hospital in Boston in 1987 and then returned here for a year-long fellowship in infectious diseases. Next, he went to the Laboratory of Medical Biochemistry at Rockefeller University in New York to begin learning how to work on malaria.

He joined the Washington University faculty in 1990 and identified two malaria proteases, Plasmodium's plasmepsins I and II, that initiate the breakdown of hemoglobin.

"Just the certain human proteases, the plasmepsins, are worked by cutting a target protein into pieces on a physical landmark on the protein," Goldberg hoped to develop a drug that mimicked this site, tricking the parasite out of its true source of nourishment. However, if the plasmepsins were too similar to their human counterparts, the drug might cause side effects. John Erickson, Ph.D., director of the Structural Biochemistry Program at the National Cancer Institute, took plasmepsin I that Goldberg sent him and used X-ray crystallography to generate images of the protease. The images showed that the protease bound its target in a different way than the human proteases.

Using the information he gathered, Goldberg has collaborated with researchers in industry and at other universities to screen potential anti-malarial drugs. He tests the best candidates on infected red blood cells grown in his laboratory. "We can outsmart a weak plasmodium inhibitor that kills the parasites in culture," Goldberg said, noting that he enjoys exchanging ideas with collaborators.

Others credit Goldberg for filling in details of the malarial parasite's life to bring these efforts to fruition. "He's taken difficult systems and cut through all the confusing things and gotten to the answer," Rathod observed.

Goldberg also determined what makes chloroquine-like drugs work. When Plasmodium digests hemoglobin, it releases a toxic substance called heme. To neutralize the heme, the bug links it to a long chain, which resembles a sharp-edged, crystalline mountain range on images of infected red blood cells. Goldberg showed that chloroquine-like drugs halt the extension of the chain by binding to one end. He is working with David E. Piwnica-Worms, M.D., Ph.D., professor of radiology and of biochemistry, to develop a potent plasmepsin inhibitor that would work alongside chloroquine-like drugs. "We're coming up with some answers on the biochemical aspects of this," Goldberg explained.

Goldberg's landmark on cancer research has its origins in a major league baseball career. "I grew up a baseball aficionado," Goldberg said. "I still enjoy cooking, reading and spending time with my wife, Mary Cullen, M.D., Ph.D., who is a dermatologist."

Understanding the parasite could lead to new drugs. But Goldberg's laboratory studies it for a simpler reason: "I was fascinated by this molecule," he said.

Goldberg's enthusiasm and dedication carry over to his leadership of the M.D. Ph.D. training program. He advises 150 students on course work, laboratory training and medical rotations. "It's great to interact with them and see them develop into physicians-scientists," he said.

Jeffrey L. Gordon, M.D., Alumni Professor and head of the Department of Molecular Biology and Pharmacology, said Goldberg's appointment as director of the program last year reflects his many strengths. "Dan is an absolutely brilliant scientist, an outstanding physician and a great teacher. He has an essential humility despite his brilliance that inspires students, motivates colleagues to seek his advice and makes him a wonderful role model."

A terrific mentor

Students Goldberg has trained agree with Gordon. David Sullivan, M.D., spent four years in Goldberg's lab before becoming an assistant professor at Johns Hopkins School of Public Health. Sullivan says Goldberg a terrific mentor, "Not only does he instill a curiosity for science, but he also teaches you to verify your research findings in multiple ways."

In his spare time, Goldberg plays tennis several times a week and watches major league baseball avidly. He also enjoys cooking, reading and spending time with his wife, Mary K. Cullen, M.D., Ph.D. A research associate in cell biology and physiology at the medical school and a practicing dermatologist, Cullen also has been coordinating science activities for the University City School District. Goldberg, a fan of chili peppers and fine foods, says she adds wonderful flavoring to his life.

But outstanding malaria is what keeps him motivated. "It's such a clever bug — much cleverer than the humans who are trying to outsmart it," Goldberg says.