Clinical Trials Taking Breast Cancer Diagnosis and Treatment Forward
Chief Residents

2003-2004

Left: Radiation Oncology Chief Residents (left to right): Doctors Angel Blanco and Wayne Lamoreaux

Above: Diagnostic Radiology Chief Residents (left to right): Doctors Lawrence Tang, Ronald Gerstle, and Jason Bronfman
NO VEINS, NO PAIN

Interventional radiologists at Mallinckrodt Institute offer an effective procedure to treat the unsightly and painful varicose veins that affect millions of Americans—endovenous laser ablation, a less invasive alternative to the traditional surgical treatment.

A PROMISING NEW TOOL FOR TRACKING MULTIPLE SCLEROSIS

Researchers in the Biomedical Magnetic Resonance Laboratory are working to devise a method for determining injury to the myelin sheath around nerves, which could have a profound impact on predicting the future course of multiple sclerosis and other neurodegenerative diseases.

TAKING BREAST CANCER DIAGNOSIS AND TREATMENT FORWARD

Mallinckrodt Institute is part of a nationwide National Cancer Institute clinical trial to determine whether digital mammography is as effective as or better than standard film-based mammography in the early detection of breast cancer.

32 YEARS OF OUTSTANDING CONTRIBUTIONS

In 1957 Fred Hodges became a part of medical history when Mallinckrodt Institute became the first facility in the United States to offer neuroradiology services, then a promising addition to the field of radiology.

ON THE COVER Dione Farria, MD, of the Institute’s Breast Imaging section, is Washington University’s principal investigator for an important study to evaluate digital mammography. Photograph by Tim Parker
Bhalla named Teacher of the Year

Since 1985 diagnostic radiology senior residents annually have honored an MIR faculty member who has made outstanding contributions to resident education, by teaching not only with a traditional course study but through example as the residents observe and participate in the interpretation of clinical studies. At the annual residents' and fellows' farewell dinner in June, Sanjeev Bhalla, MD, assistant professor of radiology, was named the MIR Teacher of the Year.

Bhalla came to Mallinckrodt Institute in 1985 as a first-year diagnostic radiology resident. He completed the residency (chief resident, 1996-1999) and a fellowship in chest radiology. He has been actively involved in resident education since joining the MIR faculty in 2000 and currently serves as assistant director of the Diagnostic Radiology Residency Program.

At the dinner, James Goddard, MD, clinical neuroradiology fellow, was presented with the Fellow of the Year award. The following MIR faculty were honored as Distinguished Teachers:

• Robert McKinstry, MD, PhD, assistant professor of radiology
• Christine Menias, MD, assistant professor of radiology
• William Middleton, MD, professor of radiology
• Franz Wippold, MD, associate professor of radiology and chief of neuroradiology.

Nuclear Medicine
Farrokh Dehdashti, MD
Keith Fischer, MD
Robert Gropler, MD
Tom Miller, MD, PhD
Mark Mintun, MD
Henry Royal, MD
Barry Siegel, MD

Radiation Oncology
Perry Grigsby, MD
Jeff Michalski, MD
Robert Myerson, MD, PhD
Joseph Simpson, MD, PhD
Marie Taylor, MD

Radiology
Claire Anderson, MD
DeWitte Cross, MD
Michael Darcy, MD
Jay Heiken, MD
David Hovsepian, MD
William McAllister, MD
William Middleton, MD
Barbara Monsees, MD
Christopher Moran, MD
Daniel Picus, MD
David Rubin, MD
Stuart Sagel, MD
Marlyn Siegel, MD
William Totty, MD
Thomas Vesely, MD
Franz Wippold, MD

MIR has best doctors

Once again, Mallinckrodt Institute physicians were included in the list of "Best Doctors in St. Louis," as reported in the August 2003 issue of St. Louis Magazine. The 433-member list was excerpted from The Best Doctors in America database, which includes approximately 30,000 doctors in more than 40 medical specialties. Best Doctors asks thousands of physicians worldwide for nominations to the list, based on patient care rather than academic or research excellence.

Faculty elected to leadership roles

Mallinckrodt Institute faculty were recognized for their outstanding contributions to and excellence in the medical field.

Jeff Michalski, MD, associate professor of radiation oncology and chief of the Radiation Oncology Clinical Division, was inducted as a fellow in the American College of Radiology (ACR) at the May 2003 Annual Meeting in Washington, DC. Fellowship is one of the highest honors conferred by the ACR, with only about 10 percent of the 32,000 radiologists, radiation oncologists, interventional radiologists, and medical physicists who comprise the membership being selected for fellowship.

David Piwnica-Worms, MD, PhD, professor of radiology and of molecular biology and pharmacology and chief of the molecular radiopharmacy laboratory, is the 2003-2004 president of the Society for Molecular Imaging (SMI), an international scientific organization. As president, Piwnica-Worms will host the SMI third annual meeting to be held September 9-12, 2004, in St. Louis.

Henry Royal, MD, professor of radiology, was elected the 2003-2004 president of the Society of Nuclear Medicine (SNM). The society, now in its 50th year, promotes the beneficial uses of radioisotopes and radiation, disseminates new ideas in nuclear medicine, and stresses the interdisciplinary nature of nuclear science. As SNM president, Royal also serves on the society’s Board of Directors.
**Another honor for Perez**

In April 2003, Carlos Perez, MD, professor of radiation oncology and chair of the Department of Radiation Oncology, received the American Radium Society’s (ARS’s) Janeway Medal in recognition of his outstanding scientific contributions. The award and associated lecture was established in 1933 in memory of Henry Janeway, MD, a pioneer in the therapeutic use of radium. The medal was presented to Perez in April 2003 at the ARS Annual Meeting in Houston, Texas.

Perez, one of the most highly regarded radiation oncologists in the world, advocates the treating of patients’ emotional and psychological needs as well as their physical needs. He has made important contributions to the clinical management of patients, especially those with gynecologic tumors and carcinoma of the prostate and of the breast.

He has received numerous honors, including Gold Medal awards from the American College of Radiology (ACR), the American Society for Therapeutic Radiology and Oncology, and CRILA/Circulo do Radioterapeutas Ibero-Latinoamericanos. Perez is a trustee of the American Board of Radiology, a member of the National Board of the American Cancer Society, and an ACR fellow.

Perez joined the MIR faculty in 1964 and was named director of the Radiation Oncology Center in 1976. During this time, he initiated a training program for radiation therapy technologists and established the Cancer Information Center (CIC), the first resource facility of its kind. The CIC became a role model for similar centers in the United States and abroad. In June 2001, he was named chairman of Washington University’s newly formed Department of Radiation Oncology.

**Siegel receives SNM award**

Barry Siegel, MD, professor of radiology and of medicine, and chief of the Division of Nuclear Medicine, received the prestigious Georg Charles de Hevesy Nuclear Pioneer Award at the Society of Nuclear Medicine Annual Meeting in June 2003. The award is presented annually for distinguished contributions to the specialty of nuclear medicine. Established in 1960, the award honors de Hevesy, a 1943 recipient of the Nobel Prize in chemistry.

Siegel is widely recognized for his clinical and scientific expertise and is often called upon as a consultant to governmental organizations, industry, medical centers, and universities. A distinguished clinician and scientist, Siegel has investigated various applications of nuclear medicine, from diagnosing thrombosis and pulmonary embolism to detecting myocardial infarction, and is now focusing on the use of positron emission tomography (PET) in cancer detection.

MIR’s Division of Nuclear Medicine was one of the first facilities to transition PET from research to clinical practice.

He is an internationally recognized expert in the clinical uses of radiopharmaceuticals and serves as chairman of the Radiopharmaceuticals Expert Committee of the United States Pharmacopeia Council of Experts, and on advisory committees to the Food and Drug Administration and the Nuclear Regulatory Commission.

**Wilson Award presented**

At Washington University’s May commencement, Daniel Hatfield received the 35th Annual Hugh M. Wilson Award for Meritorious Work in Radiology. Established in 1968 as a tribute to Hugh Wilson, MD, the second MIR director, the award historically is presented to a fourth-year medical student who has performed outstanding work in basic or clinical radiological sciences.

As part of his elective research rotation, Hatfield worked with Kyongtae Bae, MD, PhD, assistant professor of radiology, as a member of Bae’s research team studying radiological imaging for polycystic kidney disease. The research is part of a large, multicenter National Institutes of Health-sponsored trial and was Hatfield’s first exposure to modern methods of image segmentation, manipulation, and analysis. After becoming familiar with the different kidney measurement algorithms used in the study, Hatfield developed two new measurement algorithms employing 3-D imaging software.

Bae was impressed with Hatfield’s intelligence, work ethic, productivity, and resourcefulness. “It was a great pleasure to mentor a medical student who is research-minded and knowledgeable about many subjects, including mathematics, medicine, physiology, and radiology.”
no Veins, no Pain

BY ANNE KESSEN LOWELL
There is new hope for millions of Americans whose severe varicose veins discouraged them from donning a bathing suit this summer—or worse, who spent many an afternoon inside, elevating their gams to gain temporary relief from painful symptoms. Endovenous laser ablation is an easy, nearly painless procedure that treats varicose veins. Endovenous laser ablation offers several advantages over traditional surgical treatment of varicose veins: It is a much shorter procedure, uses only a local anesthetic, and is more effective. Patients can resume normal activities immediately after the procedure and more strenuous exercise, such as running or lifting, within one week. The technique received FDA approval in February of 2002 and is becoming widely used in the United States. Endovenous laser ablation is performed at Mallinckrodt Institute of Radiology at Washington University Medical Center by interventional radiologists whose particular training and expertise in catheter-guided procedures and use of ultrasound guidance systems make them well suited to meet the demands of the new technique. Michael Darcy, MD, professor of radiology and chief of interventional radiology, and Suresh Vedantham, MD, assistant professor of radiology, lead Mallinckrodt Institute’s development of this promising minimally invasive procedure.

What causes varicose veins?

Symptomatic varicose veins—larger and more painful than common surface (or spider) veins—affect about 26 million Americans. The large size and ungainly appearance have earned this class of varicose veins adjectives such as “ropy,” “wormy,” and “knotted.” Women are afflicted with varicose veins in far greater numbers than are men. These veins are more common with age—half of women in the over-50 age bracket suffer from symptomatic varicose veins. Risk factors include standing in place for long periods, family medical history, and pregnancy. Retail and factory workers, security guards, and others who stand for hours without a break are especially susceptible to the development of severe varicose veins.

Unlike smaller surface veins that are typically repaired solely for cosmetic reasons, true varicose veins are not just unsightly. Not all people with varicose veins will have symptoms; for others, the veins can cause discomfort. Aches, itching, night cramps, fatigue, and sensations of heaviness or restlessness in the affected leg are a daily fact of life for many with this condition. In some cases, varicose veins can lead to chronic venous insufficiency, which in turn can cause leg swelling, eczema, changes in skin pigmentation, and ulceration.

The saphenous vein, a large blood vessel running from ankle to groin, is the usual culprit in severe varicose vein disease. The saphenous vein transports blood from the deep veins in the calf and thigh back to the heart. In a healthy vein, blood flows upward toward the heart, assisted by one-way valves in the vein that prevent gravity from reversing the flow. However, if the valves weaken, blood leaks down and pools (or refluxes) in the veins in the lower leg. Eventually these veins bulge with the pressure of the excess blood. As the condition worsens, the veins become varicose. From the Latin varix, varicose is aptly defined as “abnormal dilatation or enlargement of a blood vessel, especially accompanied by tortuous development.”
no Veins, no Pain

Standard treatment

Treatment of the saphenous vein, the underlying cause of varicose veins, is the only effective and lasting solution to the problem. "Underlying pressure in the saphenous vein must be addressed to cure symptomatic varicose veins," emphasizes Darcy. "Until recently, surgery was the only option available. Because it is a painful procedure with a long recovery period, many people opt to do nothing and continue to suffer painful symptoms."

A safer, faster alternative

With endovenous laser ablation, patients with varicose veins who have endured discomfort and embarrassment finally have an alternative to the long, often bumpy surgical road to treatment of the diseased vein. The resulting thermal effect causes the vein to collapse, putting it out of the blood-flow business. With the saphenous vein closed, healthy veins pick up the slack and transport blood flow in the leg in a normal fashion. Although vascular surgeons, dermatologists, and plastic surgeons are also performing this new procedure, interventional radiologists are ideally suited to carry out laser ablation. "Interventional radiologists pioneered catheter-based treatment methods, and we have the most experience in ultrasound guidance for minimally invasive procedures," says Vedantham.

Forty minutes after entering the procedure room, the patient is ready to go home, with nothing more than a Band-Aid® to show for the experience. Over-the-counter pain relievers may be used to address minor leg soreness. Most patients resume normal routine immediately and more strenuous activity within a week. Many patients will opt to return to the office for cosmetic treatment of any smaller, accessory veins that may linger after treatment of the saphenous vein. This follow-up requires only surface laser treatment or sclerotherapy (a simple injection that causes the offending veins to shrivel and disappear).

Home remedies and lifestyle changes—such as weight reduction and increased exercise—are ineffective for many people with severe varicose veins. And while tube-shaped compression stockings—thick, hot, itchy and far from fashionable—are helpful in relieving some of the pain associated with varicose veins, they are not usually sufficient to completely eliminate symptoms.

Surgical nomenclature for the treatment of varicose veins may be enough to make patients queasy: The procedure is dubbed "vein stripping." Under general anesthesia, the surgeon removes the offending vein through a series of incisions. Discomfort, bruising, and numbness in the leg are common postsurgical adverse effects. Time to full recovery can be two to three weeks, and patients cannot return to normal everyday activity for a week following surgery. The surgical option is not appropriate for a large subset of patients, including the elderly; people with circulatory disorders, skin infections, or blood clotting disease; and pregnant women. Add to that a 30 percent rate of recurrence and the potential for lasting scars, and you have a procedure begging for improvement.

In a comfortable outpatient setting, a local anesthetic is applied to the vein itself. Through a tiny dot-sized incision, which the patient feels as a pinprick, a thin catheter is placed into the saphenous vein. Using ultrasound imaging, the interventional radiologist follows the catheter's position. A tiny fiberoptic laser is inserted through the catheter. At the end of the saphenous vein, the radiologist releases laser energy and slowly pulls the laser back through the catheter, applying heat to the walls of the diseased vein. The resulting thermal effect causes the vein to collapse, putting it out of the blood-flow business. With the saphenous vein closed, healthy veins pick up the slack and transport blood flow in the leg in a normal fashion. Although vascular surgeons, dermatologists, and plastic surgeons are also performing this new procedure, interventional radiologists are ideally suited to carry out laser ablation. "Interventional radiologists pioneered catheter-based treatment methods, and we have the most experience in ultrasound guidance for minimally invasive procedures," says Vedantham.

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Study documents success

In the summer of 2003 the first long-term study of laser treatment for varicose veins validated its advantages over surgery. In a study of nearly 500 patients treated with laser ablation, radiologists at Weill Cornell Vascular in New York City (where the procedure was developed) documented a 98 percent success rate and recurrence of less than seven percent over two years following treatment. Vein stripping,
Varicose veins occur in varying degrees in their appearance and severity of symptoms, largely dependent on the size of the vein affected. Different levels of treatment are available to meet the individual needs of each patient. The first line of attack against any type of varicose vein disease is to make lifestyle changes: maintain a healthy weight, exercise (especially walking or running), elevate legs while resting, and wear elastic support stockings.

Spider veins are the smallest and least symptomatic type of varicose vein, so called because of the thin, web-like appearance of the veins. Spider veins may occur on the face as well as on the legs but are not raised or bumpy as are larger varicose veins. Spider veins can be treated with sclerotherapy or laser treatment. Sclerotherapy is a simple procedure—a solution is injected into the vein and causes the vein walls to swell and stick together, eventually closing shut. In a short time, the vein turns to scar tissue and is no longer visible. Sclerotherapy requires no anesthesia, is performed in a doctor’s office, and has few adverse effects. However, recurrence is common—some veins may require several treatments to eliminate them, and the procedure cannot prevent spider veins from cropping up in new places. Laser treatment for spider veins is also relatively painless and easy, performed in the office without anesthesia. Laser light is directed at the surface of the skin, along the course of the vein. However, like sclerotherapy, laser treatments may need to be repeated to be 100 percent effective, and laser treatment does not prevent new spider veins from forming.

For medium-sized varicose veins, a procedure called ambulatory phlebectomy may be effective. These veins are frequently very unsightly and may cause painful symptoms. Ambulatory phlebectomy can be done under local or general anesthesia, and most patients can return to normal activity the next day. To remove the vein, the physician makes several incisions in the skin, pulls the vein until it breaks, and removes it in pieces. Like vein stripping, this procedure may cause pain, bruising, and scarring (although to a lesser degree than the stripping procedure).

Large, deep varicose veins can be addressed with surgical vein stripping or the less invasive laser surgery. Large varicose veins are most likely to cause painful and irritating symptoms, in addition to being unsightly. Surgical treatment must be done under general anesthesia and may keep patients from their normal routine for up to three weeks; laser treatment requires only a local anesthetic, has few adverse effects and lower recurrence, and has a recovery period of about 24 hours.
A Promising New Tool for Tracking Multiple

by Candace O'Connor
Multiple sclerosis (MS) is an all-too-common neurological disorder, affecting some 400,000 Americans. Its basic mechanism is clear: A person’s immune system mistakenly identifies the body’s own nerve tissue as foreign and attacks it, causing inflammation. Eventually, the fatty myelin sheath that acts as a kind of insulator around those nerves is injured, along with the nerve fibers or axons themselves.

Most patients develop a relapsing-remitting form of the disease, in which flare-ups alternate with long periods of remission. Others have primary-progressive or progressive-relapsing MS, marked by steadily increasing disability from the outset.

To predict the future course of the disease, it is crucial to know whether the myelin or the axon has been damaged, and how much damage has taken place. A myelin injury is also more treatable than axonal injury, which is not currently reversible. And these same questions pertain to spinal cord injuries, Alzheimer’s disease, and a host of neurodegenerative diseases.

“While MS is considered a demyelinating disease, some people now think that axonal injury may occur early in the disease process. But nobody knows for sure, because you need a noninvasive method to study the brain in a patient with MS,” says Sheng-Kwei (“Victor”) Song, PhD, assistant professor of radiology.

In 1999, Song first became interested in solving this problem through the use of an exciting new method called diffusion tensor magnetic resonance imaging (DTI). Since then, his research has had promising results: five articles (two articles published in the scientific journal Neuroimage addressed white matter injury with MS-related mouse models), several grants, and encouraging preliminary findings (culminating this year in a major collaborative grant with colleagues in radiology, neurology, biomedical engineering, pharmacology, and biophysics).

“If this method succeeds, the biggest impact will be actually seeing what type of injury has taken place, so the physician can decide what to treat and how to treat it,” says Song. “This method can also be used to see how effective that treatment is.”
Imaging of MS began in the early 1980s with the advent of magnetic resonance imaging (MRI), which is routinely used to pinpoint lesions in the brains of patients with MS. But MRI cannot define whether the damage affects the myelin or the axons. Song, who received his doctoral degree and also did his postdoctoral training at Washington University, wondered whether DTI might help clarify this picture.

After conferring with Anne Cross, MD, Department of Neurology, Song decided to use DTI on a biologically unusual form of a mouse (known as “shiverer” mice, whose axons are born without the myelin sheath around their axons) to address the question about using DTI to define white matter pathology in the brain of a patient with MS. A pilot grant from the National Multiple Sclerosis Society, as well as grants from Washington University and the National Science Council of Taiwan, supported his work.

Song's findings were encouraging. In the shiverer mice, water diffusion perpendicular to the axonal fibers (radial diffusion) was significantly higher than diffusion in a group of age-matched controls. However, the water diffusion parallel to the axonal fibers (axial diffusion) was unchanged in the shiverer mice, whose axons were intact. Song concluded, as he said in an article based on this research, that these findings “may potentially be used to differentiate myelin loss versus axonal injury.”

Doctors John Russell, Anne Cross, and Victor Song

At first, scientific journals were reluctant to accredit his research. One after another turned down his work because some reviewers were skeptical about such findings. Finally, in 2002, after a year of trying, Neuroimage published Song's study.

Next, he proceeded to further validate the method, using a mouse model with retinal ischemia, which causes damage to the optic nerve. In this model, the axonal degeneration precedes demyelination in the optic nerve of the injured eye. Song and a research team noninvasively examined the mice after the injury to establish the time course of white matter degeneration after injury to the eye.

Their findings supported those of Song's hypothesis: Axonal and myelin degeneration can be detected and differentiated noninvasively using in vivo DTI. This time, the reception of his work was quite different. Neuroimage accepted his paper immediately, with publication scheduled for November 2003.

“We showed that by using DTI we could predict how early the axonal degeneration started and when the demyelination took place. Further, we could see all this in vivo without removing the eye or nerve, which was very exciting,” says Song.

The next step, he says, is to test this concept on human volunteers. Success in mice is a hopeful sign but not conclusive, since a mouse system is much simpler than the complex human anatomy. To begin work on this new study, he has again collaborated with neurologist Anne Cross, molecular biologist John Russell, and chemist Joseph Ackerman, Song’s former mentor in Washington University’s doctoral program.
Together, the investigators applied for one of three Collaborative MS Research Center Awards, granted in 2003 by the National Multiple Sclerosis Society, to continue this research. The five-year award of $825,000 supports scientists and clinicians from various fields working together on MS-related problems. Song also received another National MS Society Research Grant of $497,000 to further support his work in this area.

Using animal models at first, and then human volunteers, they will focus on the problem of optic neuritis, an early symptom of MS in which patients temporarily—and sometimes permanently—lose their sight. Through a friend who has MS and has developed optic neuritis, Song has heard firsthand how difficult and frightening it can be.

“If we can determine whether injury involves axons or myelin, then perhaps we can look at the optic nerve when patients experience their first onset of optic neuritis to see how severely the nerve is injured. We may be able to tell whether the cause is demyelination or some other reversible process, or we may be able to say whether the problem will get better or worse,” says Song.

While this work continues, Song is also advancing along parallel lines in other diseases. With a pilot grant from the Alzheimer’s Disease Research Center and a two-year research contract from Pfizer Inc., he is looking at the process of neurodegeneration in Alzheimer’s disease. Currently he is using a mouse model to develop technologies for studying white matter degeneration to the spinal cord.

In the Collaborative MS Research Center grant, the investigators will work toward creating DTI profiles of injury to tissue, differentiating underlying tissue damages and repair in MS brain lesions. “I believe that in two to three years, we will either prove or disprove the feasibility of using this method in humans,” says Song. “I want to be optimistic and say that we will be able to prove it works or at least will work on some system of the body, such as the optic nerve. If we can do that, it would be a great accomplishment.”

**Common Symptoms of MS**

Each person is affected differently by MS. Some of the more common symptoms of this disease are listed below.

- Mobility impairment, including loss of balance, muscle coordination, partial or complete paralysis
- Impaired vision
- Bladder and bowel problems
- Joint stiffness and/or pain
- Abnormal fatigue
- Sensory changes
- Swallowing difficulty
- Speech problems
- Cognitive difficulties

**Research Collaborators**

- Joseph Ackerman, PhD, departments of Chemistry and of Radiology
- Chen Chang, PhD, Institute of Biomedical Sciences, Academia Sinica, Taiwan
- Anne Cross, MD, Department of Neurology
- Won-Kyu Ju, PhD, Department of Ophthalmology and Visual Sciences
- Shiow-Jian Lin, MS, Department of Medicine
- Arthur Neufeld, PhD, Department of Ophthalmology and Visual Sciences
- Michael Ransbottom, BS, Department of Neurology
- John Russell, PhD, Department of Molecular Biology and Pharmacology
- Sheng-Kwei (“Victor”) Song, PhD, Department of Radiology
- Shu-Wei Sun, PhD, Department of Radiology

_Editor’s Note: For more information about MS, visit the National Multiple Sclerosis Society at www.nmss.org or the Multiple Sclerosis Foundation at www.msfacts.org._
Clinical trials taking breast cancer diagnosis and treatment forward.
Women facing the staggering diagnosis of breast cancer have a rosier outlook, thanks to advances in breast imaging and clinical trials.

Jill Bokern, RN, is the nurse coordinator in the Breast Health Center at Washington University Medical Center. Because she worked there and was due for her annual screening mammogram, she thought she would participate in a clinical trial comparing traditional film-screen mammography with digital mammography. “Why not participate in a study if you qualify? This one is not painful or inconvenient. We all know that no imaging, including mammography, is one hundred percent, so if we can fine-tune our diagnostic techniques, why not?”

Early Detection Still the Best

According to the American Cancer Society (ACS), there is no question that finding a breast cancer early while asymptomatic increases the likelihood it will be relatively small and will not have spread beyond the breast. The best way to do that, says the ACS, is by a combination of the use of mammography, clinical breast exam by a health professional, and regular breast self-exam. The ACS guidelines, updated this year, recommend that women in their 20s and 30s have a clinical breast exam by a health professional as part of their regular check-ups every three years, and that breast self-exam (BSE) should be an option for women starting in their 20s. After age 40, women should have a breast exam by a health professional every year, and should begin yearly screening mammograms.
Advanced age is no reason to stop regular mammograms, as long as the woman is in good health and a candidate for treatment. The ACS states that mammograms can miss some cancers, but they remain an effective and valuable tool for early treatment and survival.

As a nurse/health educator, I both preached and followed that advice. Thirteen years ago, I sought out my doctor when I discovered a lump during a regular breast self-exam. The resulting clinical mammogram came back negative. Because of that, I delayed follow-up until the lump became too large to be treated by lumpectomy.

Had some of the newer technology, such as digital mammography been around then, would my initial diagnosis and treatment have been different? That, in essence, is what the DMIST study is trying to determine. DMIST stands for the Digital Mammographic Imaging Screening Trial. Funded by the National Cancer Institute and conducted by the American College of Radiology Imaging Network (ACRIN), the purpose of this clinical trial is to determine whether digital mammography is as good as or better than the standard film-based mammography.

Dione Farria, MD, MPH, assistant professor of radiology, is the principal investigator for the Washington University study site. “We must find out if the technology is new or if it’s new and better, especially when it costs four to five times more than the standard screen-film mammography. The industry has done well explaining and marketing the digital equipment even before clinical trials. Radiology and health care facilities are already replacing old screen-film equipment with the digital, so it’s important to know if it is indeed better technology.”

Digital Mammography

From the woman’s perspective, digital mammography is done much in the same way as the traditional screen-film mammogram, including the same breast positioning and compression. The main difference is that the mammogram can be interpreted on a computer instead of on film, allowing for image enhancement, magnification and manipulation.

Earlier studies on the use of digital versus screen-film mammography had some problems, according to several critics, such as size, enrollment bias and the use of only one type of digital equipment. Size of the study is important to obtain enough suspicious mammograms to truly evaluate the differences. Enrollment bias in the earlier smaller studies came about because those women in the study already had an abnormal or suspicious screen-film mammogram. Because of that, the studies could not be used to prove that digital
mammography could find cancers undetectable on screen film mammography. There were also concerns that radiologists were biased, knowing the enrollment requirement of an abnormal film-screen mammogram. Using participants with no anticipation of cancer and enrolled for routine screening is thought to be the only way to objectively compare the two forms of mammography.

The DMIST study has a goal of 49,500 participants in the United States and Canada. Says Farria, “We now have about forty-one thousand women enrolled across the thirty-five sites. Washington University has twenty-seven hundred patients in the study, and we are still recruiting.” The DMIST study is the largest, most comprehensive one to date, evaluating digital technology across four different manufacturers of digital equipment.

Farria says that even with the in-depth look at digital mammography, no one technology solves all diagnostic problems. Screen-film mammography, digital mammography, ultrasound, and even magnetic resonance imaging are used, sometimes together, for definitive diagnoses. Washington University supports clinical trials and critical review of published data before

Additional studies available to high-risk women

The STAR Trial: One of the largest breast cancer prevention studies ever, the Study of Tamoxifen and Raloxifene, or STAR trial, is recruiting volunteers at more than 500 centers across the United States, Puerto Rico and Canada. The trial will include 22,000 postmenopausal women at increased risk of breast cancer to determine whether the osteoporosis prevention drug raloxifene (Evista®) is as effective in reducing the chance of developing breast cancer as is tamoxifen (Nolvadex®). The Siteman Cancer Center at Washington University and Barnes-Jewish Hospital is one of the trial centers in St. Louis. For more information about STAR and a list of participating centers, call the National Cancer Institute’s Cancer Information Service at 1-800-422-6237 or go to http://www.nci.nih.gov/clinicaltrials/digestpage/STAR.

The Sisters Study: For sisters of women who have had breast cancer. Few breast cancer studies have focused on the potential role of the environment or on the interaction between the environment and genes. Sisters of women with breast cancer are at higher risk for developing breast cancer themselves. Sisters share some of the same genes and early life exposures, which may explain their higher risk. By studying the sisters of women with breast cancer and following them over time, researchers hope to learn a great deal about the risk factors for breast cancer.

The 50,000 women who join in this effort will provide information about their health, lifestyle, and environment. They will be asked to update some of that information annually for 10 or more years. As part of the study, researchers will compare the information (provided by sisters who develop breast cancer and by those who do not) to identify clues to the causes of breast cancer and ways to prevent it. Women are eligible for the Sister Study if they live in the United States, have never had breast cancer, are 35 to 74 years old, and have a full or half sister with breast cancer, living or deceased. For more information, go to http://www.sisterstudy.org.
Breast Ultrasound

Part of the problem with my negative mammogram may have been my very dense breast tissue. This type of tissue can obscure lesions on mammograms. Ultrasound breast imaging is not limited by breast tissue density. Another multicenter ACRIN trial that will get underway in early 2004 will evaluate screening breast ultrasound in high-risk women. “We are in the final stages of getting ready to accept patients,” says Farria. She and Maria Schmidt, MD, assistant professor of radiology, who directed the breast cancer education team, will be co-principal investigators for that study. Physicians who wish to refer patients will be given contact information when enrollment is open. Candidates for this study are women with dense breast tissue who might be at high risk for the following reasons: having the BRCA 1 or 2 breast cancer gene, a strong family history of breast cancer, past diagnosis of breast cancer, or a high risk lesion from a prior breast biopsy. Participants will receive annual screening mammograms and screening ultrasound tests for three years. This study will be limited to about 200 participants.
"Clinical trials...can improve quality of care and treatment outcomes for current patients and for other patients yet to come."

regular screen-film mammogram or provide one from another facility if they are not able to return. Most women will be finished at that point. A small subgroup of women will receive follow-up phone calls for two to three years about subsequent mammograms and breast health. Farria expects official results of the study to be published in 2005-2006.

She adds that she is pleased to lead this study site because of her long-time interest in women’s health and prevention. “This is a wonderful place to be based because our Breast Health Center has some exceptional specialists involved in women’s care. In many community hospitals, the radiologists are generalists. At Washington University, we have mammography radiology specialists. The same applies in treatment. We have surgeons who specialize in breast surgery. The more time a doctor devotes to an area, the more skills are gained and expertise is developed.”

Farria’s background includes a Masters in Public Health, postgraduate work in preventive medicine, and a fellowship in health services research, in addition to her work in radiology. Her interest does not start and stop with diagnosis and treatment. She is an advocate for women’s physical and fiscal health. She was also a member of a multi-disciplinary team developing communication materials on breast cancer diagnosis and treatment for women, including minority women and those with little formal education. “I have a strong interest in quality of care and making cost-effective choices. Improving health starts with prevention and how the health care team communicates with patients every step of the process.”

Bokern echoes her enthusiasm: “I’m so thankful I work in such a wonderful place, and I bless people who do clinical trials. It makes our lives healthier, happier and longer.” Her comments have a personal context. As a DMIST study participant, Bokern was diagnosed with breast cancer.

Breast cancer will become less of a threat as women take advantage of all the resources available to them: researching and using educational materials, becoming

The American College of Radiology Imaging Network (ACRIN) is a National Cancer Institute-funded cooperative group that manages clinical trials. At the 2003 ACRIN Annual Meeting in September, Darlene Bird, RT(M), research coordinator, received a Certificate of Achievement Award for her role in recruiting participants for the DMIST study. The Washington University site now has the largest number of participants than any of the other 34 sites. At left is Bruce Hillman, MD, ACRIN chairman, and Daniel Sullivan, MD, NCI associate director.

trained in breast self-examination, having recommended exams and screening tests on schedule, participating in clinical trials where appropriate, and using physicians who have strong backgrounds in detection and treatment. Bokern has been treated for her breast cancer and is back at work, educating women and encouraging them to take advantage of clinical trials.

Editor’s Note: Patients will be enrolled in the Digital Mammographic Imaging Screening Trial through October 27, 2003. If you are interested in participating, call the Washington University Medical Center Volunteer for Health office at (314) 362-1000, line 6.
32 years
of Outstanding Contributions...
Fred Jenner Hodges III, MD, professor of radiology, came to medicine quite naturally, having come from a family of physicians. His father, Fred Jenner Hodges II, was professor and chair of the Department of Radiology at the University of Michigan. And the family’s ancestors include Edward Jenner, MD, who discovered the smallpox vaccine.

Hodges first came to Mallinckrodt Institute in 1957 as an assistant professor of radiology. That same year MIR Director Hugh Wilson, with the assistance of Torgny Greitz, MD, from Sweden (where neuroradiology was developed), established the neuroradiology section. This recent and promising addition to the field of radiology was not available in other United States medical centers, so Mallinckrodt Institute quickly became a leader in the subspecialty. Hodges was named head of MIR’s neuroradiology program in 1958.

During his time at MIR, Hodges received a National Institutes of Health Fellowship in Neuroradiology and spent one year in Gothenburg, Sweden. He left MIR in 1966 to become chief of neuroradiology at Johns Hopkins Hospital in Baltimore, Maryland. He returned to Mallinckrodt Institute in 1980 as professor of radiology and codirected the neuroradiology section with Mokhtar Gado, MD.

Hodges is a past president of the American Society of Neuroradiology and a reviewer for the American Journal of Neuroradiology. In 1975, he served on the Panel of Consultants to the Commission on CIA Activities within the United States, reviewing the circumstances of the assassination of President John F. Kennedy. He served for 21 years as a guest examiner for the American Board of Radiology.

In April 2003 Hodges retired from Mallinckrodt Institute. After a career that spans nearly six decades, including 32 years of practicing diagnostic radiology at the Institute, he plans a quiet retirement—maybe puttering around his Webster Groves garden and some travelling.
**NEW FACULTY**

- **Jennifer Gould, MD**, instructor in radiology, Division of Diagnostic Radiology, Department of Radiology.
- **Wen Li, PhD**, research instructor in radiology, Division of Radiological Sciences, Department of Radiology.
- **Francisco Rodriguez, MD**, instructor in radiology, Division of Diagnostic Radiology, Department of Radiology.
- **Xiankai Sun, PhD**, research instructor in radiology, Division of Radiological Sciences, Department of Radiology.
- **Aamer Farooki, MD**, magnetic resonance imaging clinical fellow, received an undergraduate degree and a medical degree from Harvard University and a medical degree from Duke University. He completed an internship at St. Barnabas Medical Center and a diagnostic radiology residency at Mallinckrodt Institute of Radiology.
- **Cylen Javidan-Nejad, MD**, chest radiology clinical fellow, received a medical degree from the Iran School of Medical Sciences. She completed an internship and a residency at Henry Ford Hospital.

<table>
<thead>
<tr>
<th>FIRST-YEAR FELLOWS</th>
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<tbody>
<tr>
<td>Scott Andersen, MD, neuro-radiology clinical fellow, received an undergraduate degree and a medical degree from Duke University. He completed a one-year internship at St. Johns Mercy Medical Center and a diagnostic radiology residency (chief resident, 2002-2003) at Mallinckrodt Institute of Radiology.</td>
</tr>
<tr>
<td>Joelle Biernacki, MD, magnetic resonance imaging clinical fellow, received an undergraduate degree and a medical degree from the University of Missouri, Kansas City. She completed an internship at the University of New Mexico.</td>
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<tr>
<td>Tedric Boyse, MD, musculoskeletal radiology clinical fellow, received an undergraduate degree from Duke University and a medical degree from Vanderbilt University. He completed an internship at St. Mary's Medical Center, San Francisco, and a residency at the University of Michigan.</td>
</tr>
<tr>
<td>Fadi El-Merhi, MD, musculoskeletal radiology clinical fellow, received an undergraduate degree and a medical degree from the American University of Beirut. He completed an internship at The Good Samaritan Hospital and a residency at Yale-New Haven Bridgeport Hospital.</td>
</tr>
<tr>
<td>Craig Glaiberman, MD, interventional radiology clinical fellow, received an undergraduate degree from the University of California and a medical degree from the University of Texas Health Sciences Center. He completed an internship and a residency at the Milton S. Hershey Medical Center.</td>
</tr>
<tr>
<td>Brett Gratz, MD, abdominal radiology clinical fellow, received an undergraduate degree and a medical degree from Duke University. He completed an internship at Carilion Memorial Hospital and a diagnostic radiology residency at Mallinckrodt Institute of Radiology.</td>
</tr>
<tr>
<td>Peter Hu, MD, interventional radiology clinical fellow, received an undergraduate degree from Brigham Young University and a medical degree from the University of California, San Diego. He completed an internship at the University of California, San Diego, and a diagnostic radiology residency at Mallinckrodt Institute of Radiology.</td>
</tr>
<tr>
<td>Aneel Mandava, MD, interventional radiology clinical fellow, received an undergraduate degree from Johns Hopkins University and a medical degree from the University of Maryland. He completed an internship at the University of Maryland Medical System and a residency at the Long Island Jewish Medical Center.</td>
</tr>
<tr>
<td>Aviv Mazumnar, MD, neuro-radiology clinical fellow, received an undergraduate degree from Johns Hopkins University and a medical degree from New York University. He completed an internship at the University of California, San Diego, and a diagnostic radiology residency at Mallinckrodt Institute of Radiology.</td>
</tr>
</tbody>
</table>
David Mueller, MD, musculoskeletal radiology clinical fellow, received an undergraduate degree and a Masters of Science degree from Washington University in St. Louis, and a medical degree from the University of Missouri, Columbia. He completed an internship at St. John’s Mercy Medical Center and a diagnostic radiology residency at Mallinckrodt Institute of Radiology.

Andres O’Brien-Solar, MD, abdominal radiology clinical fellow, received an undergraduate degree and a medical degree from the Catholic University of Chile. He completed an internship and a residency at the Catholic University of Chile.

Jason Oliphant, MD, musculoskeletal radiology clinical fellow, received an undergraduate degree and a medical degree from Yale University. He completed an internship at Hospital of St. Raphael and a diagnostic radiology residency at Mallinckrodt Institute of Radiology.

Dimitrios Papadouris, MD, interventional radiology clinical fellow, received an undergraduate degree from the University of Toronto and a medical degree from the University of Western Ontario. He completed an internship at Victoria General Hospital and a residency at the University of British Columbia.

Naveen Parti, MD, neuroradiology clinical fellow, received an undergraduate degree from Vanderbilt University and a medical degree from Emory University. He completed an internship at St. Vincent’s Hospital and a diagnostic radiology residency (chief resident, 2002-2003) at Mallinckrodt Institute of Radiology.

Srinivasa Prasad, MD, abdominal radiology clinical fellow, received a medical degree from Bangalore Medical College. He completed radiology training at King Edward Memorial Hospital and a radiology research fellowship at Massachusetts General Hospital.

Allan Reier, MD, interventional radiology clinical fellow, received an undergraduate degree from the University of Miami and a medical degree from Jefferson Medical College. He completed an internship at Riverside Methodist Hospital and a residency at Ohio State University.

Dennis Rivet, MD, neuroradiology clinical fellow, received an undergraduate degree from the U.S. Naval Academy and a medical degree from Dartmouth University. He completed an internship and a residency at Barnes-Jewish Hospital.

Wael Saad, MD, interventional radiology clinical fellow, received a medical degree from Ain Shams University, Faculty of Medicine. He completed an internship at Union Memorial Hospital and a residency at the University of Rochester.

Cary Shlimovitz, MD, neuroradiology clinical fellow, received an undergraduate degree from the University of Texas, Austin, and a medical degree from Washington University in St. Louis. He completed an internship at Barnes-Jewish Hospital and a diagnostic radiology residency at Mallinckrodt Institute of Radiology.

Megan Strother, MD, neuroradiology clinical fellow, received an undergraduate degree from Princeton University and a medical degree from the University of Arkansas. She completed an internship and a residency at Wake Forest University.

Lisa Wang, MD, abdominal radiology clinical fellow, received an undergraduate degree from the Georgia Institute of Technology and a medical degree from the Medical College of Georgia. She completed an internship at the University of Virginia and a residency at Saint Louis University.

**FIRST-YEAR DiAGNOSTIC RADIOLoGY RESIDENTS**

John Anderson, MD, assistant in radiology, received an undergraduate degree and a medical degree at Case Western Reserve University. He completed an internship at Brooke Army Medical Center.

George Cannon, MD, assistant in radiology, received an undergraduate degree from Brigham Young University and a medical degree from the University of Utah. He completed an internship at Intermountain Health Care’s LDS Hospital.

Jeffrey Carenza, MD, assistant in radiology, received an undergraduate degree and a medical degree from Texas A&M University. He completed an internship at Austin Medical Center.

Kristopher Cummings, MD, assistant in radiology, received an undergraduate degree and a medical degree from the University of Alabama. He completed an internship at Barnes-Jewish Hospital.

Gregory dePrisco, MD, assistant in radiology, received an undergraduate degree from Texas A&M University and a medical degree from the University of Texas Southwestern. He completed an internship at Baylor University Medical Center.

Joseph Erinjeri, MD, assistant in radiology, received an undergraduate degree from the University of Michigan and a medical degree from Washington University in St. Louis. He completed an internship at Virginia Mason Hospital.

Phoebe Freer, MD, assistant in radiology, received an undergraduate degree from Amherst College and a medical degree from Washington University in St. Louis. She completed an internship at HealthOne Alliance.
FIRST-YEAR DIAGNOSTIC RADIOLOGY RESIDENTS

Continued from page 21

Heather Garrett, MD, assistant in radiology, received an undergraduate degree from the University of Virginia and a medical degree from Washington University in St. Louis. She completed an internship at St. Louis University Hospital.

William Holloway, MD, assistant in radiology, received an undergraduate degree from the University of South Carolina and a medical degree from the University of Chicago Pritzker School of Medicine. He completed an internship at Louis Weiss/University of Chicago.

Jack Jennings, MD, assistant in radiology, received an undergraduate degree from Wheaton College and a medical degree from the University of South Florida. He completed an internship at the University of South Florida Health Sciences Center.

Neil Kennedy, MD, assistant in radiology, received an undergraduate degree from the University of Wisconsin and a medical degree from the University of Colorado. He completed an internship at St. Luke’s Medical Center.

Michelle Lee, MD, assistant in radiology, received an undergraduate degree from Saint Louis University, a medical degree from the University of Illinois, and a medical degree from Northwestern University. She completed an internship at MetroHealth Medical Center.

Shao Pow Lin, MD, assistant in radiology, received an undergraduate degree from Stanford University and a medical degree from Washington University in St. Louis. He completed an internship at St. John’s Mercy Medical Center.

John Loh, MD, assistant in radiology, received an undergraduate degree from the University of Michigan and a medical degree from Washington University in St. Louis. He completed two years of orthopedic training at the University of Pittsburgh.

Shawyon Shadman, MD, assistant in radiology, received an undergraduate degree from Duke University and a medical degree from Washington University in St. Louis. He completed an internship and a residency at the University of Iowa Hospitals and Clinics.

Randal Anderson, MD, assistant in radiology, received an undergraduate degree from Brigham Young University and a medical degree from the University of Iowa Hospitals and Clinics.

Dennis Hsueh, MD, assistant in radiology, received an undergraduate degree from the University of California, Berkeley, and a medical degree from the University of Texas, San Antonio. He completed an internship at Loma Linda University Medical Center and a residency at the University of New York.

Akash Sharma, MD, assistant in radiology, received an undergraduate degree from Ross University School of Medicine. He completed an internship at Prince George’s Hospital Center and a residency at Hartford Hospital.

Feiyu Xue, MD, PhD, assistant in radiology, received an undergraduate degree from Beijing University, a Masters of Science degree from Tulane University, a medical degree from Dartmouth University, and a doctoral degree from Yale University. He completed a one-year internship at May Imogene Bassett Hospital and a diagnostic radiology residency at the Mallinckrodt Institute of Radiology.

Jane Yang, MD, assistant in radiology, received a medical degree from Capital University of Medical Sciences. She completed a pediatric radiology fellowship at Long Island Jewish Medical Center, a diagnostic radiology residency at Beijing Ji Shui Tan Hospital, and a surgical residency at Beijing Yan Shan Petrochemical General Hospital.

FIRST-YEAR RADIATION ONCOLOGY RESIDENT

Andrew Hope, MD, assistant in radiation oncology, received a medical degree from the University of Wisconsin, Madison. He completed an internship at St. Luke’s Hospital Center.

MALLINCKRODT INSTITUTE OF RADIOLOGY
GRANTS

Samuel Achilefu, PhD, associate professor of radiology, as principal investigator, received a $153,000 grant from the National Institutes of Health to study “Novel monomolecular multi-modality imaging agents.” Coinvestigators for the one-year study are Michael Welch, PhD, professor of radiology; Barry Siegel, MD, professor of radiology; Gregory Lanza, MD, and Samuel Wickline, MD, Department of Medicine; and Brinton Chance, MD, University of Pennsylvania.

Mark Conradi, PhD, professor of physics and of radiology, as principal investigator, received a $150,000 grant from the Global Environmental Management Initiative (GEMI) Foundation for research on “Lung imaging with C2F6 gas by F-19 MR.” Coinvestigators for the two-year grant are Jie Zheng, PhD, assistant professor of radiology, and Dmitriy Yablonskiy, PhD, DSc, professor of radiology and of physics.

Gregg Franklin, MD, PhD, assistant in radiation oncology, received the Siemens Medical Solutions/ Radiological Society of North America (RSNA) Research Resident Grant for “A pilot study on functional and physiologic imaging of the salivary glands by magnetic resonance imaging on patients treated by intensity modulated radiation therapy for head and neck cancers.” Coinvestigators for the $30,000 grant are Joseph Deasy, PhD, associate professor of radiation oncology, and Thomas Conturo, MD, PhD, associate professor of radiology.

Robert Gropler, MD, associate professor of radiology, of medicine, and of biomedical engineering, as principal investigator, received a $3.7 million grant from the National Heart, Lung, and Blood Institute of the National Institutes of Health for “Altered myocardial fatty acid metabolism in obesity.” Coinvestigators for the five-year grant are Pilar Herrero, MS, research scientist of radiology; and Samuel Klein, MD, and Linda Peterson, MD, Department of Medicine.

Daniel Low, PhD, associate professor of radiation oncology, received a three-year grant from the National Institutes of Health for “Lung trajectory mapping.” Coinvestigators for the $1.1 million grant are Joseph Deasy, PhD, associate professor of radiation oncology; David Politte, DSc, research instructor in radiology; Bruce Whiting, PhD, research assistant professor of radiology; and Gary Christensen, PhD, University of Iowa.

Robert Mach, PhD, professor of radiology, received a one-year grant of $272,942 from the National Institute on Drug Abuse for research on “Development of D3 antagonists to treat cocaine addiction.”

Robert McKinstry, MD, PhD, assistant professor of radiology; Asif Moinuddin, MD, research associate; and Kathy Grange, PhD, Department of Pediatrics and Genetics, are coinvestigators for a five-year grant to study “Prefrontally-mediated memory in phenylketonuria.” Principal investigator for the $1.2 million grant is Desiree White, PhD, Department of Psychology. The study is in collaboration with Oregon Health and Sciences University.

Tom Miller, MD, PhD, professor of radiology, as principal investigator, received a $1.7 million grant from the National Institutes of Health, National Cancer Institute, for research on “Positron emission tomography in prostate cancer.” Coinvestigators for the five-year grant are Farrokh Dehdashti, MD, associate professor of radiology; Barry Siegel, MD, professor of radiology; Cary Siegel, MD, assistant professor of radiology; Michael Welch, PhD, professor of radiology; Adam Kibel, MD, and Gerald Andriole, MD, Department of Urology; Jeff Michalski, MD, associate professor of radiology oncology; Kathryn Trinkaus, Bio-statistics; Peter Humphrey, MD, Department of Pathology and Immunology; and Nobuyuki Oyama, PhD, Fukui Medical University, Japan.

2002-2003 Radiation Oncology Residents

(Front row, left to right) Doctors Lilie Lin, Parag Parikh, Binh Tran, Gregg Franklin, Fengming Kong, Catherine Wu. (Back row) Doctors Angel Blanco, Anurag Singh, Wayne Lanoreaux, Andrew Hope, Jon Anders, Charles Hechtman.
**APPOINTMENTS/ELECTIONS**

**Kyongtae Bae, MD, PhD,** assistant professor of radiology, was elected to an indefinite term as a member of the Radiological Society of North America’s Education Grant Study Section and the Research Grant Study Section.

**Colin Derdeyn, MD,** associate professor of radiology, was appointed as a consultant to the Neurological Devices Panel of the Medical Devices Advisory Committee for the Center for Devices and Radiological Health of the Food and Drug Administration.

**Daniel Low, PhD,** associate professor of radiation oncology, was appointed to a one-year term as vice president, faculty, for the Hillel Center at Washington University in St. Louis.

**Elizabeth McFarland, MD,** associate professor of radiology, was elected to the Association of University Radiologists’ 2003-2004 Board of Directors as the director of the Philips-AUR Faculty Development Program. She was appointed director for Mallinckrodt Institute’s Summer Research Program.

**Robert McKinstry, MD, PhD,** assistant professor of radiology, was appointed to a one-year term on the Neurology/Head & Neck Subcommittee of the Scientific Program of the Radiological Society of North America.

**Joel Perlmutter, MD,** professor of neurology, of neurological surgery, and of radiology, was elected to a two-year term as a member of the Parkinson Study Group Executive Committee. He was appointed to a three-year term on the Standards Committee of the Huntington’s Study Group.

**Steven Peterson, PhD,** professor of neurology, of neurological surgery, of anatomy and neurobiology, and of radiology, was appointed as a consultant to the Education Committee of the American Association of Physicists in Medicine.

**Anurag Singh, MD,** assistant professor in radiation oncology, was elected vice-chairman of the Association of Residents in Radiation Oncology. He was appointed as resident liaison to the Education Committee and the Refresher Course Committee of the American Society for Therapeutic Radiology and Oncology. Singh was appointed to the Executive Board of the Association of Directors of Radiation Oncology Programs and as a member of the Education of Physicians Subcommittee of the American Association of Physicists in Medicine.

**HONORS/AWARDS**

**Kyongtae Bae, MD, PhD,** assistant professor of radiology, received a Cum Laude Award from the Society of Computed Body Tomography and Magnetic Resonance for each of two presentations (“Principles and practices of contrast material delivery for MDCT” and “CT coronary artery imaging”) made at the 26th Annual Course Meeting in April, 2003.

**Christine Menias, MD,** assistant professor of radiology, received a visiting professorship at the Universidad Catolica in Santiago, Chile.

**Bradley Schlaggar, MD, PhD,** assistant professor of neurology, of pediatrics, and of radiology, received the 2003 Young Investigator Award, in the amount of $20,000, from the Child Neurology Society for his research on “Development of controlled visual lexical processing: fMRI studies.”
**LECTURES/PRESENTATIONS**

Kyongtae Bae, MD, PhD, assistant professor of radiology, presented “Principle and practice of computer-aided diagnosis” to the Department of Nuclear Engineering, Korean Advanced Institute of Technology and “CT coronary artery imaging” to the Department of Radiology, Chung-Nam University, Daejon, Korea, June 4. He spoke on “Computer-aided diagnosis in radiology” at Seoul National University, Department of Computer Science, Seoul, Korea, June 5. He presented “Computer-aided diagnosis in chest radiology” at the International Symposium on Issues in Thoracic Radiology: Update, Seoul, Korea, June 7 and 8. Bae spoke on “Principles and applications of MDCT” at Hyun-Dai Joong-Hang Hospital, Asan University, Seoul, Korea, on June 10, and at Yeong-Dong Severance Hospital, Seoul, Korea, June 13. He presented “MDCT made easy” to the Department of Radiology, Sam-Sung Hospital, Seonggkyunkwan University, Seoul, Korea, June 10. He spoke on “Radiology research in the USA: update,” “Basic body MR physics,” and “CT coronary artery imaging” at the Department of Radiology, Seoul National University, Seoul, Korea, June 11-13. Bae presented “Principles and practice of contrast material delivery for MDCT” at the 5th Annual International Symposium on Multidetector-Row CT, San Francisco, California, June 25-28. He presented “MDCT” to the Department of Radiology, University of Kansas Medical Center, Kansas City, Kansas, July 15. He spoke on “Technical aspects of contrast in CTA imaging” at the Applied Radiology Focus Group for CTA Contrast Administration, New York City, New York, July 25.

Jeffrey Bradley, MD, assistant professor of radiation oncology, as invited lecturer, presented “PET targeting in radiation therapy: applications in lung and head and neck cancer” at the Case Western Reserve University PET Symposium, Cleveland, Ohio, May 15 and 16. He presented “PET/CT for radiation therapy planning: the concepts of biological target volumes” at the CPS Innovations Advisory Board Meeting, New Orleans, Louisiana, June 20.

Colin Derdeyn, MD, associate professor of radiology, spoke on “Treatment of carotid atherosclerotic disease: medicine, surgery, or stent” at Grand Rounds, Salem Public Hospital, Salem, Illinois, April 8, and at the 9th Annual Neuroscience Update, Carbondale Memorial Hospital, Carbondale, Illinois, July 12. He presented “Cerebral hemodynamics in acute and chronic ischemia” and “Preparing a grant application” at the 41st Annual Meeting of the American Society of Neuroradiology, Washington, DC, April 29.

Louis Gilula, MD, professor of radiology and of surgery, presented “Lumbar diskography,” “Introduction to vertebroplasty,” and “Lumbar and sacral nerve blocks” at Skeletal Radiology 2003, Scottsdale, Arizona, April 6-9. He spoke on “Cervical spine trauma” and “Plain film approach to bone tumors” at Oregon Health and Science University, Portland, Oregon, June 17.


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**Purdy Lecture**

John Wong, PhD, director of clinical physics for the Department of Radiation Oncology at William Beaumont Hospital in Royal Oak, Michigan, presented The First James A. Purdy Medical Physics Lecture on May 16. He spoke on “Image guided radiation therapy: present methods and future challenges.” Shown (left to right) are James Purdy, PhD, professor of radiation oncology and chief of the Division of Physics; John Wong, PhD; and Carlos Perez, MD, professor of radiation oncology and chair of the Department of Radiation Oncology.
LECTURES/PRESENTATIONS

Continued from page 25

Jay Heiken, MD, professor of radiology, spoke on “Pancreatic cancer: evaluation with multidetector CT,” “CT evaluation of small bowel obstruction,” and “CT colonography: What are the issues?” at the 33rd Meeting of the Sao Paulo Radiological Society, Sao Paulo, Brazil, May 1-4. As a representative of the Society of Computed Body Tomography and Magnetic Resonance, he presented “Ultrasound practitioners” at the American College of Radiology Intersociety Summer Conference, Pasadena, California, August 1-3.

Saulo Klahr, MD, professor of medicine and radiology, presented “Obstructive nephropathy and renal fibrosis” at the Management of Comorbidities in Kidney Disease Conference, Long Island College Hospital, New York City, New York, May 30 and 31.

Jason Lewis, PhD, research instructor in radiology, presented “Cu-ATSM-PET imaging of hypoxia: basic science to the clinic” at Memorial Sloan-Kettering Cancer Center, New York City, New York, June 16.

Elizabeth McFarland, MD, associate professor of radiology, as chair of the Philips-AUR Faculty Development Program, spoke on “What do we value in academics?” at the 51st Annual Meeting of the Association of University Radiologists, Miami, Florida, April 9-13. She presented “CT colonography: performance to politics” at the GI Division Rounds, Department of Gastroenterology, Washington University in St. Louis, Missouri, June 10.

Robert McKinstry, MD, PhD, assistant professor of radiology, spoke on “MRI of disorders of brain development” at the 79th Annual Meeting of the American Association of Neuropathologists, Special Course: Magnetic Resonance Imaging of Neurological Disease, Orlando, Florida, June 19.

Carlos Perez, MD, professor of radiation oncology, presented “Brachytherapy in carcinoma of the breast,” “Brachytherapy in carcinoma of the uterine cervix,” “3D-CRT in localized carcinoma of the prostate,” “Radiation therapy accidents and quality assurance,” and “Radiation therapy and hormonal therapy in prostate cancer” at the II Jornadas de Radioterapia de Alta Complejidad Braquiterapia y Fisica Medica, Cordoba, Argentina, July 31-August 2. He spoke on “Innovative management of bone metastases” at the Center for Cancer Care and Research, Lakeland, Florida, August 15.


Steven Peterson, PhD, professor of neurology, of neurological surgery, of anatomy and neurobiology, and of radiology, presented “Strategies for studying cognitive development with fMRI” at the RIKEN Brain Science Institute, Saitama, Japan, August 9.

William Powers, MD, professor of neurology, of neurological surgery, and of radiology, presented “Cerebrovascular disease” at the Capri PET Conference, Capri, Italy, May 8. He spoke on “Logistics and pitfalls of multicenter studies with imaging” at the National institute of Neurological Disorders Symposium on the Role of Neuroimaging in Parkinson Disease, Washington, DC, July 10.

Joseph Roti Roti, PhD, professor of radiation oncology, as platform speaker, presented “Exposure of C3H 10T1/2 cells to CDMA, FDMA or TDMA radiofrequencies does not significantly modify gene expression” at the Electroned 2003 Symposium, San Antonio, Texas, June 11-13. He presented "Results of recent studies to determine if RF radiation can induce RNA damage" at the 2003 Michaelson Conference, West Yellow- stone, Montana, August 8-12.

Stuart Sagel, MD, professor of radiology, spoke on “CT angiography for pulmonary embolism,” “Role of CT in bronchogenic carcinoma,” “CT of the thoracic aorta,” “CT of nonvascular mediastinal masses,” and “Problematic ‘unknown’ CT cases” at the Rocky Mountain Radiologic Society Meeting, Vail, Colorado, July 11-13. He presented “CT angiography for pulmonary embolism: alternative/additional diagnoses,” “CT of the pericardium,” and
**Focal Spot, Summer 2003**

**Symposia**

In this section of FSYI, only those faculty and staff who have Department of Radiology or Department of Radiation Oncology appointments are listed.

**American Roentgen Ray Society**

103rd Annual Meeting
San Diego, California
May 4-9, 2003

**Screening for Disease with CT Forum**

Elizabeth McFarland, MD, "Colon cancer screening: interpretation and results."

**Categorical Course**

Barry Siegel, MD, "PET for monitoring and predicting response to therapy."

**Scientific Presentations**

Edward Lee, MD, MPH; Marilyn Siegel, MD; Charles Hildebolt, DDS, PhD; Sanjeev Bhalla, MD; Fernando Gutierrez, MD, "Comparison of multislice axial, multplanar, and 3D volume rendering images in evaluation of congenital thoracic aortic abnormalities."

Christine Menias, MD, "CT of nontraumatic acute abdominal pain."

Srinivasa Prasad, MD, "Primary hepatic lymphoma."

Marilyn Siegel, MD, "Neonatal cranial sonography."

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**Henry Royal, MD, professor of radiology, presented “The SNM: here today—where is it going tomorrow?” and “Radiation and terrorism: perceptions and realities” at the 48th Annual Meeting, Southwestern Chapter of the Society of Nuclear Medicine, Oklahoma City, Oklahoma, April 11-13.**

**Barry Siegel, MD, professor of radiology and of medicine, spoke on “FDG-PET: artifacts, variants and benign lesions simulating cancer” and “Evaluating tumor response to treatment with PET: FDG and beyond” at the 48th Annual Meeting, Southwestern Chapter of the Society of Nuclear Medicine, Oklahoma City, Oklahoma, April 11-13. He presented “PET artifacts/variants” and “PET in women’s imaging” at Clinical Nuclear Medicine 2003, sponsored by Harvard Medical School, Boston, Massachusetts, May 13-16. As guest speaker, Siegel presented “Assessing response of cancer therapy with PET: FDG and beyond” at the Ninth Annual William D. Kaplan Lecture, sponsored by The Joint Program in Nuclear Medicine and Harvard Medical School, Boston, Massachusetts, May 13. He presented “Interpreting PET images” and “PET in oncology: breast and gynecological cancers” at PET Imaging for the Radiologist, sponsored by the American College of Radiology, Hilton Head, South Carolina, June 14 and 15. As invited lecturer, Siegel spoke on “Current status of PET in clinical practice,” “PET in thoracic oncology,” “PET in women’s cancers,” and “PET for assessing response to therapy: FDG and beyond” at the South African Radiological Congress 2003, sponsored by the Radiology Society of South Africa, Pretoria, South Africa, August 15-17. He also spoke at Tygerburg Hospital, Stellenbosch Medical School, Cape Town, South Africa, August 26.
SYMPOSIA

Continued from page 27

POSTER PRESENTATIONS
Edward Lee, MD, MPH; Christine Menias, MD; Amy Hara, MD; Jay Heiken, MD; Dennis Balfe, MD, “Practical multiplanar CT evaluation of small bowel obstruction: techniques and clinical applications.” Certificate of Merit Award.

Edward Lee, MD, MPH; Markus Lammle, MD; Kianoush Rezaei, MD; Vamsidhar Narra, MD; Jeffrey Brown, MD, “Practical MRI of the fetus: principles and applications.” Certificate of Merit Award.

MIR in South Africa

As a Radiological Society of North America (RSNA) International Visiting Professor, Marilyn Siegel, MD, professor of radiology and of pediatrics, presented “CT of common focal hepatic masses,” “CT of pediatric mediastinal masses,” “Pediatric renal masses: multimodality imaging,” “Imaging acute abdominal pain in children,” and “Pediatric pelvic masses: CT and MRI” at the South African Radiological Congress 2003, sponsored by the Radiology Society of South Africa, Pretoria, South Africa, August 15-17. While in South Africa, she also presented invited lectures at Pretoria Academic Hospital, Johannesburg Hospital, Red Cross Hospital, and Ga Rankuwa Hospital, August 18 and 19.

The RSNA International Visiting Professor team: (left to right): Doctors Scott Pretorius, University of Pennsylvania; Marilyn Siegel; Anina Wilkes, Thomas Jefferson University.
SOCIETY OF NUCLEAR MEDICINE
50th Annual Meeting
New Orleans, Louisiana
June 21-25, 2003

Carolyn Anderson, PhD,
comoderator, Radiopharmaceutical Chemistry Track
New Chemistry—Oncology II.

Farrokh Dehdashti, MD,
moderator, Oncology/Hematology Track Oncology—
Clinical Diagnosis: Melanoma and Thyroid Cancer.

Jason Lewis, PhD,
comoderator, Radiopharmaceutical Chemistry Track New Chemistry—Other I.

Robert Mach, PhD,
moderator, Radiopharmaceutical Chemistry Track New Chemistry—Oncology I.

Tom Miller, MD, PhD, chair,
Scientific Program.

SCIENTIFIC PAPERS
Farrokh Dehdashti, MD; Jeff Michalski, MD; Carmen Dence, MS; Barry Siegel, MD; Michael Welch, PhD, "Positron tomographic assessment of androgen receptors in prostate carcinoma."

Pilar Herrero, MS; Jeffrey Baumstark; Deborah Delano, RN; Robert Gropler, MD, "Improved aerobic capacity with exercise training in the elderly correlates with increased myocardial fatty acid uptake during dobutamine."

Pilar Herrero, MS; Zulfiya Kisrieva-Ware, MD, PhD; MD, PhD; Susan Stellhorn, RN; Robert Gropler, MD, "Impact of dobutamine on myocardial substrate metabolism in type I diabetes."

Pilar Herrero, MS; Zulfiya Kisrieva-Ware, MD, PhD; Carmen Dence, MS; Paul Eisenbeis; Terry Sharp; Robert Gropler, MD, "Assessment of a mathematical model to measure myocardial glycolysis/oxidation by PET with 1-carbon-11-glucose." Pilar Herrero, MS; Zulfiya Kisrieva-Ware, MD, PhD; Carmen Dence, MS; Paul Eisenbeis; Terry Sharp; Robert Gropler, MD, "Assessment of a mathematical model to measure myocardial glycolysis/oxidation by PET with 1-carbon-11-glucose."

Melanie Kotys; Erbil Akbudak, PhD; Thomas Conturo, MD, PhD, "Increased dose dynamic range and temporal resolution of AIFs without additional noise."

POSTER SESSIONS
Jason Lewis, PhD; Robert Malyapa, MD, PhD; Ryuji Higashikubo, PhD; Michael Welch, PhD, "Histological comparison of the hypoxia selective Cu-ATSM and pimonidazole." Data Ponde, PhD; Nobuyuki Oyama, MD, PhD, Carmen Dence, MS; Michael Welch, PhD, "[18F]-fluoroacetate, an analog of C-11 acetate for tumor imaging." Ananya Ruangma, PhD; Richard Laforest, PhD; Mark Mintun, MD, "Quantitative evaluation of metal artifacts on PET data in combined PET/CT imaging." Zheng Wang, PhD; Michael Welch, PhD; Jerrel Rutlin; Jason Sohn, PhD, "microPET imaging in autoimmune uveitis: asymmetric lymphadenopathy in the secondary lymphoid system."

INTERNATIONAL SOCIETY FOR MAGNETIC RESONANCE IN MEDICINE
11th Annual Scientific Meeting & Exhibition
Toronto, Ontario, Canada
July 10-16, 2003

Thomas Conturo, MD,
PhD, organizer, Diffusion/Perfusion Study Group; cochair, Diffusion MRI: To Tensor or Not To Tensor; cochair, Diffusion Tensor Imaging Acquisition Methods; cochair, Diffusion Tensor Imaging: Clinical Applications.

ORAL PRESENTATIONS
Thomas Conturo, MD, PhD, "Numerical analysis of the feasibility of human q-space MRI in the case of finite-duration diffusion-encoding gradients."

Melanie Kotys; Erbil Akbudak, PhD; Thomas Conturo, MD, PhD, "Increased dose dynamic range and temporal resolution of AIFs without additional noise."

POSTER PRESENTATIONS
Erbil Akbudak, PhD; Joanne Markham, MS; Melanie Kotys; Glenn Foster, RT; Thomas Conturo, MD, PhD, "A high spatial temporal resolution AIF method for bolus cerebral perfusion."

Melanie Kotys; Erbil Akbudak, PhD; Thomas Conturo, MD, PhD, "Increased dose dynamic range and temporal resolution of AIFs without additional noise."

AMERICAN ASSOCIATION FOR CANCER RESEARCH
94th Annual Meeting
Washington, DC
July 11-14, 2003

Douglas Rowland, PhD, co-coordinator, 2003-2004 Associate Member Council Program.

FOCAL SPOT, SUMMER 2003
SYMPOSIA

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SCHOLAR-IN-TRAINING AWARD

Wen Ping Li, PhD, "A radiolabeled gelatinase inhibitor for metalloproteinase 2 and 9 expression in a murine melanoma mouse model."

POSTER SESSIONS

Jason Lewis, PhD; Joonyoung Kim, PhD; Michael Welch, PhD, "Tumoricidal activity by targeted radiotherapy with the hypoxia specific agent 64Cu-ATSM is enhanced by treatment with 2-deoxyglucose."

Weng Ping Li, PhD; Jennifer Sprague; Carolyn Anderson, PhD, "A radiolabeled gelatinase inhibitor for PET imaging of amatrix metalloproteinase 2 and 9 expression in a murine melanoma mouse model."

Jacob Locke, MD, "Celecoxib enhances cytotoxicity of heat shock, reduces thermotolerance and modifies HSF and AP-1 activation."

Girdhar Sharma, PhD; Tej Pandita, PhD, "Physical and functional interaction of HOX-B7 with members of the NHEJ pathway in breast cancer."

AMERICAN ASSOCIATION OF PHYSICISTS IN MEDICINE

45th Annual Meeting
San Diego, California
August 10-14, 2003

Walter Bosch, DSc, speaker, Symposium—RT Extensions to DICOM: Do They Really Work?

Joseph Deasy, PhD, chair, Scientific Session—Other.
Eric Klein, MS, cochair, Poster Discussion Session—Educational.

Zuofeng Li, DSc, chair, Scientific Session—IMRT: Planning and Optimization.

Daniel Low, PhD, moderator, Symposium—IMRT: QA—What Is Enough?

Sasa Mutic, MS, chair, Poster Discussion Session—Brachytherapy.

REFRESHER COURSE

Sasa Mutic, MS, "Use of CT and PET in radiotherapy."

CONTINUING EDUCATION COURSE

Daniel Low, PhD, "IMRT system quality assurance."

SCIENTIFIC SESSIONS

Joseph Deasy, PhD; Issam El Naqa, PhD; Milos Vicic, PhD, "Validation maps for bias correction in Monte Carlo dosimetry."

Robert Drzymala, PhD; Zuofeng Li, DSc, "A simple independent dose calculation method for verification of treatment time in Gamma Knife radio-surgery using integral dose.

Issam El Naqa, PhD; Joseph Deasy, PhD; Milos Vicic, PhD, "Denoising of Monte Carlo dose distributions via locally adaptive hybrid median filtering."

Issam El Naqa, PhD; Daniel Low, PhD; Joseph Deasy, PhD; Michelle Nystrom, PhD, "Automated breathing motion modeling for 4D CT."

Jian-Yue Jin, PhD; Joseph Deasy, PhD; Konstantin Zakaryan, PhD, "Open-source DICOM and GUI tools for treatment planning research (WIP)."

Evgeny Kalinin; Joseph Deasy, PhD, "A method for fast 3-D IMRT dose calculations: the quadrant infinite beam (QIB) algorithm."

Fritz Lerma, PhD; Robert Drzymala, PhD, "Practical quality assurance of the automatic positioning system on the Leksell Gamma Knife."

Sasa Mutic, MS; Zuofeng Li, DSc; Joseph Deasy, PhD; Issam El Naqa, PhD; Daniel Low, PhD, "Measured 90 degree leakage TLVs of photon beams from an Elekta linear accelerator."

Bruce Whiting, PhD, "Tomographic reconstructions from incomplete data (WIP)."

POSTER SESSIONS

Joseph Deasy, PhD; Konstantin Zakaryan, PhD, "Dose-distance constraints: a new method for controlling intensity modulated treatment planning dose distributions."

Joseph Deasy, PhD; Issam El Naqa, PhD, "Adaptive gridding for IMRT dose calculations."

Jian-Yue Jin, PhD; Sasa Mutic, MS; Wade Thorstad, MD; Daniel Low, PhD; Fengming Kong, MD; Perry Grigsby, MD; James Purdy, PhD, "Study of field matching between SMLC-IMRT and conventional radiotherapy."

Petr Novak, MSc; Anurag Singh, MD; Eduardo Moros, PhD; William Straube, MS; Andrea Zeng, Jacob Locke, MD; Robert Myerson, MD, PhD, "Performance of a new microPET compatible small animal hyperthermia system."

Milos Vicic, PhD; Daniel Low, PhD; Perry Grigsby, MD; Joseph Deasy, PhD, "Monte-Carlo based optimization of a small animal conformal therapy irradiator (microRT)."

Sasha Wahab, MD; Daniel Low, PhD; Issam El Naqa, PhD; Parag Parikh, MD; Michelle Nystrom; Jeffrey Bradley, MD; Sasa Mutic, MS, "Use of four-dimensional computed tomography in conformal therapy planning for lung cancer."

Bruce Whiting, PhD, "Tomographic reconstructions from incomplete data (WIP)."
INTERNATIONAL SYMPOSIUM ON RADIOPHARMACEUTICAL CHEMISTRY
15th Annual Meeting
Sydney, Australia
August 10-14, 2003

SCIENTIFIC SESSIONS
Carolyn Anderson, PhD; Wen Ping Li, PhD; James Kozlowski; Zhaohui Zhou, PhD; Daniel Schuster, MD, “Evaluation of Cu-64-DOTA-CTT, a MMP-9 inhibitor, as a potential PET lung inflammation imaging agent.”

Heather Bigott, Michael Welch, PhD, “Synthesis of rhenium/technetium labeled estrogen receptor imaging agents: evaluation using microPET with technetium-99m.”

Charles Boswell; Xiankai Sun, PhD; Carolyn Anderson, PhD, “In vivo stability of Cu-64-azamacrocyclic complexes: comparison of Teta and Dota with cross-bridged chelators.”

Carmen Dence, MS; Joon-young Kim, PhD; Xiankai Sun, PhD; Richard Laforest, PhD; Michael Welch, PhD, “Synthesis, microPET imaging, biodistribution and dosimetry data of D- and L-[3-14C]lactic acid.”

Jason Lewis, PhD; Jerrel Rutlin; Lynne Jones; Michael Welch, PhD, “Cu-64-complexes targeted at topoisomerase-II, a regulatory enzyme for DNA topology.”

MIR Reunion

While in Sydney, Australia, for the International Symposium for Radiopharmaceutical Chemistry, Michael Welch, PhD, cochief of the Division of Radiological Sciences, hosted a reunion for 52 past and present members of the Radiological Chemistry Laboratory. Left to right: Xiankai Sun, PhD; Jeongsoo Yoo, PhD; Welch; Yashuisa Fujibayashi, PhD, DMedSci, from Japan’s Fukui Medical University; and Jim Wang, PhD. In 1999, Fujibayashi and Welch coordinated an academic and cooperative research agreement between MIR and Fukui University.

With Welch are (left to right) Jennifer Sprague, Amy Vavere, Andrew Boswell, and Heather Bigott—Radiological Chemistry Laboratory graduate students who presented scientific papers at the meeting in Australia.
**Symposia**

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Richard Laforest, PhD; Ananya Ruangma, PhD; Jason Lewis, PhD; Xiankai Sun, PhD; Michael Welch, PhD, "microPET imaging of radiopharmaceuticals labeled with three copper radionuclides.”

Jason Lewis, PhD; Jin-Hwan Kim, PhD; Michael Welch, PhD, "microPET imaging of the effects of tumoroidal 2-deoxy glucose.”

Robert Mach, PhD; Wenhua Chu; Zhude Tu, PhD; Carmen Dence, MS; Michael Welch, PhD, "[12]PJ34: a PET radiotracer for imaging the role of PARP-1 in necrosis.”

Paul McQuade, PhD; Jason Lewis, PhD; Michael Welch, PhD, "Cu labeling and evaluation of the metallopeptide, DOTA-reCCMSH(1g11), a cyclized alpha-MSH analogue.”

Douglas Rowland, PhD; Zhude Tu, PhD; Robert Mach, PhD; Michael Welch, PhD, "Investigation of a new sigma 2 receptor ligand for detection of breast cancer.”

Jennifer Sprague; Xiankai Sun, PhD; Laura Meyer; Samuel Achilefu, PhD; Carolyn Anderson, PhD, "In vivo behavior of copper-64 labeled Y3-octreotate using a cross-beidged cyclam ligand.”

Xiankai Sun, PhD; Joel Garbow, PhD; Jason Lewis, PhD; Jerrel Rutlin; Carolyn Anderson, PhD; Michael Welch, PhD, "Multi-modality imaging studies on osteolytic bone metastasis.”

Lucie Tang, BScA; Douglas Rowland, PhD; Debbie Sultan, PhD; Michael Welch, PhD, "Remote separation procedure for halogen production.”

Amy Vavere; Michael Welch, PhD, "microPET imaging of a titanium-45 labeled titanocene complex to delineate biodistribution of titanium anti-cancer drugs.”

Zhihong Wang, PhD; David Reichert, PhD; Wouter Nagengast, "microPET imaging studies of the initiation and progression of a murine model of rheumatoid arthritis.”

Jeongsoo Yoo, PhD; David Reichert, PhD; Peter Wolohan, PhD; Michael Welch, PhD, "Regioselectively N-substituted cyclers: synthesis, biodistribution, log P and modeling.”

**Poster Sessions**

Mohammed Al-Qahtani, PhD; Michael Welch, PhD, "A new synthesis procedure of [18F]FFNP for in vivo imaging of progesterin receptors.”

Pilar Herrero, MS; Zulfia Kisrieva-Ware, MD, PhD; Carmen Dence, MS; Paul Eisenbeis; Terry Sharp; Robert Gropler, MD, "Assessment of a mathematical model to measure myocardial glycolysis/oxidation by PET and 1-carbon-11-glucose.”

Paul McQuade, PhD; Lynne Jones; Michael Welch, PhD, "mTC and Cu labeled annexin-V, positron emitting radiopharmaceuticals to study apoptosis.”

Paul McQuade, PhD; Jason Lewis, PhD, Investigation into improved imaging agents for cardiovascular and neurologic hypoxia.”

David Reichert, PhD; Zhi Wang, PhD, "Approaches to the in vivo PET imaging of T cells in adoptive immunotherapy.”

Xiankai Sun, PhD; Carolyn Anderson, PhD, "In vivo evaluation of indium-111-labeled cross-bridged tetraazamacrocyclic ligands.”

Lucie Tang, BScA; Gregory Gaehle; Jason Lewis, PhD; Michael Welch, PhD, "Automated separation, purification and labeling systems for copper isotopes (Cu, 61Cu, 63Cu).”

Zhude Tu, PhD; Suwanna Vangveravong; Carmen Dence, MS; Robert Mach, PhD, "Conformationally-flexible benzamide analogues as dopamine D3 receptor imaging agents for PET and SPECT.”

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**Special Award**

At the April meeting of the American Radium Society (ARS), Robert Malaya, MD, PhD, assistant professor of radiation oncology, received the ARS Young Oncologist Essay Award for his talk on “ERK $\frac{1}{2}$ activation is associated with poor prognosis in hypoxic cancers of the uterine cervix.” At left is Frank Wilson, MD, ARS president.