

SUMMER/FALL 2004

VOLUME 35, NUMBER 2

# FOCAL SPOT

MALLINCKRODT

## *More Choices*

*for Women with  
Early Breast Cancer*

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## DIAGNOSTIC RADIOLOGY CHIEF RESIDENTS



Doctors Christine Peterson (left), Gregory Sanders, and Catherine Appleton.

# CONTENTS

FOCAL SPOT  
SUMMER/FALL 2004  
VOLUME 35, NUMBER 2



## UNDER NEW LEADERSHIP...

4

Simon Powell, MD, PhD, newly appointed chairman of the Department of Radiation Oncology, plans to continue the tradition of innovation and excellence in the clinical, research, and education programs set by his predecessor Carlos Perez, MD.

## CHANGING OF THE GUARD

6

Although the leadership of Mallinckrodt Institute's body computed tomography (CT) service recently changed, the vision for this service remains the same as when it was established three decades ago: to provide the best in patient care through the use of body CT for both chest and abdominal imaging.



## THE LATEST IMAGING FOR THE LITTLEST PATIENTS

11

Two exciting radiology services, which can have a major impact on patient care, have been established at St. Louis Children's Hospital: fetal magnetic resonance imaging and pediatric cardiac computed tomography.



## 2.....SPOT NEWS



20.....FYI

## MORE CHOICES FOR WOMEN WITH EARLY BREAST CANCER

15

Radiation oncologists now offer women who have early-stage breast cancer and are candidates for breast conservation therapy the opportunity to return to their families, careers, and lives in less time than with other types of radiation treatments.



**ON THE COVER** Imran Zoberi, MD, a radiation oncologist, is shown with equipment used in breast brachytherapy—delivering radiation deep within a breast tumor while sparing the surrounding healthy tissue and conserving the breast. Photography by Tim Parker.

Visit the MIR web site at  
[www.mir.wustl.edu](http://www.mir.wustl.edu)

# SPOT NEWS

## MIR offers the best doctors

The Best Doctors in America maintains a database of physicians who have been acknowledged as providing the best in patient care. Best Doctors updates the database annually by mailing a survey to thousands of healthcare professionals worldwide, asking them for nominations based on patient care rather than academic or research excellence. The top nominated physicians—approximately 30,000 annually—are then entered into the database. The following Mallinckrodt Institute nuclear physicians, radiation oncologists, and radiologists are among The Best Doctors in America, 2004.

### 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  
Marie Taylor, MD

### Radiology

Claire Anderson, MD  
Preamsri Barton, MD  
Daniel Brown, MD  
DeWitte Cross, MD  
Michael Darcy, MD  
Jay Heiken, MD  
David Hovsepian, MD  
William McAlister, MD  
William Middleton, MD

Barbara Monsees, MD  
Christopher Moran, MD  
Daniel Picus, MD  
David Rubin, MD  
Stuart Sagel, MD  
Marilyn Siegel, MD  
William Totty, MD  
Suresh Vedantham, MD  
Thomas Vesely, MD  
Franz Wippold, MD  
Pamela Woodard, MD

## Young investigators receive awards

Tammie Benzinger, MD, PhD, a fourth-year diagnostic radiology resident, was selected by the International Society for Magnetic Resonance in Medicine (ISMRM) to participate in the Amersham Health MRI Fellowship Program. The fellowship is supported by a grant from Amersham Health, the world's leading manufacturer of diagnostic imaging products. The award was presented at the 2004 ISMRM meeting in Kyoto, Japan, where Benzinger gave an oral presentation of her research on "Diffusion-weighted MRI analysis of the effects of prematurity and white matter injury on cerebral cortical development." Benzinger's project mentor is Jeffrey Neil, MD, PhD, assistant professor of pediatrics, of neurology and neurological surgery, and of radiology.

The Roentgen Resident/Fellow Research Award is presented annually by the Radiological Society of North America's (RSNA's) Research and Education Foundation to

recognize and encourage outstanding residents and fellows in radiologic research. The Institute was well-represented among the 2004 award recipients:

- Tammie Benzinger, MD, PhD, diagnostic radiology
- Wayne Lamoreaux, MD, 2004-2005 radiation oncology chief resident
- Feiyu Xue, MD, PhD, nuclear medicine.

The RSNA Research and Education Foundation also awards special grants that afford faculty investigators greater opportunities to mentor medical students. Julie Schwarz, Washington University in St. Louis School of Medicine, received the 2004 Philips Medical Systems/RSNA Medical Student Departmental Program Grant for research on "Identification of molecular markers associated with poor prognosis in hypoxic tumors of the uterine cervix." Her scientific advisor is Perry Grigsby, MD, professor of radiation oncology and of radiology.

## Menias is Teacher of the Year

At the residents' and fellows' farewell dinner in June, Christine Menias, MD, assistant professor of radiology, was named the 2004-2005 MIR Teacher of the Year. The award is presented annually to a faculty member who has made outstanding contributions to resident education.

The honoree is selected by radiology senior residents.

Menias completed a diagnostic radiology residency (chief resident, 1998-1999) and an abdominal imaging fellowship at Mallinckrodt Institute. She has been involved in resident education since joining the faculty in 2000 and currently serves as assistant director of the Diagnostic Radiology Resident Program.

Tedric Boyse, MD, musculoskeletal radiology clinical fellow, received the Fellow of the Year Award. Distinguished Teacher awards were presented to Sanjeev Bhalla, MD, assistant professor of radiology; Robert McKinstry, MD, PhD, assistant professor of radiology; David Rubin, MD, associate professor of radiology; and Katie Vo, MD, assistant professor of radiology.

### Past Teacher of the Year Recipients

Dennis Balfe, MD	1983, 1987
Marilyn Siegel, MD	1984, 1989
David Ling, MD	1985
Fernando Gutierrez, MD	1986
Stuart Sagel, MD	1988
Barry Siegel, MD	1990
Franz Wippold, MD	1991
Anthony Wilson, MD	1992
William Middleton, MD	1993
Jay Heiken, MD	1994
Gary Shackelford, MD	1995
Mokhtar Gado, MD	1996
Preamsri Barton, MD	1997
Harvey Glazer, MD	1998
William Totty, MD	1999
Thomas Herman, MD	2000
Barbara Monsees, MD	2001
William McAlister, MD	2002
Sanjeev Bhalla, MD	2003

## Royal heads nuclear medicine board

Henry Royal, MD, professor of radiology, was appointed to a one-year term as executive director of the 12-member American Board of Nuclear Medicine (ABNM). Established in 1971, the ABNM oversees certification of nuclear medicine physicians, sets nuclear medicine educational standards, maintains a registry of ABNM-certified physicians, and conducts an examination process to determine competency of nuclear medicine physicians.

Royal also serves on the Board of Directors of the National Council on Radiation Protection and is associate director of Mallinckrodt Institute's Division of Nuclear Medicine. He recently completed a one-year term as president of the Society of Nuclear Medicine (SNM). Now in its 51st year, the SNM promotes the beneficial uses of radioisotopes and radiation, disseminates new ideas in nuclear medicine, and stresses the interdisciplinary nature of nuclear science.

At SNM's annual meeting this past June in Philadelphia, Pennsylvania, Royal passed on the society leadership to Matthew Thakur, PhD, professor of radiology and of radiation oncology at Thomas Jefferson University. Thakur was a visiting scholar at Mallinckrodt Institute in the mid 1970s.

## Two honors go to Welch

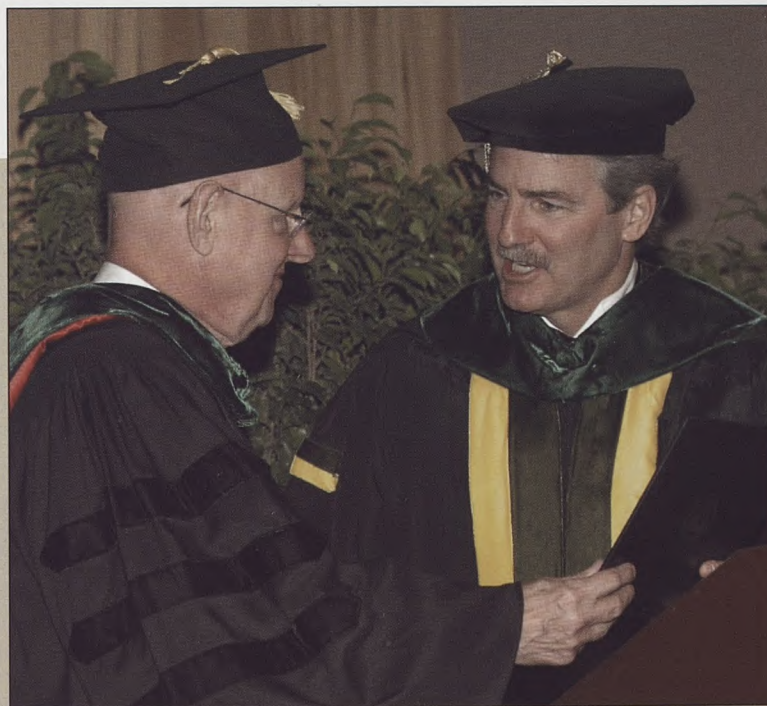
Michael Welch, PhD, professor of radiology, of chemistry, and of molecular biology and pharmacology, is the first synthetic chemist to receive the prestigious Benedict Cassen Award. This coveted honor—often called the Nobel Prize of nuclear medicine—is presented biennially by the Education and Research Foundation of the Society of Nuclear Medicine (SNM) to a scientist or physician-scientist whose work has led to a

major advancement in basic or clinical nuclear medicine. Welch received the award in June during SNM's annual meeting in Philadelphia, where he presented the first Cassen Lecture: "Tracer studies from bench to bedside: past, present, and future."

Welch, cochief of the Institute's Division of Radiological Sciences, is noted for his work on the rapid synthesis of positron-labeled organic chemicals, a vital component in the development of positron emission tomography (PET) at Mallinckrodt Institute in the early 1970s. PET is considered

the most important breakthrough in modern medical technology by many clinicians and scientists.

In May, Welch received a special recognition from the American College of Radiology (ACR): an honorary fellowship. Fellowship is one of the highest honors the ACR bestows and is reserved for outstanding radiology and radiation oncology leaders. During a career that spans more than three decades, Welch's research has focused on developing image enhancement agents ultimately used in clinical radiology techniques and procedures.



Michael Welch, PhD, (left) receives the certificate of honorary fellowship from William Thorwarth, MD, president of the American College of Radiology, during the 81st Annual Meeting and Chapter Leadership Conference in Washington, DC.

# Under New Leadership...

by Vicki Kunkler

**I**n July of this year, Washington University in St. Louis School of Medicine (WUSM) announced the appointment of Simon Powell, MD, PhD, as professor and chairman of the Department of Radiation Oncology. He succeeds Carlos Perez, MD, who has led the department since its inception in 2001.

Powell is a cancer physician-scientist and comes to WUSM from Harvard University and Massachusetts General Hospital, where he was the clinical director of the Gillette Women's Cancer Center Program and head of the Breast Cancer Service. He is well known for cancer research, particularly the molecular mechanisms needed to repair DNA damage caused by ionizing radiation. One of Powell's research interests is breast cancer and the tumor suppressing ability of mutations of BRCA1 and BRCA2, genes found in two thirds of early stage breast carcinoma and in many ovarian cancers. Powell was instrumental in developing procedures for interpreting test results for BRCA1 and 2.

Powell currently is principal investigator or coinvestigator for six federal research grants, including two grants from the National Institutes of Health (NIH): "DNA repair—role of the P53 tumor suppressor protein" and "Roles of BRCA1, BRCA2 in homologous recombination." He serves on the editorial boards of the journals *Radiation Research* and *Cancer Biology and Therapy* and is a past associate editor of the *International Journal of Cancer*.

He earned a medical degree and a doctoral degree in cell and molecular radiation biology at the University of London (England) and trained at London's Royal Marsden Hospital and the Institute of Cancer Research, a college of the University of London and one of the world's leading cancer research organizations. Powell came to the United States in 1991 as a clinical oncology fellow at Harvard University.

Powell plans to continue the Department of Radiation Oncology's goal: innovation and excellence in the clinical, research, and education programs, including high quality patient care, development of the scientific basis of radiation oncology, and translation of new discoveries into meaningful clinical advances. Powell's addition to that vision is the creation of a Center for Molecular Targeted Radiotherapy, where the latest biology will be combined with the best technology.

In a WUSM news release dated July 13, 2004, Larry Shapiro, MD, dean of WUSM and executive vice chancellor for medical affairs, said, "He [Powell] possesses the leadership skills and visions to move our Department of Radiation Oncology forward in a continued effort to achieve excellence in all of its missions."



Simon Powell, MD, PhD

# The Close of an Era...

While Powell's arrival is an exciting event for the Department of Radiation Oncology, it also is bittersweet. For 25 years Carlos Perez, MD, led the Radiation Oncology Center during its time as one of four divisions at Mallinckrodt Institute of Radiology. He was a strong advocate for the Center to become a separate department, as was the case in most of the medical schools in the United States. And in July 2001, his dream became a reality with the establishment of the Department of Radiation Oncology. Ironically, Perez had planned to retire in June of that year but agreed to remain on faculty, at William Peck's (then WUSM dean) request, as professor and chairman until a national search for a new chairman was completed.

In a career that spans four decades, Perez has amassed an enviable list of accomplishments and has received numerous honors. He is one of the most highly regarded radiation oncologists in the world and 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 coedited the definitive book on radiation oncology, published hundreds of scientific papers, presented more lectures than even he can

remember, initiated a training program for radiation therapy technologists, and established the Cancer Information Center, the first resource facility of its kind that became a role model for similar centers in the United States and abroad. In addition, Perez managed

an active clinical practice and conducted important research.

On September 30, 2004, Perez passed the department's leadership into the capable hands of Simon Powell, but he will remain on faculty as professor emeritus.

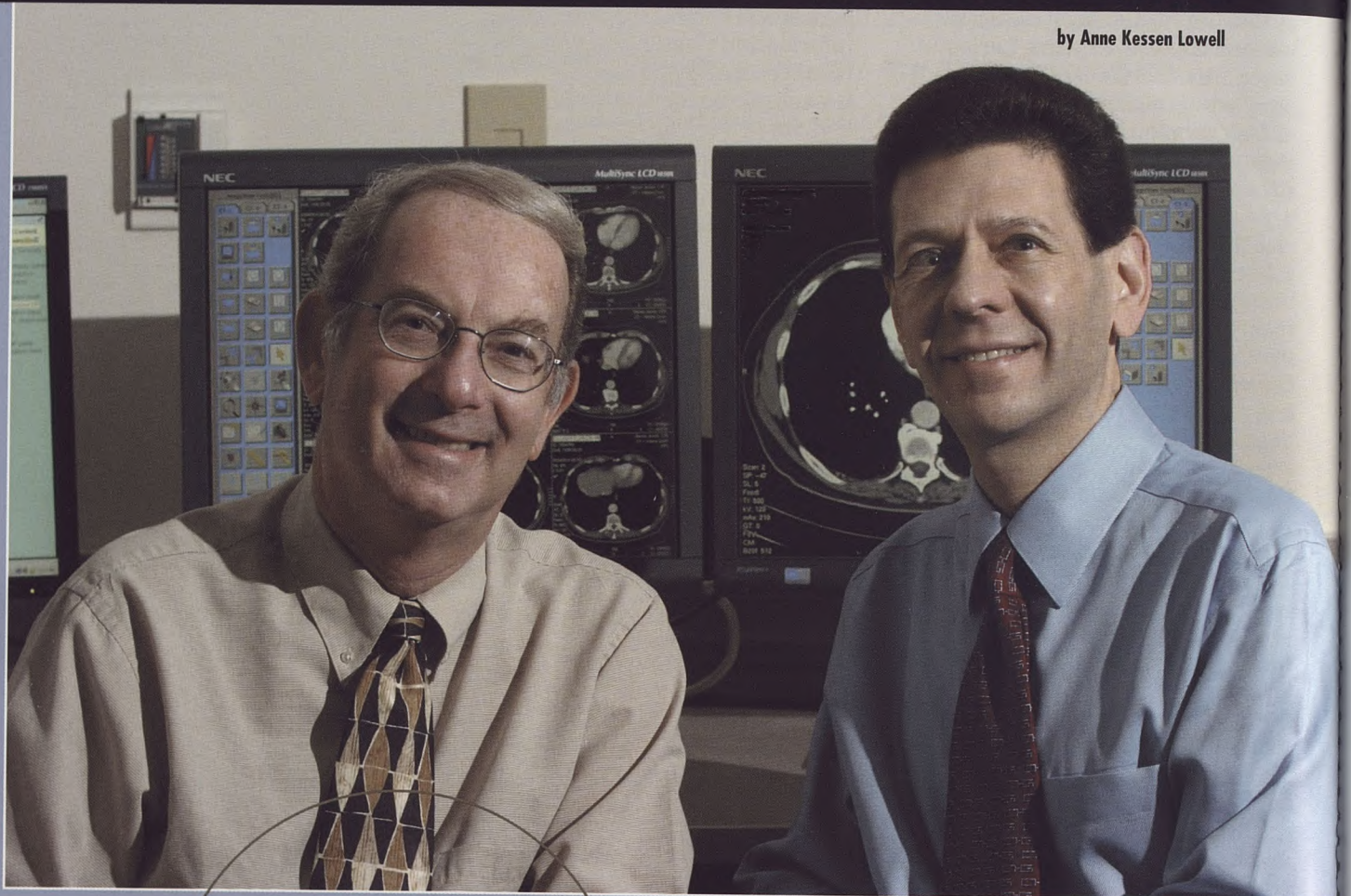


Carlos Perez, MD

# Changing of the Guard:

## NEW LEADERSHIP OF THE CT SERVICE

by Anne Kessen Lowell



Doctors Stuart Sagel (left) and Jay Heiken

AFTER CONTRIBUTING A COMBINED TOTAL OF 46 YEARS TO THE CODIRECTORSHIP OF MALLINCKRODT INSTITUTE OF RADIOLOGY'S (MIR'S) COMPUTED TOMOGRAPHY (CT) SERVICE, STUART SAGEL, MD, AND JAY HEIKEN, MD, ARE PASSING THE MANTLE OF LEADERSHIP ON TO TWO TALENTED SUCCESSORS. THE BODY CT SERVICE BRINGS THE INSTITUTE'S CHEST RADIOLOGY AND ABDOMINAL IMAGING SECTIONS TOGETHER IN A CONTINUING EFFORT TO MAXIMIZE THE USE OF ADVANCES IN CT TECHNOLOGY FOR PATIENT CARE AND TREATMENT.


Sanjeev Bhalla, MD, and Christine Menias, MD, have proverbially big shoes to fill, as they take over leadership of one of the largest and most respected CT services in the world. Plus, MIR's CT service has a long history of innovation, exceedingly high standards of patient care, and a profound impact in both teaching and technology development. Heiken and Sagel express confidence in the future of the service in the hands of its new stewards.

"CT technology and applications continue to advance and to take us in new directions," says Heiken, professor of radiology and chief of abdominal imaging. "The field demands a breadth of skills and knowledge, and our Body CT service is in very good hands with doctors Menias and Bhalla."


Sagel and Heiken deserve credit for bringing the CT service to its current premier position in the field of radiology. Sagel, professor of radiology and chief of chest radiology, has been codirector since 1975, when MIR tested one of the first body CT scanners in the United States. Heiken became codirector in 1988, the third codirector from the abdominal section.

Although in 1973 physicians at MIR had evaluated one of the first head CT scanners and by 1975 were performing over 100 neurological scans a week, use of the technology for scanning other organs was a new concept and opened a new world of possibility in the field of diagnostic radiology.

Sagel describes the excitement and intellectual curiosity surrounding the arrival of the first body CT scanner. "Nobody knew what the machine could do. The manufacturer really didn't send any details on its use and application."

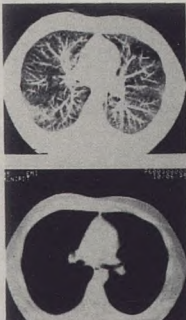


THE EDWARD MALLINCKRODT INSTITUTE OF RADIOLOGY




WASHINGTON UNIVERSITY SCHOOL OF MEDICINE


## FIRST IMAGES OBTAINED FROM EMI-BODY SCANNER AT MALLINCKRODT INSTITUTE




Chest - Pulmonary vessels (above)  
and Heart (below)




Middle abdomen - Kidneys, pancreas and aorta



Skull - orbit and facial bones



Upper abdomen - liver, pancreas and spleen



Lower abdomen - spine, back muscles, and aorta

Ronald Evens, MD, then director of the Institute and now president of Barnes-Jewish Hospital, appointed one chest specialist and one abdominal specialist to evaluate the new scanner to see just what it could do. Sagel and Robert Stanley, MD, then head of MIR's abdominal section and now the editor of the *American Journal of Roentgenology*, worked closely with Roy Petersen,

MD, then chairman of Washington University's Department of Anatomy. Together the trio tackled a very steep learning curve and soon found that body CT had tremendously useful applications in both chest and abdominal imaging. From this discovery, the codirectorship was born. "It was a true cooperative effort between sections that continues to this day," explains Sagel.

# Changing of the Guard



Doctors Christine Menias and Sanjeev Bhalla

CT's diagnostic capability began to supplant invasive techniques such as exploratory surgery. "CT gives good anatomic information as to the presence of disease," credits Sagel. "Patients no longer have to undergo diagnostic explorations for confusing symptoms."

## Advances under Sagel and Heiken

Under Sagel and Heiken, MIR continued to lead the CT field with new clinical applications and—with an even greater impact—teaching and professional development. In 1983, Sagel, along with 30 of the Institute's faculty and technical staff, wrote *Computed Body Tomography*, one of the best-selling medical textbooks available at the time. Sagel and his colleagues now are at

work on the fourth edition of this comprehensive text. In 1978, Sagel and six colleagues from around the country founded the Society of Computed Body Tomography (now known as the Society of Computed Body Tomography and Magnetic Resonance), which today has 408 members. Heiken is the immediate past president of the Society.

Keeping pace with technology advances and using them to improve the quality of CT examinations is one of the demands of the CT service's codirectors and one aspect of MIR's CT service that keeps it at the head of the pack. "We work with manufacturers, share our experience, and relate what types of new developments are needed," explains Heiken. "Our goal is to continuously improve how we use the equipment."

New generations of CT scanners evolved under Heiken's and Sagel's watch, each generation of scanner advancing efficiency and improving patient care. Sagel and Heiken have overseen the shift from "one slice-at-a-time" exams to the method that is becoming the new standard: 3-D, or "volumetric" scans. Once CT technology advanced enough to allow up to 16 "slices" (or rows of images) to be captured with each rotation of the gantry, radiologists took advantage of the resulting higher resolution to construct three-dimensional representations of the patient's anatomy.

Menias, an assistant professor of radiology who was completing a radiology residency and fellowship as 3-D imaging was being perfected, sees tremendous advantages in 3-D scans. "This is a whole new wave of

CT technology. With three-D we have a more realistic picture of the anatomy," she explains. "As a result we can use CT in diagnostic procedures that we couldn't have imagined before."

An unexpected result of 3-D imaging is the artistry the radiologist can apply to the image, giving it a unique signature. Bhalla, assistant professor of radiology, explains: "I have to be more artistic with three-D images to convey the information I want. We are not just doling out images." Bhalla once received a call from a pulmonologist who thanked him for preparing a 3-D chest image. Puzzled, because he had not sent the scan to this physician, Bhalla asked how the doctor knew whom to call. "Oh, I'd recognize your work anywhere," was the reply.

## New Leadership

Bhalla and Menias step into the directorship at the advent of another major technological advance in body CT scanning: In October, the CT service will install a 64-detector scanner, quadrupling the number of images (or slices) that can be taken with a single rotation of the gantry. This technology will allow radiologists to construct even better 3-D images, with superior resolution and contrast in any plane—not just the typical transaxial view. Higher resolution images are opening the door to diagnostic cardiac and vascular imaging, virtual colonoscopy, tracheography/bronchography, urography, and endoscopy.

Bhalla and Menias are excited about the challenges that lie ahead and are eager to continue to influence the use of CT to improve patient care. "This has been a very smooth transition," says Bhalla. "We have the luxury of having doctors Sagel and Heiken continue as section chiefs of their respective groups. Doctor Menias and I want to continue their vision and to push the envelope further." As the 2003 and 2004 recipients of the Institute's Teacher of the Year Award, Bhalla and Menias also believe passionately in the role of the body CT service in teaching residents. "It's a service that defines Mallinckrodt Institute," says Bhalla. "Body CT is taught incredibly well here."

Bhalla points to features of the service that he feels set it apart from services at other institutions: the close working relationship between the chest and abdominal sections, the cross-training the radiology staff receives in both areas, and a tradition of emphasizing patient needs—from reading 100 percent of scans on the day they are taken to consulting with patients prior to radiology procedures. Bhalla highlights the critical role of the service's talented technical staff. "We work with the finest group of radiology technologists available. Many are instructors in the hospital's School of Radiography; they have tremendous knowledge, and they always want to learn more."

Menias is equally passionate about the future of the CT service at MIR. "We are making excellent use of new and more complex CT technology. Eventually, many of our original modalities, such as barium and IVP [*intravenous pyelogram*], will be a thing of the past. We are navigating a new wave of diagnostic imaging techniques."

## Future Developments

Diagnosis of cardiac disease and abnormality has been revolutionized by advanced CT imaging; for example, the detection of potential coronary arterial blockage. Previously, patients entering the Emergency Department with chest pain routinely were taken to another area of the hospital to undergo an invasive catheter angiography, which required hours of post-procedure recovery. Now with CT, patients can be examined in the Emergency Department, with little or no recovery time following the procedure.

All four former and current codirectors are excited about the potential role CT may play in screening for lung and colon cancers, which are two of the four leading causes of cancer deaths in the United States. According to the American Cancer Society, lung, prostate, breast, and colon cancers are the leading causes of cancer deaths, accounting for more than half of all new cancer cases. The high-resolution 3-D images produced by the 64-detector CT scanner will be powerful screening tools.

MIR is participating in a national trial involving CT scanning of patients at high risk for developing lung cancer. CT scanning can detect lung cancers at an early stage, allowing early treatment and a possible reduction in mortality. In the case of colon screening, radiologists hope that the less-invasive "virtual" colonoscopy will encourage people to have an annual screening exam at age 50. Heiken believes that after 10 years of trials and with the advent of the high-resolution imaging technology, virtual colonoscopy is ready for "prime time." "This noninvasive procedure could save thousands of lives," he says.

## Sir Godfrey Hounsfield and CT ARRIVES AT MALLINCKRODT INSTITUTE

by Vicki Kunkler

Another exciting development in body CT scanning is the combined PET/CT scanner. By using radioactive isotopes that are absorbed by active tumors, PET scans generally can detect whether a growth is malignant or benign but do not have the resolution needed to pinpoint size or location of a tumor. CT scans can show a growth or enlarged node but cannot tell if the node is malignant or benign. Combining the functional capabilities of PET with the high resolution of a 3-D CT scan provides surgeons with an immediate accurate picture of a malignant growth, its location, and the anatomy surrounding it. And it's done in one examination, eliminating worrisome waiting time and speeding up treatment for the patient.

In 1980 the *St. Louis Post-Dispatch* ran an article covering recent advances at Mallinckrodt Institute, including news of Godfrey Hounsfield being named a corecipient of the 1979 Nobel Prize for Physiology and Medicine for the development of CT as well as his ties to the Institute. A quarter century later, the reporter's conclusion continues to hold true: "Mallinckrodt is on the leading edge of a diagnostic medical revolution." **MIR**

In all likelihood, the far-reaching advantages of the CT scanner were never envisioned by the man who invented it. But with the collaboration of Mallinckrodt Institute's clinicians and scientists, Godfrey Hounsfield's first CT scanner was adapted for clinical use and was hailed by many as the greatest medical advancement since the X ray.

Godfrey Hounsfield grew up on a farm in Nottinghamshire, England, and was intrigued by mechanical and electrical machinery at an early age. During World War II, he joined Britain's Royal Air Force and worked as a radar-mechanic instructor. In 1951, he was employed by the research and design arm of Electrical & Musical Industries (EMI)—the company who also produced the Beatles' early albums—to work on radar and guided weapons. Seven years later, his research team built Britain's first all-transistor computer.

But it was in 1975 that Hounsfield's work in EMI's Central Research Laboratories would produce the impetus for his eventual arrival at Mallinckrodt Institute: a computed axial tomography (CAT) scanner capable of imaging the entire body. The Institute's reputation, research experience, and excellent clinical, technical, and engineering staff convinced Hounsfield that MIR was the right collaborative fit for adapting the new equipment for clinical use. And his inclination proved to be on target. Although that first CT scanner in 1972 was designed exclusively to produce

detailed cross-sectional images of the brain useful for diagnosing injuries and tumors, MIR's staff provided data that allowed the equipment to create diagnostic images of the entire body.

That collaboration resulted in surprises for both Hounsfield and for MIR's radiologists. "In addition to its advantage as a noninvasive technique, the CT scanner also gave added information which the physician wasn't even looking for," said Stuart Sagel, MD, in a 1985 interview marking the tenth anniversary of CT at the Institute. "And it made us all better interpreters of plain film radiography because it taught us anatomy in better detail than we knew before."

And Hounsfield earned the 1979 Nobel Prize for Physiology and Medicine. He shared the award with Allan Cormack, a South African nuclear physicist, who, unknown to Hounsfield, also had worked on a reconstruction technique to allow CT scanning of the whole body.

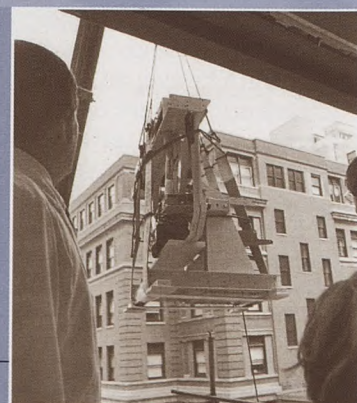
**Note:** Sir Godfrey Hounsfield — he was knighted in 1981 — died August 12, 2004. He was 84. His obituary, which ran in the *London Telegraph*, stated that "the invention of the CAT scanner was a remarkable achievement, not least because of the complex algebraic calculations involved in the computer programming." What was even more remarkable was that "Hounsfield had never been to university and was largely self-taught."

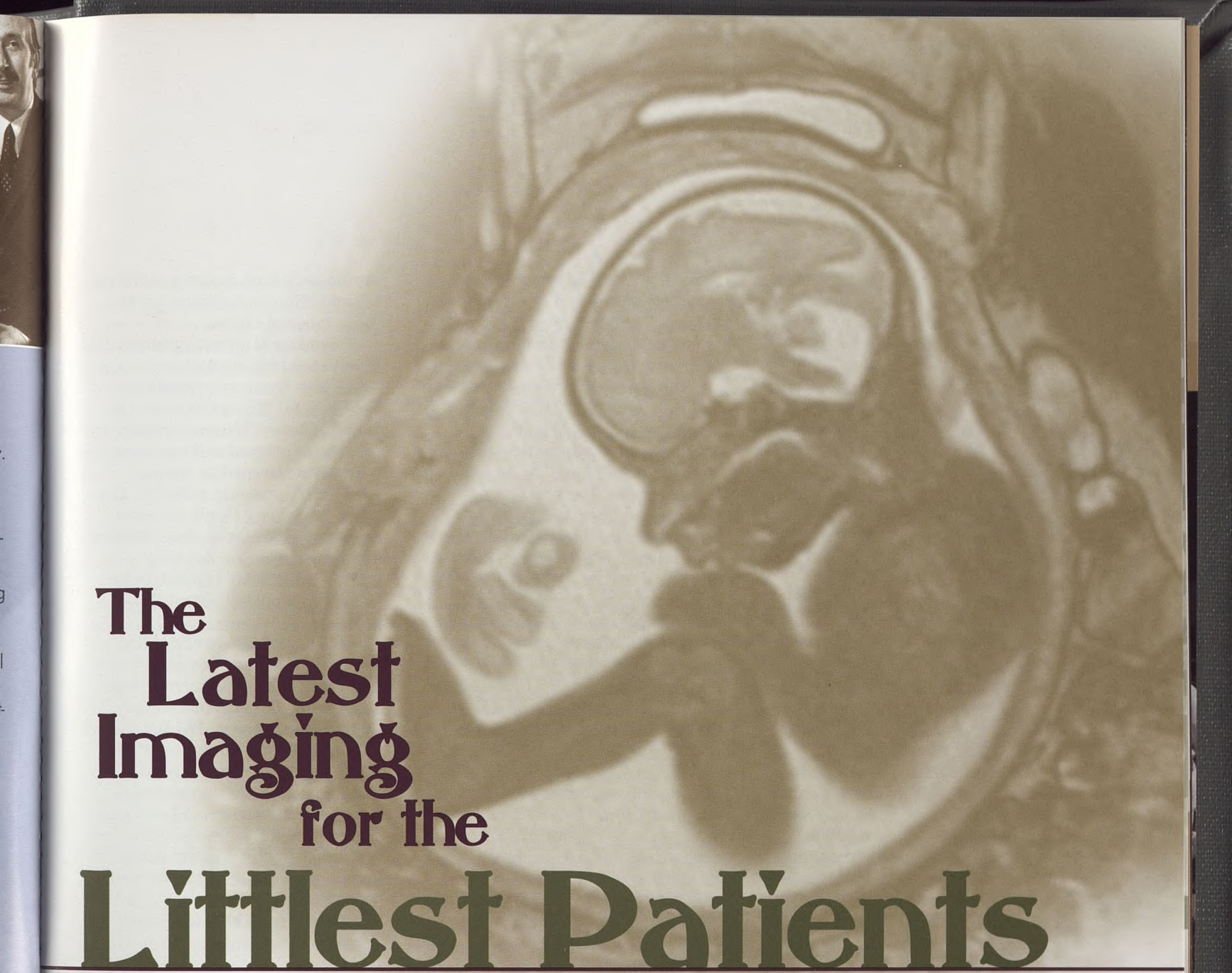


Godfrey Hounsfield and the EMI scanner

Right: Godfrey Hounsfield (far right) discusses physics principles of a computer programming phantom with (left to right) doctors Ronald Evens, Gilbert Jost, Stuart Sagel, and Robert Stanley.

Far right: A portion of the wall of the Institute's second floor had to be removed to install the first CT body scanner.





# The Latest Imaging for the Littlest Patients

It was early in her third trimester of pregnancy, and the expectant mother was anxiously awaiting word on the health of her unborn child. Already, ultrasound studies had revealed a cardiac anomaly: part of the baby's heart was outside his chest. But exactly how much of it was protruding? And was this defect associated, as it often can be, with any serious abdominal abnormalities such as an omphalocele?

BY CANDACE O'CONNOR

## The Latest Imaging for the **Littlest** Patients

**R**ecently, pediatric radiologist Madelyn Stazzone, MD, was asked to provide more information to the patient's medical team. The case was especially intriguing to Stazzone, because it combined two areas in which she has clinical and research expertise. A specialist in fetal magnetic resonance (MR) imaging, she established a service in this area at St. Louis Children's Hospital (SLCH) soon after her arrival at Mallinckrodt Institute of radiology in 2003. Last August, she began a program in pediatric cardiac computed tomography (CT), then added MR in mid-2004.

In this particular case she would be doing cardiac *and* fetal imaging, using MR in combination with a package of newly arrived, state-of-the-art software. "This was actually the first fetal cardiac MR that we have done here," says Stazzone, who previously founded and headed a Fetal MR Imaging

Service at the University of New Mexico Health Sciences Center. "This is leading-edge technology."

For the expectant mother, the news was cautiously favorable. In her MR studies, Stazzone could see that only a small part of the baby's heart was outside his chest, she could tell what part was involved, and she found there was no omphalocele. The real test of the infant's condition will come after birth, when pediatric cardiologists can measure the baby's cardiac output. For now, the medical team is well prepared with accurate, detailed information—giving them a chance to help this child with the best possible care.

For Stazzone, that is the goal of all her fetal MR and cardiac CT/MR efforts. On the cardiac side, she and a team of radiology residents and fellows see cases that largely fall into three categories: newborns with heart problems that doctors are trying to pinpoint; children who have just had cardiac surgery but are still experiencing problems; and children who have had surgery in the past but a new condition has

developed. Both imaging methods, CT and MR, can be lifesavers in these types of cases.

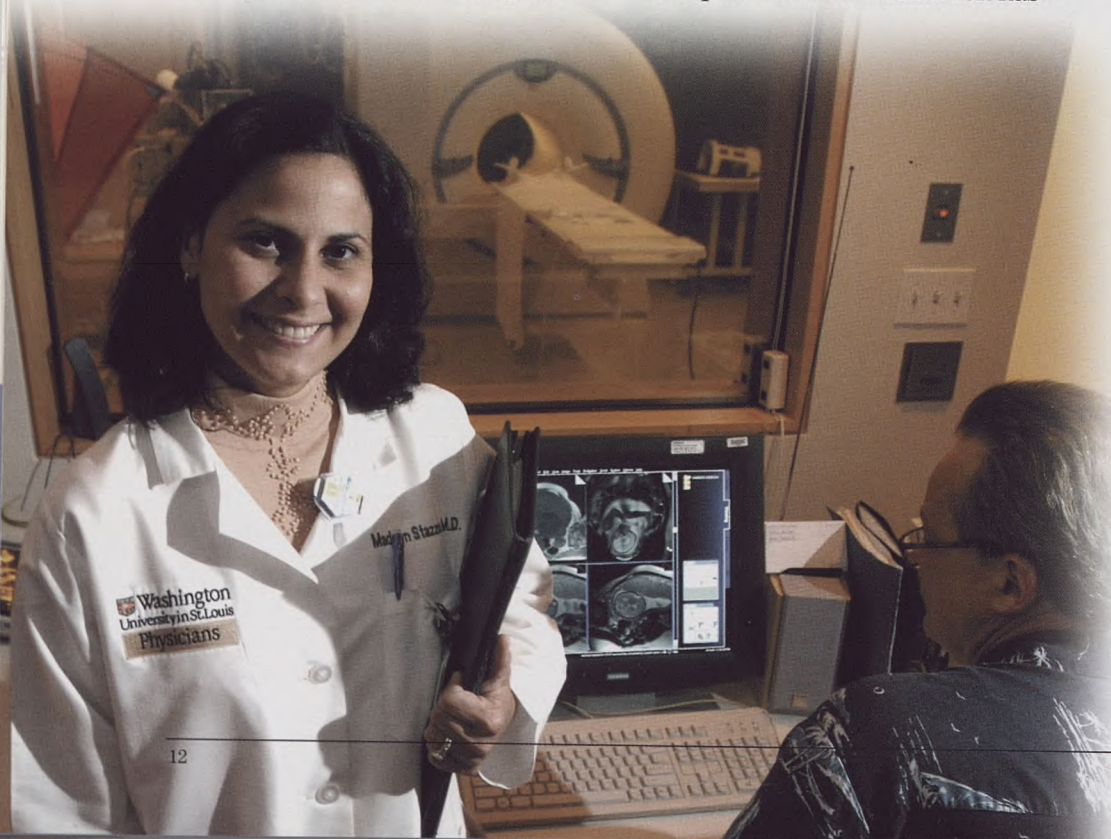
"Cardiac MR provides beautiful detail about heart anatomy or function," says Stazzone, who is one of only 20 fetal MR specialists in the United States. "We can actually see the heart contract and can measure parameters in cardiac output, which isn't possible with CT. But when we want to look at certain anatomy—especially fine, detailed anatomy such as a coronary artery—I think CT is much better than MR, especially in our little patients."

These two kinds of cardiac scanning are made possible by state-of-the-art equipment. High-resolution CT takes place on a 16-detector scanner, "which allows us to do phenomenal reconstructions," says Stazzone. For MR imaging, there are two scanners: a 1.5 Tesla and a new 3-Tesla scanner. St. Louis Children's is the first children's hospital in the nation to have both a 3-T MR scanner and a 16-detector CT scanner.

On the fetal MR side of her schedule, Stazzone is engaged in work that she first started during her fellowship in pediatric radiology (1997 to 1999) at Children's Hospital of Philadelphia. In one research project there, she used MR to describe, for the first time, the development of the posterior fossa of the fetal brain, which can be seen in much more detail using MR than it can with ultrasound. The paper that resulted from this work was published in the *American Journal of Roentgenology* in 2000.

"If we know a normal pattern of development in a fetus, we can diagnose anything that is abnormal," she says. "So having that

**Madelyn Stazzone, MD, and Robert Davis, RT(R), in the pediatric MR area at St. Louis Children's Hospital.**



paper on the normal posterior fossa helps pediatric radiologists, because if we see an abnormal case now we can pick up even very subtle brain abnormalities.”

Currently, her research focuses on the use of fetal MR in diagnosing monoamniotic twin pregnancy—two babies contained in one amniotic sac, instead of the normal two—a condition that carries with it a fetal mortality risk of up to 50 percent. Within the first trimester of pregnancy, this condition is visible on ultrasound, but in the second trimester it is not so clear. A CT scan will easily reveal it; however, doctors shy away from using CT for fetal scanning, because of the risks of radiation to the fetus.

Stazzone has now developed a test to diagnose monoamniotic twin pregnancies using fetal MR together with a contrast agent previously used only in CT scanning. While this test must still undergo laboratory testing to conclusively prove its effectiveness, Stazzone presented her preliminary findings at the Society of Pediatric Radiology Annual Meeting last April, to a favorable response. She is also involved in another project investigating the usefulness of MR in detecting fetal brain ischemia.

A strong advocate of MR, Stazzone says that its use is growing nationwide, in part because of the minute detail it shows, particularly in the fetal brain. “We can actually differentiate grey and white matter in the brain,” she says. “With ultrasound we can see a global picture of the brain, but not that exquisite detail shown in MR.”

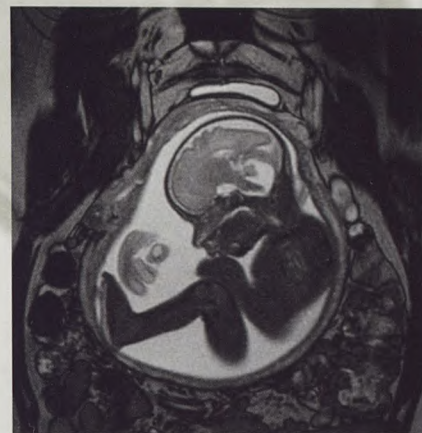
The development of ultra-fast MR technology a decade ago has added to its utility, particularly in fetal imaging. To obtain a good

MR image, the patient must lie still—a difficult requirement for a baby *in utero*. Before ultra-fast imaging became available, physicians often had to sedate the fetus or the fetus and mother together, using paralytics or Valium.

“But if images are acquired so quickly that your ‘snapshot’ is a fraction of a second in time, then basically you are providing a tool that is resistant to fetal motion,” Stazzone says. “Most sequences used at Children’s Hospital for fetal imaging have an acquisition time of about two-hundred milliseconds per image—*ultra-ultra* fast. Of course, sometimes we still have to ‘follow’ the fetus around to obtain the desired plane through the areas of interest, but the actual images of the fetus will have a very high resolution.”

That does not mean MR has superseded ultrasound, she quickly adds, nor is it used as a screening tool. In fact, all patients will have already had an ultrasound before they are referred to Stazzone for an MR. An MR is usually performed when the ultrasound is equivocal or when physicians need more information to make a diagnosis.

The results from MR can have a major impact on a patient’s care. In a monoamniotic pregnancy, for example, the obstetric team usually chooses to induce delivery at 32 to 33 weeks because studies have shown that, past week 31, fetal mortality increases precipitously. In other cases, MR findings may lead to fetal surgery at one of three centers in the United States that specialize in this type of procedure: Children’s Hospital of Philadelphia, Vanderbilt University, and the University of California, San Francisco. “Most important, for me as a parent, is that I would know what



Fetal MR imaging provides important information for the medical team and for the expectant parents.

to expect once my child is born,” says Stazzone, who has three young sons.

Best of all are the times when Stazzone can pass on good news to worried parents-to-be or to the patient’s medical team. Physicians may be wondering about a possible mass on the posterior part of the brain—and Stazzone can prove that it is a normal variant. Or the medical team may have identified what they fear is a spinal cord condition, but the unborn child proves to be just fine. Often, the obstetrician sees a mass on ultrasound but cannot tell what it is: Bowel? Fluid-filled structure? Tumor? By using MR, Stazzone may be able to reassure the patient that the anomaly is actually a cyst rather than a tumor.

Recently, she scanned an unusual case: a patient whose ultrasound at 16 weeks had shown what appeared to be a mass on the baby’s neck. The clinicians needed to know whether the cystic mass was surrounding the fetus’ airway. It had also looked as though the baby was in a “bicornute” uterus, in which two hornlike parts of the uterus are attached.

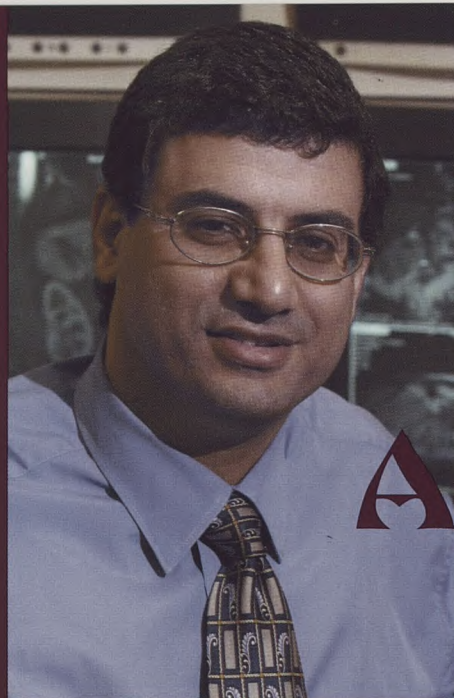
## The Latest Imaging for the **Littlest Patients**

First, the fetal MR showed that the neck mass was actually a harmless area of fluid outside the fetus. In addition, she advised the team to expect a "jejunal atresia"; the baby's intestine had not developed normally. Then Stazzone saw a decompressed uterine horn completely separate from the fetus. She alerted the obstetricians that this was not consistent with the history of a bicornuate uterus. It later turned out to be an intra-abdominal pregnancy: The baby was completely outside the uterus and its placenta was attached to the mother's colon.

"So, based on my findings, the medical team knew in advance they would not require an ENT specialist present at the delivery, as there was no fetal neck mass. We also prepared them for a different uterine diagnosis with respect to the uterus," she says. "Moreover, it prepared the neonatologists and pediatric surgeons for treatment of jejunal atresia. In the end, the baby was delivered by cesarean section, was taken to surgery, and is doing just fine."

According to Stazzone, both the fetal MR and cardiac imaging programs at Mallinckrodt Institute in St. Louis Children's Hospital are advancing at a good pace, aided by the collaboration of colleagues such as obstetric imagers and pediatric cardiologists. After only a year, the pediatric radiology group is now scanning, on average, four fetal cases a week. On the cardiac side, her goal is for Mallinckrodt Institute at SLCH to become "one of the major centers of cardiac imaging, pushing the technology forward and bringing in the latest software," she says.

The research prospects also seem limitless. "Every week we get a new and exciting case, something that strikes our interest and may lead to a new project," she says. "It is that kind of exciting field. So there is a lot of room for expansion and progress." **MIR**



## A Welcome **Addition** to Pediatric Radiology

**L**ike Madelyn Stazzone, Khaled Elsayes, MD, plans a future in the growing field of pediatric radiology, with a particular emphasis on the use of magnetic resonance (MR) as an imaging tool. Elsayes, who has served since 2001 as a visiting fellow in the body MR group under the guidance of codirectors Jeffrey Brown, MD, professor of radiology, and Vamsidhar Narra, MD, assistant professor of radiology, will become a clinical fellow in pediatric radiology in the section headed by William McAlister, MD.

This new position is a tribute to the ability of Elsayes, who has published several scientific papers and made 26 presentations at medical meetings this year alone. "Doctor Elsayes has gone beyond the expectations for a visiting fellow," says McAlister, professor of radiology and of pediatrics at Washington University and radiologist-in-chief at St. Louis Children's Hospital. "He has presented his research findings at national conferences including the Radiological Society of North America, the American Roentgen Ray Society, and the International Hepato-Pancreatico-Biliary Society and has been selected to focus his career at Mallinckrodt Institute in pediatric radiology."

But Elsayes sees his new role as a small step toward decreasing the shortage of pediatric radiologists nationwide. During this fellowship, he also wants to expand his current area of research: studies comparing MR to other imaging modalities, with a focus on his area of expertise—abdominal imaging.

With recent innovations in MR, such as three-dimensional imaging, this diagnostic procedure has become a more powerful tool than ever for medical problem-solving. "I think MR is underestimated currently in the field of pediatric radiology," he says. "Unlike other modalities, it does not involve ionizing radiation and provides excellent soft-tissue resolution."

"Whereas previously sagittal, axial and coronal images were needed to make a diagnosis, we can now take just one axial image and reconstruct it using three-dimensional imaging with the same quality and—in addition to the development of ultra-fast MR technology—shorten the exam time for pediatric patients," he adds. "Overall, I believe MR provides a greater diagnostic advantage than is currently being utilized for the pediatric population."

# More Choices

*for Women with  
Early Breast Cancer*



*Brachytherapy:  
Radiation Treatment that Fits Our Lives*

BY MARY JO BLACKWOOD, RN, MPH, CHES

The wire protruding from this tube has a radiation seed on the tip; the wire and seed (much smaller than shown here) are fed into a catheter that is inserted into the breast tissue.



## More Choices

**W**hen Kimberly Oesch was diagnosed with early breast cancer last July and was told

that she was a candidate for lumpectomy and radiation treatment, she was relieved. "I was forty years old and single. I didn't want to lose my breast." When she found out she was eligible for brachytherapy instead of external radiation, she jumped at the chance. "I'm adventuresome and somewhat of a risk-taker, so when I found out I was eligible for this type of radiation and that it would take only one week out of my life instead of six or seven weeks, it was a no-brainer."

Oesch underwent five twice-daily interstitial brachytherapy radiation treatments—and her treatment regimen was finished. She took a little over a week off from work, and then went back to her job and to her life.

Breast brachytherapy, a method for conserving the breast, delivers radiation deep into the breast, in and around the tumor area (where microscopic cancer cells are most likely to remain), without irradiating the entire breast and possibly damaging surrounding healthy tissue. And unlike patients treated with whole-breast external beam radiation, patients treated with brachytherapy finish their treatment in one week. Brachytherapy, used for a long time to routinely and successfully treat prostate cancer, is developing a good track record in treating breast cancer as well.

Imran Zoberi, MD, a radiation oncologist, is the specialist in charge of breast brachytherapy at Siteman Cancer Center at Washington University Medical Center. Kimberly Oesch was one of his patients.

"Breast brachytherapy—or the placement of a radiation source into the tumor bed after the tumor has been surgically removed—can be administered by two methods," says Zoberi. "Interstitial brachytherapy involves the placement of several very thin catheters, or hollow tubes, through the breast tissue in a calculated pattern around and in the tumor site. MammoSite involves the insertion of a single catheter containing a balloon into the tumor cavity, then the balloon is inflated. The radiation source is inserted into the balloon and withdrawn after a specific period of time. Brachytherapy and MammoSite each involve treatment twice daily for five days."

### *MammoSite*

As Zoberi explains, within a group of women eligible for partial internal breast radiation, all can be treated with interstitial radiation, but only some are eligible for MammoSite treatment. "The conditions have to be very specific. For MammoSite to be effective, the dissection cavity has to be spherical. If it is an odd shape, the balloon will inflate but not uniformly contact the cavity walls. Also, MammoSite's not an appropriate treatment for a tumor cavity that's too close to the skin or the chest wall, because the skin or other healthy tissues would be affected," he says.

The ideal candidate for MammoSite has a spherical dissection cavity deep in the middle of breast tissue, not too close to organs or tissues. MammoSite radiation treats a sphere of tissue about one centimeter out from the cavity, in a uniform pattern. Zoberi says that whether the survival rates for patients treated by MammoSite are in line with those treated by external whole-breast radiation is yet to be seen. Hard data now covers about two to three years.

Zoberi, an instructor in Washington University's Department of Radiation Oncology, says that physicians, particularly those with less experience, may tend to favor MammoSite because the treatment is less complex than interstitial brachytherapy. Experts expect MammoSite usage to become even more widespread as more women opt for breast conservation and some form of follow-up radiation treatment. A National Cancer Institute study found that only 25 percent of patients undergoing lumpectomy (removing only the tumor plus a small margin of sur-

# More Choices

rounding tissue) did not receive radiation therapy. And the incidence of MammoSite being bypassed increased only in correlation to the further distance a woman had to travel to reach a clinic offering the procedure.

In comparison, brachytherapy requires extensive training, and treatment planning is complex and time-consuming. However, in many cases, brachytherapy is the better choice of treatment and allows site-specific internal radiation requiring one week, rather than the six to seven weeks needed for external beam radiation. And interstitial brachytherapy offers more hope for survival because many women simply are not candidates for MammoSite.

### *Interstitial Brachytherapy*

"Interstitial brachytherapy allows radiation dose and pattern control and was used for many years before MammoSite became available," says Zoberi. Before treatment begins, an array of thin, flexible catheters are inserted around and in the tumor bed site, based on careful planning of dose and exposure pattern and tumor bed proximity to other organs and tissues. Ideally, a candidate for interstitial therapy has undergone breast conservation surgery, had a tumor of less than three centimeters in diameter, and had negative lymph nodes or only one positive lymph node under the arm. Zoberi favors negative nodes for the best results.

"With interstitial therapy, we can typically treat two centimeters of breast tissue surrounding the surgical cavity and control the radiation dose to the skin, heart, and lungs. In contrast, MammoSite only

treats one centimeter of breast tissue. Treatment planning takes the most time. Where should the radiation source go in each catheter and for how long? We have to optimize treatment exposure and protect the surrounding healthy tissue," he explains. After the planning is completed and the array placement and treatment time is calculated, the actual procedure takes about thirty minutes twice a day for five days.

On average, 25 catheters are inserted and while that may seem daunting, it is manageable. "The catheters are very thin and flexible and can be folded against the skin, either under the arm, under the breast, or between the breasts. The catheters cannot be seen externally. The tiny incisions where the catheters are inserted heal quickly. After the catheters are removed, the scars usually fade within a year.

Kimberly Oesch received 20 catheters. "My cancer was on the underside of my left breast. There was some concern that whole breast radiation could have affected my heart and lungs, even to a small extent. I was a little sore when the catheters were in, but I was able to go about my regular routine at home. After the catheters were removed, the incisions were tender for about a week. You can still see the scars, but they are fading away," she says.

Now, with a solid eight years of data proving its effectiveness, interstitial brachytherapy has the same five-year survival rate as full-breast external radiation.

**Imran Zoberi, MD, with a high-dose-rate remote afterloader (on left) and a portable ultrasound scanner.**





## More Choices

### *A Tradition of Fighting Breast Cancer*

As far back as 1983, breast brachytherapy was offered at Washington University Medical Center. In 1990, Robert Kuske, MD, then chief of the breast service at Mallinckrodt Institute's Radiation Oncology Center, reported the results of an innovative—for that time in clinical practice—collaborative study involving Washington University and the University of Cincinnati. The following information is taken from "The Right Choice," published in *Focal Spot* magazine, Fall/Winter 1990, volume 21, number 3.

The study, spearheaded by Kuske, mapped the progress of 417 women who had undergone conservative breast cancer treatment from 1969 to 1984, a range of from five to 20 years previous to the study. One half of these women had been treated by lumpectomy (removing only the tumor plus a small margin of surrounding tissue) followed by external radiation treatments; the other half had undergone lumpectomy plus brachytherapy (radiation implant therapy) in addition to external radiation.

The results of the five-to-eight year follow-up were eye-opening. The women who had received brachytherapy in addition to external radiation had a 4.6 percent breast cancer rate—the lowest result ever recorded in medical literature—as opposed to a 10 to 15 percent rate with other forms of conservative treatment. The overall survival rate for women undergoing brachytherapy is similar to the survival rate of those women who have had a mastectomy.

"This is an exciting time for the treatment of breast cancer. We have the opportunity to give women a chance to save their breasts and their lives. I want to inform as many surgeons and patients as possible about lumpectomy and brachytherapy." [quote from Kuske in article].

### *Other Radiation Treatment Options*

Some medical centers offer a combination of brachytherapy treatment and external beam radiation. Typically, external whole-breast radiation is given for four weeks and then interstitial brachytherapy is given for one week as a "boost" to the tumor site. However, the combination is rarely used at Siteman Cancer Center, Zoheri explains. Treatment time is decreased by only a week or two. There are no current randomized studies supporting any advantage of the combination treatment. More women are now receiving chemotherapy to treat positive lymph nodes. Usually a patient with positive lymph nodes would receive chemotherapy prior to the six to seven weeks regimen of external radiation. Brachytherapy takes five days and can be administered first, followed by chemotherapy.

### *Clinical Trial for Brachytherapy*

Siteman Cancer Center (SCC), a National Cancer Institute-designated cancer center, is conducting a quality of life and cosmetic study on brachytherapy in which patients can now enroll. Participants are asked to complete a pre-questionnaire, have breast conservation and brachytherapy treatment at SCC, and complete follow-up questionnaires at different times after treatment. Physicians interested in referring patients or patients interested in participating in the study can call Melissa Karl at 314-362-7830.

### The Future is Now

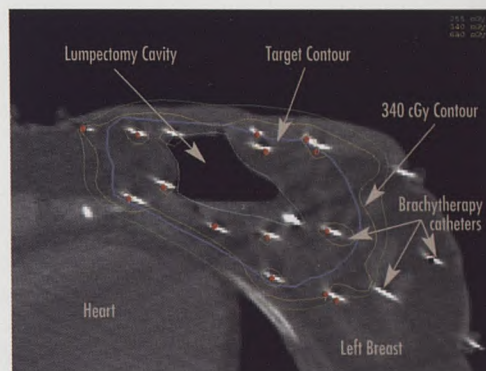
Says Zoberi, "Three fourths of the women with early breast cancer are eligible for breast conservation therapy, and most of them are eligible for brachytherapy as their post-surgical radiation treatment. Some women choose mastectomy because they feel safer or they don't want the disruption in their lives caused by the thirty daily treatments of external whole-breast radiation. For those women, brachytherapy is an attractive alternative."

Oesch praises interstitial brachytherapy. "I have recommended it many times. Women considering the treatment have called me. I did some research on it and then found a doctor I trusted. It worked well for me: it was an

efficient treatment and it really helped me mentally to have it over with so quickly. It was a great option."

*Editor's Note: October is designated as National Breast Cancer Awareness Month. The Barnes-Jewish Hospital Mammography Van, which is cosponsored by Mallinckrodt Institute, is at area Schnucks Markets monthly to screen woman 40 years and older for breast cancer. To schedule an appointment, call 314-TOP-DOCS (toll free at 1-866-867-3627). The van schedule is online at [www.barnesjewish.org](http://www.barnesjewish.org) (click on Mammography Van Schedule in the right-hand box). VIII*

**Below:** These spaghetti-like wires are the transfer tubes. Each transfer tube will have a thin wire, called the "source" coming out through the opening. A radiation seed will be placed on the tip of each source as shown on page 15.



**Above:** CT radiation planning image of a woman with a pathologic invasive ductal carcinoma involving the left breast, lower inner quadrant. Patient underwent a lumpectomy (cavity visible) with placement of 23 brachytherapy catheters (shown as small white lines) in and around the lumpectomy cavity. A dose of 340cGy was administered two times per day for five days, thus completing her entire radiation treatment. She remains disease-free nearly two years later.



*In this section, the names of employees who are full-time faculty or staff or who have an appointment in the Department of Radiology or Department of Radiation Oncology are highlighted in boldface type.*

## PROMOTIONS

**Kyongtae Bae, MD, PhD**, assistant professor of radiology, was promoted to associate professor of radiology, Division of Diagnostic Radiology, Department of Radiology.

**Jeffrey Brown, MD**, associate professor of radiology, was promoted to professor of radiology, Division of Diagnostic Radiology, Department of Radiology.

**Yvette Sheline, MD**, associate professor of psychiatry, of radiology, and of neurology, was promoted to associate professor of radiology, Division of Radiological Sciences, Department of Radiology.

**Franz Wippold, MD**, associate professor of radiology, was promoted to professor of radiology, Division of Diagnostic Radiology, Department of Radiology.

## NEW FACULTY

**Gregory Jamroz, MD**, instructor in radiology, Division of Diagnostic Radiology, Department of Radiology.

## JOINT APPOINTMENT

**Deanna Barch, PhD**, associate professor of psychology, was appointed associate professor of radiology, Division of Radiological Sciences, Department of Radiology.

**Todd Braver, PhD**, assistant professor of psychology, was appointed associate professor of radiology, Division of Radiological Sciences, Department of Radiology.

**Tamara Hershey, PhD**, assistant professor of psychiatry, was appointed assistant professor of radiology, Division of Radiological Sciences, Department of Radiology.

**Jeffrey Zacks, PhD**, assistant professor of psychology, was appointed assistant professor of radiology, Division of Radiological Sciences, Department of Radiology.

**Allyson Zazulia, MD**, assistant professor of neurology, was appointed assistant professor of radiology, Division of Radiological Sciences, Department of Radiology.

## FIRST-YEAR FELLOWS

**Benjamin Aronovitz, MD**, neuroradiology clinical fellow, received an undergraduate degree from the University of Colorado, Boulder, and a medical degree from the State University of New York, Syracuse. He completed an internship at the University of Cincinnati Medical Center and a residency at the State University of Syracuse.

**Stephen Bai, MD**, magnetic resonance imaging clinical fellow, received an undergraduate degree from the University of Colorado, Boulder, and a medical degree from the Medical College of Wisconsin. He completed a residency at Oakwood Hospital and Medical Center.

**Jeffrey Brent, MD**, magnetic resonance imaging clinical fellow, received an undergraduate degree from Duke University and a medical degree from Washington University in St. Louis. He completed a one-year internship at St. John's Mercy Medical Center and four years of diagnostic radiology training at Mallinckrodt Institute of Radiology.

**Jason Bronfman, MD**, chest radiology clinical fellow, received an undergraduate degree from the University of Pennsylvania and a medical degree from the University of Pittsburgh. He completed a one-year internship at Mercy Hospital, San Diego, and four years of diagnostic radiology training (2003-2004 chief resident) at Mallinckrodt Institute of Radiology.

**Anil Dasyam, MD**, abdominal imaging clinical fellow, received an undergraduate degree from St. Mary's Junior College, a master's degree from the University of Iowa, and a medical degree from Osmania Medical College. He completed an internship at Osmania General Hospital and a residency at Nizam Institute of Medical Sciences.

**Khaled Elsayes, MD**, pediatric radiology clinical fellow, received a medical degree from Cairo University School of Medicine. He completed an internship at Cairo University Hospitals and a residency at Theodore Bilharz Institute/National Cancer Institute.

**Susan Fanapour, DO**, abdominal imaging clinical fellow, received an undergraduate degree from Northwestern University and a medical degree from Chicago College of Osteopathic Medicine at Midwestern University. She completed an internship at Edgewater Medical Center and a residency at Presbyterian-St. Luke's Hospital at Rush University Medical Center.

**Ronald Gerstle, MD**, neuroradiology clinical fellow, received an undergraduate degree from Duke University and a medical degree from the University of North Carolina. He completed a one-year internship at Barnes-Jewish Hospital and four years of diagnostic radiology training (2003-2004 chief resident) at Mallinckrodt Institute of Radiology.

**Vladislav Gorengaut, MD**, magnetic resonance imaging clinical fellow, received an undergraduate degree from Sangamon State University and a medical degree from the University of Illinois. He completed a one-year internship at Southern Illinois University Hospital and four years of diagnostic radiology training at Mallinckrodt Institute of Radiology.

**Ningmei Hu, MD**, neuroradiology clinical fellow, received an undergraduate degree and a medical degree from the University of Kansas. She completed a one-year internship at the University of Kansas and four years of diagnostic radiology training at Mallinckrodt Institute of Radiology.

**Rolf Hultsch, MD**, interventional radiology clinical fellow, received an undergraduate degree from the University of Virginia and a medical degree from Ohio State University. He completed a one-year internship at Riverside Methodist Hospital and four years of diagnostic radiology training at Mallinckrodt Institute of Radiology.

**David Johnston, MD**, breast imaging clinical fellow, received an undergraduate degree from Brigham Young University and a medical degree from the University of Utah. He completed a one-year internship at Ball Memorial Hospital and four years of training in diagnostic radiology at Mallinckrodt Institute of Radiology.

**Jo Anne Lacey, MD**, neuroradiology clinical fellow, received an undergraduate degree from the University of New Mexico and a medical degree from McGill University. She completed an internship at St. Mary's Health Services and a residency at St. Louis University Hospital.

**Luis Landeras, MD**, abdominal imaging clinical fellow, received an undergraduate and a medical degree from the Universidad Nacional de Trujillo. He completed an internship and a residency at the University Hospitals of Cleveland.

**Jennifer Lee, MD**, abdominal radiology clinical fellow, received an undergraduate degree from Harvard University and a medical degree from the University of Texas, Galveston. She completed a one-year internship at the University of Texas, Galveston, and four years of diagnostic radiology training at Mallinckrodt Institute of Radiology.

**Carl Mazzola, MD**, abdominal imaging clinical fellow, received an undergraduate degree from the University of Missouri, Columbia, and a medical degree from St. Louis University School of Medicine. He completed an internship at Forest Park Hospital and a residency at the Medical University of South Carolina.

**Kenneth McCabe, MD**, neuroradiology clinical fellow, received an undergraduate degree from the University of New Hampshire and a medical degree from the University of Colorado. He completed an internship at Presbyterian Medical Center and a residency at the University of Colorado.

**Ramin Midia, MD**, neuroradiology clinical fellow, received a medical degree from Hacettepe University Faculty of Medicine. He completed an internship and a residency at Southern Illinois University, Springfield, and an interventional radiology fellowship at the University of Michigan.

**Amy Nordmann, MD**, breast imaging clinical fellow, received an undergraduate degree, a master's degree, and a medical degree from Washington University in St. Louis. She completed a one-year internship at St. John's Mercy Medical Center and four years of diagnostic radiology training at Mallinckrodt Institute of Radiology.

**Clay Padginton, DO**, interventional radiology clinical fellow, received an undergraduate degree from the State University of New York, Buffalo, and a medical degree from New York College of Osteopathic Medicine. He completed an internship at Good Samaritan Hospital Medical Center and a residency at Pennsylvania State University Hospital.

**Kianoush Rezaei, MD**, chest radiology clinical fellow, received a medical degree from Tabriz University. She completed four years of training at Rene Descartes University and a one-year internship at the State University of New York, Buffalo. She completed three years of diagnostic radiology training at Mallinckrodt Institute of Radiology.

## ACR Fellowship

Sean Higginson, MD, third-year diagnostic radiology resident, was awarded the American College of Radiology (ACR) J. T. Rutherford Government Relations Fellowship. By providing a fellowship recipient with direct exposure to the activities of the ACR government relations office in Washington, DC, the program's goal is to better inform residents about the important role of state and federal governmental factors in shaping the future of radiology. Higginson is the first Mallinckrodt Institute resident to participate in the program.

## FIRST-YEAR FELLOWS

*Continued from page 21*

**Michael Smith, MD**, musculoskeletal radiology clinical fellow, received an undergraduate degree from the University of Kentucky and a medical degree from the University of Louisville. He completed an internship and a residency at Tripler Army Medical Center.

**Lawrence Tang, MD**, musculoskeletal radiology clinical fellow, received an undergraduate degree from Texas A&M and a medical degree from Washington University in St. Louis. He completed a one-year internship at Barnes-Jewish Hospital and four years of diagnostic radiology training (2003-2004 chief resident) at Mallinckrodt Institute of Radiology.

**Trongtum Tongdee, MD**, interventional radiology clinical fellow, received a medical degree from Mahidol University, Bangkok. He completed a residency at Siriraj Hospital, Bangkok.

**Kishan Yalavarthi, MD**, neuroradiology clinical fellow, received an undergraduate degree and a medical degree from the University of Missouri, Columbia. He completed an internship at Truman Medical Center and a residency at Kansas University Medical Center.

**Yuming Yin, MD**, musculoskeletal radiology clinical fellow, received a medical degree from Beijing Medical University. He completed three years of radiology training at Beijing JiShuiTan Hospital. He completed an internship at St. Luke's Hospital, St. Louis, and four years of diagnostic radiology training at Mallinckrodt Institute of Radiology.

## FIRST-YEAR DIAGNOSTIC RADIOLOGY RESIDENTS

**Tabassum Ahmed, MD**, assistant in radiology, received an undergraduate degree from Pomona College and a medical degree from the University of Pennsylvania. She completed a transitional year at the University of Pennsylvania.

**Tara Anthes, MD**, assistant in radiology, received an undergraduate degree from Brown University and a medical degree from the University of Washington. She completed a transitional year at Virginia Mason Medical Center.

**Carl Aschkenasi, MD**, assistant in radiology, received an undergraduate degree and a medical degree from Harvard University. He completed an internship at Barnes-Jewish Hospital.

**Stanley Chan, 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 at Barnes-Jewish Hospital.

**Gilbert Cheung, MD**, assistant in radiology, received an undergraduate degree from Massachusetts Institute of Technology and a medical degree from Washington University in St. Louis. He completed an internship at Barnes-Jewish Hospital.

**Jennifer Demertzis, MD**, assistant in radiology, received an undergraduate degree from the University of Notre Dame and a medical degree from Emory University. She completed a transitional year at Emory University.

**Eric Hatfield, MD**, assistant in radiology, received an undergraduate degree from the University of Notre Dame and a medical degree from Washington University in St. Louis. He completed an internship at St. Mary's Health Center.

**Kevin Johnson, MD**, assistant in radiology, received an undergraduate degree from Harvard University and a medical degree from Yale University. He completed an internship at Greenwich Hospital.

**Patricia Lew, MD**, assistant in radiology, received an undergraduate degree from the University of California, Berkeley, and a medical degree from the University of California, San Francisco. She completed a transitional year at Forest Park Hospital.

**Jeffrey Lin, MD, PhD**, assistant in radiology, received an undergraduate degree from the University of Washington and a medical degree and a doctoral degree from Harvard University. He completed an internship at Massachusetts General Hospital.

**David Loy, MD, PhD**, assistant in radiology, received an undergraduate degree, a medical degree, and a doctoral degree from the University of Louisville. He completed a surgical internship at the University of Louisville.

**Meghan Lubner, MD**, assistant in radiology, received an undergraduate degree and a medical degree from the University of Wisconsin. She completed an internship at Barnes-Jewish Hospital.

**Paolo Marciano, MD, PhD**, assistant in radiology, received an undergraduate degree, a medical degree, and a doctoral degree from the University of Pennsylvania. He completed a transitional year at the University of Pennsylvania.

**Amy Oberhelman, MD**, assistant in radiology, received an undergraduate degree from Stanford University and a medical degree from Washington University in St. Louis. She completed a transitional year at St. John's Mercy Medical Center.

**Sara Rohr, MD**, assistant in radiology, received an undergraduate degree from Gustavus Adolphus College and a medical degree from the University of Iowa. She completed a transitional year at Forest Park Hospital.

**Jonathan Sehy, MD**, assistant in radiology, received an undergraduate degree from the University of Illinois and a medical degree from Washington University in St. Louis. He completed a transitional year at St. Vincent's Hospital, New York.

**Quan Vu, MD**, assistant in radiology, received an undergraduate degree from the University of Virginia and a medical degree from Emory University. He completed an internship at Carilion Health System.

**Danielle Weems, MD**, assistant in radiology, received an undergraduate degree from the University of Mississippi and a medical degree from Washington University in St. Louis. She completed a transitional year at St. John's Mercy Medical Center.

**Robin Yang, MD**, assistant in radiology, received an undergraduate degree from the University of California, Los Angeles, and a medical degree from Washington University in St. Louis. She completed a transitional year at St. John's Mercy Medical Center.

## FIRST-YEAR NUCLEAR MEDICINE RESIDENTS

**Delphine Chen, MD**, assistant in radiology, received an undergraduate degree from Harvard University and a medical degree from Washington University in St. Louis. She completed a surgery residency at Barnes-Jewish Hospital.

**Eric Hutchins, MD**, assistant in radiology, received an undergraduate degree from Freed Hardemann University and a medical degree from the University of Tennessee. He completed an internship and a residency at Methodist University Hospital.

**Russell Roberts, MD**, assistant in radiology, received an undergraduate degree from Hendrix College and a medical degree from the University of Arkansas. He completed an internship and a residency at the University of Arkansas for Medical Sciences.

## FIRST-YEAR RADIATION ONCOLOGY RESIDENTS

**Dusten MacDonald, MD**, assistant in radiation oncology, received an undergraduate degree from Brigham Young University and a medical degree from the Medical College of Wisconsin, Milwaukee.

**Elesya Outlaw, MD**, assistant in radiation oncology, received an undergraduate degree from Avila College and a medical degree from St. Louis University.

**Jayeson Stroud, MD**, assistant in radiation oncology, received an undergraduate degree from Brigham Young University and a medical degree from the Medical College of Wisconsin, Milwaukee.

## MIR in Chile and Argentina

Barry Siegel, MD, professor of radiology and of medicine, and Marilyn Siegel, MD, professor of radiology and of pediatrics, presented lectures in their respective areas of expertise—nuclear medicine and pediatric radiology—at the Catholic University Hospital in Santiago, Chile, and at The Foundation Nuclear Medicine School, National University of Cuyo, Mendoza, Argentina.



A. Shown with Marilyn Siegel, MD, (middle) are Catholic University Hospital radiology residents Claudia Beatriz Ortega Mogilevich, who was on an elective rotation at MIR in the spring of 2004, and Dimitri Parra.

B. Shown at The Foundation Nuclear Medicine School with Barry Siegel, MD, (third from left) are nuclear medicine physicians Cecilia Tutor and Manuel Guirao and radiation oncologist Sergio Binia, who received PET training at MIR as part of an International Atomic Energy Agency grant.

## GRANTS

**Samuel Achilefu, PhD**, associate professor of radiology, as principal investigator, received a five-year grant from the National Institutes of Health (NIH) for research on "Optical probes and methods for imaging integrin expression." Coinvestigators for the \$3.7 million grant are Gregory Nikiforovich, PhD, DSc, research professor of biochemistry and molecular biophysics, and **Joseph Culver, PhD**, assistant professor of radiology. Achilefu, as principal investigator, received a \$1.8 million, four-year grant from NIH to study "Novel monomolecular multimodal imaging agents."

**Joseph Ackerman, PhD**, professor of chemistry, of medicine, and of radiology, as principal investigator, received a \$3.7 million grant from the National Institutes of Health/National Cancer Institute to support the Washington University Small Animal Imaging Resource (WUSAIR) project. **Michael Welch, PhD**, professor of radiology, of chemistry, and of molecular biology and pharmacology, is the WUSAIR codirector. Other key radiology staff for the five-year grant are **Samuel Achilefu, PhD**, assistant professor of radiology; **Joseph Culver, PhD**, assistant professor of radiology; **Joel Garbow, PhD**, research associate; and **Jason Lewis, PhD**, assistant professor of radiology.

**Carolyn Anderson, PhD**, associate professor of radiology and of molecular biology and pharmacology, as principal investigator, and **Joseph**

**Culver, PhD**, assistant professor of radiology, as coinvestigator, received a five-year grant of \$444,609 from the National Institutes of Health/National Institute of General Medical Sciences to develop a curriculum for imaging sciences at Washington University in St. Louis. Additional investigators for the grant are **Daniel Schuster, MD**, professor of medicine and of radiology; **Robert McKinstry, MD, PhD**, assistant professor of radiology; **Mark Conradi, PhD**, professor of physics and of radiology; and Gregory Lanza, MD, PhD, assistant professor of medicine.

**Thomas Conturo, MD, PhD**, associate professor of radiology and adjunct professor of physics and biomedical engineering, as principal investigator, and **Erbil Akbudak, PhD**, research assistant professor of radiology, as coinvestigator, received a one-year grant of \$213,100 from Invitrogen, Inc. to study "Contrast agents for MR perfusion imaging."

**Robert Drzymala, PhD**, associate professor of radiation oncology, and **Jeffrey Bradley, MD**, assistant professor of radiation oncology, as coinvestigators, received a two-year grant of \$127,673 from Elekta to coordinate the Elekta Stereotactic Body Frame and Precise Plan Evaluation and testing at Washington University.

**Daniel Low, PhD**, associate professor of radiation oncology, received a two-year, \$378,675 grant from the National Institutes of Health for research on "microRT."

**Mark Mintun, MD**, professor of radiology and of psychiatry, as principal investigator, received a three-year grant of \$3.7 million from the National Institute of Health/National Institute of Neurological Disorders (NINDS) and Stroke to create the NINDS Center Core Brain Imaging to "enhance the quality, diversity, and utilization of neuroimaging research at Washington University." Coinvestigators are **Joseph Ackerman, PhD**, professor of chemistry, of medicine, and of radiology; **Robert Mach, PhD**, professor of radiology; **Mark McAvoy, PhD**, research instructor in radiology; **Robert McKinstry, MD, PhD**, assistant professor of radiology; **Stephen Moerlein, PhD**, associate professor of radiology; **Marcus Raichle, MD**, professor of radiology, of neurology, of neurological surgery, and of anatomy and neurobiology; **Abraham Snyder, MD, PhD**, research scientist of radiology and of neurology; and **Dmitriy Yablonskiy, PhD**, professor of radiology and of physics.

**Buck Rogers, PhD**, assistant professor of radiation oncology, as principal investigator, received a four-year grant of \$720,000 from the American Cancer Society for research on "Treatment of hormone-refractory prostate cancer with radiolabeled peptides." He also received a one-year grant of \$38,300 from FRIENDS for an Earlier Breast Cancer Test to study "PET imaging for early detection of breast cancer with a radioactive peptide."

**Joseph Roti Roti, PhD**, professor of radiation oncology, as principal investigator, received an \$8.6 million grant from the National Cancer Institute for research on "Radiosensitization by the cellular heat shock response." Department of Radiation Oncology coinvestigators for the projects covered by the five-year award are **Tej Pandita, PhD**, assistant professor; **Nobuo Horikoshi, PhD**, assistant professor; **Clayton Hunt, PhD**, research assistant professor; **Andrei Laszlo, PhD**, associate professor; **Kathy Feurer**; **Ryuji Higashikubo, PhD**, research associate professor; **Buck Rogers, PhD**, assistant professor; and **Eduardo Moros, PhD**, associate professor.

**Yuan-Chuan Tai, PhD**, assistant professor of radiology, received a one-year grant of \$191,209 from the National Cancer Institute to study "A novel device to allow zoom-in imaging for PET scanners."

**Pamela Woodard, MD**, assistant professor of radiology, as Washington University principal investigator, received a four-year subcontract of \$554,894 from the National Institutes of Health to study "MRI-based computational modeling for carotid plaque rupture and stroke." Dalin Tang, PhD, Worcester Polytechnic Institute, Worcester, Massachusetts, is principal investigator of the \$1.07 million grant. Washington University investigators include, **Jie Zheng, PhD**, assistant professor of radiology; **Gregorio Sicard, MD**, professor of surgery and of radiology; and Jeffrey Saffitz, MD, PhD, professor of pathology and immunology.

## APPOINTMENTS/ ELECTIONS

**Colin Derdeyn, MD**, associate professor of radiology and of neurology and neurological surgery, was appointed to a two-year term as chairman of the Rules Committee for the American Society of Interventional and Therapeutic Neuroradiology. He was appointed to the Data, Safety and Monitoring Committee: MR and Mechanical Revascularization of Stroke Clots Using Embolectomy (MR Rescue) of the National Institute of Neurological Disorders and Stroke.

**Robert Drzymala, PhD**, associate professor of radiation oncology, was elected to a one-year term as secretary of the American College of Medical Physics.

**Charles Hildebolt, DDS, PhD**, associate professor of radiology and adjunct associate professor of anthropology, was elected to a three-year term as secretary/treasurer of the Diagnostic System Group of the International Association for Dental Research and the American Association for Dental Research. He was appointed to a four-year term as councilor for educational affairs for the Executive Council of the American Academy of Oral and Maxillofacial Radiology.

**Jacob Locke, MD**, assistant professor of radiation oncology, was appointed to the Regulatory Committee of the American Society for Therapeutic Radiology and Oncology.

**Jeffrey Neil, MD, PhD**, professor of neurology, of pediatrics, and of radiology, was appointed to the Allen P. and Josephine B. Green Professorship in Pediatric Neurology at Washington University in St. Louis. He was elected to a four-year term on the Board of Trustees and was appointed chairman of the Student Stipend Committee for the International Society for Magnetic Resonance in Medicine.

**Fred Prior, PhD**, research associate professor of radiology, was appointed to the Steering Committee for the Digital Transformation in Health Care Conference, sponsored by the Institute for Advanced Medical Education.

**Brian Rubin, MD**, associate professor of surgery and of radiology, was appointed to a two-year term as industry liaison for the Midwestern Vascular Surgical Society and to a two-year term on the Program Committee of the Society for Vascular Surgery.

## HONORS/ AWARDS

**Dione Farria, MD, MPH**, assistant professor of radiology, received the 2004 Salute to Excellence in Health Care Award, sponsored by the St. Louis American Foundation and Mound City Medical Forum.

**Louis Gilula, MD**, professor of radiology and of surgery, served as an examiner for the American Board of Radiology oral examinations, Louisville, Kentucky, June 6-9.

**Eduardo Moros, PhD**, associate professor of radiation oncology, served as mentor for the Siteman Cancer Center's Cancer Research Summer Student Program for Pre-Med, Medical, and Undergraduate Students.

**Jeffrey Zacks, PhD**, assistant professor of psychology and of radiology, received the American Psychological Association Young Investigator Award in Experimental Psychology.

## LECTURES

**Samuel Achilefu, PhD**, associate professor of radiology, presented "Molecular optical probes for imaging tumors" at the Institute of Electrical and Electronic Engineers/Lasers and Electro-Optics Society Summer Topical Meeting, San Diego, California, June 29.

**Carolyn Anderson, PhD**, associate professor of radiology, presented "Copper-64 chelator biomolecule conjugates for PET imaging applications" at the Cardiovascular Molecular Imaging Workshop, sponsored by the National Institutes of Health, Bethesda, Maryland, May 3. She spoke on "Chemistry, imaging, and therapy applications of copper-64 radiopharmaceuticals" at the Gordon Research Conference: Metals in Medicine, sponsored by Colby College, Waterville, Maine, June 15. She presented "Copper-64-labeled receptor ligands and enzyme inhibitors" at the 7<sup>th</sup> Nuclear Cardiology Invitational Conference, Park City, Utah, July 18.

**Kelly Botteron, MD**, associate professor of psychiatry and of radiology, presented "Neuroimaging in early onset mood disorder, defining neuromorphometry and implications for prevention" at Prevention of Depression in Children and Adolescents Workshop, sponsored by the National Institute of Mental Health, Bethesda, Maryland, June 21 and 22.

## LECTURES

*Continued from page 25*

**Colin Derdeyn, MD**, associate professor of radiology and of neurology and neurological surgery, presented "Endovascular treatment for acute ischemic stroke" at the Advances in the Treatment of Stroke Conference, sponsored by Boone Hospital Center and the American Heart Association, Columbia, Missouri, May 1.

**Dione Farria, MD, MPH**, assistant professor of radiology, spoke on "Eliminating breast cancer disparities in our community" at the Breast Cancer Summit, sponsored by the Komen Diversity Committee, St. Louis, Missouri, July 31.

**Perry Grigsby, MD**, professor of radiation oncology and of radiology, presented "Lack of benefit of concurrent chemotherapy for lymph node negative cervical cancer" at the American Radium Society meeting, Napa Valley, California, May 1-5.

**Jay Heiken, MD**, professor of radiology, spoke on "MDCT contrast medium administration and scan timing," "Thoracoabdominal aorta CTA," and "Liver and pancreas MDCT" at MDCT: A Practical Approach, sponsored by the Society of Computed Body Tomography and Magnetic Resonance,

## Melson Lecture

MIR alumnus Thomas Winter, MD, professor of radiology and director of the Ultrasound Division at the University of Wisconsin Medical Center, presented the Twelfth Annual G. Leland Melson Visiting Professorship and Lecture on September 13. He spoke on "Image guided tumor ablation."



Shown (left to right) are doctors Sharlene Teefey, Winters, Jay Heiken, and William Middleton.

Boston, Massachusetts, May 22. He presented "Scan and contrast optimization in MDCT" and "Imaging the pancreas with MDCT" at the 5<sup>th</sup> Bracco Symposium on Multi-detector CT, Brussels, Belgium, May 28 and 29. Heiken presented "Contrast administration and scan timing for CTA with MDCT" and "Endoluminal stent graft repair of AAA: evaluation with multi-detector CT" at New Advances in Non-Invasive Vascular Imaging 2004, sponsored by Educational Symposia: Atlanta, Georgia, July 10; Chicago, Illinois, July 17; Charlotte, North Carolina, July 31; and Philadelphia, Pennsylvania, August 14. He spoke on "CTA of the abdominal aorta and endoluminal stent grafts" at the General Electric Healthcare CTA Forum, New York City, New York, July 23.

**Wayne Lamoreaux, MD**, radiation oncology chief resident, presented "Concurrent chemoradiotherapy in carcinoma of the vagina" at the American Radium Society meeting, Napa, California, May 1-5. He spoke on "Local control with interstitial brachytherapy implants in patients with carcinoma of the vagina" at the Joint Brachytherapy Meeting of the American Brachytherapy Society, Barcelona, Spain, May 13-15.

**Robert McKinstry, MD, PhD**, assistant professor of radiology, spoke on "Pediatric MR neuroimaging research imaging basics, study design considerations, and a survey of research applications" and "The nuts and bolts of neuroimaging the fetus, infant and toddler for research" at Neuroimaging the Developing Brain from Fetus to Adolescence, sponsored by Montreal Children's Hospital, McGill University, Montreal, Quebec, June 4.

**Carlos Perez, MD**, professor of radiation oncology, presented "Impact of elapsed treatment time and irradiation dose on outcome in localized carcinoma of the prostate" to the American Radium Society, Napa Valley, California, May 3. He spoke on "Hormones and radiation therapy in higher-risk localized prostate cancer" and "3-D conformal and intensity modulated radiation therapy of localized prostate cancer" at the 70<sup>th</sup> Anniversario, Instituto Nacional de Cancerologia, Bogota, Colombia, July 15. He spoke on "Management of painful bone metastases" at St. John's Regional Medical Center, Joplin, Missouri, August 31.

**David Piwnica-Worms, MD, PhD**, professor of radiology and of molecular biology and pharmacology, presented "Reporter strategies for imaging protein-protein interactions in vivo" at the Scientific Workshop on Functional Imaging in Living Systems, sponsored by the Howard Hughes Medical Institute and the Max Planck Society, Chevy Chase, Maryland, June 14.

**Fred Prior, PhD**, research associate professor of radiology, spoke on "Essential components of a RIS" at the 21<sup>st</sup> Meeting of the Society for Computer Applications in Radiology, Vancouver, British Columbia, May 21.

**Joseph Roti Roti, PhD**, professor of radiation oncology, presented "Potential effects of short (1-5 second) thermoexposures (+15°C) from 95 GHz radiation on DNA repair" at the Bioelectromagnetics Society Meeting, Washington, DC, June 22-25. He spoke on "Tumor cell killing by 10 NS 80-300 KV electric pulses" and "Different levels of HSP27 phosphorylation following acute and mild heat shock and TDMA exposure in HELA S3 cells" at the 11<sup>th</sup> Annual Michaelson Research Conference, Hood River, Oregon, August 6-10.

**Brian Rubin, MD**, associate professor of surgery and of radiology, spoke on "Novel techniques of SFA intervention" at Expanding the Horizons: Endovascular Symposium of the Society for Vascular Surgery, Anaheim, California, June 2. He presented "Carotid endarterectomy in octogenarians—age over 80 years—is not an indication for carotid stenting" and "Aortic neck attachment failure and the AneuRx graft: incidence, treatment options & early results" at the Peripheral Vascular Surgical Society Annual Meeting, Anaheim, California, June 5.

**Stuart Sagel, MD**, professor of radiology, spoke on "CT of non-vascular mediastinal masses" and "Interactive thoracic CT case discussions" at the 34<sup>th</sup> Annual Fleischner Society Conference on Chest Disease/American Thoracic Society Refresher Course in Radiology, Orlando, Florida, May 22. He presented "CT angiography for pulmonary symbolism," "CT of the pericardium," and "CT of focal lung lesions" at the 14<sup>th</sup> Summer Practicum of the Society of Computed Body Tomography/Magnetic Resonance, Whistler, British Columbia, August 8-12.

**Bradley Schlaggar, MD, PhD**, assistant professor of neurology, of radiology, of pediatrics, and of anatomy and neurobiology, presented "The developmental functional neuroanatomy of lexical processing" at the

Universite Pierre Mendes France, Grenoble, France, June 8. He spoke on "How to design an fMRI experiment" at the John Merck Scholars Fund Summer Institute on the Biology of Developmental Disabilities, hosted by Princeton University, Princeton, New Jersey, July 20.

**Barry Siegel, MD**, professor of surgery and of medicine, as the James Quinn Memorial Lecturer, presented "Oncologic PET: beyond FDG" at The Changing Landscape of Nuclear Medicine, sponsored by the Central Chapter of the Society of Nuclear Medicine, Chicago, Illinois, May 14-16. He spoke on "Oncologic PET and PET/CT: artifacts, variants, and benign conditions simulating cancer" at Radiology Grand Rounds, Brigham and Women's Hospital, Harvard Medical School, Boston, Massachusetts, May 25, and at Radiology Grand Rounds, Massachusetts General Hospital, Harvard Medical School, Boston, Massachusetts, May 26. He presented "Clinical applications of PET and PET/CT in oncology" at Radiology Grand Rounds, Boston University Medical School, Boston, Massachusetts, May 25; at St. Patrick Hospital and Health Sciences Center, Missoula, Montana, June 4; and at the United Regional Health Care Sys-

tem, Wichita Falls, Texas, July 15. Siegel spoke on "PET in oncology: monitoring and predicting response to treatment" at the Chilean Society of Nuclear Medicine, Santiago, Chile, August 26. As visiting professor, he presented "Applications of PET and PET/CT in oncology" and "Current status of PET in clinical practice" at the Catholic University Hospital, Santiago, Chile, August 27 and September 1, respectively. He presented "PET in oncology: beyond FDG" at The Foundation Nuclear Medicine School, National University of Cuyo, Mendoza, Argentina, August 30.

**Marilyn Siegel, MD**, professor of radiology and of pediatrics, spoke on "Imaging tumor response in the musculoskeletal system" at the European Society of Pediatric Radiology, Heidelberg, Germany, June 7-9. She presented "Multidetector CT in pediatrics: update 2004" at the Siemens User Meeting, Las Vegas, Nevada, August 13 and 14. As visiting professor, she presented "Multidetector CT in pediatrics," "US/CT of common abdominal neoplasms in children," "CT of congenital thoracic lesions," "CT of pediatric mediastinal masses," "CT/MR of common pelvic lesions in children," "Sonography of neonatal renal lesions," and "Intracranial sonography: hemorrhage and ischemia" at the Catholic University, Santiago, Chile, August 25-September 3.

## LECTURES

*Continued from page 27*

**Yuan-Chuan Tai, PhD**, assistant professor of radiology, presented "MicroPET imaging" at the American Society of Nuclear Cardiology, Symposium on Cardiovascular Imaging, Bethesda, Maryland, May 4, and at the American Society of Nuclear Cardiology, 7<sup>th</sup> ASNC Nuclear Cardiology Invitational Conference, Park City, Utah, July 18. He spoke on "MicroPET and molecular imaging" at Chang-Gang University, Taipei, Taiwan, August 13.

**Dmitriy Yablonskiy, PhD**, professor of radiology and of physics, presented "Physical mechanisms behind diffusion attenuated MR signal formation in biological tissues" at The 45<sup>th</sup> ENC—Experimental Nuclear Magnetic Resonance Conference, Monterey. He spoke on "Theoretical model of brain temperature distribution and changes during functional activation" at the Society for Industrial and Applied Mathematics Conference on the Life Sciences, Portland, Oregon, July 16, California, April 20.

**Jeffrey Zacks, PhD**, assistant professor of psychology and of radiology, spoke on "The cognitive structure of everyday events" at the Laboratories/University of New Mexico Cognitive Systems Workshop, Santa Fe, New Mexico, June 30.

## SYMPOSIA

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

### AMERICAN ROENTGEN RAY SOCIETY

*104<sup>th</sup> Annual Meeting  
Miami Beach, Florida  
May 2-7, 2004*

**Marilyn Siegel, MD**, program chair, Pediatric Section.

### SCIENTIFIC SESSIONS

**Steven Don, MD; Bruce Whiting, PhD; Keith Kronemer, MD; Richard Kraus, MD**, "Computed radiography for neonatal chest imaging: the effect of image processing on the perception of image quality."

**Khaled Elsayes, MD; Paul Stavetig, MD; Vamsidhar Narra, MD; Markus Lammle, MD; Jeffrey Brown, MD**, "Retropertoneal tumors MR findings with pathologic correlation."

**Khaled Elsayes, MD; Govind Mukundan, MD; Vamsidhar Narra, MD; Aamer Farooki, MD; Jeffrey Brown, MD**, "Adrenal masses: MR imaging features with pathologic correlation."

**Khaled Elsayes, MD; Govind Mukundan, MD; Vamsidhar Narra, MD; Christine Menias, MD; Jay Heiken, MD**, "MR imaging of the spleen: spectrum of abnormalities."

**Khaled Elsayes, MD; Yuming Yin, MD; Vamsidhar Narra, MD; Markus Lammle, MD; Govind Mukundan, MD; Jay Heiken, MD**, "Focal hepatic lesions: differential enhancement pattern approach with 3D gradient echo post contrast MR imaging."

**Khaled Elsayes, MD; Vamsidhar Narra, MD; John Leyendecker, MD; Paul Staveteig, MD; Jeffrey Brown, MD**, "MR imaging of the peritoneum: spectrum of abnormalities."

**Khaled Elsayes, MD; Vamsidhar Narra, MD; John Leyendecker, MD; Christine Menias, MD; Jeffrey Brown, MD**, "MR imaging of adrenal and extra-adrenal pheochromocytomas."

**Marilyn Siegel, MD**, "Multimodality imaging of renal masses in children."

### SCIENTIFIC EXHIBITS

**Edward Lee, MD, MPH; Marilyn Siegel, MD; Fernando Gutierrez, MD; Sanjeev Bhalla, MD; Jonathan Chung; Amy Oberhelman, MD**, "Multi-detector CT angiography evaluation of thoracic vascular anomalies in pediatric patients: techniques, protocols, and clinical applications." *Bronze Medal Award*

### INTERNATIONAL SOCIETY FOR MAGNETIC RESONANCE IN MEDICINE

*12<sup>th</sup> Scientific Meeting and Exposition  
Kyoto, Japan  
May 15-21, 2004*

**SCIENTIFIC PRESENTATIONS**  
**Fadi El-Merhi, MD; Jie Zheng, PhD; Faith Rowold; Robert Gropler, MD; Pamela Woodard, MD**, "Late enhancement of infarct may overestimate myocardial ischemia in stress/rest MR perfusion imaging."

**Yun Gao, PhD; Glenn Foster, RT; Nikolaos Tsekos, PhD; Pamela Woodard, MD; Jie Zheng, PhD; Robert Gropler, MD**, "Lipid assessment with magnetic resonance imaging and magnetic resonance spectroscopic imaging."

**Nicolas Lori, Thomas Conturo, MD, PhD**, "Numerical analysis of the feasibility of finite-delta q-space probability measurements in human white matter."

**Nicolas Lori; Erbil Akbudak, PhD; Ertugrul Sorar; Joshua Shimony, MD, PhD; Thomas Conturo, MD, PhD**, "Identification of an amygdalo-fusiform pathway in humans using diffusion tensor tracking."

**Mark McAvoy, PhD**, "Voxel power for repeated measures ANOVA with nonsphericity."

**Haosen Zhang, PhD; Robert Gropler, MD; Jie Zheng, PhD**, "Myocardial BOLD imaging: comparison between TrueFISP and TSE sequences."

**Jie Zheng, PhD; Mark Nolte; Pamela Woodard, MD; Robert Gropler, MD**, "Dynamic assessment of myocardial oxygen consumption by MRI."

**Jie Zheng, PhD; Faith Rowold; Thomas Pilgram, PhD; Pamela Woodard, MD**, "Quantification of vulnerability of coronary artery plaques with MRI and biomechanics: an ex vivo study."

## **INTERNATIONAL HEPATO-PANCREATO-BILIARY SOCIETY**

*6<sup>th</sup> World Congress  
Washington, DC  
June 2-6, 2004*

### **SCIENTIFIC SESSIONS**

**Khaled Elsayes, MD; John Leyendecker, MD; Christine Menias, MD; Yuming Yin, MD; Vamsidhar Narra, MD; Jeffrey Brown, MD**, "MR characterization of focal hepatic lesions that are indeterminate on CT."

**Khaled Elsayes, MD; Yuming Yin, MD; Vamsidhar Narra, MD; Markus Lammle, MD; Govind Mukundan, MD; Jay Heiken, MD**, "Focal hepatic lesions: differential enhancement pattern approach with 3D gradient echo post contrast MR imaging."

**Ranista Tongdee, MD; Erica Oliveira, MD; Vamsidhar Narra, MD; Khaled Elsayes, MD; Jeffrey Brown, MD**, "Utility of 3D MR imaging in preoperative evaluation of hepatobiliary diseases."

**Erica Oliveira, MD; Ranista Tongdee, MD; Khaled Elsayes, MD; Vamsidhar Narra, MD; Jeffrey Brown, MD**, "MRI and MRCP findings in primary sclerosing cholangitis."

## **AMERICAN SOCIETY OF NEURORADIOLOGY**

*42<sup>nd</sup> Annual Meeting  
Seattle, Washington  
June 5-11, 2004*

**Colin Derdeyn, MD**, moderator, Adult Brain: Vascular Imaging in Tumor and Ischemia.

**Katie Vo, MD**, moderator, Adult Brain: Vascular Imaging.

**Alan Williams, MD**, moderator, Spine: Degenerative Disc Disease and Biomechanics.

### **SPECIAL PRESENTATIONS**

**Henry Royal, MD**, "V/Q imaging;" "Terrorism using radioactive materials—hospital preparedness;" FDA imaging guidance document."

### **SCIENTIFIC PRESENTATIONS**

**Thomas Conturo, MD, PhD**, "Diffusion tensor imaging methodology and terminology."  
**James Goddard, MD; Christopher Moran, MD; DeWitte Cross, MD; Colin Derdeyn, MD**, "Calculation of the volume embolization ratio in small aneurysms treated with a single detachable coil."

**Mehrdad Sehizadeh, MD; Joshua Shimony, MD, PhD**, "Diffusion imaging in spinal diskitis and osteomyelitis."

### **POSTER PRESENTATIONS**

**Jeong Lee, PhD; Joanne Markham, MS; Tom Videen, PhD; Colin Derdeyn, MD; William Powers, MD; Joshua Shimony, MD, PhD**, "Comparing perfusion measurements using singular value decomposition and maximum likelihood expectation maximization."

### **COMPUTER-ASSISTED EXHIBIT**

**Colin Derdeyn, MD**, "Physiology of cerebral perfusion autoregulatory mechanisms and their evaluation with state-of-the-art neuroradiologic imaging."

### **FOCUS SESSIONS**

**Thomas Conturo, MD, PhD**, "Diffusion tensor imaging techniques and terminology."

**Colin Derdeyn, MD**, "Grantsmanship: the art of writing a grant."

**Colin Derdeyn, MD**, "Carotid angioplasty and stenting: patient selection."

## **SOCIETY OF NUCLEAR MEDICINE**

*51<sup>st</sup> Annual Meeting  
Philadelphia, Pennsylvania  
June 19-23, 2004*

**Carolyn Anderson, PhD**, moderator, New Chemistry—Oncology: Radiolabeled Peptides.

**Robert Gropler, MD**, moderator, Cardiovascular—Clinical Science: Imaging of Myocardial Metabolism and Disease.

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

**Mark Mintun, MD**, moderator, Neurosciences—Psychiatry: Psychiatry-Drug Abuse.

**David Reichert, PhD**, comoderator, New Chemistry—Other: New Chemistry—Protein, Peptide and Other Biomolecule Preparation.

**Michael Welch, PhD**, The Cassen Lectureship: "Tracer studies from bench to bedside: past, present, and future."

### **CATEGORICAL SEMINARS**

**Carolyn Anderson, PhD**, "Preparation of Cu-64-labeled chelators and chelator-peptide/protein conjugates."

**Farrokh Dehdashti, MD**, "PET—gynecological malignancies."

### **SCIENTIFIC PAPERS**

**Pilar Herrero, MS; Carmen Dence, MS; Zulfia Kisrieva-Ware, MD, PhD; Paul Eisenbeis; Michael Welch, PhD; Robert Gropler, MD**, "Measurement of myocardial kinetics of L-3[C-11]lactic acid."

**Jason Lewis, PhD; Robert Malyapa, MD, PhD; Ryuji Higashikubo, PhD; Carmen Dence, MS; Michael Welch, PhD**, "Validation of the hypoxia selectivity of Cu-ATSM with pimonidazole and <sup>18</sup>F-FMISO in a rodent model of cancer."

**Jason Lewis, PhD; Datta PondePhD; Carmen Dence, MS; Michael Welch, PhD**, "Comparative distribution of hypoxia selective Cu-64-ATSM with F-18-FDG and the proliferative marker F-18-FLT in a rodent model of cancer."

## SYMPOSIA

*Continued from page 29*

**Robert Mach, PhD; Zhude Tu, PhD; Suwanna Vangveravong; Michael Welch, PhD**, "Radiolabeled probes for imaging of the  $\delta$  receptor status of breast tumors."

**Jennifer Sprague, Carolyn Anderson, PhD**, "In vitro and in vivo evaluation of copper-64 labeled TYR-3-octreotate using a cross-bridged cyclam ligand."

**Raffaella Rossin; Xiankai Sun, PhD; Jerrel Rutlin; Michael Welch, PhD**, "Biological evaluation of folate-nanoparticles as potential agents for tumor therapy and diagnosis."

**Yuan-Chuan Tai, PhD; Heyu Wu; Ananya Ruangma, PhD**, "Design of a detector insert for zoom-in PET imaging."

**Zhude Tu, PhD; Carmen Dence, MS; Michael Welch, PhD; Robert Mach, PhD**, "Carbon-11-labeled sigma-2-receptor ligands for imaging breast cancer."

**Jeongsoo Yoo, PhD; Todd Perkins; Lucie Tang, BScA; Douglas Rowland, PhD; Jason Lewis, PhD; Michael Welch, PhD**, "Preparation of high specific activity Y-86 using a small biomedical cyclotron."

## EDUCATIONAL SESSION

**Carolyn Anderson, PhD**, "Preparation of Cu-64-labeled chelators and chelator-peptide/protein conjugates."

**Jerold Wallis, MD**, "The IHE nuclear medicine profile."

## MODERN IMAGING TECHNOLOGY WORKSHOP

**Richard Laforest, PhD**, "Computational techniques to improve resolution."

## POSTER SESSIONS

**Carmen Dence, MS; Pilar Herrero, MS; Robert Gropler, MD; Michael Welch, PhD**, "L-3[C-11]lactic acid: improved purification and in vivo metabolites determination after injection in canines for cardiac PET studies."

**Nobuyuki Oyama, MD, PhD; Datta Ponde, PhD; Carmen Dence, MS; Barry Siegel, MD; Michael Welch, PhD**, "In vitro and in vivo assessment of 18F-fluoroacetate; a potential analog for tumor imaging."

**Jeongsoo Yoo, PhD; Carmen Dence, MS; Michael Welch, PhD**, "Synthesis and biodistribution of an estrogen receptor  $\beta$  selective radioligand: 5-[18F]fluoro-(2R,3S)-2,3-bis(4-hydroxyphenyl)-pentanenitrile (FDPN)."

## AMERICAN ASSOCIATION OF PHYSICISTS IN MEDICINE

*46<sup>th</sup> Annual Meeting  
Pittsburgh, Pennsylvania  
July 25-29, 2004*

**Joseph Deasy, PhD**, moderator, IMRT Optimization Poster Session; moderator, Therapy/Joint Tracks Symposium: IMRT Optimization & Operations Research; cochair, Therapy/Joint Tracks Symposium: Functional Imaging & Fusion.

**Eric Klein, MS**, codirector, Education Program (Therapy Program); moderator, Image Processing & PACS Poster Session.

**Daniel Low, PhD**, cochair, Therapy/Joint Tracks Symposium: Motion Tracking.

**James Purdy, PhD**, moderator, Therapy/Joint Tracks Symposium: The Advanced Technology QA Consortium (ATC).



Shown left to right are doctors **Jeff Michalski, Gerald Andriole, Crawford, and Carlos Perez.**

## Probstein Lecture

David Crawford, MD, associate director of the UC Cancer Center at the University of Colorado Health Sciences Center, was guest speaker for the Seventeenth Annual Norman K. Probstein Oncology Lecture on September 17. He presented "Management of primary: role of the radical prostatectomy."

## CONTINUING EDUCATION COURSES

**Walter Bosch, DSc,** "DICOM: definitions & testing."

**Joseph Deasy, PhD,** "The influence of linear accelerator delivery errors on IMRT"; "Radiobiological issues for IMRT."

**Eric Klein, MS,** "Transition to heterogeneity corrections."

**Zuofeng Li, DSc,** "Quality assurance of ultrasound imagers in diagnostics and therapy."

**Daniel Low, PhD,** "The effects of motion on IMRT."

**Sasa Mutic, MS,** "CT/PET in radiation oncology."

## SCIENTIFIC SESSIONS

**Angel Blanco, MD; Joseph Deasy, PhD; Issam El Naqa, PhD,** "Normal tissue complication probability modeling techniques using bootstrap replicates of the variable selection process."

**Joseph Deasy, PhD; James Purdy, PhD; Konstantin Zakaryan, PhD; James Alaly,** "An IMRT treatment planning research laboratory."

**Issam El Naqa, PhD; Daniel Low, PhD; Wei Lu; Michelle Nystrom; Parag Parikh, MD; Joseph Deasy, PhD; Jeffrey Bradley, MD,** "Multi-frame optical flow approach for automated breathing motion tracking in 4D computed tomography."

**Issam El Naqa, PhD; Jeffrey Bradley, MD; Joseph Deasy, PhD; Richard Laforest, PhD; Daniel Low, PhD,** "Improved analysis of PET images for radiotherapy treatment planning: de-blurring and automated segmentation techniques."

**Patricia Lindsay, PhD; Joseph Deasy, PhD; Issam El Naqa, PhD; Milos Vivic, PhD,** "Monte Carlo corrected DVHs for retrospective dose-volume modeling."

**Daniel Low, PhD,** "Dynamic accuracy of an AC magnetic 4D localization system prototype."

**Daniel Low, PhD; Richard Laforest, PhD; Parag Parikh, MD; Wei Lu; Issam El Naqa, PhD; Sasa Mutic, MS; Tom Miller, MD, PhD; Jeffrey Bradley, MD,** "4D PET: quantitative validation."

**Wei Lu; Parag Parikh, MD; Issam El Naqa, PhD; Michelle Nystrom; Sasha Wahab, MD; Anurag Singh, MD; Sasa Mutic, MS; Sasha Wahab, MD; Jeffrey Bradley, MD; Daniel Low, PhD,** "Quantitation of the four-dimensional computed tomography process."

**Michelle Nystrom; Wei Lu; Parag Parikh, MD; Issam El Naqa, PhD; Daniel Low, PhD,** "A comparison of spirometry and abdominal height as 4DCT metrics."

**Parag Parikh, MD; Daniel Low, PhD,** "Development of a 3D dynamic verification phantom for 4DCT and IMRT."

**Parag Parikh, MD; Wei Lu; Michelle Nystrom; Issam El Naqa, PhD; Jeffrey Bradley, MD; Daniel Low, PhD,** "Tumor motion mapping using four dimensional computed tomography."

**David Politte, DSc; Wei Lu; Bruce Whiting, PhD; Parag Parikh, MD; Jeffrey Bradley, MD; Daniel Low, PhD,** "Improving lung scan temporal resolution using tidal-volume sorted sinograms from 4DCT."

**Bruce Whiting, PhD; Joseph O'Sullivan, PhD; David Politte, DSc,** "X-ray CT signal statistics."

## POSTER SESSIONS

**James Alaly; Joseph Deasy, PhD; Konstantin Zakaryan, PhD; Andrew Hope, MD; Walter Bosch, DSc; James Purdy, PhD,** "Modeling radiotherapy treatment outcomes: open-source data collection, database, and plan review tools."

**Vanessa Clark; Joseph Deasy, PhD,** "A greedy set cover algorithm for the IMRT beam selection problem."

**Joseph Deasy, PhD; Issam El Naqa, PhD; Milos Vivic, PhD,** "Improvements in Monte Carlo denoising based on batching."

**Jacqueline Esthappan, PhD; Zuofeng Li, DSc; Imran Zoberi, MD,** "Dose-metric considerations for HDR breast interstitial implant technique based on optimized treatment planning."

**Sreekrishna Goddu, PhD; Gisele Pereira; Daniel Low, PhD; Robert Drzymala, PhD; Eric Klein, MS,** "IMRT quality assurance using Thebes II, linear ion-chamber array."

**Sreekrishna Goddu, PhD; Eric Klein, MS; Gisele Pereira; Jeff Michalski, MD; James Purdy, PhD,** "Acceptance testing and commissioning of CMS ultrasound based prostate localization system (I-beam)."

**Bruce Gu, PhD; Jacqueline Esthappan, PhD; Zuofeng Li, DSc,** "Impact of revised TG-43 data on COMS eye plaque dosimetry."

**Tareque Islam, PhD; Sasa Mutic, MS; Sreekrishna Goddu, PhD; Zuofeng Li, DSc; Perry Grigsby, MD,** "A simple technique to produce split field compensating filters for pelvic irradiation of cervical carcinoma using static MLC delivery."

**Eric Klein, MS,** "ASTRO physics curriculum for radiation oncology residents."

**Zuofeng Li, DSc; Sreekrishna Goddu, PhD; Jacqueline Esthappan, PhD; Daniel Low, PhD,** "Dynamic MLC QA testing using multi-detector linear accelerator beam quality check devices."

**Eduardo Moros, PhD; Bibiana Cha; Petr Novak, PhD; William Straube, MS,** "A Linac-SURLAS-patient interface transport to minimize accelerator usage time during simultaneous thorioradiotherapy."

## SYMPOSIA

*Continued from page 31*

**Sasa Mutic, MS; Milos Vivic, PhD; Daniel Low, PhD; Joseph Deasy, PhD; Andrew Hope, MD; Perry Grigsby, MD**, "Dosimetric properties of a microRT small animal irradiator."

**Sasa Mutic, MS; Daniel Low, PhD; Milos Vivic, PhD; Joseph Deasy, PhD; Andrew Hope, MD; Perry Grigsby, MD**, "Progress towards a microRT small animal conformal irradiator."

**Issam El Naqa, PhD; Daniel Low, PhD; Wei Lu; Michelle Nystrom; Parag Parikh, MD; Joseph Deasy, PhD; Jeffrey Bradley, MD**, "Breathing motion tracking in 4D computed tomography."

**Parag Parikh, MD; Wei Lu; Michelle Nystrom; Issam El Naqa, PhD; Jeffrey Bradley, MD; Daniel Low, PhD**, "Tumor motion mapping using four dimensional computer tomography."

**Gisele Pereira**, "IMRT delivery accuracy as a function of segmentation intensity levels and dose rate."

**Milos Vivic, PhD; Wade Thorstad, MD; Daniel Low, PhD; Joseph Deasy, PhD**, "Lymphatic flow mapping utilizing multi-modality image fusion."

**Konstantin Zakaryan, PhD; Joseph Deasy, PhD; James Alaly**, "Controlling dose falloff in IMRT treatment planning: the 'anchor zone' method."

**Konstantin Zakaryan, PhD; Joseph Deasy, PhD; James Alaly**, "Including scatter dose in IMRT optimization calculations."

## AMERICAN CHEMICAL SOCIETY

*228<sup>th</sup> National Meeting & Exposition  
Philadelphia, Pennsylvania  
August 22-26, 2004*

### SCIENTIFIC PRESENTATIONS

**Samuel Achilefu, PhD; Yunpeng Ye, PhD; Sharon Bloch, PhD; Zongren Zhang, PhD; Mikhail Berezin, PhD; Kexian Liang**, "Development of contrast effectors for optical and multimodal imaging of tumors."

**Charles Boswell, Edwin Chu, Laura Meyer, Carolyn Anderson, PhD**, "Mechanisms of metal dissociation from copper(II) azamacrocyclic-based radiopharmaceuticals."

**Hsiaoju Lee; Michael Welch, PhD; Robert Mach, PhD**, "Positron emitting ligands for the peroxisome proliferator-activated receptor  $\gamma$  (PPAR $\gamma$ )."

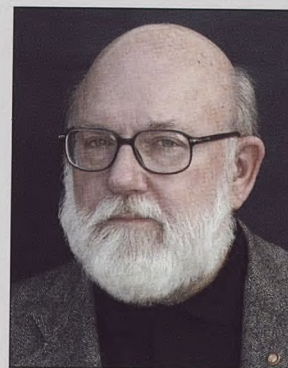
**Michael Welch, PhD**, "Production of 'non-standard' positron emitting nuclides."

**Yunpeng Ye, PhD; Samuel Achilefu, PhD**, "Novel fluorescent carbocyanine-based molecular beacons: synthesis and metal binding properties."

## IN MEMORIAM

We sadly report the deaths of three Mallinckrodt Institute alumni: Paul Colomb, MD; Edward Hoffman, PhD; and William Seaman, MD.

**PAUL COLOMB, MD** died suddenly on July 21, 2004. A native of Australia, Colomb received a medical degree from the University of Sydney and completed internships in emergency medicine at Nepean District Hospital and at Royal Prince Alfred Hospital. He completed an internship in orthopedic surgery at Columbia-Presbyterian Hospital, New York, and three years of diagnostic radiology training at the Hospital of St. Raphael, New Haven, Connecticut. Colomb was a nuclear medicine resident (20001-2002) at Mallinckrodt Institute.



**EDWARD HOFFMAN, PhD**, died July 1, 2004; he was 62. Born on New Year's Day in St. Louis, Missouri, Hoffman received an undergraduate degree from St. Louis University and a doctoral degree in nuclear chemistry from Washington University. After two years at the Franklin Institute in Swathmore,

Pennsylvania, he returned to St. Louis and joined the staff of Mallinckrodt Institute's Division of Radiation Sciences as a Special National Institutes of Health Fellow. In the early 1970s he was a member of the Mallinckrodt Institute research team that developed the first positron emission tomography (PET) scanner. At the time of his death, he was a professor of radiological sciences and molecular and medicinal pharmacology and director of the Biomedical Physics Interdepartmental Graduate Program at the University of California, Los Angeles.

**WILLIAM SEAMAN, MD**, died June 7, 2004, in Tequesta, Florida; he was 87. Seaman received a medical degree from Harvard University and completed a diagnostic radiology residency at Yale University. He joined the Mallinckrodt Institute faculty in 1948 as an instructor in radiology and was named professor of radiology in 1955. He accepted the position of professor and chairman of the Department of Radiology at the College of Physicians and Surgeons at Columbia University in New York City in 1956 and retired from Columbia University in 1990. Seaman also served as chairman of the Board of Chancellors of the American College of Radiology.

# Diagnostic Radiology

## Nuclear Medicine/Nuclear Radiology

FELLOWS AND RESIDENTS FOR 2003 - 2004



(First Row, left to right) Doctors Kristopher Cummings, Andrew Bierhals, Yuliya Lakhman, Phoebe Freer, Jeffrey Carezza, John Anderson, Joseph Erinjeri, Shao Pow Lin. (Second row) Doctors Shawyon Shadman; Cynthia Santillan; Wincha Chong; Jennifer Gould, assistant director, Diagnostic Radiology Residency Program; Christine Menias, assistant director, Diagnostic Radiology Residency Program; Catherine Appleton; Lawrence Tang, diagnostic radiology chief resident; Gilbert Jost, director, Mallinckrodt Institute; Dennis Balfe, director, Diagnostic Radiology Residency Program; Ronald Gerstle, diagnostic radiology chief resident; Daniel Picus, chief, Division of Diagnostic Radiology; Jason Bronfman, diagnostic radiology chief resident; Gregory Sanders; Sanjeev Bhalla, assistant director, Diagnostic Radiology Residency Program; Kianoush Rezaei; Andres O'Brien-Solar. (Third row) Doctors George Wang, Neil Kennedy, John Loh, Ryan Murtagh, Heather Byer, Michael Smith, Jason Kerr, Daniel Wessell, Timothy Smullen, Jack Jennings, Richard Heller, Jason Wagner, Jeffrey Brent, Vikram Patel, Anand Singh, Vladislav Gorengaut, John Agles, Scott Bolton, Brett Gratz, Humberto Rosas, Heather Garrett. (Fourth row) Doctors Govind Mukundan, Paul Stavetig, Jamie Colonnello, William Holloway, Dimitrios Papadouris, Lisa Wang, Robert Kadner, David Johnston, Rolf Hultsch, Cylen Javidan-Nejad, Mehrdad Sehzadeh, Yuming Yin, Nelson Elkins, Krishna Thirumala, Ashesh Parikh, Cary Shlimovitz.

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Design  
Purviance & Company  
Marketing Communications

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Printing  
Swift Print Communications  
LLC

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*Focal Spot* magazine is distrib-  
uted three times annually.

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