2012

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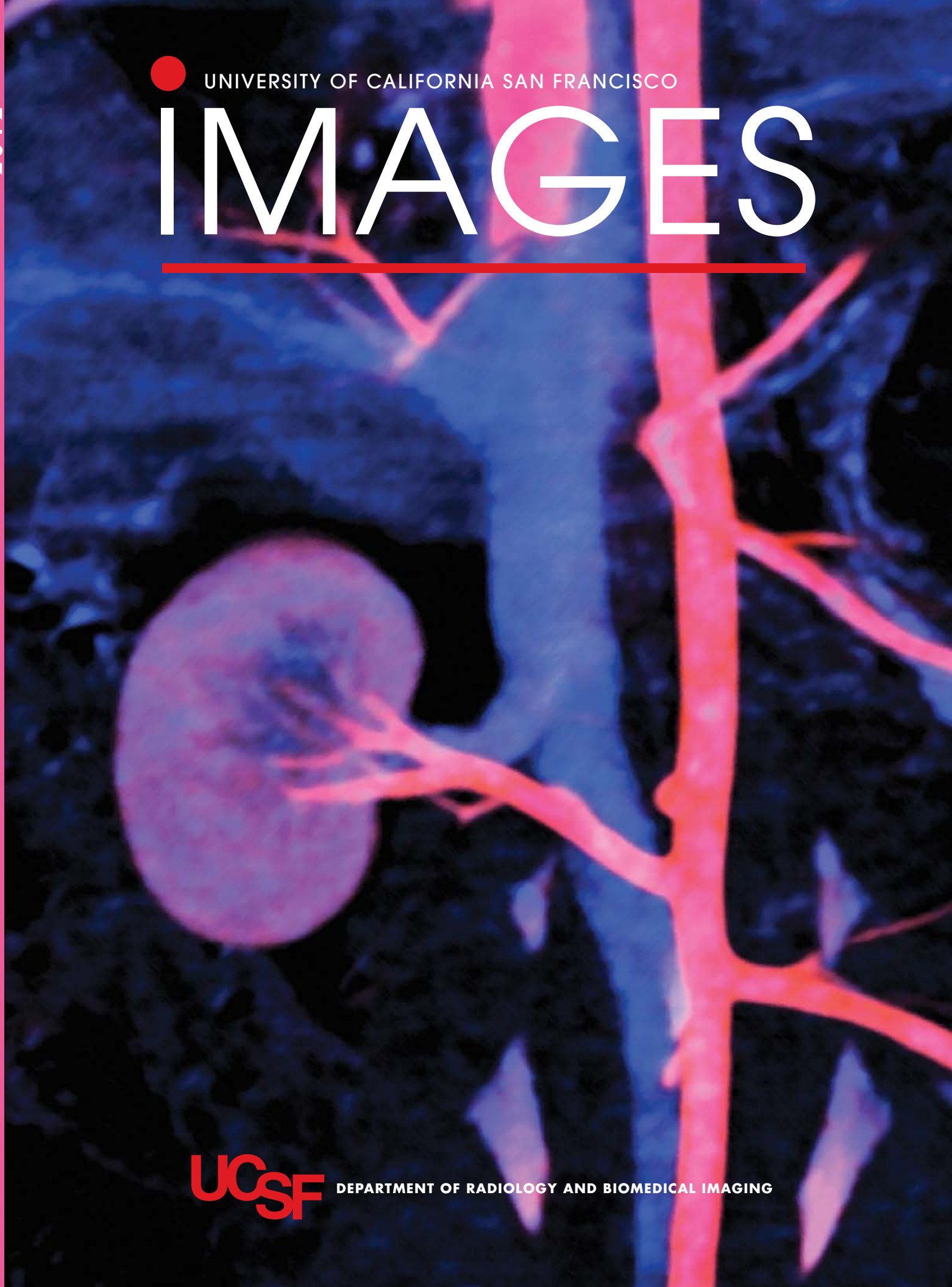

UCSF DEPARTMENT OF RADIOLOGY AND BIOMEDICAL IMAGING

About the Cover:

This color composite image of simultaneously acquired, perfectly co-registered angiographic and venous phase CT images of the retroperitoneum was made possible by employing a dual-energy CT scanner and experimental tungsten contrast agent (venous phase, blue) in combination with commercial iodinated iohexol contrast (arterial phase, pink). The cover image was provided by John Mongan, MD, PhD, a senior resident, Samira Rathnayake, BS, a UCSF Medical Student, Yanjun Fu, PhD, an assistant research scientist, Dong-wei Gao, MD, a specialist, and Benjamin M. Yeh, MD, a professor in residence in the Department of Radiology and Biomedical Imaging.

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Dear Colleagues and Friends,

A key goal in UCSF's strategic plan is to be the workplace of choice for faculty, staff, students, and trainees. As I prepared to write to you this year, it became obvious that nearly all of our department's many fine clinical, academic, and educational accomplishments depend on the excellent people we have on our faculty and staff.

Before describing some of Radiology's "great people," I must first acknowledge the loss of one of them, Richard Sollitto, MD, who passed away just after Thanksgiving last year (see page 28). Hardly a day goes by without someone in the department mentioning him, laughing about something he said, or remembering his passion for being available to patients and referring physicians. Richard was an incredible supporter of the Margulis Society, and I know he would be proud of the support the Society continues to provide our residents and our educational program. We hope that next year's Margulis Society Gala (please save the date—April 6, 2013 at the Maritime Museum in San Francisco) will live up to the standard Richard set in previous years.

Since 2008, our Residency program has benefitted from the leadership of one of our best faculty members, Aliya Qayyum, MBBS. While Aliya has decided to focus on her research, she leaves behind one of the top programs in the country, and our residents continue to astound us year after year. Soonmee Cha, MD, professor in residence in Neuroradiology assumed the Residency program leadership in June 2012 and has already impressed us by outlining curriculum changes and section expectations to assist our residents with the new board requirements. Dr. Cha will be assisted by more great people, including assistant program directors at each of our main sites: David Avrin, MD, PhD, at Parnassus; Stefanie Weinstein, MD, at the VA Medical Center, and Thomas Urbania, MD, at San Francisco General Hospital.

We achieved another educational milestone this year with the graduation of our first class of Masters of Science students in Biomedical Imaging. I was especially pleased to have our new MS graduates join our residents at commencement this year. We have now welcomed a new class and at the start of its second year, it is fair to say the program is a great success.

Our faculty are among the best in the country and the world. I want to highlight just a few of the exceptional awards they received in 2012:

- A. James Barkovich, MD, received the Gold Medal from the American Society of Neuroradiology, recognizing his exceptional service and achievement in the field.
- Six members of our neuroradiology and interventional neuroradiology faculty were noted by *US News and World Report* as being among the top one percent of physicians in their specialty: Drs. Barkovich, Cha, Dillon, Dowd, Halbach, and Higashida.
- Charles Higgins, MD, professor emeritus and a recall member of our faculty, was named one of the American Heart Association's Six Distinguished Scientists for 2012 (see page 22). He joined the ranks of 70 other eminent scientists and researchers "whose significant, original, and sustained scientific contributions advanced the association's mission of 'building healthier lives free of cardiovascular disease and stroke.'" This is a distinct honor for Dr. Higgins, because he is one of the few radiologists to receive the award, most often given to cardiologists.

Our PhD scientists continue to receive accolades as well. David Saloner, PhD, director of the Vascular Imaging Research Center at UCSF was elected to the American Institute for Medical and Biological Engineering (AIMBE) College of Fellows in 2012. The AIMBE College of Fellows is comprised of the top two percent of medical and biological engineers in the country (see page 21).

One of the hallmarks of a department full of great people is that they teach and mentor others to achieve their utmost. This year, the UCSF Graduate Students' Association and the Graduate Division Alumni Association chose Sarah Nelson, PhD, professor of Radiology and director of the Surbeck Laboratory of Advanced Imaging, to receive the Outstanding Faculty Mentorship Award (see page 21). This award shows the extreme respect and appreciation of graduate students toward someone who has provided exceptional mentoring and advice.

And finally, it is fair to say that one of the most flattering acknowledgements that ours is a department of great people is when one of them is recruited away. Many of you worked over the years with Fergus Coakley, MD, chief of the Abdominal Imaging section and vice chair–Clinical Services. In a career at UCSF spanning 14 years, Fergus was an outstanding clinician, educator, researcher, and leader. In August 2012, he became chair of the Department of Radiology at Oregon Health Sciences University in Portland (see page 23). I fully expect Fergus to be extremely successful and to develop his own department of great people that some of you might call on in the future!

Please join us again this year at our RSNA reception on Sunday, November 25, 2012 from 6:30–8:30 PM at the Chicago Cultural Center on Michigan Avenue. I look forward, as always, to seeing you again and hearing your thoughts about how you develop the best academic and staff work force possible in these challenging times.

Sincerely,

Ronald L. Arenson, MD

Color Contrast Agents for CT: Our Future Reality?

John Mongan, MD, PhD, Samira Rathnayake, BS, Yanjun Fu, PhD, Dong-wei Gao, MD, Benjamin M. Yeh, MD

Will multicolored contrast agents one day replace the traditional "white" contrast agents now used for clinical computed tomography (CT) imaging? New research by our group at UCSF suggests that with clinical use of different "colors" of contrast that can be differentiated by color, dual-energy CT scans may not be too far off.

In dual-energy CT (DECT) attenuation is measured simultaneously for each pixel using two different X-ray energy spectra. Analogous to the way two different colored objects with equal brightness might appear identical in a black-and-white photograph, but would be distinguishable in a color photograph, two contrast agents with equal brightness at conventional CT can be distinguished as different colors in DECT. Dual-energy CT data can be computationally processed to differentiate a range of "color" materials, including soft tissue, bone, and iodinated contrast materials.

Preliminary Investigation of Color Contrast

This year, our group at UCSF published the first report on the *in vivo* use of pairs of color contrast materials that can be distinguished from each other at DECT. Beyond merely possible, we showed how simple it is to do on commercially available CT scanners. Iodine-colored contrast material in the arterial system can be simultaneously imaged with—yet vividly distinguished from—tungsten-colored contrast material in the venous system or bismuth-colored enteric contrast in the bowel. Contrast material no longer needs to be simply "white."

Figure 1 Just as these colored fluids are easily distinguishable to our eyes, contrast agents based on appropriately selected materials are readily distinguished by dual-energy CT.

We investigated the application of this concept in depth in the CT imaging of penetrating abdominopelvic trauma. In addition to vascular contrast, these scans often use positive enteric (oral and rectal) contrast to increase sensitivity for bowel perforation. Since both the vascular and enteric contrast agents have similar (high attenuation) appearance on a conventional CT scan, there is no direct way to determine whether extravasated contrast represents hemorrhage, bowel perforation, or both. Instead, the source of the contrast must be inferred by location and the context of surrounding findings.

We studied an abdominopelvic trauma model with DECT in conjunction with different colored vascular and experimental enteric contrast materials to see if the different colors of the extravastated contrast would help radiologists identify the source. Ten radiologists, spanning a range of experience levels from first-year resident to abdominal imaging attending, evaluated 10 sites of contrast extravasation, first using conventional CT and then using DECT.

The results were revealing: Residents who viewed DECT showed superior diagnostic accuracy than seasoned attending radiologists who had access only to conventional CT. For all readers, trainees and attendings combined, overall accuracy increased from 79% using conventional CT to 92% with DECT scans. Nine of the 10 radiologists improved their accuracy when using dual energy compared to conventional CT. Mean diagnostic confidence also increased from 67% to 81%; these improvements were significant with $p < 0.001$.

Why Now? History of Dual Energy CT

Dual energy CT dates back to the 1970s. In fact, UCSF was the first to publish on clinical DECT scans in a series of papers by David Avrin, MD, PhD, Christopher Cann, PhD, W. Richard Webb, MD, and Henry Goldberg, MD, as early as 1978. Though DECT held much promise, the slow speed

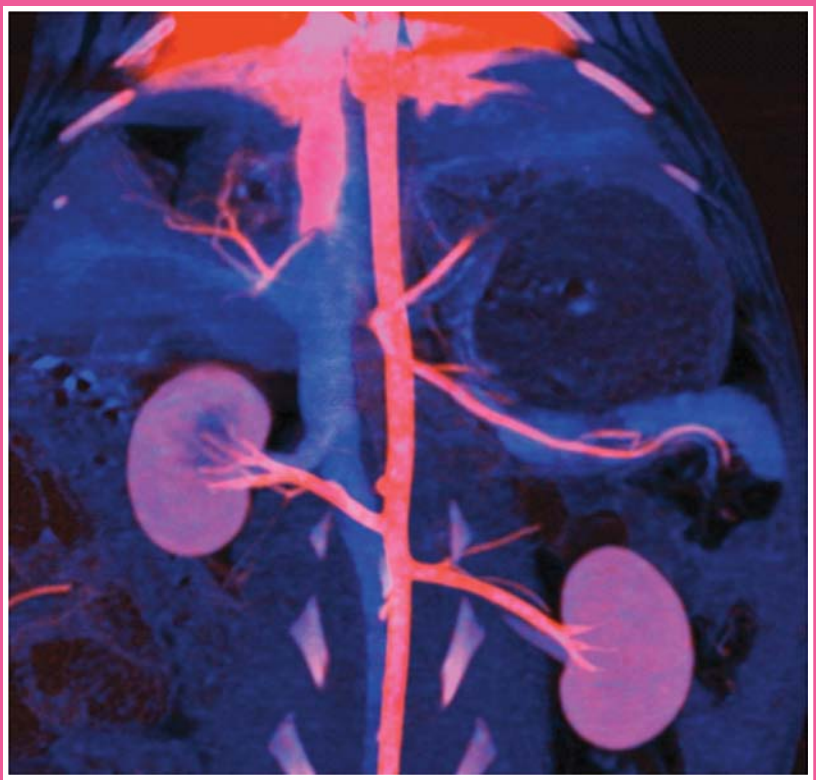


Figure 2 Dual energy CT image showing the iodinated contrast material in the arteries and kidneys (pink) and experimental tungsten contrast material in the veins (blue).

of early scanners prevented widespread use of clinical dual-energy scanning because it required two separate passes, one for each X-ray energy spectrum. The time difference between passes, seven seconds or more, inevitably resulted in image mis-registration and inconsistency in contrast enhancement due to the rapid diffusion of contrast in the body.

Fortunately, technology has advanced substantially in the last 40 years. Modern CT can now capture data from two energy spectra obtained nearly simultaneously. UCSF has the latest commercial dual-energy scanners from General Electric Healthcare installed at the Parnassus, Mt. Zion, and San Francisco Veterans Affairs Medical Center campuses. Though modern DECT scanner technology is still nascent, it has already shown clinical value as a method to determine the material composition of kidney stones, evaluate for lung perfusion defects in patients at risk for pulmonary emboli, differentiate uric acid tophi from abnormal bone formation in gout, evaluate for tumor enhancement in renal masses, improve the detection of hyper- or hypo-vascular tumors, evaluate for iron deposition and fatty liver, and potentially reduce the radiation dose for patients requiring both unenhanced and iodine-contrast material-enhanced CT scans.

From the Lab to the Clinical Scanner

How might clinical CT change if we could simultaneously image two or more contrast materials and be able to tell them apart? The benefits of such a capability should not be underestimated. For example, we may be able to perform two or more different CT exams at once. Patients would gain higher diagnostic yield from fewer CT passes, fewer visits, less risk, and less radiation dose.

Currently, no color CT contrast agents have been approved by the FDA. All currently available CT contrast media are based on iodine or barium, which happen to have nearly identical X-ray color. Gadolinium-based contrast materials, used for magnetic resonance imaging, have a distinct color, but are potentially toxic at the high doses needed for CT.

Realization of the full potential of contrast-enhanced DECT requires the creation of new classes of contrast materials based on atoms that have different X-ray colors than

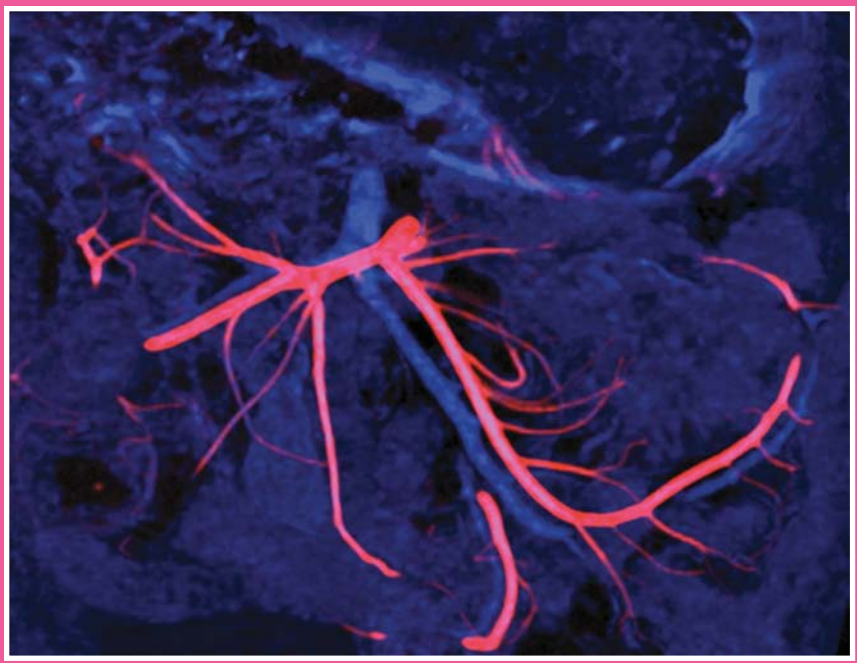


Figure 3 Dual-energy CT of the mesenteric blood vessels shows the arteries as red and veins as blue. The arteries and veins are perfectly co-registered on this image with minimal displacement from bowel peristalsis because the image was acquired in a single pass of the CT scanner.

iodine and barium. Potential CT agents with a markedly different color include agents based on bismuth, tungsten, tantalum, or even inert gold or platinum.

Further Applications of Color Contrast

Many uses are possible for several types of multicolored CT contrast agents, including general vascular and oral agents, targeted agents, and non-liquid agents.

Color vascular and enteric agents may be used concurrently with available iodinated and barium intravascular and oral agents. Combinations of multiple vascular agents will allow high-resolution, co-registered DECT scans to highlight many different vascular beds in multi-organ diseases to minimize ambiguity. Implementation will require carefully timed boluses of these contrast agents, to ensure that each agent is in a different phase of enhancement when a single DECT scan is obtained.

Although the radiation dose of a DECT scanning pass is somewhat greater than a single, conventional CT scanning pass, it is significantly lower than the two or more passes required in a conventional multiphase exam, resulting in a net reduction in radiation dose.

Another advantage of this technique is perfect registration of images between the phases of the scan. In a traditional multiphase scan, the phases are acquired on separate breath holds, so a given lesion may not fall in exactly the same position relative to image slices on each phase. For small lesions in particular, this can raise questions about whether differences in enhancement are real or artifactual due to differences in partial volume effects. Multi-contrast DECT eliminates this problem: since all phases are obtained at the same time in exactly the same position, partial volume effects are identical across the phases.

The use of simultaneous enteric and vascular contrast for conventional abdominal CT has a long history and many benefits. But the major drawback of obscured bowel wall enhancement has led to movement away from routine use of positive enteric contrast. However, when an enteric contrast agent with a different color than the vascular agent is used in conjunction with DECT, the benefits of positive enteric contrast are retained without sacrificing evaluation of bowel wall enhancement.

Targeted agents accumulate in high concentrations in specific tumors, areas of inflammation, or organs. If conjugated to medications, these agents can potentially be converted into "theranostic" or "diapeutic" agents that not only show the location of disease, but combat disease by providing highly concentrated drug delivery to specific disease

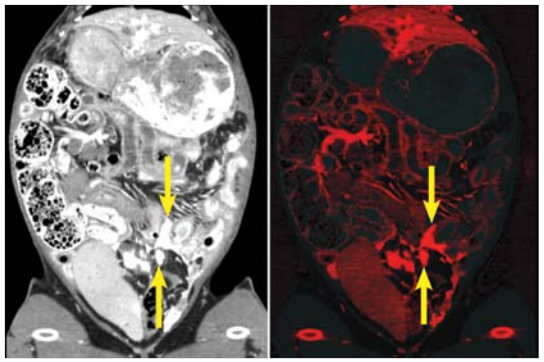


Figure 4 Conventional CT scan (left) of an injured abdomen shows contrast material outside the lumen of bowel and blood vessels (arrows), but the source of the leakage is unclear. Dual energy CT vascular contrast map (right) shows that the leakage is the same color as vascular contrast, indicating active bleeding.

sites. Targeted agents are ideal for concurrent use with intravascular agents that allow precise CT delineation of blood vessels that may be critical for surgical or interventional radiology planning and triage purposes. Non-liquid agents include radiodense gases, such as xenon, that may potentially be differentiated from iodine vascular agents. Such approaches may be used, for example, in high-resolution CT interrogation of the lung to assess ventilation and perfusion in a subsegmental fashion.

The Future of Color-Contrast CT

Now that clinical DECT scanners are becoming widely available, we expect the landscape of CT imaging to change rapidly. The principal barrier to the clinical application of multicolored contrast techniques is the lack of clinically approved differently colored contrast media. Our promising preliminary investigations point to a clear benefit of color contrast agents, but the experimental contrast agents we utilized are currently too toxic for clinical use. When will better agents become available? Time will tell, but probably within 5 to 10 years. We are collaborating with colleagues and industry to develop and test clinically feasible contrast materials. With ongoing work, we fully expect to have a more colorful future as researchers and radiologists.

Acknowledgements

We would like to acknowledge the many contributions of our colleagues, including Ella Jones, PhD, Runtang Wang, PhD, Wilbur Wang, BA, Rahi Kumar, MD, Carlos Forsythe, BS, David Tran, MD, Hing Hung, AS, Tina Hampton, CRT, ARRT, Judy Yee, MD, Jessica Pfannenstiel, BSRT, Elaine Breen-Brown, ARRT, Robert Gould, ScD, Alexander Keedy, MD, Miguel Cabarrus, MD, Rizwan Aslam, MB, ChB, Pierre Cohen, MD, Abby Deans, MD, PhD, Robert Flavell, MD, PhD, Ryan Kohlbrenner, MD, Victor Sai, MD, Ruedi Thoeni, MD, Stephanie Weinstein, MD, S. Jarrett Wrenn, MD, PhD, as well as General Electric Healthcare and the UCSF Laboratory Animal Resource Center.

John Mongan, MD, PhD, is a PGY5 diagnostic radiology resident; Samira Rathnayake, BS, is a UCSF medical student; Yanjun Fu, PhD is an assistant research scientist; Dong-wei Gao, MD, is a specialist; and Benjamin M. Yeh, MD, is a professor in residence in the Department of Radiology and Biomedical Imaging.

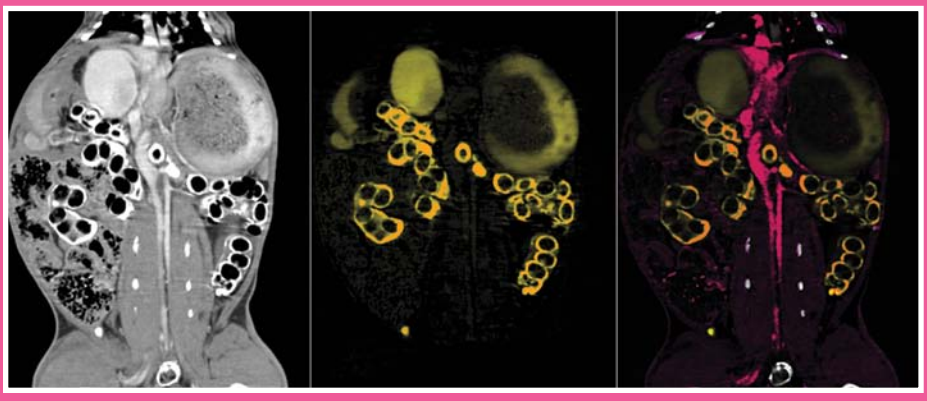


Figure 5 In conventional CT (left image), the color of contrast material is indistinguishable in the bowel and blood vessels. In DECT, contrast-enhanced bowel can be viewed in isolation (middle; colored yellow), or with perfectly co-registered contrast-enhanced vasculature, here colored red (right).

How Is a Baby's Brain Wired? —The MRI "Baby Connectome" Gives Answers

Olga Tymofiyeva, PhD, Christopher P. Hess, MD, PhD, Etay Ziv, MD, PhD, Donna M. Ferriero, MD, A. James Barkovich, MD, and Duan Xu, PhD

Babies born prematurely and babies with birth injuries face life-long health consequences. It is very difficult to predict developmental abnormalities in these babies using anatomic imaging, since alterations of connections within the brain can be subtle. At UCSF, we are developing a cutting-edge approach to detecting and monitoring these alterations.

Diffusion magnetic resonance imaging (MRI) and tractography have allowed researchers to reconstruct white matter tracts in the brain for nearly a decade. Recently, this approach has taken one step further with the development of the field of MRI connectomics, which treats the brain as a complex network and applies graph theory to analyze its properties. Our team at UCSF has developed a robust framework for assessing structural connectivity in the newborn brain—the "baby connectome" (Figure 1). We believe that a better understanding of structural connectivity will offer new insights into brain maturation and plasticity, ultimately leading to better diagnosis and treatment.

What is a Connectome?

The human brain is a complex network that is organized on multiple scales. On the microscopic scale, the network is comprised of single neurons and their synaptic connections. On the macro scale, anatomically segregated local brain regions, characterized by short connections, communicate with other local regions via longer inter-regional white matter pathways. The connectome is a relatively new term, introduced in analogy to the genome, and is used

Figure 1 A schematic image of structural connectivity in a six-month-old baby, the so-called "baby connectome." A whole-brain tractogram (left) obtained from diffusion tensor imaging (DTI) is used to construct a network of cortico-cortical connections (right).

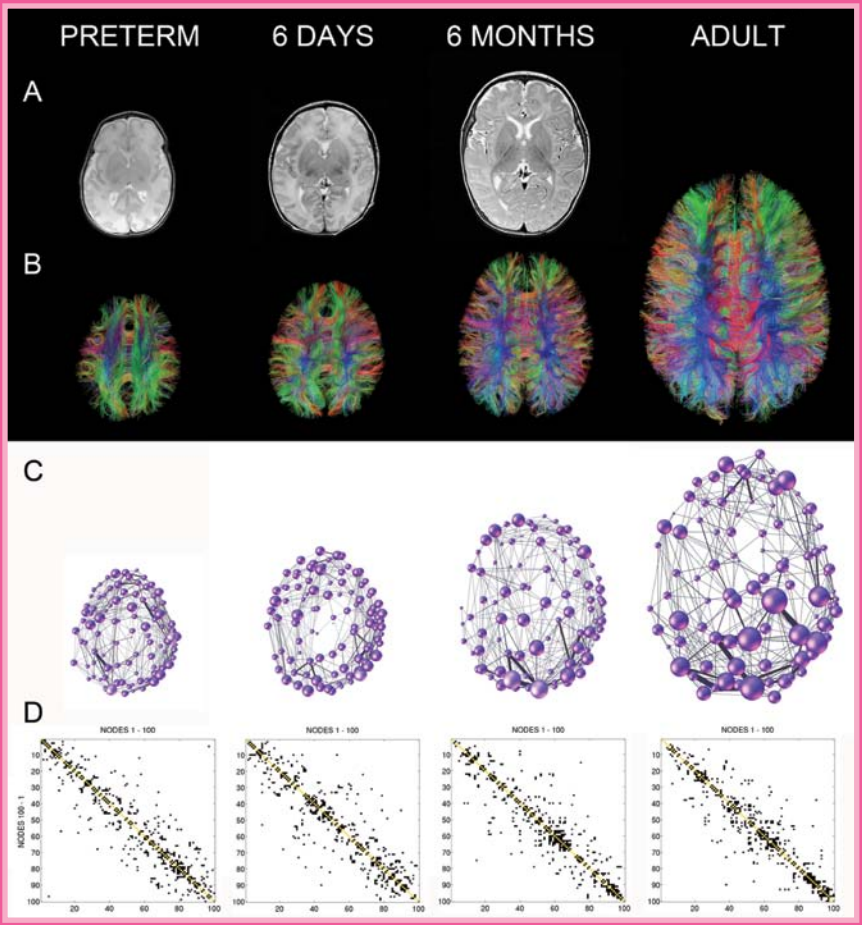


Figure 2 Maturation of the baby connectome: Examples of brain networks at 4 different ages. A) Anatomic MRI images (3T, T2-weighted fast spin-echo pulse sequence, echo train length 16, TR/TE=5000/120 ms, 512x512 matrix, in-plane resolution 0.4x0.4 mm2, slice thickness 3 mm, 2 averages). B) Tractograms reconstructed using DTI data (3T, spin-echo echo planar imaging diffusion sequence, 128x128 matrix, in-plane resolution 2x2 mm2, slice thickness 1.8–2 mm, 30 directions, b=600 s/mm2 for preterm babies and 700 s/mm2 otherwise). C) Brain networks represented as weighted graphs. D) Connectivity matrices, binarized with an adaptive threshold to preserve 5% of matrix elements and reordered to maximize the number of connections close to the main diagonal. Note: The 6 days and 6 months networks were mapped in the same baby longitudinally.

to describe the set of connections of an organism's neural system. Depending on the scale, one can speak about a microscopic or macroscopic connectome. The complete microscopic connectome at the level of the synapse is known only for the worm *C. elegans*' nervous system, which has as few as 302 neurons, and obviously cannot be mapped without destroying the tissue.

Recently, it became possible to study the macroscopic connectome non-invasively using MRI. This large-scale connectivity can be investigated using diffusion MRI (structural connectomes) or fMRI (functional connectomes). The structural connectome describes fiber pathways linking brain regions, whereas the functional connectome describes temporal correlations of brain activity.

In this article, we focus on the structural connectivity mapped with diffusion MRI. Diffusion tensor imaging (DTI) measures the anisotropy of water diffusion in the brain. The main anisotropy exists in the white matter as hydrophobic cell membranes, and myelin sheaths hinder water diffusion. Therefore, the main direction of the diffusion tensor reflects the underlying orientation of white matter tracts. We extract this information by performing computational fiber tractography (Figure 2B). The whole-brain tractogram obtained from DTI can be used to construct a network of cortico-cortical connections, usually expressed as a graph (Figure 2C) or connectivity matrix (Figure 2D). A graph is defined as a set of nodes (in our case, brain regions), connected by a set of edges (e.g., white matter tracts). Graph theory-based analysis can be applied to the connectivity matrices for the extraction of important network characteristics, such as node degree, characteristic path length, average clustering coefficient, and the like. Studying the human connectome using network science offers a unique opportunity to better understand

inter-individual differences in neural connectivity. While most studies examine the adult brain connectome, we are interested in studying the developing brain.

Framework for Constructing the Baby Connectome

In general, imaging newborns poses several unique technical challenges. For reliable structural connectivity network construction and characterization, we had to address the following two issues:

1. *Data quality assurance.* Data quality suffers from bulk motion, particularly in unsedated babies. To address this issue, we developed an automated rejection algorithm to identify and discard measurements distorted by motion and to correct the remaining data.

2. *Automated and unbiased definition of network nodes of the connectome.* We needed an automated, yet unbiased cortical parcellation scheme suitable for objective evaluation in the developing brain. In other words, how do we define the nodes of the network? As of yet, there is no single universally accepted parcellation scheme, even for the adult brain. In previous studies of the adult human brain, parcellation into nodes has been based on anatomic templates and landmarks or functional architecture. However, this approach is difficult to realize in the rapidly changing and relatively undeveloped newborn brain. In our project, we developed an unbiased, automated method for parcellating the brain surface based on equal-area sphere partitioning, an approach that is more flexible than atlas-based approaches and that suits the rapidly changing, developing brain. In addition, we developed a network-driven method for determining the optimal number of equal area nodes.

Once we have defined the nodes, we examine every pair of nodes (regardless of location) to determine whether fiber tracts are present that connect them. In this manner, we obtain the connectivity matrix, from which a lot of important network measures can be derived.

Correlating Network Properties with the Outcome

With our collaborators in Neurology and Pediatrics—Hannah C. Glass, MD, Sonia L. Bonifacio, MD, and Patrick S. McQuillen, MD—we are looking at the network properties in different clinical populations: prematurely born neonates, babies with hypoxic ischemic encephalopathy (HIE), and babies undergoing surgery for congenital heart defects. Our initial results for the HIE cohort at age six months indicated a correlation of certain global network properties, with the neurological outcome at that age expressed as the neuromotor score. Our long-term goal is to be able to predict which children will have developmental abnormalities at an older age by examining their brain networks shortly after birth. This knowledge will allow the application of appropriate therapies in a timely and targeted manner.

Maturation of Baby Brain Networks

Because the baby connectome approach is based on an automated, template-free parcellation scheme, it is suitable for mapping the human brain network at any stage of development. Our current study examines the maturational changes of the structural connectome in subjects of different ages, including premature neonates, term-born neonates, six-month-old infants, and adults. (See Figure 2 for the developmental trajectory of the structural brain network.)

Thus far, we have studied only global network properties, such as the network's integration, which tells us how efficiently two parts of the brain communicate. The template-free parcellation scheme does not allow for local properties of single nodes, such as the node degree, which can help pinpoint the important hubs of the network, to be compared directly. However, we are working toward the ambitious goal of finding a network-driven common space for the brain. Achieving this goal will enable us to fully characterize the maturation of baby brain networks and will increase our understanding of how brain structure and function develop.

We would like to acknowledge the nurses of the Newborn Brain Research Institute at UCSF for taking care of the newborns and assisting with scans, and Laurel Haeusslein and Veronica de Santiago for coordinating the study.

Olga Tymofiyeva, PhD, is a postdoctoral scholar in the Department of Radiology and Biomedical Imaging; Christopher P. Hess, MD, PhD, is an assistant professor in the Department of Radiology and Biomedical Imaging and Neuroradiology chief at the San Francisco VA Medical Center; Etay Ziv, MD, PhD, is a diagnostic radiology resident in the Department of Radiology and Biomedical Imaging; Donna M. Ferriero, MD, is the chair of the Department of Pediatrics; A. James Barkovich, MD, is chief of Pediatric Neuroradiology; and Duan Xu, PhD, is an assistant professor in the Department of Radiology and Biomedical Imaging.

Capital Equipment and Technology: Past Year Overview

Robert G. Gould, ScD

Construction to install new and replacement imaging equipment took place in nearly all of Radiology's locations over the last 12 months. We completed four major projects:

- Constructing three new ultrasound rooms on the third floor of the Ambulatory Care Center (ACC) at Parnassus
- Installing a new low-dose computed tomography (CT) scanner in the main department at Parnassus
- Installing a single-plane angiographic room for body interventional work at Mt Zion
- Installing a new research wide-bore 3T magnet at China Basin

Still underway is the installation of a new SPECT-CT camera in Long Hospital at Parnassus, a project nearly two years in the making.

Parnassus Area

The March 2012 completion of the ultrasound (US) project in the ACC brings the count of US exam rooms there to 5, an expansion by 1 room from the plaza level space formerly used for US outpatient imaging. The project included building a new and more spacious US reading room and created a better space for patients and faculty. We acquired 3 GE Logiq 9 ultrasound units to fill the exam rooms and replace aging US equipment.

Brett Elicker, MD, Cardiac and Pulmonary Imaging chief, and Jessica Pfannenstiel, BSRT, principal radiologic technologist, using the new CT scanner installed in Radiology in Long Hospital.

The main Radiology Department at Parnassus has a new GE 750 HD CT scanner, replacing an older 8-slice CT. This is the second such scanner in our system, the other being at Mt Zion. To facilitate image-guided interventions, the new scanner can be activated from within the scan room and images viewed on a ceiling-suspended display beside the gantry. This scanner has dual-energy capabilities and high-resolution imaging. It also uses GE's Veo system to perform a complex iterative reconstruction (IR) that can potentially reduce patient dose considerably more than simpler IR programs such as ASiR, which we now use on our other GE 64-slice CT scanners. The ASiR reconstruction allowed us to reduce dose by up to 40% compared to standard reconstructions, and we anticipate further dose reductions with Veo.

After two years of planning and permitting, the replacement of two nuclear gamma cameras in the main department started in August. This complex project will require more than 5 months of construction to install a SPECT-CT camera, the GE NM/CT 670, a multimodality device consisting of a dual-head gamma camera and a 16-slice CT. This will be the first installation of this gamma camera in a hospital in California. During construction, Parnassus is down to a single, fixed gamma camera and, while some nuclear imaging is being done with portable gamma cameras, the completion of this project will be a relief.

More work has been done on the PACS Data Center, located on the first floor of the Kalmanovitz Library, to decrease its vulnerability to environmental problems. The computer infrastructure located in this computer room produces a large amount of heat, sufficient to overheat the room within an hour. Last year we replaced the UPS and now a larger air conditioning system has been installed. Aside from the expense, the difficulty with this project was how to cool the room while the air conditioner was down.

Mt Zion Campus

Mt Zion was not spared construction during the past year. We remodeled the primary body interventional angiographic room and installed a Siemens Artis Zee ceiling-hung, single-plane unit to replace an image-intensifier-based system. Mt Zion now has state-of-the-art equipment in all imaging areas including angiography, CT, and magnetic resonance imaging.

China Basin

We recently installed a GE 75 wide-bore (70 cm), 3T magnet, filling the previously empty bay adjacent to the GE research 3T magnet (aka the long bore) on the first floor of the China Basin facility. This state-of-the-art system includes a multitransmit RF coil, multinuclear spectroscopy, and cardiac imaging capabilities. It will be used primarily for research by faculty of both UCSF and San Francisco General Hospital. The Insightec high-intensity, focused ultrasound unit (HIFU) will be moved from the adjacent long-bore MRI system, which has a 55 cm bore, to provide greater flexibility for HIFU procedures.

Projects Being Planned

The design drawings to replace the last of Radiology's <64-slice CT scanners, located in the Radiology Department in Long Hospital, are complete and have been submitted to the State of California for approval, likely a 9-month process. (If you're keeping count, we now have eight CT scanners, not counting PET-CT.) This CT project includes the replacement of an old neurointerventional biplane room, and will considerably alter the Radiology Department in Long Hospital, closing corridors, moving the neurointerventional reading room, and creating an improved patient workflow.

In addition, we are adding 2 radiographic rooms to our equipment in the Ortho Institute, bringing the total to 4 at this location, in addition to a 3T magnet.

Robert G. Gould, ScD, is professor of radiology in residence and vice-chair for Technology and Capital Projects. He oversees the purchase of the department's capital equipment.

Cha Becomes Residency Director

Soonmee Cha, MD, professor in residence, assumed the role of program director of the Diagnostic Radiology Program in July 2012. She takes the reins from Aliya Qayyum, MBBS, professor in residence in the Abdominal Imaging Section, who had served in this capacity since 2008.

"Dr. Cha has a strong background in clinical neuroradiology, research, and education at all levels," said department Chairman Ron Arenson, MD. "And I want to extend my deepest thanks to Dr. Aliya Qayyum for her outstanding leadership of the residency program. I am pleased she and Dr. Cha are working together to ensure a smooth transition."

Cha received her MD from Georgetown University in 1991 and completed an internship there in 1992. She completed her Radiology residency at the North Shore University Hospital at Cornell University in 1996. Afterwards, she joined the New York University School of Medicine and trained as a Neuroradiology Fellow from1996–1998. In 1998, she was appointed an assistant professor at NYU. She joined UCSF in February 2002 as an assistant professor in residence. Her promotion to associate professor in residence became effective in July 2005 and she was promoted to professor in residence in July 2011.

Two new assistant residency program directors will work with Cha: Thomas Urbania, MD, at San Francisco General Hospital and Stefanie Weinstein, MD, at the Veterans Affairs Medical Center. They will join David Avrin, MD, the associate program director at Parnassus.

"This team, with Terry Brosnan as program coordinator and Chris Hess. MD, leading the Resident Selection Committee will provide the excellent leadership needed to match our superb residency program," said Arenson.

Ring Returns as Chief of Radiology at Mt. Zion and ACC

In July 2012, Ernest Ring, MD, professor emeritus of Radiology, returned to the position of Chief of Radiology at UCSF Medical Center at Mt. Zion and the Ambulatory Care Clinic.

Over the 30-year span of his UCSF career, Ring has served in a variety of roles. He was chief of the Interventional Radiology section from 1982–1997. At Mt. Zion, he served as chief of the Radiology Service from 1993–1999, was chief medical officer from 1997–1999 and associate dean from 1997–2001. From 2001–2004, Ring was chief of Radiology at San Francisco General Hospital. He returned to become the UCSF chief medical officer from 2004–2008. Ring retired in 2008, returning on recall to work in the Interventional Radiology Section at San Francisco General Hospital and Parnassus.

"We all owe Dr. Ring our appreciation and gratitude for his continued service to our department and university," said department Chairman Ron Arenson, MD.

Montano de Jiménez now Manager of Radiology Postgraduate Education

In June 2012, Silvia Montano de Jiménez became the Manager for Radiology Postgraduate Education. She follows Mary Sheridan who retired in 2012 (see page 26).

Previously, Montano de Jiménez worked as a post-award analyst in the UCSF Department of Neurosurgery, where for the last two years she was responsible for post-award funds analysis and management. From 1992 to 2009, Montano de Jiménez served in various roles, including director with the Pew Programs in the UCSF Center for Health Professions. There, she was responsible for educational program development, contracting, staff development and management, and planned and organized educational conferences including international programs.

"We know Silvia's background will be extremely helpful as we continue to develop high quality, excellent education for radiologists across the country," said Cathy Garzio, administrative director for the Department of Radiology and Biomedical Imaging.

New Faculty

Spencer Behr, MD

Assistant Clinical Professor of Radiology

Abdominal Imaging and Nuclear Medicine

Spencer Behr received his medical degree from Tufts University School of Medicine in 2005, followed by a one-year medicine internship at Saint Vincent Hospital in Worcester, Mass. In 2010, he completed a four-year diagnostic radiology residency at the Lahey Clinic Medical Center, Burlington, Mass. Following his residency, Behr completed two one-year fellowships at UCSF; the first in Abdominal Imaging, followed by a fellowship in Nuclear Medicine. Behr joined the faculty of the Abdominal Imaging and Nuclear Medicine sections as an assistant clinical professor in July 2012.

UCSF DWM PHOTOGRAPHY

Jonathan W. Blevins, MD

Assistant Clinical Professor of Radiology

Musculoskeletal Imaging

In 2006, Jonathan W. Blevins completed his medical degree at Georgetown University, School of Medicine, in Washington, DC. He did a transitional medical internship in 2006–2007 at the University of Pittsburgh Medical Center in Pennsylvania, followed by a four-year diagnostic radiology residency at the same institution. Blevins completed a clinical fellowship in Musculoskeletal Radiology at UCSF in 2012. Areas of particular interest to Blevins include sports medicine and orthopedic imaging. In July 2012, he accepted the position of assistant clinical professor of Radiology.

Daniel L. Cooke, MD

Assistant Professor of Clinical Radiology

Neurointerventional Radiology

Daniel L. Cooke received his medical degree from Emory University in 2004, followed by a one-year General Surgery internship at the University of Hawaii, Honolulu. In 2009, he completed a four-year diagnostic radiology residency at the University of Washington, Seattle. While there, he received an ACR Reeder–Goldberg travel grant (2008) and the University of Washington Neuroradioiology Research Award (2009). Following his residency, Cooke completed a two-year Neurointerventional surgical fellowship at UCSF. He has been an author on multiple peer-reviewed publications covering diagnostic and treatment elements of neurovascular diseases. Cooke joined the UCSF Neurointerventional faculty as an assistant professor in July 2012.

Nidhi Azad Gupta, MD

Assistant Clinical Professor

Abdominal Imaging, VAMC

Nidhi Gupta completed her medical degree in 2006 at the University of Southern California, Keck School of Medicine in Los Angeles. She completed her internal medicine internship at the University of California, Irvine, followed by a four-year diagnostic radiology residency at Santa Clara Valley Medical Center in San Jose, Calif. Gupta did a one-year Abdominal Imaging fellowship at UCSF in 2011–12 at San Francisco General Hospital and the Veterans Affairs Medical Center. From July–September 2012 she was a Kaiser Permanente pool physician. Gupta accepted the position of assistant professor in Abdominal Imaging at the VAMC in October 2012.

Jung-Jiin (Jason) Hsu, PhD

Assistant Professor in Residence
Center for Imaging of Neurodegenerative Diseases, VAMC

Jason Hsu received his Masters of Science degree in Physics from National Taiwan University in 1991 and his PhD in Physics from the University of Pittsburgh, Penn., in 2002. Hsu was a postdoctoral fellow from 2002–2007, a research associate from 2007–2008, and a research assistant professor from 2009 until June 2012 at the Lucas Center for Imaging, Stanford University, Calif. His research interests include magnetic resonance physics, imaging instrumentation, and experiment design; quantitative and functional magnetic resonance imaging, discrete-time signal processing, and analysis of functional imaging data; and computational research and computerization. In September 2012, he accepted the position of assistant professor in residence at the Center for Imaging of Neurodegenerative Diseases at the San Francisco Veterans Affairs Medical Center.

Maureen P. Kohi, MD

Assistant Professor of Clinical Radiology
Interventional Radiology

Maureen P. Kohi became an assistant professor of Clinical Radiology in the Department of Radiology and Biomedical Imaging in July 2012. Kohi received her medical degree in 2005 from New York Medical College and completed her radiology residency at UCSF in 2010. While a resident, Kohi completed a research fellowship as a recipient of a NIH/NIBIB T32 Training Grant (2008–2009). Following her residency, Kohi completed a fellowship in Vascular and Interventional Radiology at UCSF (2010–2011), followed by a second fellowship in Women's Imaging (2011–2012). During her second fellowship, Kohi was an attending physician in the Vascular and Interventional Radiology section. She enjoys training fellows and mentoring residents. Her primary research interests include interventional oncology and women-directed interventions, particularly high-intensity focused ultrasound and varicose vein ablation.

UCSF DIMM PHOTOGRAPHY

K. Pallav Kolli, MD

Assistant Professor of Clinical Radiology
Interventional Radiology

In 2006, K. Pallav Kolli received his medical degree from Northwestern University, Feinberg School of Medicine in Chicago, Ill. He did a one-year transitional medicine internship at McGaw Medical Center of Northwestern University in Evanston, Ill., where he was named intern of the year, followed by a four-year diagnostic radiology residency at UCSF, which he completed in 2011. This was followed by a one-year fellowship in Interventional Radiology at UCSF. Kolli's areas of interest include magnetic-resonance guidance for interventional procedures, interventional oncology applications, and venous interventions. In July 2012, Kolli became an assistant professor of clinical radiology in the Interventional Radiology Section at UCSF.

UCSF DMM PHOTOGRAPHY

Peder E.Z. Larson, PhD

Assistant Professor in Residence
Surbeck Laboratory, Mission Bay

Peder Larson received both an MS (2003) and a PhD (2007) in Electrical Engineering from Stanford University in Palo Alto, Calif., where his research focused on medical imaging systems, signal and image processing, and magnetic-resonance imaging technology. From 2007–2011, Larson served as a postdoctoral scholar in the Margaret Hart Surbeck Laboratory at UCSF, where his research focused on the development of hyperpolarized carbon-13 MR spectroscopy and imaging methods, including novel RF pulse design and advanced reconstructions. In September 2011, Larson became an assistant professor in residence in the Surbeck Laboratory. Larson's work continues to focus primarily on hyperpolarized carbon-13 MR spectroscopy and the development of imaging methods for unique biological information and rapid imaging techniques. He also works on semi-solid (short T2) MRI methods in cortical bone and myelin.

UCSF DMM PHOTOGRAPHY

Jing Liu, PhD

Assistant Adjunct Professor
Cardiovascular Imaging RIG, China Basin

In 2003, Jing Liu received her MS in Electrical Engineering from McMaster University in Hamilton, Ontario, Canada. In 2007 she earned a PhD in Electrical Engineering from the University of Wisconsin-Madison. From 2008–2010, Liu served as a postdoctoral associate in the Department of Radiology at Weill Cornell Medical College, New York, New York. In December 2010, Liu accepted the position of assistant adjunct professor of Radiology in UCSF's Cardiovascular Imaging Research Interest Group. Her research focuses on developing magnetic-resonance imaging data-acquisition techniques and image reconstruction algorithms for 3D dynamic MRI imaging, including contrast-enhanced MRA, cardiac-cine imaging, and coronary imaging. She is interested in effectively identifying clinically important medical imaging issues and applying solutions directly to clinically relevant problems.

Peter (Buzz) Marcovici, MD

Assistant Professor of Clinical Radiology
Pediatric Radiology

In 2006, Buzz Marcovici received his medical degree from Columbia University's College of Physicians and Surgeons, New York, New York. He completed a transitional medicine internship at Legacy Hospitals in Portland, Ore. in 2007. This was followed by a four-year diagnostic radiology residency from 2007–2011 at University of California, San Diego. Marcovici completed a one-year fellowship in Pediatric Radiology at Harvard Medical School, Boston Children's Hospital, Mass. in 2012. In addition to Pediatric Radiology, Marcovici is interested in imaging informatics, quality assurance, and teaching. He joined the UCSF Pediatric Radiology section in October 2012 as an assistant professor of clinical radiology.

Andrew Phelps, MD

Assistant Professor of Clinical Radiology

Pediatric Radiology

Andrew Phelps received his medical degree in 2006 from the University of California, San Diego and completed his medical internship at Olive View Medical Center - University of California, Los Angeles in 2007. A four-year diagnostic radiology residency followed at UCSF, where Phelps served as a chief resident in 2010. He later completed a one-year clinical fellowship in Pediatric Radiology at Harvard Medical School, Boston Children's Hospital in Massachusetts. Phelps' interests are teaching, anatomy, and medical illustration. In July 2012, Phelps joined the Pediatric Radiology faculty as an assistant professor of clinical radiology.

UCSF DMM PHOTOGRAPHY

Andrew G. Taylor, MD, PhD

Assistant Professor of Clinical Radiology

Interventional Radiology

Andrew G. Taylor, received both his medical degree and PhD in biomedical engineering from the University of Pennsylvania in Philadelphia in 2006, followed by a one-year internship in internal medicine at the same institution. In 2011, he completed a four-year UCSF diagnostic radiology residency. In 2012, Taylor completed a fellowship in vascular and interventional radiology, also at UCSF. His areas of particular interest include interventional oncology, especially tumors of the liver and kidneys, venous interventions such as placement and management of IVC filters, and new methods of molecular imaging such as hyperpolarized carbon MRI. Taylor accepted the position of assistant professor of clinical radiology in July 2012.

UCSF DMM PHOTOGRAPHY

Silaja Yitta, MD

Assistant Clinical Professor, Radiology

Women's Imaging, Mt. Zion

Silaja Yitta received her medical degree from New York University Medical School in 2006, followed by a one-year preliminary medicine internship at Lenox Hill Hospital in New York. In 2011, Yitta completed a four-year diagnostic radiology residency at NYU Langone Medical Center. Following her residency, she completed a one-year fellowship in Breast Imaging and Ultrasound at UCSF. Yitta's areas of interest include breast, ultrasound, female pelvis, breast magnetic-resonance imaging, and medical education. Yitta joined the Women's Imaging Section at Mt. Zion Hospital as an assistant clinical professor in July 2012.

Honors and Awards

Ronald L. Arenson, MD

- Inaugural guest speaker, Stanford CME Radiology Grand Rounds: "The Future of Radiology with Health Reform," October 2011, Palo Alto, Calif.
- Seymour Ochsner Radiology Lectureship, "The Future of Radiology: Patient-Centric Care, Molecular Imaging or Integrated Diagnostics," Ochsner Health System, November 2011, New Orleans, La.

A. James Barkovich, MD

- Recipient, American Society of Neuroradiology Gold Medal Award for exceptional service and achievement in the field of Neuroradiology.

Miles Conrad, MD

- Recipient, San Francisco General Hospital, Robert Lull Non-Medicine Consultant of the Year Award

Brett Elicker, MD

- Promoted to Associate Professor of Clinical Radiology

Christine M. Glastonbury, MD

- Promoted to Professor of Clinical Radiology
- Recipient, Certificate of Merit, Education Exhibit, RSNA 2011
- Recipient, Silver Medal, Education Exhibit, Scientific Program of the American Roentgen Ray Society, 2012

A. James Barkovich, MD, (l) received the ASNR 2012 Gold Medal Award from ASNR President David Hackney, MD, (center), and Judy Donovan-Post (r) chair of the Gold Medal Committee.

Ernest Ring, MD, (r) presented Robert K. Kerlan, MD, (l) with the Outstanding Alumni award, while Ronald L. Arenson, MD, (c) offered congratulations.

Steven W. Hetts, MD

- Visiting Professor, Memorial Sloan-Kettering Cancer Center, New York, "Endovascular Interventional Neuroradiology: State of the Art and Opportunities for the Future"

Charles B. Higgins, MD

- Named American Heart Association Distinguished Scientist
- Named honorary member, Austrian Radiology Society

Robert K. Kerlan, Jr., MD

- Recipient, 2012 Radiology and Biomedical Imaging Outstanding Alumni Award
- Recipient, American Board of Radiology Distinguished Service Award

Kayvan Keshari, PhD

- Named Junior Fellow for excellence in research, International Society for Magnetic Resonance in Medicine

Thomas Lang, PhD

- Appointed an Associate Editor, *Journal of Bone and Mineral Research,* effective January 2013

Thomas M. Link, MD, PhD

- 2012 Head, Musculoskeletal Section, Scientific Editorial Board, *European Radiology*
- Elected Editor-in-Chief, *Current Radiology Reports*, Springer (to be launched in 2013)
- Editor's Recognition Award with distinction, *Radiology*

Pratik Mukherjee, MD, PhD
- Keynote Lecturer, "MR Connectomics," at the 11th International Symposium on Highfield MR in Clinical Applications Conference, September 2012, Bonn, Germany
- Appointed Chair of Neuroradiology and Head and Neck Imaging, RSNA Scientific Program Committee
- Appointed Chair of Neuro Education, International Society for Magnetic Resonance in Medicine Program Committee

David M. Naeger, MD
- Recipient, Excellence in Teaching Award, Haile T. Debas Academy of Medical Educators, UCSF

Sujal Nanavati, MD
- Promoted to Associate Clinical Professor

Srikantan Nagaranjan, PhD
- Recipient, Editors Choice award, *NeuroImage*

Sarah J. Nelson, PhD
- Recipient, 2012 Outstanding Faculty Mentorship Award, UCSF Graduate Students Association and Graduate Division Alumni Association
- Named "2012 Most Influential Woman," *San Francisco Business Times*

Karen M. Ordovás, MD
- Granted, Masters degree in Advanced Clinical Research, Department of Epidemiology and Biostatistics, UCSF, 2012

Aliya Qayyum, MBBS
- Chair, Association of University Radiologists/Radiology Research Alliance Task Force on "New Health Care Delivery Environment"

Sabrina M. Ronen PhD
- Promoted to Professor in Residence

David Saloner, PhD
- Elected to the American Institute for Medical and Biological Engineering College of Fellows, Class of 2012.

Youngho Seo, PhD
- Promoted to Associate Adjunct Professor

Rebecca Smith-Bindman, MD
- Invited Expert, Congressional Hearing: Appropriateness of Standards for Medical Imaging Technologists, US House of Representatives, Energy and Commerce Subcommittee, June 2012
- 2012 Scientific Paper of the Year Finalist, The Minnies
- 2012 Invited Participant, Institute of Medicine Report: *Breast Cancer and The Environment: A Life Course Approach*

Lynne S. Steinbach, MD
- Recipient, Outstanding Teaching Award, International Society for Magnetic Resonance in Medicine
- Carmen Lecturer, St Louis, Mo.
- Editor's Recognition Award with Distinction, *Radiology*
- Certificate of Distinction, *Skeletal Radiology*
- Distinguished Reviewer, *Journal of Magnetic Resonance Imaging*

Lori M. Strachowski, MD
- Recipient, 2012 Radiology and Biomedical Imaging Hideyo Minagi Outstanding Teacher Award

Henry F. VanBrocklin, PhD
- Named Editor-in-Chief, *Molecular Imaging*

Emily M. Webb, MD
- Promoted to Associate Professor of Clinical Radiology

Stefanie Weinstein, MD
- Recipient, Best Poster Award, Society of Gastrointestinal Radiologists, 2012

Antonio C. Westphalen, MD
- Promoted to Associate Professor in Residence
- Editor's recognition for outstanding reviewer service, *Annals of Internal Medicine.*

Judy Yee, MD
- Recipient, Best Poster Award, Society of Gastrointestinal Radiologists, 2012

Xiaoliang Zhang, PhD
- Recipient, National Natural Science Foundation of China Overseas Award for outstanding research

Nelson Recognized for Teaching and Leadership

Sarah J. Nelson, PhD

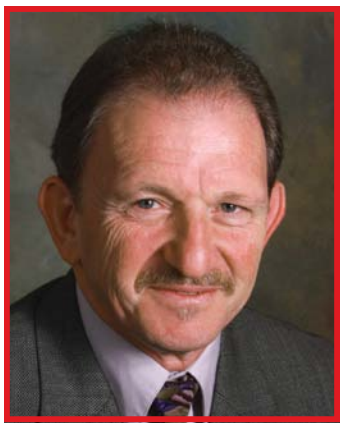
Professor Sarah J. Nelson, PhD, director of the Surbeck Laboratory and co-chair of the Department of Bioengineering and Therapeutic Sciences, received two notable honors in 2012. The UCSF Graduate Students Association and Graduate Division Alumni Association honored her with its 2012 Outstanding Faculty Mentorship Award in May. Nelson also was named a "2012 Most Influential Woman" by the *San Francisco Business Times*.

The Outstanding Faculty Mentorship award recognizes UCSF faculty members "who consistently provide exceptional support, both professional and personally." Graduate students in the Basic Sciences, Nursing, Social & Behavioral Sciences or Physical Therapy, along with other students and postdoctoral fellows nominate candidates for the award.

Nelson's nominators praised her "strong work ethic, successful research career, practicality, and logic, editorial skills, kindness, and diplomacy," and noted her ability to reach "across the traditional boundaries to make sure her work is clinically relevant."

The *San Francisco Business Times* acknowledgement is given annually to women in leadership in the Bay Area who make a difference in their industries and communities across the Bay Area.

Saloner Elected to AIMBE



David Saloner, PhD

David Saloner, PhD, professor in residence and director of the Vascular Imaging Research Center at the VAMC and the Cardiovascular Imaging Research Interest Group in the Department of Radiology and Biomedical Imaging was inducted to the American Institute for Medical and Biological Engineering (AIMBE) College of Fellows, Class of 2012, in Washington, DC in February 2012.

Working in collaboration with colleagues from multiple disciplines across UCSF sites, Saloner has received long-term support from the National Institutes of Health and other agencies to pursue multi-modality imaging in the evaluation of atherosclerosis and aneurysmal disease. A major theme of his research is the links between underlying biomechanical and biochemical factors, principally hemodynamic forces, and disease progression as monitored by non-invasive longitudinal imaging.

Comprised of the top two percent of medical and biological engineers in the country, the AIMBE advocates for the value of medical and biological engineering to society. Since 1991, its College of Fellows has led the way for technological growth and advancement in the fields of medical and biological engineering.

AHA Names Higgins "Distinguished Scientist"

Charles B. Higgins, MD

Charles B. Higgins, MD, professor emeritus of Radiology and Biomedical Imaging, received the American Heart Association's highest honor, Distinguished Scientist, at its 2012 Scientific Sessions meeting. He joined a group of 70 "eminent scientists and researchers whose significant, original and sustained scientific contributions have advanced the association's mission" and was honored as "a world-renowned leader in cardiac imaging … widely viewed as one of the founding fathers and current leaders of cardiac MRI."

At UCSF, his clinical and laboratory research focused on cardiovascular applications for magnetic-resonance imaging. Higgins was one of the first to recognize the uptake of gadolinium-based MRI contrast agents into infracted myocardial tissue (2001) and to suggest its diagnostic benefit. He was an early researcher of flow quantification techniques, applying them to assess the extent of shunt in patients with atrial and septal ventricular defects (1987), and of valvular regurgitation (1988). He also is likely to have been the first researcher to suggest that CT images could be acquired and made into a cine to assess myocardial function (1996).

Garzio Honored for Excellence in Administration

Cathy Garzio

On October 2, 2012, Cathy Garzio, administrative director of the Department of Radiology and Biomedical Imaging, accepted the Association of Administrators in Academic Radiology's (AAARAD) 2012 award for Excellence in Leadership in the field of radiology administration.

"Cathy is not reluctant to make sound business decisions, yet what really sets her apart is her leadership and her ability to implement decisions with integrity, fairness, and kindness," said department Chair Ron Arenson, MD. "We recently co-authored the book, *A Practical Guide to Leadership and Management in Academic Radiology.* Cathy's input, based on her knowledge and experience in all areas of departmental administration, was vital. We all should be pleased to see her recognized this way."

Garzio has been in her current role since 2002. She is responsible for all financial and operational activities, including the administration of an $80-million annual budget. Accomplishments under her leadership include improved physician productivity benchmarking, business planning and performance monitoring for clinical equipment, and development of joint venture business and marketing plans. She was key point person in multi-million dollar construction and equipment projects for the Medical Center and Radiology's China Basin site.

Garzio's sphere of influence extends well beyond Radiology. She took on administrative director responsibilities for Otolaryngology-Head and Neck Surgery on an interim basis, and recently was asked by the Dean to continue in that department on a permanent basis—in addition to her position in Radiology.

Coakley to Chair OHSU Radiology Department

This summer, Fergus V. Coakley, MD, former chief of the Abdominal Imaging Section and vice-chair of Clinical Services left UCSF to become the Chair of the Department of Diagnostic Radiology at Oregon Health Sciences University School of Medicine, in Portland. "OHSU's gain is our great loss, but I know Fergus will be a tremendous chair and will make a huge difference at OHSU," said department Chair Ronald Arenson, MD, in announcing the move.

Arenson noted that Coakley "has built this section into one of the finest clinical and research body imaging divisions in the country" and that "his advice, suggestions and ideas have made this a stronger department." In 2005, Coakley obtained a T32 Training Grant from the National Institutes of Health, which has allowed more than 20 talented residents to experience the excitement of research.

Coakley also competed for and received a high-end instrumentation grant from the NIH, which allowed the department to purchase an MR-guided focused ultrasound system for the China Basin campus in July 2010. This MRgFUS program continues under the leadership of Thomas Link, MD, PhD, professor in residence and chief of the Musculoskeletal Section, and Sharmila Majumdar, PhD, professor in residence and vice-chair, Research.

Coakley received his medical degree in 1988 from the Faculty of Medicine, University College, Cork, Ireland. He was a Fellow in Body Imaging at Memorial Sloan-Kettering Cancer Center from 1996–1997 before joining the Abdominal Imaging Section in the Department of Radiology and Biomedical Imaging at UCSF. He returned briefly to Memorial Sloan-Kettering Cancer Center and Weill Medical College of Cornell University in New York as an assistant professor of Radiology from May 2000 through June 2001. Coakley returned to UCSF in June 2001 as chief of Abdominal Imaging and associate professor of Radiology.

Fergus V. Coakley, MD

He became a professor in residence and vice-chair of Clinical Affairs in 2007.

"He is respected, well liked, and collegial," said Arenson. "I am very sorry to lose him, but know that he has an outstanding future ahead. We have gained a new competitor, because I am certain that with Fergus Coakley running the department at OHSU, it will not be long before we see it emerging as a strong player within academic radiology circles."

Retired in 2012

Peter W. Callen, MD

Peter W. Callen, MD, arrived at UCSF in 1969 as a first-year medical student. In June 2012, he retired as a professor in residence. "We all have benefited from Dr. Callen's dedication to UCSF and the Department of Radiology and Biomedical Imaging, and while we wish him well in his retirement, we also appreciate his willingness to return to the department with a part-time recall appointment," said department Chairman Ronald L. Arenson, MD.

Callen received his medical degree in 1973 from the UCSF School of Medicine, followed by a one-year medicine internship. As a second-year UCSF diagnostic radiology resident, Callen studied Body Computed Tomography in Manchester, England at a time when there were just a handful of scanners in the world. He served as chief resident in 1976 and completed his residency in 1977. He joined the department's faculty as assistant professor in residence, rising to associate professor in residence in 1981 and professor in residence in 1986. Beginning in 1981, Callen held a concurrent appointment in the Department of Obstetrics, Gynecology and Reproductive Sciences as a professor in residence.

During his tenure, Callen served on the UCSF Medical School Admissions Committee and numerous departmental committees. He has published more than 200 peer-reviewed articles and is a sought-after lecturer in teaching and continuing medical education. He is well known for his textbook, *Ultrasonography in Obstetrics and Gynecology,* now in its fifth edition and considered the most widely used book on obstetrical ultrasound in the world. Callen has received numerous teaching awards and in 2011 was honored with the UCSF Radiology and Biomedical Imaging Outstanding Alumnus Award.

When asked about retirement plans, Callen indicated he is "auditing classes in Constitutional and Criminal Law at UC Hastings Law School" and spending his free time "with my family, playing golf, and eating an occasional hot dog."

Roy L. Gordon, MD

In June 2012, Dr. Roy Gordon retired after more than 20 years of service to the UCSF Department of Radiology and Biomedical Imaging. Announcing Gordon's retirement, department Chairman Ron Arenson, MD, praised Gordon's "consummate professionalism and commitment to providing the highest standard of patient care," through his leadership as associate chair for Safety and former chief of Interventional Radiology.

Gordon completed his medical degree at Oxford University, England and his radiology residency at Hadassah University Hospital, Jerusalem, Israel and the Hospital of the University of Pennsylvania, Philadelphia. He continued at the Hospital of the University of Pennsylvania with a one-year fellowship in Angiography and Interventional Radiology. From 1979–1987, Gordon returned to Hebrew University to serve as chief of Interventional Radiology. He joined the UCSF faculty in 1989, after two years as a visiting professor. In 1997, Gordon became chief of Interventional Radiology at UCSF, a position he held until 2006 when he was named associate chair for Safety.

"Dr. Gordon has been a cornerstone of the department providing expertise in the full gamut of interventional radiology procedures. He developed the very successful uterine fibroid embolization program at UCSF and is a recognized, global expert in interventional biliary radiology," said Robert Kerlan, Jr., MD, chief of Interventional Radiology. "We will greatly miss Dr. Gordon and are fortunate that he will provide continuing service on a call-back basis."

Eileen O'Sullivan

Eileen O'Sullivan, academic personnel director for the Department of Radiology and Biomedical Imaging, who retired in June 2012, did far more than ensure faculty members' paychecks were accurate and on time. According to Administrative Director Cathy Garzio, "Eileen elevated the Academic Personnel role in our department and on our campus in a way that is recognized, admired, and appreciated by many faculty and co-workers across UCSF."

O'Sullivan joined UCSF in 1981 and transferred into Radiology two years later. For several years she provided administrative support in the Chairman's office, helping to prepare grants and coordinate the fellowship program. At the same time, she completed her bachelor's and master's degrees in Clinical Psychology at San Francisco State. In 1994, she took on the position of analyst for department Chair Ron Arenson, MD. In 2003, O'Sullivan was promoted to academic personnel manager, a role she dove into. Over the years, she put into effect processes and systems for a streamlined Radiology Human Resources office.

O'Sullivan had excellent relationships with the research administration and finance teams, and truly understood the connection between faculty funding and excellent post-award grant management. Her attention to detail, polished organization skills, and commitment to doing things right were essential to ensuring faculty members were appointed, re-appointed, and promoted in a timely and correct manner. She handled every flavor of academic HR situation: visas, extensions, changes in series, recruitment, and confidential and public record requests.

"Eileen was a wonderful partner to both me and Dr. Susan Wall on academic affairs, and kept our Merit and Promotions Committee running smoothly and consistently for a decade, She also excelled at developing and promoting her own staff," said Arenson.

Susan Wall, MD, professor emeritus and vice-chair for Academic Affairs noted that, "It is because of Eileen's incredible work ethic, knowledge, and skill that the academic advancements of our faculty have progressed on time. We will miss her tremendously, but wish her the very best in this well-deserved retirement."

Mary Sheridan

Mary Sheridan, manager of Radiology Postgraduate Education (PGE), retired in June after 5 years in that position and more than 12 years at UCSF.

Under Sheridan's leadership, PGE solidified its reputation for offering quality programs. According to Lynne Steinbach, MD, chair of the Radiology Postgraduate Education Committee, "Mary's know-how, leadership, and dedication propelled our courses to new heights."

It is equally important to note that, according to Administrative Director Cathy Garzio, every course PGE offered in 2011/12 was profitable. "Even during the recession, Mary and her team delivered a high-quality product, while minimizing financial risk. Given the importance of these programs to our clinical sections, this is an incredible accomplishment."

Sheridan's UCSF career started in the School of Dentistry in 2000, where she administered postgraduate dental education programs. She joined the Department of Radiology and Biomedical Imaging as manager of the Division of Postgraduate Education in 2007. Sheridan's skills in contract negotiations, marketing, and her attention to detail were instrumental to planning more than 30 individual continuing medical education courses annually in locations ranging from San Francisco to Bermuda.

When asked about her future plans, Sheridan said she intends to travel "without having to oversee a course wherever I am," spend time with family and friends, return to volunteer activities, and "finally read all the books stacked up on my night table and on my Kindle."

"Any radiologist who has taken one of our courses knows what Mary contributed to our department's reputation for academic excellence," said Chairman Ron Arenson, MD. "I am pleased that she has agreed to return to us on recall for special projects as needed."

Mary Sheridan (l) with Lynne Steinbach, MD, (r) chair of the Postgraduate Education Committee at Sheridan's retirement celebration.

In Memoriam: Frederick R. Margolin, MD, FACR

Hideyo Minagi, MD

It is wrong and foolish to mourn the men who died. Rather we should thank God that such men lived.

—Gen. George S. Patton

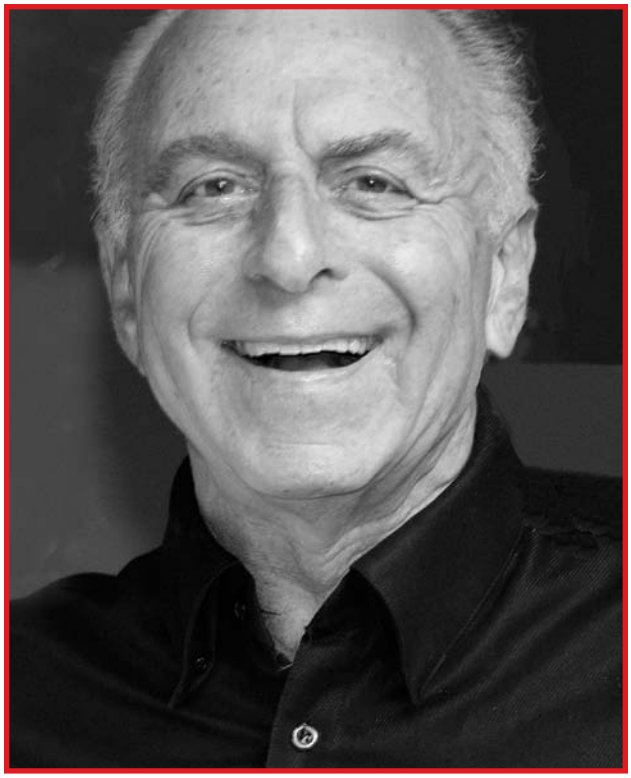
My dear friend Frederick R. Margolin, MD, FACR, passed away on May 10, 2012, at age 76. Fred died after he and Myrna, his wife of 54 years, had together waged a long and courageous battle with amyotrophic lateral sclerosis.

After graduating from the University of Miami Medical School in 1960, Fred interned at Los Angeles County Hospital and served two years as an Air Force medical officer in Germany. He completed his diagnostic radiology residency at UCSF in 1967, and was a UCSF faculty member at San Francisco General Hospital before entering private practice at Children's Hospital, now California Pacific Medical Center (CPMC), in 1968. There, he became Chairman of Radiology in 1978, and served in that capacity until 1992. Fred was the first to envision the Breast Health Center at CPMC and worked tirelessly to see it come to fruition in 1984, when he became its first Medical Director. Under his leadership, the Breast Health Center grew into national prominence as a leader in the battle against breast cancer. Even after his retirement in 2007, he continued to contribute to that unending battle.

Fred's relationship with the Department of Radiology and Biomedical Imaging endured over the years, including many years of teaching UCSF radiology residents on rotation at CPMC and medical students in the Goldberg Center (Radiology Learning Center).

Few people recall that, prior to dedicating his efforts to breast imaging, Fred was a superb general radiologist, perhaps the best I've ever seen.

Our cherished memories of Fred will always include his towering intellect and outrageous sense of humor, and his dedication to, and love of, his family. During his final months and days, all who knew them were in absolute awe of Fred and Myrna's resolute demeanor, their refusal to give up, their capacity for enjoying whatever life remained for Fred, and their capacity for sharing the gift of laughter, even until the very end.



Let us not mourn Fred's departure from us so much as we instead thank God that he lived and that we were blessed for having known him.

In addition to Myrna, Fred is survived by his children: Jody Margolin Hahn (husband, Miles Hahn), Elizabeth Brett Garon (husband, Joseph Garon), Lawrence Harry Margolin (wife, Michelle Boucher), and seven grandchildren.

Those who wish to remember Dr. Frederick Margolin with a charitable gift may send a donation to the CPMC Foundation at 2015 Steiner Street, San Francisco, CA 94115. Checks should be payable to CPMC Foundation and reference "The Breast Health Center in honor of Dr. Frederick Margolin." For questions, please contact Ms. Barbara Lowe, CPMC Foundation, at 415-600-2769 or loweb@sutterhealth.org.

In Memoriam: Richard A. Sollitto, MD

Ronald L. Arenson, MD

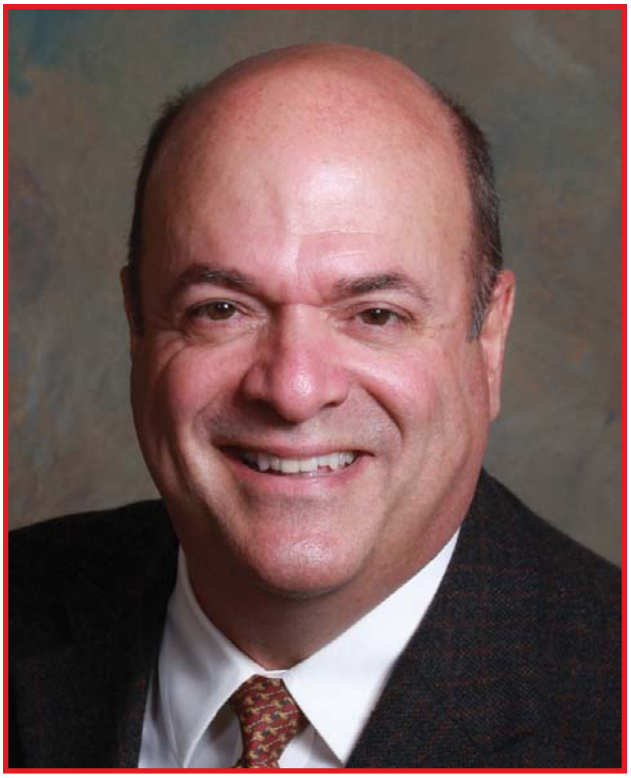
Just two weeks after his retirement from UCSF, our friend and colleague, Richard A. Sollitto, MD, associate chair for Radiology-Mount Zion, passed away at home on November 26, 2011 after an illness of several months.

Even in the last weeks of his illness, Richard was charming, gracious, and kind. My admiration of his dignity and courage in the face of a devastating illness grew each time I spoke with him.

Richard Sollitto, MD, received his medical degree from the University of Pennsylvania in 1978. He was an intern in medicine at the Thomas Jefferson University Hospital from 1978–1979, and joined UCSF in 1979 as a diagnostic radiology resident. Following his residency, he completed a one-year Nuclear Medicine Residency in 1983 and joined our faculty as an assistant clinical professor that same year. He was promoted to associate clinical professor in 1989 and to clinical professor in 1995.

Starting in 2003, Richard served as the Section Chief of the Radiology services at the Ambulatory Care Clinics and Mt. Zion Medical Center. In this role, he enhanced service to the Emergency Department and ambulatory care physicians, always emphasizing excellent service and fast turnaround. He was instrumental in expanding the clinical and research services in Women's Imaging at Mt. Zion and advocated for quality patient care at both sites. He was appointed associate chair for the department in 2007. In this capacity, Richard organized and oversaw special projects, particularly those on the Mt. Zion campus.

Dedicated to resident education, Richard served on the Margulis Society Board of Directors from 1993–2007, including 8 years as president from 1999–2007. He participated in numerous fundraising and membership drives and was a member of the Margulis Society's Resident Research Review Committee. He also served as a member of the Radiology Resident Selection Committee since 1985. For many years, he chaired or was closely involved in the Margulis Society Gala. His leadership, grace, and extraordinary taste made the Gala a truly special event, filled with style and class, enjoyed by so many of us over the years.



Richard was a great doctor and a true gentleman, who brought to his work a strong ethic of physician and patient service. He was naturally happy, had a positive attitude, and focused on solving problems quickly and proactively. He did not dwell in the past, but embraced change in the department, at Mt. Zion, and at UCSF. Along with many of you, I will miss his advice and friendship. So many of us enjoyed talking with him about music, theater, dogs, medicine, travel, and real estate. We will miss those conversations, his smile, and his old-world demeanor.

He is survived by two brothers and a sister, five nieces, two nephews, and his mother, as well as his beloved dogs, and a legion of friends and colleagues across the country.

Donations in memory of Richard Sollitto, MD, may be made to the Margulis Society, c/o UCSF Foundation, Box 45339, San Francisco, California 94145-0339. For further details please contact Katie Murphy at katherine.murphy@ucsf.edu.

Diagnostic Radiology Residency Program 2012

Soonmee Cha, MD
Residency Program Director

My predecessor, Aliya Qayyum, MBBS, stepped down in June 2012 on a high note. During her four years of leadership, the residency program was re-accredited for five years following a successful ACGME site visit and review in 2009. The number of residents increased and we have approval to grow to a total of 56. She guided the development of a resident educator track, mini-fellowships in Ultrasound and Women's Imaging, one-on-one evaluations at mid-rotation, and an-end-of-rotation exam. She introduced on-line resident conference attendance and evaluations, sectional journal clubs, interdisciplinary conferences, and the transition to a night-float call system. The audience response system was introduced under her watch as was the short evening call shift system, designed to reduce the intensity of the call experience. Residents, faculty, and administrative staff thank her for all she has done to steward and sustain the program as one of the top radiology residencies in the country.

As I write this article, six weeks into becoming the new program director, I am convinced I have found my calling. I have always been interested in resident education and training, now I have an official title to go along with my passion for educating, nurturing, and inspiring the future leaders of radiology. I have met with all residents. They all have unique and interesting backgrounds, aspirations, and personalities, but all share a genuine warmth, intelligence, and decency. They have embraced their rookie program director with open arms. I am incredibly lucky to take on this new role supported by three outstanding chief residents, S. Jarrett Wrenn, MD, PhD, Kevin Koo, MD, and Victor Sai, MD, who take their job with utmost responsibility, joy, and conviction. David Avrin, MD, PhD, associate program director, will continue to be the backbone of the program's behind-the-scene and data-driven operations. New to the program are two assistant program/site directors: Stefanie Weinstein, MD, at the Veterans Affairs Medical Center and Thomas Urbania, MD, at San Francisco General Hospital, who have already had positive impacts on the resident education and training at each site. Christopher Hess will spearhead our residency recruitment process. This team will advocate for and support our residents' daily endeavors and nurture their potential.

(l–r) Victor Sai, MD, Kevin Koo, MD, and S. Jarrett Wrenn, MD, PhD.

In terms of resident accomplishment, this past year was yet another year of spectacular results. Our residents continue to pursue academic and research excellence while taking on the daily responsibilities of clinical rotations, and each appreciates the opportunity and support our program offers.

This academic year will bring an important change. Oral board examination as we know it will end in June 2013, to be replaced with a computer-based CORE examination in October. The new exam will cover 15 radiology disciplines, including physics. We are preparing for the change by involving residents and faculty with specific assignments based on the CORE guidelines. We hope to turn this process into a systematic and joyful learning exercise.

I look forward to working with our new team of directors and our superb residents, faculty, and administrative staff to make sure our radiology residency program remains one of the best in the world.

Resident Accomplishments 2011–2012

Awards

Thomas A. Hope, MD: RSNA Roentgen Resident/Fellow Research Award, 2012; co-recipient, Margulis Society Research Award, 2012

Nazia Jafri, MD: Elmer Ng Award, presented to outstanding resident, 2012

Aaron Miracle, MD: SFGH Julius R. Krevans Award presented to outstanding first-year resident for excellence in patient care

Jay Starkey, MD: Magna Cum Laude Award, Diffusion-weighted MR Imaging of CNS Fungal Infections: Histopathologic Correlation, Differential Diagnosis, and Imaging Pitfalls. Starkey LJ, Moritani T. RSNA Annual Meeting, 2011

Jason Talbott, MD, PhD: Co-recipient, Margulis Society Research Award, 2012

Service

Marjan Bolouri, MD: Resident Representative, UCSF Graduate Medical Education Committee

Marcel Brus-Ramer, MD, PhD: President-elect, Residents and Fellows Section, California Radiological Society

Ingrid M. Burger, MD, PhD: Resident Representative, The Margulis Society

Stephanie Hou, MD: Resident Representative, Radiation Oversight Committee; Resident Representative, UCSF Graduate Medical Education Committee; Member, UCSF Fellow and Resident Advisory Group for APeX

Nazia Jafri, MD: Member, News Editorial Board, RSNA

Kevin Koo, MD: Chief Resident, 2012; vice president, American Alliance of Academic Chief Residents in Radiology

Anand Patel, MD: President, Residents and Fellow Section, California Radiology Society; Resident Representative, The Margulis Society

Sara Plett, MD: Resident Representative, The Margulis Society

Victor Sai, MD: Chief Resident, 2012; president, American Alliance of Academic Chief Residents in Radiology; Resident Representative, The Margulis Society

Jay Starkey, MD: Member, Education Committee, American Society of Neuroradiology

S. Jarrett Wrenn, MD, PhD: Chief Resident, 2012

David Avrin, MD, PhD, Nazia Jafri, MD, the 2012 Elmer Ng Award recipient, and and Kevin Koo, MD

Presentations and Posters

Vishal K. Agarwal, MD: Consent: Using Tablet Devices to Bridge the Information Gap between Patient and Provider in Interventional Radiology. Agarwal V, Sinha T, Durack J. RSNA Annual Meeting 2011

Marjan Bolouri, MD: MRI to FDG-PET Correlation in Invasive Breast Cancer: Differences Among Triple Negative Subtypes. Accepted, RSNA Annual Meeting 2012

Matthew Bucknor, MD: Extraspinal Sciatica in the Setting of Proximal Hamstring Injury - An Under-diagnosed Clinical Syndrome. Bucknor M, Steinbach LS, Chin CT. RSNA Annual Meeting 2011; Musculoskeletal Radiology Case of the Day. Bucknor M, Sandman D. Electronic Poster Presentation. RSNA Annual Meeting 2011

Renu Chundru, MD: Imaging Characteristics and Differential Diagnosis of Radiation-induced Tumors of the Brain, Neck, and Spine. Chundru, R, Glastonbury, CM, RSNA Annual Meeting 2011

Stephanie Hou, MD: Impact of Importing Outside Hospital Imaging on Care for Patients Transferred for Neurointerventional Treatment of Acute Ischemic Stroke: A Preliminary Evaluation. Hou SW, Hetts SW, Avrin D, Urbania T. Accepted, RSNA Annual Meeting 2012

Alexander Keedy, MD: Determinants of Second-Order Bile Duct Visualization at CT Cholangiography in Potential Living Liver Donors. Keedy AW, Breiman RS, Webb, EM, Roberts JP, Coakley FV, Yeh BM. Presentation, SGR Annual Meeting 2012; MR Evaluation of Tetralogy of Fallot Patients after Surgical Repair: Relationship between Aortic Dilation and Aortic Regurgitation. Keedy AW, Naeger DM, Hope MD, Ordovas KG. Presentation, SCMR Annual Meeting 2012

Parham Moftkhar, MD: Preliminary Study: Degree of Clot Enhancement on Admission CT Predicts Revascularization Efficacy in Acute Ischemic Stroke. Moftakhar P. English JD, Dowd CF, Higashida RT,Halbach V, Hetts SW. Oral Presentation, International Stroke Conference, 2012; Degree of Clot Enhancement on Admission CT Predicts Revascularization Efficacy in Acute Ischemic Stroke: An Investigation of 90 Patients. Moftakhar P. English JD, Dowd CF, Higashida RT, Halbach V, Hetts SW. Oral Presentation, American Society of Neuroradiology, 2012

John Mongan, MD, PhD: Trauma Imaging with Color Contrast for Color CT: *In vivo* Use of Complementary Contrast Materials at Dual-energy Computed Tomography. J Mongan, MD, PhD, San Francisco, CA; S Rathnayake; Y Fu, PhD; M C Cabarrus, BS; B M Yeh, MD, oral presentation, RSNA Annual Meeting, 2012; Improving Efficiency of Pulmonary Embolism Testing in Young Female Patients. J Mongan, J A Kline, R Smith-Bindman, oral presentation Alternate/Poster Presentation, RSNA Annual Meeting, 2012

Michael Ohligher, MD, PhD: Basic Principles of Hyperpolarized Carbon-13 MRI, Ohliger, M, Vigneron, DB, Wilson, DM, Wang, Z, Coakley, FV, Qayyum, A, Nelson, SJ, Kurhanewicz, J, RSNA Annual Meeting, 2011

Anand Patel, MD: The RSNA Image Share Network: Initial 7 Month Results from a Pilot Site. Patel AS, Tellis WM, Avrin DE, Arenson RL. RSNA Annual Meeting, 2012; Intravenous Chemotherapy Filter: A Novel Device for High Dose Intra-arterial Chemotherapy Delivery. Patel AS, Hetts S. 4th Annual UCSF/Caltech Innovation Symposium 2012; Atypical MRI Features in Soft Tissue Arteriovenous Malformation. Patel AS, Dowd C, Hoffman W, Frieden I, Hess CP. ISSVA Conference 2012, Sweden; Spinal Arteriovenous Metameric Syndrome with Coagulopathy. Patel AS, Hess CP, Frieden IP, Dowd C. Society of Pediatric Interventional Radiology Meeting, 2011

Victor Sai, MD: Molecular Correlates to *in vivo* Hyperpolarized [1-^{13}C] Dehydroascorbate Reduction. Victor Sai, Kayvan R. Keshari, Romelyn Delos Santos, John Kurhanewicz, David M. Wilson. ISMRM 2012, Australia

S. Jarrett Wrenn, MD, PhD: Increased Growth with Eccentricity: 4D Flow Evaluation of Valve-Related Aortic Disease. Wrenn SJ, Sigovan M, Hope MD. ISMRM 2012, Australia; Imaging Biomarkers of Aortic Disease: Increased Growth Rates with Eccentric Systolic Flow. Wrenn SJ, Sigovan M, Dyverfeldt P, Hope MD. RSNA Annual Meeting, 2012

Publications

Ramon F. Barajas, Jr, MD: Regional Variation in Histopathologic Features of Tumor Specimens from Treatment-Naive Glioblastoma Correlates with Anatomic and Physiologic MR Imaging. Barajas RF Jr, Phillips JJ, Parvataneni R, Molinaro A, Essock-Burns E, Bourne G, Parsa AT, Aghi MK, McDermott MW, Berger MS, Cha S, Chang SM, Nelson SJ. *Neuro Oncol.* 2012 Jul;14(7):942-54; Intracranial Subdural Osteoma: A Rare Benign Tumor that can be Differentiated from Other Calcified Intracranial Lesions Utilizing MR Imaging. Barajas RF Jr, Perry A, Sughrue M, Aghi M, Cha S. *J Neuroradiol.* 2011 Dec 23. [Epub]; Super-Resolution Track Density Imaging of Glioblastoma: Histopathologic Correlation. Barajas RF Jr, Hess C, Phillips J, Von Morze C, Yu JP, Chang S, Nelson S, McDermott M, Berger M, Cha S. *AJNR*, Publication Pending

Ingrid M. Burger, MD, PhD: Value of "Minimum Menstrual Age" in Determining Early Pregnancy Failure. Burger IM, Filly RA. *J Ultrasound Med*. 2011 Nov;30(11):1553-9

Thomas A. Hope, MD: Gadolinium Accumulation and Fibrosis in the Liver after Administration of Gadoxetate Disodium in a Rat Model of Active Hepatic Fibrosis. Hope TA, Doherty A, Fu Y, Aslam R, Qayyum A, Brasch RC. *Radiology*. 2012 Aug;264(2):423-7; Improved Risk Assessment for Abdominal Aortic Aneurysm Rupture: Off-the-Wall Imaging. Hope TA, Hope MD. *J Am Coll Cardiol*. 2011 Dec 6;58(24):2531-2.

Stephanie Hou, MD: Enterprise Imaging: Planning and Business Justification. Avrin D, Hou SW. *Acad Radiol.* 2012 Feb;19(2):214-20

Alexander Keedy, MD: Contrast Delay on Perfusion CT as a Predictor of New, Incident Infarct: A Retrospective Cohort Study. Keedy AW, Fischette WS, Soares BP, Arora S, Lau BC, Magge R, Bredno J, Cheng S, Wintermark M. *Stroke* 2012; 43:1295-1301; A Pictorial Essay of Brain Perfusion-CT: Not Every Abnormality is a Stroke! Keedy AW, Soares B, Wintermark M. *J. Neuroimaging*. Article in press

Marc Laberge, MD: Obesity Increases the Prevalence and Severity of Focal Knee Abnormalities Diagnosed using 3T MRI in Middle-Aged Subjects—Data from the Osteoarthritis Initiative. Laberge MA, Baum T, Virayavanich W, Nardo L, Nevitt MC, Lynch J, McCulloch CE, Link TM. *Skeletal Radiol.* 2012 Jun;41(6):633-41

Michael T. Lu, MD: Reducing the Rate of Repeat Imaging: Import of Outside Images to PACS. Lu MT, Tellis WM, Fidelman N, Qayyum A, Avrin DE.*AJR Am J Roentgenol.* 2012 Mar;198(3):628-34

Parham Moftakhar, MD: Spinal Dural Arteriovenous Fistulas and Intrathecal Venous Drainage: Correlation Between Digital Subtraction Angiography, MRI, and Clinical Findings. Hetts SW, Moftakhar P, English JD, Dowd CF, Higashida RT, Lawton MT, Douglas VC, Halbach VV. *J Neurosurg Spine*. 2012 May;16(5):433-40; A Paradigm for Awake Intraoperative Memory Mapping during Forniceal Stimulation. Brandling-Bennett EM, Bookheimer SY, Horsfall JL, Moftakhar P, Sedrak M, Barkulis CT, Gertsch JH, MacDougall MG, Boucharel W, Nuwer MR, Bergsneider M. *Neurocase.* 2012 Feb;18(1):26-38; Relationship between Tumor Enhancement, Edema, IDH1 Mutational Status, MGMT Promoter Methylation, and Survival in Glioblastoma. Carrillo JA, Lai A, Nghiemphu PL, Kim HJ, Phillips HS, Kharbanda S, Moftakhar P, Lalaezari S, Yong W, Ellingson BM, Cloughesy TF, Pope WB. *AJNR Am J Neuroradiol*. 2012 Feb 9. [Epub]; Vascular Myelopathies. Review. Moftakhar P, Ko N, Hetts SW. *Semin. Neurol,* (accepted); Density of Thrombus on Admission CT Predicts Revascularization Efficacy in Large Vessel Occlusion Acute Ischemic Stroke. Moftakhar P, English JD, Cooke D, Kim W, Stout C, Smith WS, Dowd CF, Higashida RT, Halbach VV, Hetts SW. *Stroke* (accepted); Pediatric Spinal Vascular Malformations: Diagnosis and Treatment. Moftakhar P, Hetts SW. *J Pediatr Neurol*. (accepted)

John Mongan, MD: *In Vivo* Differentiation of Complementary Contrast Media at Dual-Energy CT, Mongan, J, Rathnayake, S, Fu, Y, Wang, R, Jones, E, Gao, DW, Yeh, BM. *Radiology.* 2012 Jul 10. [Epub]; Dual-contrast Dual-energy Computed Tomography for Improved Diagnosis of Extravasated Contrast in Penetrating Abdominopelvic Trauma. Mongan J, Rathnayake S, Y Fu, Gao DW, Yeh BM. *Radiology* (accepted)

Anand Patel, MD: Cross-Specialty Integrated Resident Conferences: An Education Approach to Bridging the Gap. Naeger DM, Phelps A, Kohi M, Patel A, Elicker B, Ordovas K, Urbania T, Avrin D, Qayyum A. *Acad Radiol.* 2012 Aug;19(8):1029-34; A Simple Noniterative Principal Component Technique for Rapid Noise Reduction in Parallel MR Images. Patel AS, Duan Q, Robson PM, McKenzie CM, Sodickson DK. *NMR in Biomedicine*. 2012 Jan;25(1):84-92

Victor Sai, MD: Colonoscopy after CT Diagnosis of Diverticulitis to Exclude Colon Cancer: A Systematic Literature Review. Sai VF, Velayos F, Neuhaus J, Westphalen AC. *Radiology.* 2012 May;263(2):383-90. Review

Jay Starkey, MD: Starkey J, Maeda S. Earthquake in Japan. *Lancet.* 2011 May 14;377(9778):1653

Vignesh Arasu, MD, (see page 34) receives Stauffer Award from AUR President Robert Novelline, MD

S. Jarrett Wrenn, MD, PhD: Imaging Biomarkers of Aortic Disease: Increased Growth Rates with Eccentric Systolic Flow. Hope MD, Wrenn J, Sigovan M, Foster E, Tseng EE, Saloner D. *J Am Coll Cardiol.* 2012 Jul 24;60(4):356-7; Post-stenotic Dilation: Evaluation of Ascending Aortic Dilation with 4D Flow MR Imaging. Hope MD, Dyverfeldt P, Acevedo-Bolton G, Wrenn J, Foster E, Tseng E, Saloner D. *Int J Cardiol*. 2012 Apr 19;156(2):e40-2; Mesofluidic Devices for DNA-Programmed Combinatorial Chemistry. Weisinger RM, Marinelli RJ, Wrenn SJ, Harbury PB. *PLoS One*. 2012;7(3):e32299; Highly Parallel Translation of DNA Sequences into Small Molecules. Weisinger RM, Wrenn SJ, Harbury PB. *PLoS One*. 2012;7(3):e28056

Grants

Amaya Basta, MD: NIH T-32 Training Grant

Matthew Bucknor, MD: Margulis Society Research Grant Award; UCSF Radiology Seed Grant; NIH T-32 Training Grant

Abby Deans, MD, PhD: UCSF Radiology Seed Grant

Yuo-Chen Kuo, MD: NIH T-32 Training Grant

Ginger Merry, MD, MPH: American College of Radiology Goldberg-Reeder Resident Travel Grant

John Mongan, MD: UCSF Radiology Seed Grant; NIH R21-EB013816 Grant

Anand Patel, MD: NIH T-32 Research Grant Recipient; UCSF Radiology Seed Grant; UCSF Margulis Society Resident Research Grant

Victor Sai, MD: UCSF Radiology Seed Grant

Etay Ziv, MD, PhD: UCSF Radiology Seed Grant

UCSF Resident Pilots Breast Imaging Project in Uganda

Ginger Merry, MD, MPH

In the last year of her residency, Ginger Merry, MD, MPH, had the extraordinary opportunity to spend four weeks in Uganda. Together with two team members from the University of Vermont, she trained physicians and sonographers, and piloted a breast cancer diagnosis algorithm at the rural Kamuli Mission Hospital. Merry received an ACR Goldberg–Reeder Travel Grant from the American College of Radiology for the project. Here are her first-hand impressions:

Currently in Uganda, imaging breast masses is not a standard component of the work-up of a breast mass in rural settings. Mammography is not available, and ultrasound machines are present, but the sonographers have not been trained in breast ultrasound. Instead, palpable breast masses are biopsied using palpitation or are surgically excised.

Working with Dr. Kristen DeStigter (radiologist and program director at University of Vermont) and Mary Streeter (a sonographer from Vermont), we spent our first week teaching the sonographers at the rural Kamuli Mission Hospital to take cine images of a palpable mass and training the doctors to perform ultrasound-guided biopsies. The pilot was a great success. We demonstrated that ultrasound for breast imaging and sampling can be done and that staff are willing and eager to incorporate it into their breast cancer diagnosis algorithm.

Kristen DeStigter, MD, founder of Imaging the World (left) and Merry (right) show Ugandan physician, Alphons Matovu, MD, how to perform ultrasound guided biopsies using a breast phantom.

Merry gave radiology residents at Makerere University in Kampala, Uganda hands-on training in ultrasound-guided biopsies in a session using a breast phantom.

Next, we traveled to Kampala, the capital city, for a Stakeholders Meeting of more than 50 attendees: radiologists, surgeons, pathologists, ministry of health representative, and the staff from Kamuli Mission Hospital. I presented background information on breast cancer in Uganda and described our project in detail. Dr. DeStigter and Alphons Matovu, MD, a breast cancer surgeon in Uganda, led an excellent discussion which generated many great ideas for improving the project.

In addition to doing more training and gathering data in Kamuli, I also gave lectures on breast imaging, pelvic ultrasound, and ultrasound-guided procedures to radiology residents at Makerere University (the only radiology training program in Uganda) and sonography students at the Ernest Cook Ultrasound Research and Education Institute. The radiology students were especially excited to have a hands-on practice session in core and fine needle aspiration biopsy technique using breast phantoms. Their first experience practicing on non-patients was a huge success!

My time in Uganda was invaluable. I am now working with our collaborators in Uganda to finalize the Institutional Review Board submission for a full-scale project proposal and am applying for larger-scale funding. To see more of what we did, our blog is at *http://imagingtheworld.org/blog/*.

First-Year Diagnostic Radiology Residents 2012

Vignesh Arasu, MD

MD 2011 University of California, San Francisco, School of Medicine

2011–2012 Internship, Kaiser Permanente, Los Angeles, Calif.

Honors and Awards:

2012 Herbert M. Stauffer Award, AUR

2012 Featured profile 'Research Medical Student Grantee is Improving Tools for Women's Imaging,' RSNA R&E Foundation Focus, Fall 2012 issue (*http://rsna.org/VigneshArasuMD.aspx*)

Research:

2007–2012 University of California, San Francisco, Dept. of Radiology and Biomedical Imaging

Selected Publications:

Arasu VA, Chen RC, Newitt DN, Chang CB, Tso H, Hylton NM, Joe BN. Can Signal Enhancement Ratio (SER) Reduce the Number of Recommended Biopsies Without Affecting Cancer Yield in Occult MRI-Detected Lesions? *Acad Radiol.* 2011 Jun;18(6):716-21.

Arasu VA, Joe BN, Lvoff NM, Leung JW, Brenner RJ, Flowers CI, Moore DH, Sickles EA. Benefit of Semiannual Ipsilateral Mammographic Surveillance Following Breast Conservation Therapy. *Radiology.* 2012 Aug;264(2):371-7.

Kambadakone A, Arasu VA, Samir AE, Eisner BH, Kulkarni NM, Hahn PF, Sahani DV. Qualitative Assessment of Enhancement in a Renal Mass: Contribution of Subtraction CT. *J Comput Assist Tomogr.* 2012 Jul;36(4):381-7.

UCSF DIMA PHOTOGRAPHY

Eric Ehman, MD

MD 2011 Mayo Medical School, Rochester, Minn.

2011–2012 Internship, Santa Clara Valley Medical Ctr., Calif.

Honors and Awards:

2010 Alexander R. Margulis First Time Presenter Award, SGR

2009 Medical Student Research Trainee Prize, RSNA

Research:

2006–2011 Mayo Clinic, Rochester, Minn.

Selected Publications:

Ehman EC, Guimarães LS, Fidler JL et al. Noise Reduction to Decrease Radiation Dose and Improve Conspicuity of Hepatic Lesions at Contrast-Enhanced 80-kV Hepatic CT Using Projection Space Denoising. *AJR Am J Roentgenol.* 2012 Feb;198(2):405-11.

Ehman EC, Hayes ML, Berger, RA, Feimiee JP, Amrami KK. Subluxation of the Distal Radioulnar Joint as a Predictor of Foveal Triangular Fibrocartilage Complex Tears. *J Hand Surg Am.* 2011 Nov;36(11):1780-4.

Bruining DH, Loftus EV Jr, Ehman EC et al. Computed Tomography Enterography Detects Intestinal Wall Changes and Effects of Treatment in Patients with Crohn's Disease. *Clin Gastroenterol Hepatol.* 2011 Aug;9(8):679-683

Kimberly Kallianos, MD

MD 2011 Harvard Medical School, Boston, Mass.

2011–2012 Internship, Mount Auburn Hospital, Cambridge, Mass.

Research:

2009–2010 Cardiac MR, PET CT Program, Massachusetts General Hospital, Boston

Selected Publications:

Maurovich-Horvat P, Kallianos K, Engel LC, Szymonifka J, Fox CS, Hoffmann U, Truong QA. Influence of Pericoronary Adipose Tissue on Local Coronary Atherosclerosis as Assessed by a Novel MDCT Volumetric Method. *Atherosclerosis.* 2011 Nov;219(1):151-7.

Kappas NC, Zeng G, Chappell JC, Kearney JB, Hazarika S, Kallianos KG, Patterson C, Annex BH, Bautch VL. The VEGF Receptor Flt-1 Spatially Modulates Flk-1 Signaling and Blood Vessel Branching. *J Cell Biol.* 2008 Jun 2;181(5):847-58.

Rahi Kumar, MD

MD 2011 University of California, San Francisco, School of Medicine

2011–2012 Internship, Kaiser Permanente, San Francisco, Calif.

Research:

2009–2010 Howard Hughes Medical Institute Fellowship, UCSF

Selected Publications:

Kumar R, Hawkins RA, Yeh BM, Wang ZJ. Focal Fluorine-18 Fluorodeoxyglucose-Avid Lesions without Computed Tomography Correlate at Whole-Body Positron Emission Tomography-Computed Tomography in Oncology Patients: How Often are they Malignant? *Nucl Med Commun.* 2011 Sep;32(9):802-7.

Kumar R, Wang ZJ, Forsythe C, Fu Y, Chen YY, Yeh BM. Dual Energy CT Monitoring of the Renal Corticomedullary Sodium Gradient in Swine. *Eur J Radiol.* 2012 Mar;81(3):423-9.

Kumar R, Wang ZJ, Fu Y, Forsythe C, Webb EM, Yeh BM. Visualization of Renal Medullary Hyperattenuation at Unenhanced CT: What is the Effect of Furosemide Administration? *Radiology.* 2010 May;255(2):495-500.

Yi Li, MD

MD 2011 Harvard Medical School, Boston, Mass.

2011–2012 Beth Israel Deaconess Medical Ctr., Boston, Mass.

Research:

2011 World Health Organization, Country-Level Assessment of Mammographic Needs, Geneva, Switz.

2009–2010 Doris Duke Research Fellowship, Harvard Medical School, Boston, Mass.

2009–2011 Dana Farber Cancer Institute, Boston, Mass.

2006–2011 Beth Israel Deaconess Medical Ctr., Boston, Mass.

Selected Publications:

Li Y, Estroff J, Khwaja O et al. Callosal Dysgenesis in Fetuses with Ventriculomegaly: Levels of Agreement Between Imaging Modalities and Postnatal Outcome. *Ultrasound Obstet Gynecol.* 2012 Jan 20. [Epub]

Li Y, Estroff JA, Mehta TS, et al. Ultrasound and MRI of Fetuses With Ventriculomegaly: Can Cortical Development be used to Predict Postnatal Outcome? *AJR Am J Roentgenol.* 2011 Jun;196(6):1457-67.

Christopher Mutch, MD, PhD

MD 2011 Northwestern University, Feinberg School of Medicine, Chicago, Ill.

PhD 2009 Northwestern University, The Graduate School, Evanston, Ill.

2011–2012 Internship, University of Chicago, Northshore Health Sys., Ill.

Honors and Awards:

2009 Morton Heller Exemplary Research Award, Northwestern University, Evanstan, Ill.

Research:

2002–2011 NIH Medical Scientist Training Program, Northwestern University, Chicago, Ill.

2004–2009 Dept. of Pathology, Northwestern University, Evanston, Ill.

Selected Publications:

Mutch CA, Schulte JD, Olson E, Chenn A. Beta-Catenin Signaling Negatively Regulates Intermediate Progenitor Population Numbers in the Developing Cortex. *PLoS One.* 2010 Aug 25;5(8):e12376.

Zhang J, Woodhead GJ, Swaminathan SK, Noles SR, McQuinn ER, Pisarek AJ, Stocker AM, Mutch CA et al. Cortical Neural Precursors Inhibit their Own Differentiation via N-Cadherin Maintenance of Beta-Catenin Signaling. *Dev Cell.* 2010 Mar 16;18(3):472-9.

Mutch CA, Funatsu N, Monuki ES, Chenn A. Beta-catenin Signaling Levels in Progenitors Influence the Laminar Cell Fates of Projection Neurons. *J Neurosci.* 2009 Oct 28;29(43):13710-9.

Hriday Shah, MD

MD 2011 University of Michigan Medical School, Ann Arbor, Mich.

2011–2012 Internship, St. Joseph Mercy Hospital, Ann Arbor, Mich.

Honors and Awards:

2011 Roger A. Berg Prize in Radiology, University of Michigan Health Sys.

Research:

2007–2012 Departments of Cardiology, Plastic Surgery and Radiology, University of Michigan Health Sys.

Selected Publications:

Shah HM, Gemmete JJ, Chaudhary N, Pandey AS, Ansari SA. Preliminary Experience with the Percutaneous Embolization of Paragangliomas at the Carotid Bifurcation using only Ethylene Vinyl Alcohol Copolymer (EVOH) Onyx. J Neurointerv Surg. 2012 Mar;4(2):125-9.

Shah H, Gemmete JJ, Chaudhary N, Pandey AS, Ansari SA. Acute Life-Threatening Hemorrhage in Patients with Head and Neck Cancer Presenting with Carotid Blowout Syndrome: Follow-Up Results after Initial Hemostasis with Covered-Stent Placement. AJNR Am J Neuroradiol. 2011 Apr;32(4):743-7.

Shah H, Gurm HS. M-118, a novel, low-molecular-weight heparin for the potential treatment of cardiovascular disorders. Curr Opin Investig Drugs. 2010 Sep;11(9):1059-65.

Christopher Starr, MD, PhD

MD 2011 Wake Forest University, Winston-Salem, N.C.

PhD 2009 Wake Forest University, Winston-Salem, N.C.

2011–2012 Internship, Santa Clara Valley Medical Ctr., Calif.

Research:

2004–2009 Neurobiology and Anatomy, Wake Forest University, Winston-Salem, N.C.

Selected Publications:

Starr CJ, Sawaki L, Wittenberg GF et al. The contribution of the putamen to sensory aspects of pain: insights from structural connectivity and brain lesions. *Brain.* 2011 Jul;134 (Pt 7):1987-2004.

Starr CJ, Houle TT, Coghill RC. Psychological and sensory predictors of experimental thermal pain: a multifactorial model. *J Pain.* 2010 Dec;11(12):1394-402.

Starr CJ, Sawaki L, Wittenberg GF et al. Roles of the insular cortex in the modulation of pain: insights from brain lesions. *J Neurosci.* 2009 Mar 4;29(9):2684-94.

Javier Villanueva-Meyer, MD

MD 2011 Baylor College of Medicine, Houston, Tex.

2011–2012 Internship, Virginia Tech Carilion School of Medicine, Roanoke, Va.

Research:

2010 Beth Israel Deaconess Medical Ctr., Boston, Mass.

2010 The Methodist Hospital, Neurointerventional Radiology, Houston, Tex.

2009–2010 Baylor College of Medicine, Houston, Tex.

Selected Publications:

Simoni J, Villanueva-Meyer J, Simoni G et al. Control of Oxidative Reactions of Hemoglobin in the Design of Blood Substitutes: Role of the Ascorbate-Glutathione Antioxidant System. *Artif Organs.* 2009 Feb;33(2):115-26.

Sophia Virani, MD

MD 2011 Harvard Medical School, Boston, Mass.

MBA 2011 Harvard Business School, Boston, Mass.

2011–2012 Internship, Massachusetts General Hospital, Boston, Mass.

Research:

2007–2011 Dana Farber Cancer Institute, Boston, Mass.

Selected Publications:

Virani S, Michaelson JS, Hutter MM et al. Morbidity and Mortality after Liver Resection: Results of the Patient Safety in Surgery Study. *J Am Coll Surg.* 2007 Jun;204(6):1284-92.

Genevieve Woodard, MD, PhD

MD 2011 University of Pittsburgh, Penn.

PhD University of Pittsburgh, Penn.

2011–2012 Internship, University of Pittsburgh Medical Ctr., Penn.

Honors and Awards:

2010 Outstanding Doctoral Student Award, Graduate School of Public Health, University of Pittsburgh

Research:

2006–2011 University of Pittsburgh, Penn.

Selected Publications:

Woodard GA, Narla VV, Ye R et al. Racial differences in the association between carotid plaque and aortic and coronary artery calcification among women transitioning through menopause. *Menopause.* 2012 Feb;19(2):157-63.

Cooper JN, Tepper P, Barinas-Mitchell E, Woodard GA, Sutton-Tyrrell K. Serum aldosterone is associated with inflammation and aortic stiffness in normotensive overweight and obese young adults. *Clin Exp Hypertens.* 2012;34(1):63-70.

Melinda Jean Yeh, MD

MD 2011 University of California, San Diego

2011–2012 Internship, Cedars-Sinai Medical Center, Los Angeles, Calif.

Honors and Awards:

2007 Computer Science and Engineering Award for Excellence and Leadership, University of California, San Diego

Research:

2008 NIH Short-term Research Training Grant Program, UCSD

Selected Publications:

Ances BM, Vaida F, Cherner M, Yeh MJ et al. HIV and Chronic Methamphetamine Dependence Affect Cerebral Blood Flow. *J Neuroimmune Pharmacol.* 2011 Sep;6(3):409-19.

Ances BM, Vaida F, Yeh MJ et al. HIV Infection and Aging Independently Affect Brain Function as Measured by Functional Magnetic Resonance Imaging. *J Infect Dis*. 2010 Feb 1;201(3):336-40.

Ngo JC, Gullingsrud J, Giang K, Yeh MJ et al. SR Protein Kinase 1 is Resilient to Inactivation. *Structure.* 2007 Jan;15(1):123-33.

Second, Third, and Fourth–Year Diagnostic Radiology Residents 2012–2013

Second-Year Residents

Jacob D. Brown, MD, PhD
Marcel Brus-Ramer, MD, PhD
Nicholas Burris, MD
Matthew L. Eltgroth, MD
Robert R. Flavell, MD, PhD
Elisabeth Garwood, MD
Patrick C. Gonzales, MD
Ryan Kohlbrenner, MD
Valentin Lance, MD
Marc Mabray, MD
Aaron C. Miracle, MD
Sara K. Plett, MD
David Valenzuela, MD

Third-Year Residents

Ramon F. Barajas, Jr., MD
Amaya M. Basta, MD
Nancy J. Benedetti, MD
Stephanie Hou, MD
Akash Kansagra, MD
Yuo-Chen Kuo, MD
Parham Moftakhar, MD
Dare Olorunsola, MD
Anand S. Patel, MD
Jay Starkey, MD
Ricky T. Tong, MD, PhD
David N. Tran, MD
John-Paul Yu, MD, PhD

Fourth-Year Residents

Marjan Bolouri, MD
Matthew Bucknor, MD
Abby Deans, MD, PhD
D. Thor Johnson, MD, PhD
Lauren Hollowell, MD
Alexander Keedy, MD
Kevin Koo, MD, Chief
John Mongan, MD, PhD
Victor Sai, MD, Chief
Ronnie Sebro, MD
Leo Sugrue, MD, PhD
S. Jarrett Wrenn, MD, PhD, Chief
Etay Ziv, MD, PhD

Clinical Fellows and Instructors 2012–2013

Clinical Fellows:

Eric Aaltonen, MD
Interventional Radiology

Vishal K. Agarwal, MD
Interventional Radiology

Saad Ali, MD
Neuroradiology

Patrick Alore, MD
Abdominal Imaging

Ania J. Azziz, MD
Women's Imaging/Ultrasound

Ingrid Burger, MD, PhD
Women's Imaging/Ultrasound

J. Levi Chazen, MD
Neuroradiology

Gurpreet Dhillon, MD
Women's Imaging/Ultrasound

Matthew Epstein, MD
Musculoskeletal Radiology

Ankur Garg, MD
Musculoskeletal Radiology

Rita Gidwaney, MD
Women's Imaging/Ultrasound

Keith Herr, MD
Abdominal Imaging

Roozbeh Houshyar, MD
Abdominal Imaging

Maowen Hu, MD, PhD
Women's Imaging/Ultrasound

Nazia Jafri, MD
Women's Imaging

Jane Kim, MD
Pediatric Radiology

Warren Kim, MD, PhD
Neurointerventional Radiology

Peter Lokken, MD
Interventional Radiology

Dustyn Marshall, MD
Interventional Radiology

Jan Mazura, MD
Neuroradiology

Hugh McSwain, MD
Neurointerventional Radiology

Jeffrey Meier, MD
Abdominal Imaging

Tara Morgan, MD
Abdominal Imaging

Jared Narvid, MD
Neuroradiology

Michael Ohliger, MD, PhD
Abdominal Imaging

Brian Park, MD
Cardiac and Pulmonary Imaging

Priyesh Patel, MD
Musculoskeletal Radiology

Gregory Punch, MD
Neuroradiology

Jennifer Saline, MD
Women's Imaging

Naomi Schwarz, MD
Abdominal Imaging

Andrew D. Scott, MD
Abdominal Imaging

Tony Sedlic, MD
Cardiac and Pulmonary Imaging

Evan Sirc, MD
Nuclear Medicine

Charles Stout, MD
Neurointerventional Radiology

Jason Talbott, MD, PhD
Neuroradiology

Benita Tamrazi, MD
Neuroradiology

Khoa Tran, MD
Abdominal Imaging

Wayne Tran, MD
Nuclear Medicine

Karen Wallace, MD
Abdominal Imaging

Peggy Wu, MD
Women's Imaging/Ultrasound

Clinical Instructors:

Matthew Ammans, MD
Neuroradiology/NeuroInterventional Radiology

Gerritt Lagemann, MD
Neuroradiology

Chia-Shang Jason Liu, MD, PhD
Neuroradiology

Jessica Tan, MD
Neuroradiology

Bruno Soares, MD
Neuroradiology

Diagnostic Radiology Residency Graduates–Class of 2012

Congratulations to our 2012 graduates. We wish them success in their new fellowship positions.

Vishal K. Agarwal, MD
Fellowship, Interventional Radiology, UCSF

Ania J. Azziz, MD
Fellowship, Women's Imaging, UCSF

Ingrid M. Burger, MD, PhD
Fellowship, Women's Imaging, UCSF

Renu M. Chundru, MD
Fellowship, Neuroradiology, Cornell University, N.Y.

Thomas A. Hope, MD
Fellowship, Nuclear Medicine and Body MRI, Stanford University, Calif.

Nazia F. Jafri, MD
Fellowship, Women's Imaging, UCSF

Marc A. Laberge, MD
Fellowship, Musculoskeletal and Spine Imaging, National Orthopedic Imaging Assoc., San Francisco, Calif.

Michael T. Lu, MD
Fellowship in Cardiothoracic Imaging, Massachusetts General Hospital, Boston, Mass.

Ginger Merry, MD, MPH
Fellowship, Women's Imaging, Northwestern University, Chicago, Ill.

Michael Ohliger, MD, PhD
Fellowship, Abdominal Imaging, UCSF

John G. Schneider, MD
Fellowship, Emergency Radiology, Massachusetts General Hospital, Boston, Mass.

Jason F. Talbott, MD, PhD
Fellowship, Neuroradiology, UCSF

Kia Vahidi, MD
Fellowship, Body MRI/Women's Imaging, University of Southern California, Los Angeles

2012 Diagnostic Radiology Residency Graduates: (l–r top row) Vishal K. Agarwal, MD, Thomas A. Hope, MD, Michael Ohliger, MD, PhD, Ingrid Burger, MD, PhD, John G. Schneider, MD, Renu Chundru, MD, Marc Laberge, MD, Ginger Merry, MD, MPH, Jason Talbott, MD, PhD (l–r bottom row) Michael T. Lu, MD, PhD, Nazia Jafri, MD, Kia Vahidi, MD, Ania J. Azziz, MD

UCSF Graduates First Masters of Science in Biomedical Imaging Class

Proud 2012 Masters of Science in Biomedical Imaging graduates gathered at Commencement. (l–r) Program Director David Saloner, PhD, Aditi Guha, Joseph Schooler, Manu Mulaveesala, Director of Graduate Studies Alastair Martin, PhD, Michelle Grabau, Farshid Faraji, Zhixiang (Ian) Zhang, Priscilla Vu, Carmin Liang, Cheng-Liang (Thomas) Liu, Tzu-Cheng (Efren) Lee, Wei-Ching (Tina) Lo, and Hendry Cahaya. Not pictured: Yan Xing.

The first class of 13 students completed the Masters of Science in Biomedical Imaging (MSBI) program in 2012. The graduates, who hail from across and outside the U.S. received their diplomas from UCSF's Graduate Division and were recognized at the Department of Radiology and Biomedical Imaging's commencement ceremony.

The core courses in the MSBI program deliver in-depth training in the principles of *in vivo* imaging modalities. Students also choose from a wide set of electives related to imaging applications for major diseases and different organ systems. The program covers topics such as Image Processing, and Research Study Design. Following their coursework, students bring the different elements of their learning together in applied research projects, working with faculty supervisors or as interns with industry partners.

Students benefited from the wide range of the department's state-of-the-art imaging facilities to obtain hands-on imaging experience. Students were extremely appreciative of the high caliber of lectures that are broadly available, not only within the department, but across the UCSF campus.

In its first year, the MSBI program was led by the co-chairs of the program committee who created its structure, Sharmila Majumdar, PhD, and David Saloner, PhD. This year, Saloner has taken on the role of program director. Director of Graduate Studies, Professor Alastair Martin, PhD, defined program logistics and was the liaison between students and faculty, assisted by Program Administrator Robert Smith, who capably addressed students' day-to-day concerns, from the professional to the personal.

Graduates and MSBI Look Ahead

The MSBI students thrived on the small class size, which gave them easy access to the faculty and helped them form a cohesive, collaborative group. One student commented, "The people in the program, from students and instructors to administrators, make it an exceptional experience. This program revolutionized what I see for myself in the future, and has made me even more excited to go to medical school and build upon what I've learned here. I will always cherish this experience for what I've learned, the passion it has sparked in me, and the friends I have made."

Several class members have chosen to attend medical school. Some are pursuing opportunities with commercial operations such as pharmaceutical companies that use imaging studies to investigate drug efficacy, while others are exploring research opportunities.

The program welcomed its second class of students with the Fall semester. This year, the program will offer increased emphasis on developing ties to companies that can offer students internship opportunities and insights into the needs of the wider imaging community.

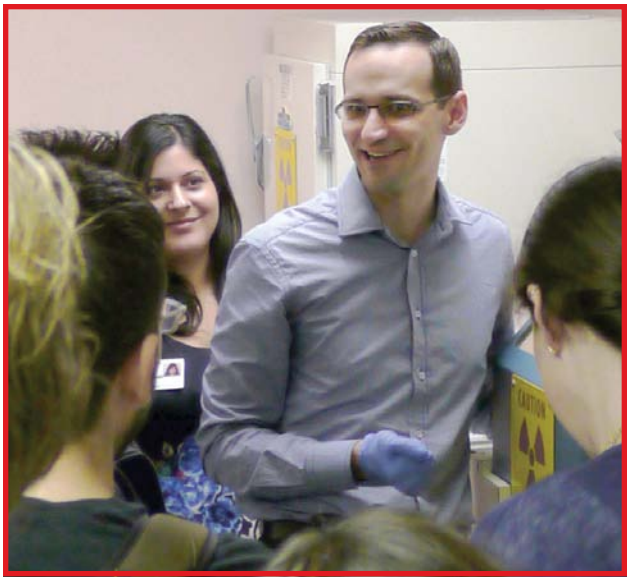
Anatomy Education Moves Forward at the Henry I. Goldberg Center for Advanced Imaging Education

This fall marked the opening of a brand new, state-of-the-art anatomy lab in the UCSF School of Medicine. Now that we have additional classroom space and students have access to computers in the Anatomy Lab, we are able to integrate more radiology into the curriculum, using "virtual" education tools. Pre-clinical students will now have ready access to X-ray and computed tomography images for anatomic correlation in the main dissection space. Additionally, faculty members, led by Miles Conrad, MD, have been working with the UCSF Anatomy Department to develop a new curriculum using ultrasound as an educational tool. These ultrasound sessions will take place in a classroom adjacent to the Anatomy Lab and will give small groups of students the opportunity to work directly with radiologists to learn about the basics of ultrasound imaging, as well as human anatomy.

Another innovation this academic year is the expansion of radiology's footprint in the third-year curriculum. This is a critical time, when students are making decisions about their future careers on the basis of experiences during their core rotations. Because Radiology electives typically are not offered until the fourth year, there has been a relative lack of exposure to radiology. However, David Naeger, MD, developed a radiology lecture series geared specifically towards students on the wards. The lectures will be incorporated into the classroom-based "intersessions" that occur between core rotations. This will expose students to radiology earlier in the context of their clinical rotations, and teach them the basic skills and information needed to excel on the wards.

Last year, using funds from the Hideyo Minagi Endowed chair, we started supporting selected faculty in projects such as developing a new radiology curriculum for the School of Medicine, fostering teaching skills development, and promoting educational research in radiology. Our goal is to develop a cadre of skilled educators who are interested in pursuing medical education as a primary career focus. This year, Brett Elicker, MD, Emily Webb, MD, David Naeger, MD, Miles Conrad, MD, Jesse Courtier, MD, Tom Urbania, MD, and Elissa Price, MD, are participating.

The faculty and resident members of the Medical Student Education Committee supervise the Goldberg Center's academic activities. New faculty members on the Committee this year include Price and Conrad. Nancy Benedetti MD, is the new Resident Liaison for Medical Student Education Continuing members of the committee include: Elicker, Naeger, Webb, and Vickie Feldstein, MD, Stefanie Weinstein, MD, Lynne Steinbach, MD, and Khai Vu, MD.



David Naeger, MD teaches students how radio-tracers are prepared and administered to patients receiving nuclear medicine studies.

Additionally, many UCSF faculty, volunteer faculty, fellows, and residents give generously of their time in our programs. Their efforts are very appreciated, particularly by the UCSF medical students who benefit directly from their contributions and time.

For more information about the Goldberg Learning Center's activities, please contact Melinda Parangan-Chu (*Melinda.Parangan-Chu@ucsf.edu*) or visit our website at *www.radiology.ucsf.edu/education/medical-students*.

The Henry I. Goldberg Center for Advanced Imaging Education is the headquarters for all medical student education in the Department of Radiology and Biomedical Imaging. The Center oversees radiology instruction in the pre-clinical core curriculum, provides imaging workshops during clinical clerkships, offers a variety of radiology electives spanning both clinical applications of Radiology and imaging research, and offers career advising and mentoring to UCSF medical students.

Alumni News

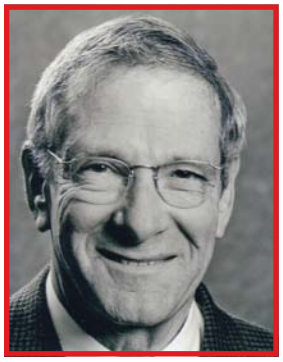
Drs. Charles and Gretchen Gooding, then (June 19, 1961) and now (June 2012), after 51 years of marriage.

1967

Charles A. Gooding, MD, and **Gretchen A.W. Gooding, MD**, (resident, 1975), Mill Valley, Calif., celebrated their 51st wedding anniversary in Carmel, Calif.

1970

Frank D. Mainzer, MD, San Francisco, Calif., received the Outstanding Clinical Faculty Award at UCSF's Department of Radiology and Biomedical Imaging Commencement.



Frank D. Mainzer, MD, named Outstanding Clinical Faculty member at commencement.

1974

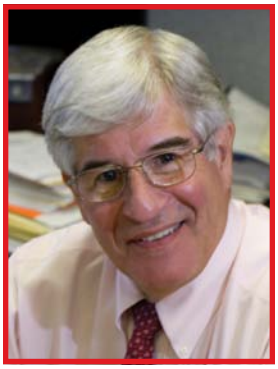
Peter S. Moskowitz, MD, Palo Alto, Calif., will retire as clinical professor of Radiology at Stanford School of Medicine and staff radiologist at Lucile Packard Children's Hospital at Stanford, in December 2012. He will continue to serve as executive director of the Center for Professional and Personal Renewal in Palo Alto (*www.cppr.com)*, serving the life and career coaching needs of physicians nationwide.

Peter S. Moskowitz, MD, retires.

Moskowitz was the founder and first president of the Board of the UCSF Margulis Society. He will continue to serve on its Board of Directors.

1981

William G. Bradley, MD, San Diego, Calif., chairman of the Department of Radiology at University of California, San Diego, was awarded the American College of Radiology's highest honor, the ACR Gold Medal, for distinguished and extraordinary service to the ACR and to the discipline of radiology.



Bill Bradley, MD, a 2012 recipient of the ACR Gold Medal.

1985

David Steinberg, MD, Las Vegas, Nev., is the managing partner of Steinberg Diagnostic Medical Imaging (SDMI) with five imaging centers located throughout the Las Vegas and Henderson area and a sixth center set to open in early 2013 in Centennial Hills. SDMI employs 21 physicians and more than 300 staff. In February 2013, SDMI (*www.sdmi-lv.com*) will celebrate 25 years of imaging excellence.

Board-certified in Diagnostic Radiology and Nuclear Cardiology, Steinberg is a Distinguished Fellow of the American College of Nuclear Medicine. He and his wife Betsi have two children. In his spare time, he enjoys fly fishing, traveling, skiing, hiking, and bicycling; but mostly enjoys spending time with his family.

David L. Steinberg, MD

1986

Diane Newton, MD, Boise, Idaho, shares a photo from RSNA 2011 and writes "I am doing well, practicing 100% neuroradiology out of my home via teleradiology, for a group called Radisphere. My daughter, Kate Mueller, is married and has (an absolutely adorable) 4 year-old son. Her family just moved to Stratford-Upon-Avon, England, where Kate is getting her graduate degree at the Shakespeare Institute, part of the University of Birmingham. She and her husband Michael are both in the theater/acting world."

(l–r) Bill Dillon, MD, Diane Newton, MD, (daughter of longtime UCSF neuroradiologist T. Hans Newton, MD) with her daughter Kate Mueller and Chair Ron Arenson, MD.

1990

Debra L. Monticciolo, MD, Temple, Tex., was appointed to the American College of Radiology Board of Chancellors and named Chair of the Commission on Quality and Safety of the ACR in April 2012. This commission is the largest in the College and is responsible for Guidelines and Technical Standards, Appropriateness Criteria, all Accreditation Programs, RADPEER, Metrics, and the National Registries in Diagnostic Radiology. She also is president and chairwoman of the Society of Breast Imaging and chairs the American Institute of Radiologic Pathology's Education Advisory Board.

1998

Michael B. Gotway, MD, of Scottsdale, Ariz., left Scottsdale Medical Imaging to join Mayo Clinic in Scottsdale as a cardiothoracic radiologist and senior associate consultant. He sent a recent photo and writes "my daughter Allison turned six this year and started kindergarten."

Allison Gotway and proud papa Mike.

1998

Jessica W.T. Leung, MD, of San Francisco, Calif., was inducted as a Fellow in the American College of Radiology. She is the medical director of the Breast Health Center and a vice-chairperson of the Dept. of Radiology, California Pacific Medical Center, San Francisco.

2000

Christopher J. Schultz, MD, Yountville, Calif., sends a recent family photo and writes: "this photo is from Sedona where we enjoy (not frequently enough) a second home and love of the Red Rocks. We have had a recent move up-valley to Yountville were we live on a five- acre country property. Despite living in the heart of the wine country, we prefer craft beers and have taken to all-grain home brewing." Schultz is the chief of MR and Body Imaging and director of the Napa Valley Imaging Center, Queen of the Valley Medical Center, Napa, Calif.

The Schultz family: Sheila, an internist at Kaiser-Permanente, Napa, Chris, 5-year-old Kingston, 10-year-old Presley, and Kennedy, age 7, in Sedona, Ariz.

2003

Raymond H. Thornton, MD, New York, N.Y., has been appointed vice-chair of Radiology for Quality, Safety and Performance Improvement; program director of the Vascular Interventional Radiology fellowship; and associate attending radiologist on the Vascular Interventional Radiology faculty at Memorial Sloan-Kettering Cancer Center.

2005

Matthew S. Falk, MD, of Orinda, Calif. shared a recent family photo.

Olivia, age 6, Matthew, his wife Gloria, and 3-year-old Owen.

2005

Joseph M. Hoxworth, MD, Scottsdale, Ariz., and Nicole C. Prall, MD, of Miami, Fla. were married on September 15, 2012 at the Four Seasons Resort Scottsdale at Troon North.

Dr. Joseph Hoxworth and his bride, Dr. Nicole Prall

2009

David W. Carlson, MD, Carpinteria, Calif., former resident in Nuclear Medicine, is practicing at the Cancer Center of Santa Barbara and Santa Barbara Cottage Hospital. He sent a recent family photo and writes "We welcomed our son, Wyatt, this past June."

David and Sarah Jane Carlson, holding baby Wyatt.

Amita Kamath, MD, of New York, N.Y., and husband Sanjay Pamnani announce the arrival of their "boy/girl" twins born on December 5, 2011.

Sanaya (l) and Vikash (r) Pamnani, nine months old.

Michael D. Ringler, MD, Oronoco, Minn., and wife Jennifer announce the arrival of daughter Alexcia born January 20, 2012. Ringler is a radiologist in Musculoskeletal Radiology at the Mayo Clinic in Rochester, Minn.

Jennifer Ayers-Ringler, Alexcia, and Michael Ringler.

2010

Peter Jun, MD, Menlo Park, Calif., received the department's Outstanding Fellow/ Clinical Instructor Teaching Award, presented by the chief residents at the 2012 commencement. He recently accepted a position at Kaiser Permanente, Santa Clara, Calif.

Outstanding Clinical Instructor, Peter Jun, MD

Rainer Poley, MD, Austin, Tex., writes "Here is a picture of residency and interventional radiology fellowship alums **VJ Bhagat, MD**, (1999), **Jeremy Durack, MD**, (2007), and me at the Western Angiographic and Interventional Society Meeting in Maui, September 2012."

Alumni Poley, Bhagat, and Durack met up in September 2012.

2011

Jose Diaz-Hernandez, MD, New York, N.Y., sent a photo of his recent marriage to Kalika Khanna, December 3, 2011, in Puerto Rico.

Dr. Jose Diaz-Hernandez and Kalika Khanna (center, top row) pictured with wedding guests, including classmates (top row, right) K. Pallav Kolli MD and (bottom row, left and right) Vinil Shah, MD and Fabio Settecase, MD.

Jeffrey Hom, MD, Portland, Ore., writes that after his Stanford Body Imaging fellowship he "served three months as Clinical Instructor in the Body Imaging section at Stanford and then accepted a position as a Body Imaging Attending at the Veterans Affairs Medical Center, Portland, Oregon."

Fabio Settecase, MD, MSc, FRCPC, Toronto, Canada, and Shaadi Shams were married on July 7, 2012 in Taormina, Sicily. In August, he started as a staff neuroradiologist at Sunnybrook Health Sciences Centre in Toronto.

Fabio Settecase, MD, and Shaadi Shams

Vinil Shah, MD, Boston, Mass. sent a recent photo of a gathering of former residents in his Boston apartment. Shah is clinical assistant and chief fellow in neuroradiology at Massachusetts General Hospital doing his second year of neuroradiology fellowship. He also serves as a Member-in-Training on the ASNR Executive Board.

Classmates get together in Boston (l–r standing) Maria Parayno, MD, Andrew Phelps, MD, Judong Pan, MD (all class of 2011) with Yang Yang Pan. Vinil Shah (center) is holding Aria Phelps.

The Margulis Society

The dedication, vision, and leadership of former board President, Richard A. Sollitto, MD, who died in November 2011, will be greatly missed (see page 28). His efforts, first as a board member and over his eight years as president of the Margulis Society, were key to many successful projects. Sollitto's leadership of the fundraising for Stone Library resulted in a renovated library with a greatly enhanced workspace for trainees. Over the years, he provided the vision for elegant and enjoyable Galas that brought together faculty, alumni, and trainees. The Society greatly appreciates the friends and family who donated in Richard's memory this year. (See page 50.)

Kressel Returns to UCSF

Herbert Y. Kressel, MD, editor of the medical research journal *Radiology*, was the featured speaker at the biennial Margulis Society Alumnus Lecture on April 3, 2012. He spoke on "Challenges and Opportunities for Imaging Journals: Emerging from the Shadows." He offered the audience a knowledgeable and unique perspective on peer-reviewed journals, including an exploration of the issues facing scientific journals today, such as online communication, peer review, conflicts of interest, and honorary authorship. During his tenure as editor of *Radiology* (a position he has held since 2008), Kressel has implemented shorter timeframes from submission to publication and developed the journal's online presence.

Kressel is the Miriam H. Stoneman Professor of Radiology at the Harvard Medical School and radiologist-in-chief emeritus of the Department of Radiology at Beth Israel Hospital in Boston, Mass. He graduated from the diagnostic radiology residency at UCSF in 1976.

This biennial lecture recognizes a distinguished UCSF Radiology alumnus who has succeeded in life, academia, or the private sector.

Research Support Continues

Senior residents Thomas Hope, MD, and Jason Talbott, MD, PhD, shared the 2012 Margulis Society Research Award, presented at commencement for their outstanding research while in the diagnostic radiology program at UCSF.

We also supported trainee research with three $2,500 grants to:

- Matthew Bucknor, MD, for his project "Structural, Metabolic and Histological Effects of High Frequency Focused Ultrasound (HIFU) on Bone"
- Ricky Tong, MD, PhD, for his project "Thermal Responsiveness of Uterine Fibroids to MR-Guided High-Intensity Focused Ultrasound: Correlation With T2 Signal Intensity And Histopathological Findings"
- Anand Patel, MD, for his project "Intravenous Chemotherapy Filter: A Novel Device for High Dose Chemotherapy Delivery During Transarterial Chemoembolization"

Speaker Herbert Y. Kressel, MD, (r) and Robert Brasch, MD, (l), both 1976 graduates of the residency, enjoy the reception.

Margulis Society outstanding research awardees (l) Jason Talbott, MD, PhD and (r) Michael Hope, MD, with (center, l–r) Chair Ron Arenson, MD, Board President Diego Ruiz, MD.

Career Evening Panelists 2012 (l–r, top row) Drs. D. Chris Sonne, Erik Gaensler, David Avrin (l–r, bottom row) Drs. Chris Schultz, Donna Hoghooghi, Diego Ruiz, Soonmee Cha, Camilla Lindan. Miriam Bridella (not pictured) participated by Skype.

Career Conference 2012

The annual Margulis Society career evening took place at the home of board member Donna Hoghooghi, MD, on August 21. The department's strong alumni base allows trainees to learn directly from the careers and experiences of past trainees.

Miriam Bredella, MD, spoke to the audience via Skype from her home in Boston, on her decision to focus on research in an academic setting. She is an associate professor of radiology at Harvard Medical School–Massachusetts General Hospital. Other panelists included Drs. Ron Arenson, David Avrin, and Soonmee Cha from UCSF and Drs. Christopher Schultz, Donna Hoghooghi, Camilla Lindan, and Christopher Sonne from private practice, with Erik Gaensler, MD, moderating.

Remember to save the evening of
Saturday, April 6, 2013
for the
Margulis Society Gala Fundraiser
an evening of food, music, and dancing
with alumni, colleagues, and current trainees.
Maritime Museum
Downtown San Francisco

The Margulis Society Honor Roll of Donors

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Radiology Postgraduate Education 2013

2012 Highlights

Last year, we moved the **Annual Review** course from Nob Hill to the Grand Hyatt Union Square, a more convenient location for attendees. In 2013, the course will be held at the Westin San Francisco Market Street hotel on February 3–8. Offering a thorough review of all systems and modalities presented by our outstanding faculty, this weeklong, comprehensive review course continues to attract an increasing percentage of practicing radiologists.

The June 2012 international course, **Quintessential Imaging in Québec**, chaired by Cynthia T. Chin, MD, director of the Precision Spine and Peripheral Nerve Center, was very well received. The all-star faculty included Heidi C. Roberts, MD, FRCPC, former UCSF fellow who specializes in Thoracic imaging at the University of Toronto. The class was held at the Fairmont Le Chateau Frontenac in historic Québec City.

What to Look Forward to in 2013

We will return to two very popular destinations next year. The Fairmont Southampton Bermuda will be the site of our next international offering. **Bermuda Shorts: Practical Tips for Covering Call** will be co-chaired by Brett M. Elicker, MD, chief of Cardiovascular and Pulmonary imaging, and Christopher P. Hess, MD, PhD, chief of Neuroradiology at the San Francisco Veterans Affairs Medical Center. The course is designed to bridge the gap between the need for subspecialty expertise and the reality of covering general call. The dates are June 23–28, the perfect opportunity for a mini-reunion for our alumni. Get in touch with your former classmates now and make plans to join us in Bermuda.

We will return to Jackson Hole, Wyoming on August 12–16 for a **General Review** course co-chaired by Steven W. Hetts, MD, chief of Neuroradiology at San Francisco General Hospital and Karen Ordovás, MD, assistant professor

Bermuda, site of the June 23–28, 2013 international course.

Majestic Mt. Moran, Grand Teton National Park.

in the Thoracic imaging section. Surrounded by the grandeur and natural beauty of the Grand Teton National Park, the course will again be held at the widely acclaimed Hotel Terra, an eco-friendly property located in the heart of Jackson Village.

In collaboration with the UC Office of the President, the UC DOSE (an undertaking to standardize and optimize CT doses at all five 5 UC hospitals), and the Radiology Outcomes Research Library we are organizing our first virtual conference with broad educational content focused on CT radiation dose reduction. The conference, led by Rebecca Smith-Bindman, MD, will be broadcast live May 8–10, 2013.

Due to popular demand, we will continue our courses in Kona, Maui, and Scottsdale. The **Women's Imaging** course will move to the Napa Valley, where a fun wine-tasting event will be on the agenda.

Mark Your 2014 Calendar

We want our alumni to be the first to know that our June 2014 international course will be held in Budapest, Hungary. Known as the "Pearl of the Danube" and the "Paris of Eastern Europe," Budapest combines 2000-year-old Roman ruins with 400-year-old Turkish monuments. This exciting city offers unique tour options and is a short transfer flight from all major European cities, convenient for pre- or post-course trips to Vienna, Prague, or Paris. Mark your calendar now to save June 16–20, 2014 and watch for further details on our website.

Save When Attending UCSF Courses

Don't forget to take advantage of your alumni discount and our "Frequent Attendance" program. UCSF Radiology alumni qualify for a savings of $50 on the full registration fee for all our courses; if you register by the early registration deadline, your combined savings will be $125. Become a "Frequent Attendee" and save even more by earning a free course registration when you attend just four courses within three consecutive years. Find more details online and be sure to bookmark our website, *www. radiology.ucsf.edu/postgrad*. We also would like to hear from you if you have suggestions for future course destinations.

Your former teachers, as well as our newer faculty members, look forward to having you, your fellow alumni, and your colleagues join us at a course or two in 2013.

2013 Radiology CME Calendar

January 6–11, 2013
Breast Imaging and Digital Mammography
The Fairmont Orchid – Kohala Coast, HI

January 13–18, 2013
Practical Body Imaging in Paradise
The Fairmont Orchid – Kohala Coast, HI

January 27–29, 2013
Cardiovascular and Pulmonary Imaging
Hyatt Indian Wells Resort & Spa – Indian Wells, CA

January 30–February 1, 2013
Abdominal and Pelvic Imaging
Hyatt Indian Wells Resort & Spa – Indian Wells, CA

February 3–8, 2013
UCSF Radiology Annual Review
Westin San Francisco Market Street – San Francisco, CA

February 10–15, 2013
Neuro and Musculoskeletal Imaging
The Fairmont Orchid – Kohala Coast, HI

March 3–8, 2013
Spring Training for Radiologists
Fairmont Scottsdale Princess – Scottsdale, AZ

March 7–9, 2013
Virtual Colonoscopy Workshop
UCSF China Basin Research Center – San Francisco, CA

March 22–24, 2013
Breast Imaging Update
San Francisco Marriott Union Square – San Francisco, CA

May 8–10, 2013
Radiation Safety and Computed Tomography: A Virtual Conference
Online course begins with live days on May 8–10

May 19–24, 2013
Practical Applications in Diagnostic Radiology
Tenaya Lodge at Yosemite National Park – Fish Camp, CA

June 6–8, 2013
Virtual Colonoscopy Workshop
UCSF China Basin Research Center – San Francisco, CA

June 23–28, 2013
Bermuda Shorts: Practical Tips for On-Call Coverage
The Fairmont Southampton – Southampton, Bermuda

August 12–16, 2013
Tutorials in the Tetons
Hotel Terra Resort – Jackson Village, WY

September 16–20, 2013
Interventional Radiology Review
UCSF Parnassus Campus – San Francisco, CA

September 19–21, 2013
Virtual Colonoscopy Workshop
UCSF China Basin Research Center – San Francisco, CA

September 29–October 4, 2013
Women's Imaging in Wine Country
Meritage Resort at Napa – Napa, CA

October 21–25, 2013
UCSF Radiology Highlights
Marriott Union Square – San Francisco, CA

October 27–November 1, 2013
Diagnostic Radiology Seminars
The Grand Wailea Resort – Maui, HI

November 4–8, 2013
Breast Imaging and Digital Mammography
Rancho Las Palmas Resort & Spa – Rancho Mirage, CA

December 8–13, 2013
Imaging Warm-Up in the Caribbean
The Westin Resort St. John – St. John, US Virgin Islands

FOR FURTHER INFORMATION PLEASE CONTACT:

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3333 California Street, Suite 375, San Francisco, CA 94143-0629
Tel: 415/476-5731 Fax: 415/476-9213 E-mail: ***cme@radiology.ucsf.edu*** Web: ***http://radiology.ucsf.edu/postgrad***

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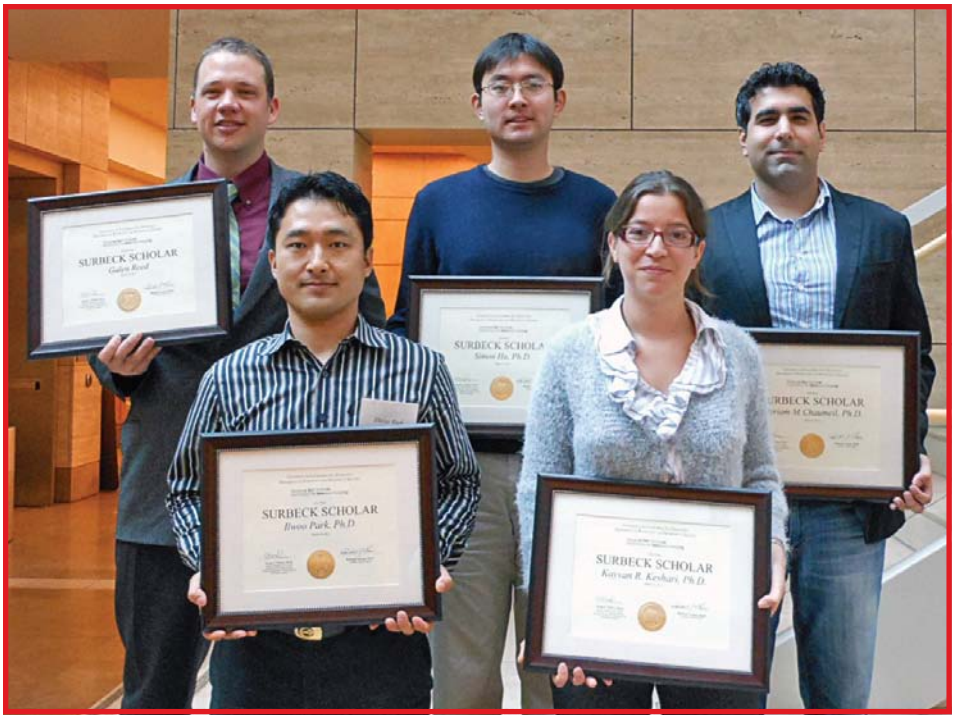
Surbeck Young Investigator Award Winners



2012 Surbeck Awardees: (l–r top row) Galen Reed, Simon Hu, PhD, Kayvan Keshari, PhD, (l–r bottom row) Ilwoo Park, PhD, Myriam M. Chaumeil, PhD.

Five talented scholars earned awards at the sixth annual Surbeck Investigators Awards presentation in 2012. They presented their work to an admiring audience in Genentech Hall, at an event moderated by Professor Sarah J. Nelson, PhD, director of the Surbeck Laboratory of Advanced Imaging and Richard Gowen, PhD, president of the INDNJC Foundation.

Hu and Park Share First Place

Simon Hu, PhD, was recognized for "13C-Pyruvate Imaging Reveals Alterations in Glycolysis that Precede c-Myc-Induced Tumor Formation and Regression." This paper describes the use of hyperpolarized carbon-13 technology to examine the metabolic consequences of switching a human ocogene on and off. Hu's findings demonstrate that the distinct metabolic profiles of a transgenic mouse liver cancer model were highly correlated with corresponding genetic profiles.

Hu received his BS and MS in Electrical Engineering from Stanford University and his PhD from the UCSF/UCB Joint Graduate Group in Bioengineering. He is a postdoctoral scholar in the research group led by Daniel B. Vigneron, PhD.

Ilwoo Park, PhD, focuses his research on developing imaging biomarkers for monitoring brain tumor response to therapy using hyperpolarized MR 13C metabolic imaging. His award-winning paper is titled "Evaluation of Heterogeneous Metabolic Profile in an Orthotopic Human Glioblastoma Xenograft Model using Compressed Sensing Hyperpolarized 3D 13C Magnetic Resonance Spectroscopic Imaging." He is postdoctoral fellow in the Brain Imaging research group led by Sarah J. Nelson, PhD.

A native of South Korea, Park completed his undergraduate work at the University of California, Berkeley and earned his PhD in the UCSF/UCB Joint Graduate Program in Bioengineering.

A Solo in Second Place and a Tie for Third

Galen D. Reed earned second-place honors for "A Method for Simultaneous Echo Planar Imaging of Hyperpolarized 13C Pyruvate and 13C Lactate."

He holds a BS in Physics from the University of California, Los Angeles, where he worked in the Particle Beam Physics Lab developing high-gradient particle accelerators and free-electron lasers. He is enrolled in the UCB/UCSF Joint Graduate Bioengineering Program, where he has contributed to creating magnetostatic-based data processing

programs for the analysis of magnetic resonance spectroscopy data for prostate cancer.

Myriam M. Chaumeil, PhD, earned a share of third place with her paper, "Longitudinal Evaluation of MPIO-Labeled Stem Cell Biodistribution in Glioblastoma using High Resolution and Contrast Enhanced MR Imaging at 14.1 Tesla." A postdoctoral scholar in the laboratory led by Sabrina Ronen, PhD, Chaumeil applies innovative magnetic resonance techniques, such as hyperpolarized carbon-13 and contrast-enhanced imaging, to characterize brain tumors and their response to treatments. She earned her PhD in Medical Physics from the University of Paris XI, where she developed new MR methods for the study of brain metabolism in normal conditions and in Huntington's disease.

Sharing third place, Kayvan Keshari, PhD, is a postdoctoral scholar in the lab led by John Kurhanewicz, PhD. His work focuses on developing novel magnetic resonance probes and engineered platforms to characterize abnormal metabolism for translation to both clinical diagnosis and drug discovery. His award-wining paper is titled "Hyperpolarized 13C Dehydroascorbate as an Endogenous Redox Sensor for *in Vivo* Metabolic Imaging." Keshari holds degrees in Biochemistry and Applied Mathematics from the University of California, Berkeley and a PhD in Bioengineering from the University of North Carolina.

The Margaret Hart Surbeck Laboratory of Advanced Imaging is dedicated to advancing imaging techniques for biological and medical applications. The Young Investigator Awards provide small grants for career development and are funded through the INDNJC Foundation honoring Margaret Hart Surbeck.

Moeller Receives 2011 Lanna Lee Award

Tenderness is as important as technology when Iris Moeller, RT, works with patients in the Ambulatory Care Center. That approach to her work earned Moeller the 2011 Lanna Lee Award, given annually to the outstanding technologist in the Department of Radiology and Biomedical Imaging. "Iris participates in every aspect of the Ambulatory Clinic, from assisting at the front desk to helping her co-workers with X-ray studies, even assisting staff at the main hospital." said Operations Director Kathy Knoerl.

Moeller earned a teaching credential in Germany, and then worked as an elementary school teacher. After coming to the United States, she was the principal of a German language school before training to become a radiologic technologist. In 2006, after completing the program at City College of San Francisco, she accepted a position at UCSF.

"I have always been fascinated by technology in the medical field. Some diseases and conditions that were difficult to diagnose just decades ago are now easily detectable with the help of medical imaging. This fact and my interest in working with people led me to pursue a career as a diagnostic technologist," said Moeller. "As a technologist you never stop learning and teaching, therefore the step from the classroom to the hospital was an easy one for me to take."

Over her years of service in Diagnostic Radiology Moeller has gained a keen understanding of what needs to be done to provide outstanding patient care. She has excellent patient care skills and problem-solving skills. Her positive attitude and energy exemplify the qualities that the Lanna Lee Award represents.

Senior Radiologic Technologist Iris Moeller with her family at the annual Department of Radiology and Biomedical Imaging holiday party: (l–r top row) Eyasu and Fana Moeller Aregawie and (l–r, bottom row) Yosef Aregawie with Iris Moeller.

The Lanna Lee Award was established in memory of Lanna Lee, a senior radiology technologist who died on her way home from work in 1989 during the Loma Prieta earthquake. Lee was a role model for others, always working with a smile and delivering excellent care to her patients. Since her death, this award is given annually in her honor at the department's holiday party. Her family regularly attends the award celebration to share in the knowledge that her spirit lives on.

Two in Department are Awarded School of Medicine "Great People" Awards

Among all the great people who work in the Department of Radiology and Biomedical Imaging, the School of Medicine acknowledged Computing Resource Manager Pranathi Sundaram, and Event and Alumni Coordinator Katie Murphy, as "Great People" in 2012.

The Great People Award recognizes employees whose daily contributions highlight the great diversity of work done within the School of Medicine, whose commitment and values make their jobs a positive experience and the School of Medicine a great place to work.

UCSF DMM PHOTOGRAPHY

Pranathi Sundaram

UCSF DMM PHOTOGRAPHY

Katie Murphy

Sundaram Advances APeX Training

When APeX, UCSF's electronic health record, went live system wide in June 2012, the School of Medicine's IT community was ready for it, thanks in large part to Pranathi Sundaram's efforts. She raised the issue of the large number of IT support staff who would be expected to answer questions about and support APeX for campus faculty, then helped create and organize training sessions to prepare them for that role.

"Our department members are familiar with Pranathi for her leadership of our Desktop Support Group, but she is also considered a campus IT leader and played a major role in Operational Excellence," said Cathy Garzio, administrative director. "Nearly every week, I rely on her expertise and consider Pranathi an invaluable resource."

In her daily work, Sundaram balances customer needs and cost-efficiency. Her leadership skills come into play when handling difficult customer support issues and ensuring that her staff are regularly involved in projects that challenge their abilities and improve their career advancement opportunities.

Murphy Helps Create Community

From overseeing the editorial production of *Images* to coordinating events as diverse as grand rounds, the recent memorial service for Richard Sollitto, MD, and the Margulis Gala, Katie Murphy harnesses the power of communication to foster a sense of community among department faculty, staff, and alumni. She also has provided valuable input on the department's social media communications, including our blog, Facebook, and Twitter presence. Murphy is one of the original members of the Dean's Communications Advisory Board in the School of Medicine, formed in 2007. "It's a pleasure having Katie on the board; she is a great listener, and her input and feedback is always helpful, no matter what issues we discuss," said Sarah Paris, director of Communications for the Dean of the School of Medicine.

In announcing the award, Garzio noted that Murphy's contributions are in evidence all year long, "from organizing the annual Research Symposium and *Images* to staffing the Margulis Society Board and the monthly Forum for Advanced Imaging Research, to planning and executing the beautiful resident graduation each year, Katie is a perfect example of nearly every criterion used for this award."

Great People Award

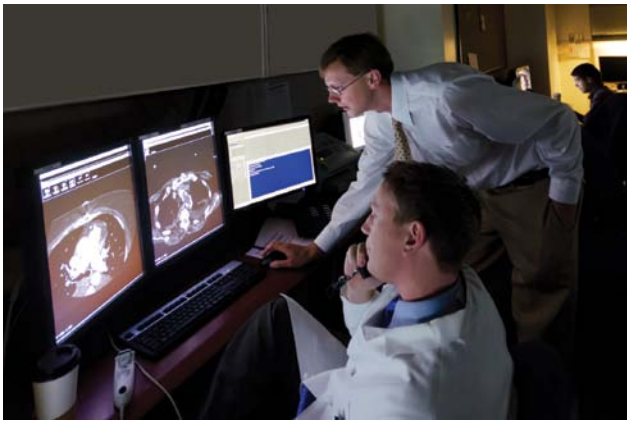
These awards are given quarterly to staff members who represent the wide array of duties and functions performed in the School of Medicine. They honor employees whose performance is characterized by one or more of the following attributes:

- Contributes to activities, programs, or events resulting in tangible added value.
- Serves as a role model for teamwork and customer service.
- Makes the School or Department a better place to work by demonstrating a positive, helpful attitude and by communicating and working cooperatively with others.
- Shows solid and consistent devotion to the job and work group.
- Inspires others to excel.

The Year in Pictures














UCSF Medical Center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Research Directions

ABDOMINAL IMAGING

Judy Yee, MD, Interim Chief

Research Directions:

- The promotion of evidence-based abdominal imaging, including systematic validation of commonly held opinions and assumptions
- Advanced modifications of MRI and CT techniques to optimize assessment of hepatic, biliary, and renal disease
- Combined MRI and MR spectroscopic imaging (MRSI) in localizing and staging prostate cancer
- High-intensity, focused ultrasound of uterine fibroids and prostate cancer
- Advanced hepatic imaging, including multi-detector CT, CT cholangiography, new hepatobiliary MR contrast agents, and MR cholangiopancreatography
- Radiological evaluation of diffuse liver disease, including cirrhosis, pseudocirrhosis, and nonalcoholic steatohepatitis
- Dynamic contrast-enhanced MRI and CT for assessment of solid organs and tumors in the abdomen and pelvis
- 3D rendering of CT and MR images, including projectional and volumetric applications, and CT colonography

Recent Key References:

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BODY IMAGING RESEARCH INTEREST GROUP

John Kurhanewicz, PhD, Director

Research Directions:

- Developing an optimized and clinically feasible multiparametric MR protocol for prostate cancer and diseases of the kidney and liver
- Rigorous histopathological correlative studies for validation of MR biomarkers
- Developing ways to analyze multiparametric imaging data
- Developing clinical predictive nomograms that incorporate imaging variables
- Image-guided biopsy and therapy (HIFU, radiation)
- Identifying, validating, and implementing robust, quantitative, noninvasive magnetic-resonance-based metabolomic biomarkers of human disease and therapeutic response using *ex vivo* tissues, biofluids, and preclinical cell and murine models of human disease
- Developing targeted contrast agents for prostate cancer and other urogenital diseases
- Developing and implementing hyperpolarized 13C MRI in patients

Recent Key References:

Hu S, Balakrishnan A, Bok RA, Anderton B, Larson PE, Nelson SJ, Kurhanewicz J, Vigneron DB, Goga A. (13)C-Pyruvate Imaging Reveals Alterations in Glycolysis that Precede c-Myc-Induced Tumor Formation and Regression. *Cell Metab.* 2011 Jul 6;14(1):131-42.

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BRAIN RESEARCH INTEREST GROUP

Srikantan Nagarajan, PhD, Co-Director
Sarah Nelson, PhD, Co-Director
Pratik Mukherjee, MD, PhD, Co-Director

Research Directions:

The scope of research conducted by the Brain RIG encompasses all aspects of brain-related inquiry.

Brain Tumors: Evaluating patients with brain tumors is a major focus for imaging research at UCSF and is an important application for the development of novel MR imaging and spectroscopy techniques. Key methodologies being applied to understand the underlying mechanisms of response to therapy and to validate *in vivo* parameters include the *ex vivo* analysis of image-guided tissue samples and the use of NMR spectroscopy in cell and pre-clinical model systems.

Brain-Behavior: Our goal is to understand the relationship between brain and behavior in health and disease, to integrate information from molecules to mind, and to translate neuroimaging advances to the clinic. Our specific mission is to map and analyze functional activation in the brain and functional network connectivity in the brain and to identify neurophysiological and neuroanatomical correlates of behavior in health and disease.

Recent Key References:

Constantin A, Elkhaled A, Jalbert L, Srinivasan R, Cha S, Chang SM, Bajcsy R, Nelson SJ. Identifying Malignant Transformations in Recurrent Low Grade Gliomas Using High Resolution Magic Angle Spinning Spectroscopy. *Artif Intell Med*. 2012 May; 55(1):61–70.

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BREAST CANCER RESEARCH INTEREST GROUP

Nola Hylton, PhD, Co-Director
Bonnie N. Joe, MD, Co-Director

Research Directions:

The Breast RIG's research aims are to advance imaging-based approaches for breast cancer diagnosis, leading to earlier detection, reduction of disease recurrence, and improved survival. Our major research areas include:

- MRI and spectroscopy to assess breast tumor response to neoadjuvant chemotherapy. UCSF is the lead institution for the national ACRIN 6657/I-SPY breast cancer clinical trial

testing MRI and molecular biomarkers for the prediction of treatment response and survival for women receiving neo-adjuvant chemotherapy for locally advanced breast cancer
- Computer-aided tools for real-time measurement of MRI biomarkers for breast cancer
- MRI of ductal carcinoma *in situ* (DCIS) for staging and assessing response to hormonal treatment
- Quantitative mammographic breast density measurement for breast cancer risk assessment
- MRI-directed tissue biopsy for radiologic-pathologic correlation of imaging and molecular biomarkers
- MRI measurement of breast density and tissue composition

Recent Key References:

Esserman LJ, Berry DA, Demichele A, Carey L, Davis SE, Buxton M, Hudis C, Gray JW, Perou C, Yau C, Livasy C, Krontiras H, Montgomery L, Tripathy D, Lehman C, Liu MC, Olopade OI, Rugo HS, Carpenter JT, Dressler L, Chhieng D, Singh B, Mies C, Rabban J, Chen YY, Giri D, van 't Veer L, Hylton N. Pathologic Complete Response Predicts Recurrence-Free Survival More Effectively by Cancer Subset: Results From the I-SPY 1 TRIAL—CALGB 150007/150012, ACRIN 6657. *J Clin Oncol.* 2012 Sep 10;30(26):3242-9.

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Fumagalli D, Bedard PL, Nahleh Z, Michiels S, Sotiriou C, Loi S, Sparano JA, Ellis M, Hylton N, Zujewski JA, Hudis C, Esserman L, Piccart M; BIG-NABCG Collaboration. A Common Language in Neoadjuvant Breast Cancer Clinical Trials: Proposals for Standard Definitions and Endpoints. *Lancet Oncol.* 2012 Jun;13(6):e240-8.

Shepherd JA, Kerlikowske. Do Fatty Breasts Increase or Decrease Breast Cancer Risk? K. *Breast Cancer Res.* 2012 Jan 25;14(1):102.

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UCSF DMM PHOTOGRAPHY

CARDIAC AND PULMONARY IMAGING

Brett M. Elicker, MD, Chief

Research Directions:

- Cardiac CT angiography (CTA)
  - CTA assessment of coronary allograft vasculopathy after heart transplantation
  - Use of cardiac CTA for pre-surgical clearance
  - Use of cardiac CTA for definitive emergency room evaluation of atypical chest pain
  - Evaluation of coronary atherosclerosis in patients with HIV infection
- Cardiac CT
  - Evaluation of pulmonary venous anatomy in atrial fibrillation
  - Characterization of myocardial ischemic injury by contrast-enhanced MRI and CT
- Chest CT/High-resolution CT
  - High-resolution CT diagnosis of lung disease
  - Clinical outcomes following negative CT for acute pulmonary embolism
  - Predictors of poor outcome in patients with acute PE diagnosed by helical CT
- Cardiac MRI
  - Use of novel cardiac MRI techniques and computational modeling for the quantitative assessment of ventricular performance in congenital heart disease
  - Use of multidimensional flow techniques for quantitative assessment of flow dynamics in congenital heart disease
  - MRI to assess cardiac function after repair of tetralogy of Fallot; correlation with clinical outcomes
  - MRI to assess cardiac function in the single ventricle patient after Fontan palliation; correlation with clinical outcomes
  - Endovascular therapy and hemodynamic assessment using MRI guidance

Recent Key References:

Cannavale G, Hope MD, Crook SE, Elicker BM. Dynamic Evaluation of Aquadricuspid Aortic Valve with Coronary Computed Tomography Angiography. *J Thorac Imaging.* 2012 May;27(3):W46–7.

Hope MD, Urbania TH, Yu JP, Chitsaz S, Tseng E. Incidental Aortic Valve Calcification on CT Scans: Significance for Bicuspid and Tricuspid Valve Disease. *Acad Radiol.* 2012 May;19(5):542–7.

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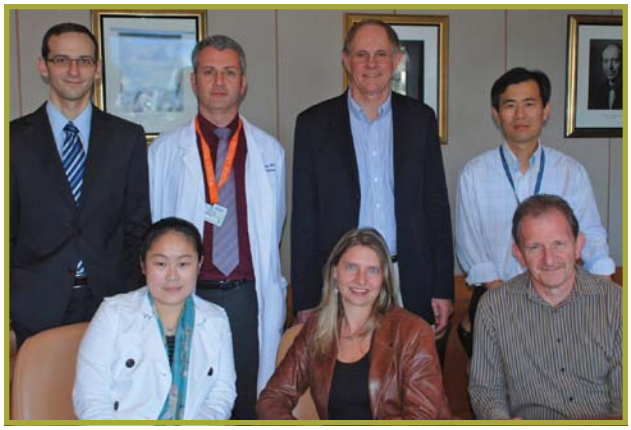

CARDIOVASCULAR RESEARCH INTEREST GROUP

Karen Ordovás, MD, Co-Director
David Saloner, PhD, Co-Director

Research Directions

The Cardiovascular RIG aims to provide leadership to the radiology community by developing and implementing state-of-the-art methods for providing early diagnosis and improved outcomes for patients suffering from cardiovascular diseases. The CVRIG works closely with physician/scientists from other disciplines to develop and evaluate methods that include numerical modeling, physical *in vitro* models, and animal and human models of cardiovascular disease. The combination of these elements, together with a program for educating and training practitioners and scientists, will provide measurable benefits to patients.

In summary, our mission is to:

- Use state-of-the-art imaging to understand the etiology of multiple cardiovascular diseases
- Investigate the scientific basis for new imaging modalities and their applications
- Apply cardiovascular imaging modalities to evaluate the physiologic, pharmacologic, and molecular basis of disease
- Develop tools for early detection of cardiovascular diseases
- Assess the role of cardiac imaging in predicting cardiovascular outcomes to reduce overall and cardiac-related mortality.

Recent Key References:

Hope MD, Wrenn J, Sigovan M, Foster E, Tseng EE, Saloner D. Imaging Biomarkers of Aortic Disease: Increased Growth Rates with Eccentric Systolic Flow. *J Am Coll Cardiol.* 2012 Jul 24;60(4):356–7.

Muzzarelli S, Ordovás KG, Higgins CB, Meadows AK. Collateral Flow Measurement by Phase-Contrast Magnetic Resonance Imaging for the Assessment of Systemic Venous Baffle Patency after Atrial Switch Repair for Transposition of the Great Arteries. *J Thorac Imaging.* 2012 May;27(3):175–8.

Sigovan M, Gasper W, Alley HF, Owens CD, Saloner D. USPIO-enhanced MR Angiography of Arteriovenous Fistulas in Patients with Renal Failure. *Radiology.* 2012 Aug 8

Ordovás KG, Carlsson M, Lease KE, Foster E, Meadows AK, Martin AJ, Hope M, Do L, Higgins CB, Saeed M. Impaired Regional Left Ventricular Strain after Repair of Tetralogy of Fallot. *J Magn Reson Imaging.* 2012 Jan;35(1):79–85.

Yang J, Yamamoto T, Cho B, Seo Y, Keall PJ. The Impact of Audio-Visual Biofeedback on 4D PET Images: Results of a Phantom Study. *Med Phys.* 2012 Feb;39(2):1046–57.

IMAGE-GUIDED THERAPY (IGT) SPECIALIZED RESOURCE GROUP

Alastair J. Martin, PhD, Co-Director
Steven W. Hetts, MD, Co-Director
Mark W. Wilson, MD, Co-Director

Research Directions:

The IGT SRG aims to be a world leader in developing new and improved guidance for a wide array of surgical and interventional procedures. The administration of therapy is evolving and several common themes are emerging: (1) therapies must be delivered in an efficacious manner; (2) therapies must be administered in a minimally invasive fashion; (3) novel therapies must achieve demonstrable benefits over existing approaches; and (4) therapy delivery must be cost effective. Imaging is central to all these goals and the IGT SRG aims to bring together the clinical and technical expertise, within our department and in collaboration with external departments, institutions, and industrial partners, to develop delivery methods that achieve optimized therapeutic results.

Our key objectives are to:

- Provide improved guidance and evaluation of therapy
- Perform interventions and therapy delivery in a more minimally invasive fashion
- Develop image guidance for evolving medical therapies for which there may not now exist acceptable delivery mechanisms
- Develop pre-clinical devices in collaboration with industrial partners
- Conduct clinical trials that provide guidance to the medical community as to best practices in the therapeutic management of patients

Recent Key References:

Durack JC, Hope TA, Seo Y, Saeed M, He J, Wilson MW, Kerlan RK Jr, Ring EJ. Intravenous Vasopressin for the Prevention of Nontarget Gastrointestinal Embolization During Liver-Directed Cancer Treatment: Experimental Study in a Porcine Model. *J Vasc Interv Radiol*. 2012 Sep 10. [Epub]

Muller L, Saeed M, Wilson MW, Hetts SW. Remote Control Catheter Navigation: Options for Guidance Under MRI. *J Cardiovasc Magn Reson*. 2012 Jun 1;14:33. [Epub]

Ostrem JL, Galifianakis NB, Markun LC, Grace JK, Martin AJ, Starr PA, Larson PS. Clinical Outcomes of PD Patients Having Bilateral STN DBS using High-Field Interventional MR-imaging for Lead Placement. *Clin Neurol Neurosurg*. 2012 Aug 31. [Epub]

Richardson RM, Kells AP, Rosenbluth KH, Salegio EA, Fiandaca MS, Larson PS, Starr PA, Martin AJ, Lonser RR, Federoff HJ, Forsayeth JR, Bankiewicz KS. Interventional MRI-guided Putaminal Delivery of AAV2-GDNF for a Planned Clinical Trial in Parkinson's Disease. *Mol Ther*. 2011 Jun; 19(6): 1048-57.

Richardson RM, Kells AP, Martin AJ, Larson PS, Starr PA, Piferi PG, Bates G, Tansey L, Rosenbluth KH, Bringas JR, Berger MS, Bankiewicz KS. Novel Platform for MRI-Guided Convection-Enhanced Delivery of Therapeutics: Preclinical Validation in Nonhuman Primate Brain. *Stereotact Funct Neurosurg*. 2011;89(3):141-51. Apr 14. [Epub]

Saeed M, Hetts S, English J, Wilson M. MR Fluoroscopy in Vascular and Cardiac Interventions. *Int J Cardiovasc Imaging*. 2012 Jan;28(1):117-37.

Saeed M, Wilson M. Value of MR Contrast Media in Image-Guided Body Interventions. *World J Radiol*. 2012 Jan 28;4(1):1-12.

INFORMATICS AND IMAGE PROCESSING/DISPLAY SPECIAL RESOURCE GROUP

David E. Avrin, MD, PhD, Director

Research Directions:

Our group encompasses three areas of applied research and development:

- PACS, RIS, Workflow, and Integration: Software development related to acquiring, storing, and displaying digital images in clinical radiology and healthcare enterprise environments. Developing tools and integrating with other components of the electronic medical record are two specific focuses. Integrated tools for education and research, such as the UCSF Teaching File and the wet-read module are examples of successful projects. We are also one of the five institutions participating in the NIBIB-supported RSNA contract demonstration project on cross-enterprise, patient-controlled Image Sharing. We also oversee research PACS to support collaborative projects that involve imaging.
- Informatics: The intersection of the broad category of informatics with medical imaging. Examples include knowledge management, clinical decision support, standards such as RadLex and XDS-i, informatics for patient safety and quality, translational imaging, and datamining (including natural language processing).
- Image Processing: The broad range of post-acquisition image processing for MR and CT that is not specific to other RIGs. Examples include deformable anatomic modeling and fitting, statistical/probabilistic pattern matching, 3D visualization, and diffusion techniques.

Recent Key References:

Lu MT, Tellis WM, Fidelman N, Qayyum A, Avrin DE., Reducing the Rate of Repeat Imaging: Import of Outside Images to PACS. *AJR Am J Roentgenol.* 2012 Mar;198(3):628-34.

INTERVENTIONAL RADIOLOGY

Robert K. Kerlan, Jr., MD, Chief

Research Directions:

- Joint project with Transplant Service for implantation of pancreatic islet cells
- Joint project with Transplant Service for downstaging hepatocellular carcinoma in potential transplant candidates
- Joint project with Abdominal Imaging in using MR diffusion imaging to differentiate flow abnormalities from hepatocellular carcinoma
- Joint project with Pediatric Surgery to create gastrojejunostomies and percutaneous jejunostomies using magnets.
- Assessing the role of interventional radiology in managing complications related to the creation of ileal pouches following proctectomy
- Use of expandable metallic stents in the airways
- Joint project with Urology on RF ablation of small renal masses
- Assessing the safety of transdiaphragmatic drainages

Recent Key References:

Arrayeh E, Fidelman N, Gordon RL, LaBerge JM, Kerlan RK Jr, Klimov A, Bloom AI. Transcatheter Arterial Embolization for Upper Gastrointestinal Nonvariceal Hemorrhage: Is Empiric Embolization Warranted? *Cardiovasc Intervent Radiol.* 2012 Feb 3. [Epub]

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Fidelman N, Qayyum A. Pre-Transplant Prediction of Microvascular Invasion In Patients with Hepatocellular Carcinoma: Added Value of Diffusion Weighted Magnetic Resonance Imaging. Liver Transpl. 2012 Aug 16. [Epub]

Statler JD, Miller DL, Dixon RG, Kuo MD, Cohen AM, Duncan JR, Gordon RL, Gross K, Saad WE, Silberzweig JE, Stecker MS, Suri R, Thornton RH, Bartal G; Society of Interventional Radiology Position Statement: Prevention of Unintentionally Retained Foreign Bodies during Interventional Radiology Procedures. Society of Interventional Radiology Safety and Health Committee. *J Vasc Interv Radiol.* 2011 Nov;22(11):1561-2.

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MARGARET HART SURBECK LABORATORY OF ADVANCED IMAGING

Sarah J. Nelson, PhD, Director

Daniel B. Vigneron, PhD, Associate Director

Research Directions:

Development of high-field, 3 Tesla and 7 Tesla Magnetic Resonance techniques with improved sensitivity and specificity that more effectively address fundamental problems in biology and medicine, most notably:

- New algorithms for reconstructing spatial and temporal responses of biological systems and quantifying the resultant multi-dimensional and multi-spectral images
- New strategies for designing high-frequency RF coils and coil arrays that address electromagnetic problems and computational electromagnetism in *in vivo* MR at high fields using the FDTD and other finite element methods
- Applications of novel RF coils designs for *in vivo* MRI and spectroscopy
- Implementing parallel imaging strategies for anatomic, vascular, and spectroscopic imaging sequences in the musculoskeletal system, prostate, and brain
- Dynamic contrast-enhanced and perfusion-weighted imaging
- Phase and susceptibility-weighted imaging
- High-resolution angiography of neurovascular disease
- Developing faster, more reliable methods to acquire and process diffusion MRI
- Integrating studies on the human scanners with *ex vivo* analyses of tissue samples using high-resolution magic angle spinning NMR spectroscopy
- Improving and translating 3T MR spectroscopy sequences for prostate and brain in routine clinical use
- Applying and developing high-resolution MRI, MR spectroscopy, and MR diffusion imaging techniques at 7T
- Developing hyperpolarized C-13 agents and integrating novel data acquisition and analysis procedures
- Applying hyperpolarized C-13 metabolic imaging in cell systems and pre-clinical models to evaluate cancer and other diseases
- Developing new methods for hyperpolarized C-13 metabolic imaging in patients

Scientists in the Surbeck Lab continue to develop hands-on educational programs in high-field MR that are available to undergraduate and graduate students, medical students, and research fellows.

Recent Key References:

Barajas RF Jr, Phillips JJ, Parvataneni R, Molinaro A, Essock-Burns E, Bourne G, Parsa AT, Aghi MK, McDermott MW, Berger MS, Cha S, Chang SM, Nelson SJ. Regional Variation in Histopathologic Features of Tumor Specimens from Treatment-Naive Glioblastoma Correlates with Anatomic and Physiologic MR Imaging. *Neuro Oncol.* 2012 Jul;14(7):942-54.

Bian W, Harter K, Hammond-Rosenbluth KE, Lupo JM, Xu D, Kelley DA, Vigneron DB, Nelson SJ, Pelletier D. A Serial *in Vivo* 7T Magnetic Resonance Phase Imaging Study of White Matter Lesions in Multiple Sclerosis. *Mult Scler.* 2012 May 28. [Epub]

Ozhinsky E, Vigneron DB, Chang SM, Nelson SJ. Automated Prescription of Oblique Brain 3D Magnetic Resonance Spectroscopic Imaging. *Magn Reson Med.* 2012 Jun 12. [Epub]

Park I, Hu S, Bok R, Ozawa T, Ito M, Mukherjee J, Phillips JJ, James CD, Pieper RO, Ronen SM, Vigneron DB, Nelson SJ. Evaluation of Heterogeneous Metabolic Profile in an Orthotopic Human Glioblastoma Xenograft Model Using Compressed Sensing Hyperpolarized 3D (13) C Magnetic Resonance Spectroscopic Imaging. *Magn Reson Med.* 2012 Jul 31. [Epub]

Reed GD, Larson PE, Morze Cv, Bok R, Lustig M, Kerr AB, Pauly JM, Kurhanewicz J, Vigneron DB. A Method for Simultaneous Echo Planar Imaging of Hyperpolarized ^{13}C Pyruvate and ^{13}C Lactate. *J Magn Reson.* 2012 Apr;217:41–7.

Von Morze C, Bok RA, Sands JM, Kurhanewicz J, Vigneron DB. Monitoring Urea Transport in Rat Kidney *in Vivo* Using Hyperpolarized ^{13}C Magnetic Resonance Imaging. *Am J Physiol Renal Physiol.* 2012 Jun 15;302(12):F1658–62.

Von Morze C, Sukumar S, Reed GD, Larson PE, Bok RA, Kurhanewicz J, Vigneron DB. Frequency-Specific SSFP for Hyperpolarized (13)C Metabolic Imaging at 14.1 T. *Magn Reson Imaging.* 2012 Aug 13. [Epub]

Wu B, Li Y, Wang C, Vigneron DB, Zhang X. Multi-Reception Strategy with Improved SNR for Multichannel MR Imaging. *PLoS One.* 2012;7(8):e42237.

MRI/MRS SPECIALIZED RESOURCE GROUP

Daniel Vigneron, PhD, Director

Research Directions:

The MRI/MRI SRG works to advance MR imaging science to benefit the study of human disease. Studies include developing hardware and techniques to improve MR anatomic, diffusion, spectroscopic, hyperpolarized, perfusion, and high-field 3T and 7T imaging. We look at everything from developing new techniques and translating existing techniques, to improving the quality, speed, information-content, applicability of advanced MR methods. This graphic depicts our approach:

Basic development=>Translation=>Optimization=> Validation

Our key missions are to:

- Be world leaders in cutting-edge MR techniques for studying human disease
- Collaborate with RIGS to translate basic science MR techniques into application studies for testing and optimization
- Work with clinical MRI to optimize and evaluate new techniques and improve state-of-the-art methods
- Train and educate all personnel in advanced MR techniques

Recent Key References:

Keshari KR, Kurhanewicz J, Macdonald JM, Wilson DM. Generating Contrast in Hyperpolarized 13C MRI using Ligand-Receptor Interactions. *Analyst.* 2012 Aug 7;137(15):3427–9.

Larson PE, Kerr AB, Reed GD, Hurd RE, Kurhanewicz J, Pauly JM, Vigneron DB. Generating Super Stimulated-Echoes in MRI and Their Application to Hyperpolarized C–13 Diffusion Metabolic Imaging. *IEEE Trans Med Imaging.* 2012; 31(2): 265–75.

Mari Aparici C, Seo Y. Functional Imaging for Prostate Cancer: Therapeutic Implications. *Semin Nucl Med.* 2012 Sep;42(5):328–42.

Pang Y, Xie Z, Li Y, Xu D, Vigneron D, Zhang X. Resonant Mode Reduction in Radiofrequency Volume Coils for Ultrahigh Field Magnetic Resonance Imaging. *Materials* (Basel). 2011 Jul 28;4(8):1333–1344.

Venkatesh HS, Chaumeil MM, Ward CS, Haas-Kogan DA, James CD, Ronen SM. Reduced Phosphocholine and Hyperpolarized Lactate Provide Magnetic Resonance Biomarkers of PI3K/Akt/Mtor Inhibition in Glioblastoma. *Neuro Oncol.* 2012 Mar;14(3):315–25.

Winant CD, Aparici CM, Zelnik YR, Reutter BW, Sitek A, Bacharach SL, Gullberg GT. Investigation of Dynamic SPECT Measurements of the Arterial Input Function in Human Subjects using Simulation, Phantom and Human Studies. *Phys Med Biol.* 2012 Jan 21;57(2):375–93.

Wu B, Li Y, Wang C, Vigneron DB, Zhang X. Multi-Reception Strategy with Improved SNR for Multichannel MR Imaging. *PLoS One.* 2012;7(8):e42237.

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MUSCULOSKELETAL AND QUANTITATIVE IMAGING RESEARCH INTEREST GROUP

Sharmila Majumdar, PhD, Co-Director
Thomas M. Link, MD, PhD, Co-Director

Research Directions:

- High-field and high-resolution MRI for quantitative characterization of the morphology and function of the musculoskeletal system
- Identification of biomarkers for degeneration in bone, cartilage, and inter-vertebral disc, and diseases such as osteoporosis, spinal disorders, and osteoarthritis
- MR spectroscopy methods for characterizing muscle in diabetes, HIV, and other diseases
- Strategies for non-invasive monitoring of cartilage and disc regeneration
- Microscopic characterization of bone, cartilage, disc, and other tissues, using methodologies such as computed tomography, Fourier Transform Infra-red imaging, high-resolution NMR spectroscopy, and confocal laser microscopy
- Development of high-resolution, and quantitative computed tomography for characterizing bone geometry, micro-architecture, and density aimed at understanding aging, ethnic differences in the skeleton, osteoporosis, metal artifact reduction, and orthopedic implants

Recent Key References:

Joseph GB, Baum T, Alizai H, Carballido-Gamio J, Nardo L, Virayavanich W, Lynch JA, Nevitt MC, McCulloch CE, Majumdar S, Link TM. Baseline Mean and Heterogeneity of MR Cartilage T2 are Associated With Morphologic Degeneration of Cartilage, Meniscus, and Bone Marrow Over 3 Years—Data from the Osteoarthritis Initiative. *Osteoarthritis Cartilage.* 2012 Jul;20(7):727-35.

Karampinos DC, Yu H, Shimakawa A, Link TM, Majumdar S. Chemical shift-based water/fat separation in the presence of susceptibility-induced fat resonance shift. *Magn Reson Med.* 2012 Jan 13. doi: 10.1002/mrm.24157. [Epub]

Kazakia GJ, Kuo D, Schooler J, Siddiqui S, Shanbhag S, Bernstein G, Horvai A, Majumdar S, Ries M, Li X. Bone and Cartilage Demonstrate Changes Localized to Bone Marrow Edema-like Lesions within Osteoarthritic Knees. *Osteoarthritis Cartilage.* 2012 Sep 28. [Epub]

Souza RB, Baum T, Wu S, Feeley BT, Kadel N, Li X, Link TM, Majumdar S. Effects of Unloading on Knee Articular Cartilage T1rho and T2 Magnetic Resonance Imaging Relaxation Times: A Case Series. *J Orthop Sports Phys Ther.* 2012 Jun;42(6):511-20.

Subburaj K, Kumar D, Souza RB, Alizai H, Li X, Link TM, Majumdar S. The Acute Effect of Running on Knee Articular Cartilage and Meniscus Magnetic Resonance Relaxation Times in Young Healthy Adults. *Am J Sports Med.* 2012 Sep;40(9):2134-41.

Zuo J, Joseph GB, Li X, Link TM, Hu SS, Berven SH, Kurhanewitz J, Majumdar S. In vivo intervertebral disc characterization using magnetic resonance spectroscopy and T1ρ imaging: association with discography and Oswestry Disability Index and Short Form-36 Health Survey. *Spine* (Phila Pa 1976). 2012 Feb 1;37(3):214-21.

MUSCULOSKELETAL RADIOLOGY

Thomas M. Link, MD, PhD, Chief

Research Directions:

Imaging of Osteoarthritis and Cartilage

- New morphological pulse sequences for cartilage imaging
- Biochemical, quantitative imaging of the cartilage matrix
- Analysis of the Osteoarthritis Initiative Cohort
- Osteoarthritis, obesity, and physical activity
- Cartilage imaging of marathoners and physically active individuals
- Assessing menisci and cartilage with matrix-sensitive MRI sequences

Bone Marrow Imaging

- Monitoring the progress of the treatment of Gaucher's disease
- MRI of bone marrow changes in osteoarthritis
- Disuse osteopenia-related bone marrow changes

Osteoporosis Imaging

- Evaluating insufficiency fractures of the pelvis, CT vs. MRI
- Contrast-enhanced, multi-slice-spiral CT for assessing bone density and structure
- Diabetic bone disease: cortical porosity and increase in fracture risk

Imaging of the Shoulder

- Optimizing MRI for visualizing metal-on-metal surface replacements
- Evaluating fatty infiltration of muscles of the rotator cuff

Imaging of the Spine

- Imaging at 1.5T and 3T
- Clinical implications of lumbosacral segmentation abnormalities

MR Arthrography

- Evaluating the complications of MR arthrography

High-field MRI for musculoskeletal applications

- *In vitro* and *in vivo* comparison of cartilage imaging at 1.5T, 3T, and 7T
- Comparing 1.5T with 3T MRI for the evaluation of smaller joints
- Optimizing MR protocols for the knee at 3T and 7T

New MRI Techniques

- Use of CUBE and IDEAL sequences at 3T to image the knee
- Application of metal suppression MAVRIC sequences for assessment of total joint replacements
- *In vitro* and *in vivo* assessment of metal suppression sequences at 1.5 and 3T
- MR neurography

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Recent Key References:

Dimmick SJ, Goh AC, Cauzza E, Steinbach LS, Baumgartner I, Stauffer E, Voegelin E, Anderson SE. Imaging Appearances of Buerger's Disease Complications in the Upper and Lower Limbs. *Clin Radiol.* 2012 Jul 9. [Epub]

Hovis KK, Stehling C, Souza RB, Haughom BD, Baum T, Nevitt M, McCulloch C, Lynch JA, Link TM. Physical Activity is Associated with Magnetic Resonance Imaging-Based Knee Cartilage T2 Measurements in Asymptomatic Subjects with and those without Osteoarthritis Risk Factors. *Arthritis Rheum.* 2011 Aug;63(8):2248-56.

Link TM. Osteoporosis Imaging: State of the Art and Advanced Imaging. *Radiology.* 2012 Apr;263(1):3-17. Review.

Majumdar S, Link TM, Steinbach LS, Hu S, Kurhanewicz J. Diagnostic Tools and Imaging Methods in Intervertebral Disk Degeneration. *Orthop Clin North Am.* 2011 Oct;42(4):501-11, viii. Review.

Nardo L, Alizai H, Virayavanich W, Liu F, Hernandez A, Lynch JA, Nevitt MC, McCulloch CE, Lane NE, Link TM. Lumbosacral Transitional Vertebrae: Association with Low Back Pain. *Radiology.* 2012 Sep 5. [Epub]

Patsch JM, Burghardt AJ, Yap SP, Baum T, Schwartz AV, Joseph GB, Link TM. Increased Cortical Porosity in Type-2 Diabetic Postmenopausal Women with Fragility Fractures. *J Bone Miner Res.* 2012 Sep 18. [Epub]

Rhee RB, Chan KK, Lieu JG, Kim BS, Steinbach LS. MR and CT Arthrography of the Shoulder. *Semin Musculoskelet Radiol.* 2012 Feb;16(1):3-14. Review.

NEURODEGENERATIVE DISEASES RESEARCH INTEREST GROUP

Norbert Schuff, PhD, Co-Director
Michael W. Weiner, MD, Co-Director

Research Directions:

- Studying the causes and effects of neurodegenerative and psychiatric disorders using MRI as a surrogate marker
- Developing powerful, new brain MR techniques for early detection, improved diagnosis, and assessment of therapeutic interventions of neurodegenerative and psychiatric disorders
- Developing more powerful multimodal brain image processing and multivariate statistical imaging analysis techniques
- Highlights include:
  - Ultra-high resolution structural MRI
  - Diffusion spectrum imaging
  - Dynamic, arterial-spin-labeling imaging
  - Susceptibility-weighted imaging
  - Spectroscopic imaging and j-modulated spectroscopy
  - Bayesian image reconstruction
  - Multivariate image analysis methods
  - MRI protocols and processing pipelines for multi-center trials
  - Standards for imaging neurodegenerative diseases that can be transferred into clinical practice and multi-center clinical trials

Recent Key References:

Chiang GC, Insel PS, Tosun D, Schuff N, Truran-Sacrey D, Raptentsetsang ST, Thompson PM, Reiman EM, Jack CR Jr, Fox NC, Jagust WJ, Harvey DJ, Beckett LA, Gamst A, Aisen PS, Petersen RC, Weiner MW. Impact of Apolipoprotein &4-Cerebrospinal Fluid Beta-Amyloid Interaction on Hippocampal Volume Loss over 1 Year In Mild Cognitive Impairment. *Alzheimers Dement.* 2011 Sep;7(5):514-20.

Durazzo, TC, Mon A, Gazdzinski, S, and Meyerhoff, DJ. Chronic Cigarette Smoking In Alcohol Dependence: Associations With Cortical Thickness and N-Acetylaspartate Levels in the Extended Brain Reward System. *Addict Biol.* 2011 Nov 9. [Epub]

Schuff N, Tosun D, Insel PS, Chiang GC, Truran D, Aisen PS, Jack CR Jr, Weiner MW, Alzheimer's Disease Neuroimaging Initiative. Nonlinear Time Course of Brain Volume Loss in Cognitively Normal and Impaired Elders. *Neurobiol Aging.* 2012 May, 33(5):845-55.

Tosun D, Rosen H, Miller BL, Weiner MW, Schuff N. MRI Patterns of Atrophy and Hypoperfusion Associations across Brain Regions in Frontotemporal Dementia. *Neuroimage.* 2012 Feb 1; 59(3):2098-109.

Weiner MW, Veitch DP, Aisen PS, Beckett LA, Cairns NJ, Green RC, Harvey D, Jack CR, Jagust W, Liu E, Morris JC, Petersen RC, Saykin AJ, Schmidt ME, Shaw L, Siuciak JA, Soares H, Toga AW, Trojanowski JQ; Alzheimer's Disease Neuroimaging Initiative. The Alzheimer's Disease Neuroimaging Initiative: A Review of Papers Published since its Inception. *Alzheimers Dement,* 2012 Feb; 8(1 Suppl):S1-68.

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NEURORADIOLOGY

William P. Dillon, MD, Chief

Research Directions:

Neuropediatrics

- Cause of cerebellar hypoplasia in prematurely born neonates and the effects of brain cooling on CNS injury in term neonates suffering hypoxic-ischemic injury
- Embryogenesis of disorders of the midbrain and hindbrain
- Normal and abnormal development of the cerebral cortex
- Fetal MR neuroimaging: development and application of advanced MRI techniques to study normal and abnormal fetal brain development

Traumatic Brain Injury

- DTI and fiber tractography, fMRI, 3D MRSI, and deformation morphometry as imaging biomarkers for mild TBI to predict clinical outcomes in post-concussive syndrome, with correlation to neurocognitive testing and genomic analysis for TBI
- Susceptibility genes such as ApoE
- DTI and fiber tractography processing for a multi-center consortium study of mild TBI

Cardiovascular Disease and Stroke

- Use of 64-slice CT to detect cardiovascular disease and stroke and a functional mapping and scoring system for predicting the outcome of ischemic stroke
- Use of perfusion and CTA imaging to detect ongoing hemorrhages in the brain of patients presenting with acute intracerebral hematoma
- Use of permeability image mapping to detect stroke patients at risk of subsequent hemorrhage

- Automated software for the outcome classification of patients with acute subarachnoid hemorrhage

Brain Tumors

- Use of permeability and perfusion imaging to guide operative biopsy
- Correlation of genetic markers and imaging markers from tissue obtained by image-guided biopsy

Head and Neck

- The utility of PET/CT in follow-up of patients with head and neck cancer
- The use of advanced imaging techniques in the detection of recurrent head and neck cancer

Spine

- CT-guided back pain management
- Use of image guidance to improve the accuracy of injections
- Utility of gadolinium MR myelography to detect CSF leaks
- MR neurography for peripheral nerve diagnosis

Neurodegenerative Diseases

- New imaging biomarkers for neurodegenerative diseases using 7T MRI
- 7T imaging of patients with intractable epilepsy
- Characterization of multimodal diffusion data using high-angular, resolution-diffusion imaging

Recent Key References:

Bloch O, Han SJ, Cha S, Sun MZ, Aghi MK, McDermott MW, Berger MS, Parsa AT. Impact of Extent of Resection for Recurrent Glioblastoma on Overall Survival. *J Neurosurg.* 2012 Oct 5. [Epub]

Glenn OA, Cuneo AA, Barkovich AJ, Hashemi Z, Bartha AI, Xu D. Malformations of Cortical Development: Diagnostic Accuracy of Fetal MR Imaging.*Radiology.* 2012 Jun;263(3):843-55.

Hess CP, Dillon WP. Imaging the Pituitary and Parasellar Region. *Neurosurg Clin N Am.* 2012 Oct;23(4):529-42.

Kralik SF, Kersten R, Glastonbury CM. Evaluation of Orbital Disorders and Cranial Nerve Innervation of the Extraocular Muscles. *Magn Reson Imaging Clin N Am.* 2012 Aug;20(3):413-34.

Kruidenier L, Chung CW, Cheng Z, Liddle J, Che K, Joberty G, Bantscheff M, Bountra C, Bridges A, Diallo H, Eberhard D, Hutchinson S, Jones E, Katso R, Leveridge M, Mander PK, Mosley J, Ramirez-Molina C, Rowland P, Schofield CJ, Sheppard RJ, Smith JE, Swales C, Tanner R, Thomas P, Tumber A, Drewes G, Oppermann U, Patel DJ, Lee K, Wilson DM. A Selective Jumonji H3K27 Demethylase Inhibitor Modulates the Proinflammatory Macrophage Response. *Nature.* 2012 Aug 16; 488(7411):404-8.

Li YO, Yang FG, Nguyen CT, Cooper SR, LaHue SC, Venugopal S, Mukherjee P. Independent component analysis of DTI reveals multivariate microstructural correlations of white matter in the human brain. *Hum Brain Mapp.* 2012 Jun;33(6):1431-51.

Shepherd TM, Hess CP, Chin CT, Gould R, Dillon WP. Reducing Patient Radiation Dose during CT-Guided Procedures: Demonstration in Spinal Injections for Pain. *AJNR Am J Neuroradiol.* 2011 Nov; 32(10):1776-82.

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NUCLEAR MEDICINE

Miguel Hernandez Pampaloni, MD, PhD, Chief,

Research Directions:

- Cardiac and vascular applications of clinical SPECT-CT, PET, and PET-CT
  - Applications of SPECT-CT for cardiac synchrony
  - Dementia imaging with SPECT-CT
  - Clinical PET and PET-CT studies of cancer, cardiovascular, and neurological diseases
  - Feasibility of PET and MRI to characterize myocardial metabolism and flow
  - Use of PET in monitoring therapy for breast and ovarian cancers
  - Conformal radiation treatment planning with PET-CT
  - Imaging structure and function in small animals with CT/SPECT
  - Molecular probe development for SPECT and PET

Key Recent References:

Aparici CM, Carlson D, Nguyen N, Hawkins RA, Seo Y. Combined SPECT and Multidetector CT for Prostate Cancer Evaluations. *Am J Nucl Med Mol Imaging.* 2012;2(1):48-54.

Bucci M, Aparici CM, Hawkins R, Bacharach S, Schrek C, Cheng S, Tong E, Arora S, Parati E, Wintermark M. Validation of FDG

Uptake in the Arterial Wall as an Imaging Biomarker of Atherosclerotic Plaques with (18) F-Fluorodeoxyglucose Positron Emission Tomography-Computed Tomography (FDG-PET/CT). *J Neuroimaging.* 2012. Aug 28. [Epub]

Sayre GA, Bacharach SL, Dae MW, Seo Y. Combining Dynamic and ECG-Gated 82Rb-PET for Practical Implementation in the Clinic. *Nucl Med Commun.* 2012 Jan;33(1):4-13.

Seo Y, Gustafson WC, Dannoon SF, Nekritz EA, Lee CL, Murphy ST, Vanbrocklin HF, Hernandez-Pampaloni M, Haas-Kogan DA, Weiss WA, Matthay KK. Tumor Dosimetry Using [(124)I] m-iodobenzylguanidine MicroPET/CT for [(131)I]m-iodobenzylguanidine Treatment of Neuroblastoma in a Murine Xenograft Model. *Mol Imaging Biol.* 2012 Mar 2. [Epub]

Winant CD, Aparici CM, Zelnik YR, Reutter BW, Sitek A, Bacharach SL, Gullberg GT. Investigation of Dynamic SPECT Measurements of the Arterial Input Function in Human Subjects using Simulation, Phantom and Human Studies. *Phys Med Biol.* 2012 Jan 21;57(2):375-93.

PEDIATRIC/FETAL RESEARCH INTEREST GROUP

A. James Barkovich, MD, Director

Research Directions:

- Developing new imaging techniques to assess normal and abnormal development, including MRSI and DTI
- Developing new technology for imaging fetuses and neonates and adapting state-of-the-art techniques for application in the developing fetus and infant
- Using imaging techniques to diagnose and study malformations of the brain
- Using imaging to assess injury in premature and term neonates
- Using imaging to assess new therapies for injured fetuses and neonates
- Using imaging to assess brain injury in neonates and infants with severe congenital heart disease

Recent Key References:

Barkovich AJ, Guerrini R, Kuzniecky RI, Jackson GD, Dobyns WB. A developmental and genetic classification for malformations of cortical development: update 2012. *Brain.* 2012 May; 135(Pt 5):1348-69.

Glenn OA, Cuneo AA, Barkovich AJ, Hashemi Z, Bartha AI, Xu D. Malformations of Cortical Development: Diagnostic Accuracy of Fetal MR Imaging. *Radiology.* 2012 Jun; 263(3):843-55.

Habas PA, Scott JA, Roosta A, Rajagopalan V, Kim K, Rousseau F, Barkovich AJ, Glenn OA, Studholme C. Early Folding Patterns and Asymmetries of the Normal Human Brain Detected from *in Utero* MRI. *Cereb Cortex.* 2012 Jan; 22(1):13-25.

Loh KC, Jelin E, Hirose S, Feldstein V, Goldstein R, Lee H. Microcystic Congenital Pulmonary Airway Malformation with Hydrops Fetalis: Steroids vs Open Fetal Resection. *J Pediatr Surg.* 2012 Jan; 47(1):36-9.

Saadai P, Jelin EB, Nijagal A, Schecter SC, Hirose S, Mackenzie TC, Rand L, Goldstein R, Farrell J, Harrison M, Lee H. Long-term Outcomes after Fetal Therapy for Congenital High Airway Obstructive Syndrome. *J Pediatr Surg.* 2012 Jun; 47(6):1095-100.

Tam EW, Haeusslein LA, Bonifacio SL, Glass HC, Rogers EE, Jeremy RJ, Barkovich AJ, Ferriero DM. Hypoglycemia is Associated with Increased Risk for Brain Injury and Adverse Neurodevelopmental Outcome in Neonates at Risk for Encephalopathy. *J Pediatr.* 2012 Jul; 161(1):88-93.

Tymofiyeva O, Hess CP, Ziv E, Tian N, Bonifacio SL, McQuillen PS, Ferriero DM, Barkovich AJ, Xu D. Towards the "baby connectome": mapping the structural connectivity of the newborn brain. *PLoS One.* 2012; 7(2):e31029.

PEDIATRIC RADIOLOGY

John Mackenzie, MD, Chief

Research Directions:

The mission of the Pediatric Radiology section is to improve the health of children through advanced clinical imaging and research. The section studies pediatric disease through the lens of imaging and is focused on the development of new imaging technologies. Several ongoing basic science and clinical studies are underway with collaborations with MRI physics, pediatric oncology, pediatric gastroenterology, and pediatric surgery. Examples of research in the Pediatric Radiology section include:

- Novel contrast media for use in tumor detection and angiogenesis
- Hyperpolarized 13C MRSI for detection and treatment monitoring of inflammatory arthritis
- High-resolution MRI for characterization of congenital rectal floor abnormalities.

Recent Key References:

Courtier JL, Perito ER, Rhee S, Tsai P, Heyman MB, Mackenzie JD. Targeted MRI Contrast Agents for Pediatric Hepatobiliary Disease. *J Pediatr Gastroenterol Nutr.* 2012 Apr; 54(4):454-62.

Gu JT, Nguyen L, Chaudhari AJ, MacKenzie JD. Molecular Characterization of Rheumatoid Arthritis with Magnetic Resonance Imaging. *Top Magn Reson Imaging.* 2011 Apr;22(2):61–9. Review.

Mackenzie JD, Hernandez A, Pena A, Ruppert K, Khrichenko D, Gonzalez L, Jawad AF, Wells L, Smith-Whitley K, Jaramillo D. Magnetic Resonance Imaging in Children with Sickle Cell Disease–Detecting Alterations in the Apparent Diffusion Coefficient in Hips with Avascular Necrosis. *Pediatr Radiol.* 2012 Jun; 42(6):706–13.

Nijagal A, Jelin E, Feldstein VA, Courtier J, Urisman A, Jones KD, Lee H, Hirose S, Mackenzie TC. The Diagnosis and Management of Intradiaphragmatic Extralobar Pulmonary Sequestrations: A Report Of 4 Cases. *J Pediatr Surg.* 2012 Aug; 47(8):1501–5.

RADIOLOGY OUTCOMES RESEARCH LABORATORY

Rebecca Smith-Bindman, Director

Research Directions:

The main objective of the Radiology Outcomes Research Laboratory (RORL) is to rigorously evaluate the benefits and harms of medical imaging that uses ionizing radiation to identify ways to improve patient safety.

- Demonstrate, through high-quality clinical and observational research, the impact of medical imaging on patient health, both beneficial and harmful
- Improve the performance of diagnostic imaging tests by conducting clinical trials that provide the evidence for appropriate and safe use
- Identify problematic trends in imaging, their potential impacts on patient safety and the healthcare system, and propose solutions
- Educate healthcare professionals on the current evidence-based techniques for maximizing image quality while simultaneously improving patient safety
- Engage healthcare providers in purposeful quality initiatives that have an immediate positive impact on the healthcare system and patient safety

The RORL is dedicated to providing rigorous evidence on the value of medical imaging that uses ionizing radiation to allow patients and their providers to engage in meaningful shared decision making around medical imaging. Our goal is to understand the impacts of diagnostic medical imaging and lessen the impacts of imaging when the costs outweigh the benefits.

Recent Key References:

Smith-Bindman R. Environmental Causes Of Breast Cancer And Radiation From Medical Imaging: Findings From The Institute Of Medicine Report. *Arch Intern Med.* 2012 Jul 9; 172(13):1023–7.

Smith-Bindman R, Miglioretti DL, Johnson E, Lee C, Feigelson HS, Flynn M, Greenlee RT, Kruger RL, Hornbrook MC, Roblin D, Solberg LI, Vanneman N, Weinmann S, Williams AE. Use of Diagnostic Imaging Studies and Associated Radiation Exposure for Patients Enrolled in Large Integrated Health Care Systems, 1996–2010. *Diagnostic Imaging and Radiation Exposure. JAMA.* 2012 Jun 13; 307(22):2400–9.

Smith-Bindman R, Lipson J, Marcus BA, Kim KP, Mahadevappa M, Gould R, Berrington de Gonzalez A, Miglioretti DL. Radiation Dose Associated with Common Computed Tomography Examinations and the Associated Lifetime Attributable Risk of Cancer. *Arch Intern Med,* 2009; 169(22): 2078-2086.

Smith-Bindman R, Miglioretti DL, McCollough CH, Leng S, Yu L, Cody DD, Boone JM, McNitt-Gray MF. CTDIvol, DLP, and Effective Dose Are Excellent Measures for Use in CT Quality Improvement. *Radiology.* 2011 Dec; 261(3):999.

SAN FRANCISCO GENERAL HOSPITAL
Mark W. Wilson, MD, Chief

Research Directions:

- Imaging evaluation of pulmonary embolism, particularly the ability of CT pulmonary angiography to predict outcomes in patients with pulmonary embolism
- Utility of imaging for diagnosis in AIDS patients
- Functional evaluation of pulmonary nodules in patients with suspected lung carcinoma, imaging of mesothelioma
- Imaging recurrent pyogenic cholecystitis and cholangitis
- Imaging trauma to the spine and spinal cord, chest, abdomen, and extremitites
- Exploring MR sequences before and after gadolinium for focal hepatic lesions
- Neutral versus positive oral contrast in abdominal imaging
- Evaluating and maintaining atypical dialysis access grafts and fistulas
- Outcomes of transcatheter embolization for treatment of hemorrhagic complications of pregnancy termination
- Evaluating evolving techniques for transcatheter embolization for pelvic trauma
- Magnetic catheter manipulation in the MRI environment
- Proliferation of ultrasound in underdeveloped countries
- Global health care initiatives
- Internet applications in radiology
- Evaluating patterns of infection by atypical mycobacteria
- Evaluating HRCT features of interstitial lung disease in the setting of hypersensitivity pneumonitis
- Imaging and computer-aided assessment of traumatic brain injury
- Optimizating hepatic MRI and CT imaging parameters
- Transcatheter treatment of pelvic hemorrhage: post-traumatic, post-partum, and post-abortion.

Recent Key References:

Gean AD. Traumatic Brain Injury, CQ (Congressional Quarterly), Published by CQ Press (division of SAGE Publications), June 2012, Volume 22, Number 20, Pages 477-500.

Hetts SW, Keenan KJ, Fullerton HJ, Young WL, English JD, Gupta N, Dowd CF, Higashida RT, Halbach VV. (2012) Pediatric Intracranial Non-Galenic Pial Arteriovenous Fistulas: Clinical Features, Angioarchitecture, and Outcomes. *AJNR Am J Neuroradiology.* Jul 5, 2012 [EPub]

Malone CD, Urbania TH, Crook SE, Hope MD. Bovine Aortic Arch: A Novel Association with Thoracic Aortic Dilation. *Clin Radiol.* 2012 Jan;67(1):28–31.

Muller L, Saeed M, Wilson MW, Hetts SW. Remote Control Catheter Navigation: Options for Guidance Under MRI. *J Cardiovasc Magn Reson.* 2012 Jun 1;14:33.

Saeed M, Hetts SW, Do L, Sullivan SM, Wilson MW. (2012) MDCT has the Potential to Predict Percutaneous Coronary Intervention Outcome in Swine Model: Microscopic Evaluation. *Acta Radiologica.* Sept 19, 2012. [epub]

Yuh EL, Cooper SR, Ferguson AR, Manley GT. Quantitative CT improves outcome prediction in acute traumatic brain injury. *J Neurotrauma.* 2012 Mar 20; 29:735-746.

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ULTRASOUND

Ruth B. Goldstein, MD, Chief

Research Directions:

- Prenatal diagnosis of CNS anomalies with ultrasound and MRI
- Further investigation of clinical manifestations and treatment of twin transfusion syndrome
- Prospective, randomized trial of repair of fetal myelomeningocele
- Prospective, randomized trial for selective ablation of connecting vessels in twin transfusion syndrome

Recent Key References:

Burger IM, Filly RA. Value of "Minimum Menstrual Age" in Determining Early Pregnancy Failure. *J Ultrasound Med.* 2011 Nov; 30(11):1553–9.

Courtier J, Schauer GM, Parer JT, Regenstein AC, Callen PW, Glenn OA. Polymicrogyria in a Fetus with Human Parvovirus B19 Infection: A Case with Radiologic–Pathologic Correlation. *Ultrasound Obstet Gynecol.* 2012 Feb [Epub]

Hecht EM, Yitta S, Lim RP, Fitzgerald EF, Storey P, Babb JS, Bani-Baker KO, Bennett GL. Preliminary Clinical Experience at 3 T with a 3D T2-Weighted Sequence Compared with Multiplanar 2D for Evaluation of the Female Pelvis. *AJR Am J Roentgenol.* 2011 Aug; 197(2):W346–52.

Jelin EB, Schecter SC, Gonzales KD, Hirose S, Lee H, Machin GA, Rand L, Feldstein VA. Guide Wire Assisted Catheterization and Colored Dye Injection for Vascular Mapping of Monochorionic Twin Placentas. *J Vis Exp.* 2011; (55):e2837.

Le T, Poder L, Deans A, Joe BN, Laros RK, Coakley FV. Magnetic Resonance Imaging of Cervical Ectopic Pregnancy in the Second Trimester. *J Comput Assist Tomogr.* 2012 Mar; 36(2):249–52.

Saadai P, Jelin EB, Nijagal A, Schecter SC, Hirose S, Mackenzie TC, Rand L, Goldstein R, Farrell J, Harrison M, Lee H. Long-term Outcomes after Fetal Therapy for Congenital High Airway Obstructive Syndrome. *J Pediatr Surg.* 2012 Jun; 47(6):1095–100.

VETERANS AFFAIRS MEDICAL CENTER DIAGNOSTIC RADIOLOGY

Judy Yee, MD, Chief

Research Directions:

- Dose reduction for screening and diagnostic CT colonography
- Stereoscopic 3D imaging clinical applications
- Spectral imaging, dual energy, and low kVp CT imaging
- CT and MR contrast timing and delivery in the abdomen and pelvis
- Eovist MR for the detection of hepatocellular carcinoma
- High-field MR imaging of the prostate
- Stroke prediction using intimal thickness on carotid ultrasound

Recent Key References:

Hope TA, Doherty A, Fu Y, Aslam R, Qayyum A, Brasch RC. Gadolinium Accumulation and Fibrosis in the Liver after Administration of Gadoxetate Disodium in a Rat Model of Active Hepatic Fibrosis. *Radiology.* 2012 Aug;264(2):423–7.

Johnson CD, Herman BA, Chen MH, Toledano AY, Heiken JP, Dachman A, Kuo MD, Menias C, Siewart B, Cheema JI, Obregon RG, Fidler JL, Zimmerman P, Horton KM, Coakley K, Iyer RB, Hara AK, Halvorsen RA, Casola G, Yee J, Blevins M, Herman BA, Burgart LJ, Limburg PJ, Gatsonis CA. The National CT Colonography Trial: Assessment of Accuracy in Participants Age 65 and Older. Radiology. 2012 May; 263: 401–408.

Mongan J, Rathnayake S, Fu Y, Wang R, Jones EF, Gao DW, Yeh BM. *In Vivo* Differentiation of Complementary Contrast Media at Dual-Energy CT. *Radiology* 2012 Jul 10. [Epub]

Prevrhal S, Forsythe CH, Harnish RJ, Saeed M, Yeh BM. CT Angiographic Measurement of Vascular Blood Flow Velocity by Using Projection Data. *Radiology* 2011 Dec;261:923–9.

Zalis ME, Blake MA, Cai W, Hahn PF, Halpern EF, Kazam IG, Keroack M, Magee C, Nappi JJ, Perez-Johnston R, Saltzman JR, Vij A, Yee J, Yoshida H. Diagnostic Accuracy of Laxative-Free Computed Tomographic Colonography for Detection of Adenomatous Polyps in Asymptomatic Adults: A Prospective Evaluation. *Ann Intern Med* 2012 May 15; 156: 692–702.

VETERANS AFFAIRS MEDICAL CENTER CENTER FOR IMAGING OF NEURODEGENERATIVE DISEASES

Michael W. Weiner, MD, Director

Research Directions:

The Center for Imaging of Neurodegenerative Diseases (CIND) is a research center dedicated to studying the causes and effects of neurodegenerative and psychiatric disorders, using imaging instruments such as MRI and PET machines. We currently have eight full-time faculty performing studies in various fields, including imaging of Alzheimer's disease, Parkinson's disease, depression, posttraumatic stress-disorder, Gulf War illness, and substance abuse. We also work on the development of novel powerful methods for brain MR, including spiral imaging and new approaches for processing and multivariate statistical analysis of brain imaging.

Our faculty is involved in large international imaging trials, such as the Alzheimer's Disease Neuroimaging Initiative (ADNI) and the Parkinson's Progression Marker Initiative (PPMI). The Center is developing new strategies for the prevention of neurodegenerative diseases. One initiative aims to develop a registry of aging individuals living in the San Francisco Bay Area. The ultimate goal for this project is the prevention of Alzheimer's and Parkinson's disease.

In the area of MRI and image processing, we work with different techniques including the following:

- Ultra-high resolution structural MRI
- Diffusion spectrum imaging
- Dynamic, arterial-spin-labeling imaging
- Resting-state functional MRI
- Susceptibility-weighted imaging
- Spectroscopic imaging and j-modulated spectroscopy
- Bayesian image reconstruction
- Multivariate image analysis methods

Recent Key References:

Chiang GC, Insel PS, Tosun D, Schuff N, Truran-Sacrey D, Raptentsetsang ST, Thompson PM, Reiman EM, Jack CR Jr, Fox NC, Jagust WJ, Harvey DJ, Beckett LA, Gamst A, Aisen PS, Petersen RC, Weiner MW. Impact of Apolipoprotein &4-Cerebrospinal Fluid Beta-Amyloid Interaction on Hippocampal Volume Loss Over 1 Year in Mild Cognitive Impairment. *Alzheimer Dementia.* 2011 Sep;7(5):514-20.

Durazzo, TC, Mon A, Gazdzinski, S, and Meyerhoff, DJ. Chronic Cigarette Smoking in Alcohol Dependence: Associations with Cortical Thickness and N-Acetylaspartate Levels in the Extended Brain Reward System. *Addiction Biology.* 2011 Nov 9. [Epub]

Schuff N, Tosun D, Insel PS, Chiang GC, Truran D, Aisen PS, Jack CR Jr, Weiner MW, Alzheimer's Disease Neuroimaging Initiative. Nonlinear Time Course of Brain Volume Loss in Cognitively Normal and Impaired Elders. *Neurobiol Aging.* 2012 May, 33(5):845-55. PMC3032014

Tosun D, Rosen H, Miller BL, Weiner MW, Schuff N. MRI Patterns of Atrophy and Hypoperfusion Associations across Brain Regions in Frontotemporal Dementia. *Neuroimage.* 2012 Feb1; 59(3):2098-109.

Weiner MW, Veitch DP, Aisen PS, Beckett LA, Cairns NJ, Green RC, Harvey D, Jack CR, Jagust W, Liu E, Morris JC, Petersen RC, Saykin AJ, Schmidt ME, Shaw L, Siuciak JA, Soares H, Toga AW, Trojanowski JQ; Alzheimer's Disease Neuroimaging Initiative. The Alzheimer's Disease Neuroimaging Initiative: A Review of Papers Published Since its Inception. *Alzheimers Dement.* 2012 Feb; 8(1 Suppl):S1-68, 2012.

VETERANS AFFAIRS MEDICAL CENTER
VASCULAR IMAGING RESEARCH CENTER

David Saloner, PhD, Director

Research Directions:

- Development of methods for visualization of complex flow in intracranial aneurysms
- Assessment of novel contrast agents in MR angiography
- Development of patient-specific models for review of endovascular therapies
- Analysis of plaque vulnerability using patient-specific, image based computational methods
- Development of 4-D MR velocimetry methods for determination in analyzing the impact of hemodynamics on vascular disease progression

Recent Key References:

Boutchko R, Rayz VL, Vandehey NT, O'Neil JP, Budinger TF, Nico PS, Druhan JL, Saloner DA, Gullberg GT, Moses WW. Imaging and Modeling of Flow in Porous Media using Clinical Nuclear Emission Tomography Systems and Computational Fluid Dynamics. *Journal of Applied Geophysics.* 76 (1): 74–81

Guo Y, Saunders T, Su H, Kim H, Akkoc D, Saloner DA, Hetts SW, Hess C, Lawton MT, Bollen AW, Pourmohamad T, McCulloch CE, Tihan T, Young WL; for the University of California, San Francisco Brain Arteriovenous Malformation (UCSF BAVM) Study Project. Silent Intralesional Microhemorrhage as a Risk Factor for Brain Arteriovenous Malformation Rupture. *Stroke.* 2012 May;43(5):1240-6.

Hasan DM, Mahaney KB, Magnotta VA, Kung DK, Lawton MT, Hashimoto T, Winn HR, Saloner D, Martin A, Gahramanov S, Dósa E, Neuwelt E, Young WL. Macrophage Imaging Within Human Cerebral Aneurysms Wall Using Ferumoxytol-Enhanced MRI: A Pilot Study. *Arterioscler Thromb Vasc Biol.* 2012 Apr;32(4):1032-8.

Wong VM, Wenk JF, Zhang Z, Cheng G, Acevedo-Bolton G, Burger M, Saloner DA, Wallace AW, Guccione JM, Ratcliffe MB, Ge L. The Effect of Mitral Annuloplasty Shape in Ischemic Mitral Regurgitation: A Finite Element Simulation. *Ann Thorac Surg.* 2012 Mar;93(3):776-82.

Zhang Z, Sun K, Saloner DA, Wallace AW, Ge L, Baker AJ, Guccione JM, Ratcliffe MB. The Benefit of Enhanced Contractility in the Infarct Borderzone: A Virtual Experiment. *Front Physiol.* 2012;3:86. [Epub]

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WOMEN'S IMAGING

Bonnie N. Joe, MD, PhD, Chief

Research Directions:

- MRI, optical imaging, and X-ray mammography for breast cancer screening and surveillance, diagnosis and tissue characterization for risk assessment, cancer staging, and treatment response assessment
- New techniques in MRI-guided biopsy and imaging protocols
- Quantitative assessment of breast density and breast cancer risk models
- Digital breast tomosynthesis
- MRI/MRS for assessing tumor response to neo-adjuvant chemotherapy for patients with locally advanced breast cancer
- Biomarker development using advanced breast MR techniques

Recent Key References:

Arasu VA, Joe BN, Lvoff NM, Leung JW, Brenner RJ, Flowers CI, Moore DH, Sickles EA. Benefit of Semiannual Ipsilateral Mammographic Surveillance Following Breast Conservation Therapy. *Radiology.* 2012 Aug;264(2):371–7.

Haneuse S, Buist DS, Miglioretti DL, Anderson ML, Carney PA, Onega T, Geller BM, Kerlikowske K, Rosenberg RD, Yankaskas BC, Elmore JG, Taplin SH, Smith RA, Sickles EA. Mammographic Interpretive Volume and Diagnostic Mammogram Interpretation Performance in Community Practice. *Radiology.* 2012 Jan;262(1):69–79.

Meyerson AF, Lessing JN, Itakura K, Hylton NM, Wolverton DE, Joe BN, Esserman LJ, Hwang ES. Outcome of Long Term Active Surveillance for Estrogen Receptor-Positive Ductal Carcinoma *in Situ*. *Breast.* 2011 Dec;20(6):529–33.

Price, E., and Morris, E. MRI-Guided Breast Biopsies – Tips And Tricks. *Canadian Association of Radiology Journal.* 2011. 62(1): 15–21.

Singer L, Wilmes LJ, Saritas EU, Shankaranarayanan A, Proctor E, Wisner DJ, Chang B, Joe BN, Nishimura DG, Hylton NM. High-Resolution Diffusion-Weighted Magnetic Resonance Imaging in Patients with Locally Advanced Breast Cancer. *Acad Radiol.* 2012 May;19(5):526–34.

Yitta S, Mausner EV, Kim A, Kim D, Babb JS, Hecht EM, Bennett GL. Pelvic Ultrasound Immediately Following MDCT in Female Patients with Abdominal/Pelvic Pain: Is it Always Necessary? *Emerg Radiol.* 2011 Oct;18(5):371–80.

Grants and Fellowships

Grants

Elias H. Botvinick, MD

- Lantheus Medical Imaging; A Phase 3, Open-Label, Multicenter Study for the Assessment of Myocardial Perfusion using Positron Emission Tomography (PET) Imaging of Flurpiridaz F18 Injection in Patients with Suspected or Known Coronary Artery Disease (CAD), 1/18/12–3/31/14, $140,006.00

Linda Chao, PhD

- Department of Defense; Investigation of the Links Between PTSD and Dementia, 09/30/11–09/29/13, $151,232.00

Daniel L. Cooke, MD

- Aneurysm and AVM Foundation; The Endovascular biopsy: Evaluation of Technical Feasibility, 5/1/12–4/30/14, $12,500.00

Randall A. Hawkins, MD

- Children's Hospital of Los Angeles; New Approaches to Neuroblastoma Therapy (NANT) Clinical Trials, 1/1/11–5/31/11, $9,000.00

Michael D. Hope, MD

- Radiological Society of North America; Comprehensive Hemodynamic Assessment of Valve-related Aortic Disease with Cardiac Magnetic Resonance, 7/1/12–6/30/13, $76,000.00

Nola M. Hylton, PhD

- American College of Radiology; MR Imaging Biomarkers for Assessment of Breast Cancer, 1/1/11–12/31/11, $10,000.00

Thomas F. Lang, PhD

- Wyle Corporate; Analysis of CT scan for NASA Bed Rest Study, 2/1/12–1/31/13, $15,000.00
- Universities Space Research Association; Bisphosphonates as a Countermeasure to Space Flight Induced Bone Loss, 10/1/11–9/30/12, $20,000.00

Xiaojuan Li, PhD

- Maine Medical Center; Interdisciplinary Study of Marrow Adiposity, Mineral Metabolism And Energy Balance, 9/30/11–6/30/12, $10,000.00

Jing Liu, PhD

- American Heart Association; 4D Cardiac MRI Development, $140,000.00, 07/01/2012–06/30/2014

John D. Mackenzie, MD

- NIH National Institute Arthritis, Musculoskeletal and Skin Diseases; Molecular Imaging for Detection and Treatment Monitoring of Arthritis, 7/1/12–6/30/13, $126,090.00

Sharmila Majumdar, PhD

- GE Healthcare; Improved Quantitative and Real Time MR Imaging, 10/1/11–10/31/13, $250,068.00

Dieter Meyerhoff, PhD

- NIH National Institute on Alcohol Abuse and Alcoholism; The Biological Basis of Alcohol-and Smoking-Induced Brain Injury, 09/01/12–08/31/17, $1,506,586.00

Sarah Nelson, PhD

- GlaxoSmithKline (GSK); Quantification of Hyperpolarized C-13 Metabolic Data, 12/7/11–12/30/14, $491,182.00
- NIH National Cancer Institute, Response to Therapy For Patients With Glioma Using Hyperpolarized C-13 Pyruvate, 7/23/12–6/30/13, $320,588.00

Viola Rieke, PhD

- GE Healthcare; Development of MR Techniques For MR Guided Focused Ultrasound (MRg-FUS) and Real Time Imaging, 1/1/12–12/31/13, $149,940.00
- Stanford University; MRI Methods for Guiding Focused Ultrasound in the Brain, 4/1/12–3/31/13, $28,776.00
- NIH National Heart, Lung and Blood Institute; MRI-Guided Cardiac Focused Ultrasound Ablation, 6/21/12–5/31/13, $249,000.00

Sabrina M. Ronen, PhD

- NIH National Cancer Institute; MR Imaging of Isocitrate Dehydrogenase (IDH) Mutational Status in Brain Tumors, 4/2/12–3/31/13, $201,623.00

Norbert Schuff, PhD

- Michael J. Fox Foundation for Parkinson's Research; Diffusion Tensor Imaging Processing and Group Analysis, 9/9/10–9/8/11, $18,750.00

John A. Shepherd, PhD

- NIH National Cancer Institute; The Breast Radiology Evaluation and Study of Tissues (BREAST) Stamp Project, 8/25/11–8/24/12, $91,688.00
- NIH National Cancer Institute; Subregional Breast Density and Cancer Risk, 3/1/12–2/28/13, $200,014.00
- PHS Centers for Disease Control; Dual Energy X-Ray Absorptiometry (DXA) Scan Analysis, 1/1/12–12/31/12, $143,847.00

Rebecca Smith-Bindman, MD

- UC Center for Health Quality and Innovation Standardization and Optimization of Computed Tomography, 7/1/11–6/30/12, $250,000.00

Henry F. VanBrocklin, PhD

- iTi Health, Inc.; Developing a Plectin-1 Targeted Imaging Agent for the Detection of Pancreatic Cancer, 2/10/12–7/31/12, $70,792.00
- Cancer Targeted Technology, LLC; Probe Development for Prostate Cancer, 7/2/11–8/30/12, $119,379.00
- University of Montana; PET Imaging Agents – ALS Therapy, 4/1/12–6/30/12, $83,506.00

Michael Weiner, MD

- Alzheimer's Association; ADNI 2 add-on project: Hippocampal Subfield Volumetry, 07/01/12–06/30/15, $454,545.00

David M. Wilson, MD, PhD

- NIH National Cancer Institute; Ascorbate-Based Biomarkers for Predicting Radiation Response in Prostate Cancer, 4/24/12–3/31/13, $500,056.00

Benjamin M. Yeh, MD

- NIH National Institute of Biomedical Imaging and Bioengineering; Complementary Injectable Tungsten Contrast for Dual Contrast Dual Energy CT, 4/1/12–3/31/13, $231,750.00

Fellowships

Kayvan R. Keshari, PhD

- NIH National Institute of Biomedical Imaging and Bioengineering; Human Tissue Culture Bioreactor and Hyperpolarized MR for Biomarker Discovery, 8/1/12–7/31/13, $87,686.00

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