



Foundation FOCUS

VOL. 1, NO. 3
A quarterly
publication of
the Radiological
Society of North
America Research
& Education
Foundation

Early Funding Puts Scientist on Ground Floor of Spiral CT

R&E Scholar Geoffrey Rubin Helps Develop CT Angiography, 3-D Imaging

GEOFFREY RUBIN, M.D., TOOK AN EARLY interest in research, writing and presenting his first research papers at the RSNA annual meeting as a second-year resident. But it took some convincing to believe a career in academia was for him.

"I have a lot of respect for the giants who have contributed to the field of radiologic research," said Dr. Rubin, now professor of Radiology at Stanford University School of Medicine and Chief of Cardiovascular Imaging. "I didn't think I could necessarily walk with them. It took me a long time to believe that I could follow in their path."

In 1994, Dr. Rubin earned a RSNA/GE Medical Systems Research Scholar Grant. Combined with another career development grant, the R&E funding gave Dr. Rubin the critical mass to win a \$2 million R01 grant from the NIH, the first of two he has received during his career.

"It's critical to build a portfolio of research and a track record of success in order to be competitive for federal grants," said Dr. Rubin, adding that the type of support offered by the R&E Foundation is unique.

"The R&E Foundation support is fantastic, it has the most opportunities to offer radiologists," he said. "It's a safe haven for research support."

Armed with funding and on faculty at Stanford, Dr. Rubin was able to get in on the ground

floor of a new technology—spiral CT. His research helped replace catheter angiography with the highly effective, less invasive CT angiography, now the primary tool for diagnosing aortic and vascular diseases.

"It was exciting to be part of a groundbreaking technology," said Dr. Rubin. "I have found my research very gratifying."

There's no question that Dr. Rubin, who also helped establish one of the first 3-D labs in the country, has blazed his own trail

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Geoffrey Rubin, M.D.



GEOFFREY RUBIN, M.D.

in the last decade and a half. In addition to studying the effect of CAD on coronary CT angiography and investigating the use of CAD in detecting lung nodules, he has a new textbook on CT and MR angiography due to be published this winter.



"It is only fitting that I give back to a specialty that has revolutionized healthcare and to those coming behind us who are entrusted with securing its continued success and commitment to furthering quality patient care."

Gilda Cardenosa, M.D.
Bronze Visionary Donor

2007 Grant Recipient Highlights

Part three in the series of 2007 grant recipients includes the projects of Dr. Michael Kuo and Dr. Patrick Bolan who were presenters at RSNA 2007. A complete listing of grant projects can be found at RSNA.org/Foundation.

Ivy Petersen, M.D.

GE Healthcare/RSNA Educational Scholar Grant
Technical and Professional Skill Development Within Radiation Oncology

Michael D. Kuo, M.D.

Bracco Diagnostics/RSNA Research Scholar Grant
Assessing Global Gene Expression Programs of Cancer Using Non-Invasive Imaging

Patrick J. Bolan, Ph.D.

Carestream Health/RSNA Research Scholar Grant
Monitoring Chemotherapy Response in Metastatic Liver Lesions with Quantitative ¹H MRS

Despina Kontos, Ph.D.

Siemens Medical Solutions/RSNA Research Fellow Grant
Computer-Assisted Risk Estimation (CARE) from Breast Tomosynthesis Images

Justin P. Hart, M.D., Ph.D.

Cook Incorporated Cesare Gianturco/RSNA Research Resident Grant
Radiation-Induced Immunotherapy: Characterization of the Systemic, Anti-Tumor Immune Response Generated Following Coadministration of an Immunoadjuvant, CpG-Oligodeoxynucleotides, with Radiation Therapy

Randall Kimple, M.D., Ph.D.

Philips Medical Systems/RSNA Research Resident Grant
Characterization of HER4, a Multifunctional Signaling Protein Involved in Breast Cancer Radiation Response

Jeffrey Lin, M.D., Ph.D.

Toshiba Medical Systems/RSNA Research Resident Grant
Noninvasive Characterization of NFκB Activation in Non-Alcoholic Fatty Liver Disease

Samuel Wang M.D., Ph.D.

RSNA Research Resident Grant
Cost-Effectiveness Analyses of Radiotherapy for Gastrointestinal Malignancies

Arvind Pathak, Ph.D.

Toshiba Medical Systems/RSNA Research Seed Grant
Vascular Phenotyping of Brain Tumors Using Magnetic Resonance Microscopy

Michael P. Greenbaum, Ph.D.

FUJIFILM Medical Systems/RSNA Research Medical Student Grant
Evaluation of Locoregional Recurrence (LRR) Before and After Implementation of a Computer Tomography (CT)-Based Treatment Planning in Post-Mastectomy Radiation Therapy (PMRT)

Suneet Pramanik, B.S., B.A.

RSNA Research Medical Student Grant
Quantitative Analysis of FDG-PET-MRI Fusion and DTI to Determine the Epileptogenic Region in Children with Tuberous Sclerosis

George Lin, M.S.

RSNA Research Medical Student Grant
Analysis of Cardiac MR Imaging Sequences for Optimal Detection of Intracardiac Thrombi

Christopher R. Spencer, M.S., B.S.

RSNA Research Medical Student Grant
Identification of Molecular Markers Associated with Poor Prognosis in Tumors of the Uterine Cervix

Ken Y. Lin, B.S.

RSNA Research Medical Student Grant
Imaging Pancreatic Cancer Vascular Phenotypes to Determine Tumor Genotype-Specific Responsiveness to TGF-β Inhibitor Using Intravital Fiber-Optic Confocal Microcatheter and Fractal Analysis

Christopher Takehana, B.S.

RSNA Research Medical Student Grant
TRIP-MRI Monitoring of Hepatic Tumor Perfusion Changes Following Therasphere and SIR-Sphere Radioembolization

Anna M. Weined, B.A.

RSNA Research Medical Student Grant
Critical Functional Pathway Sparing Approach in Brain Radiotherapy



The R&E Foundation would like to thank the following practices who joined the Visionaries in Practice program in 2007:

Asheville Radiology Associates, Asheville, NC	Irvington Radiologists Indianapolis, IN
Eastern Radiologists Greenville, NC	South Jersey Radiology Associates Cherry Hill, NJ
Greensboro Radiology, P.A., Greensboro, NC	Radia Everett, WA
Hazard Radiology Associates Hazard, KY	

“If we are lagging behind in research, radiologists will not be credible. As a result, patients and physicians will not look at us with the same degree of respect.”

Jean-François Geschwind, M.D.
2000 RSNA Research Seed Grant Recipient



Thriving Washington Radiology Group *Gives Back*

Radia Partners with Hospitals, Physicians and R&E

IN HIS BEST SELLING BOOK *GOOD TO GREAT*, author Jim Collins says one of the requirements for corporate success is being passionate about your product or service.

As president of Radia, the largest radiology group in the Pacific Northwest, Jack Little, M.D., is keenly focused on providing state-of-the-art radiology services. But he's passionate about collaboration—both within Radia's radiology and vascular surgery practice and within the group's partnerships with other healthcare providers.

Established in 1997 with the merger of two separate radiology practices, Radia has grown to serve 10 hospitals as well as outpatient facilities and clinics across the state of Washington. The group offers a full range of services including PET, CT, MR, US, vascular surgery and interventional radiology.

“In our company culture, every employee has value,” said Dr. Little. “Our goal is to create a community in which people can operate effectively.”

For members of the Radia group, that often means working in tandem with others who are equally focused on providing efficient, patient-centered care.

“We have a sense of stewardship toward the profession. We believe we have a responsibility to give back. The R&E Foundation will ultimately impact and further the practice of radiology.”

JACK LITTLE, M.D.



“Our goal is to increase our interaction with our customers, to help them to solve their problems and to make their practices work better,” he said.

Physicians using Radia's services rely on the fact that the group's 70 radiologists represent virtually every subspecialty—and that they are always at-the-ready. So that subspecialists can consult on complex patient cases from wherever they are in the system, Radia has made a significant investment to connect all of its facilities via teleradiology—branded teleRadia™ by the group.

To provide comprehensive vascular care, Radia combined the expertise of vascular surgeons and interventional radiologists to create the Radia Center for Vascular Disease, which provides diagnosis and treatment of diseases of the circulatory system.

With Radia's success comes a desire for yet another partnership—with the R&E Foundation. In 2007, Radia joined the Visionaries in Practice program as a Silver Member.

“We have a sense of stewardship toward the profession,” Dr. Little said. “We believe we have a responsibility to give back. The R&E Foundation will ultimately impact and further the practice of radiology,” he added. “We want to help the field continue to thrive.”



“Research lays the foundation for what will be done clinically in the future and who will do it.”

Pamela K. Woodard, M.D.

1996 Siemens Medical Solutions/RSNA Research Fellow Grant Recipient

1999 Eastman Kodak/RSNA Research Scholar Grant Recipient

VANGUARD COMPANY PROFILE

GE's Early Health Mission Translates into Innovation

Gemstone CT Detector, Volume US Dazzle at RSNA

IT WAS HARD TO MISS GE HEALTHCARE AT the 2007 RSNA Annual Meeting. Not only was the booth the largest ever for the company at 37,000 square feet, but it also featured the GE Gemstone, a molecularly altered garnet that, when placed under a blue light, gleamed brilliant yellow.

GE scientists are reformulating new CT detector material for the first time in 20 years, using some 4,600 carats of the new gemstone to improve spatial resolution by 30%, creating high-definition CT, or HDCT.

The innovation was just one of the many facets of the GE exhibition, which also highlighted PET/CT, mammography, breast MR, bone densitometry and ultrasound.

Eight different applications were represented in GE's ultrasound area,

where the big development was 4-D, or volume US with the addition of a square-shaped transducer and CAD. Answering the buzzwords of the day—workflow and efficiency—the GE US suite boasted the ability to quickly process images at

a computer workstation instead of at the US unit, freeing up the machine for additional exams.

Olympic athletes, rehab centers and professional sports teams are among the customers of the company's new iDEXA machine,

which performs both bone density as well as body composition scans. In just minutes the iDEXA can provide patients weighing up to 450 pounds with highly accurate fat and muscle assessments.

GE Healthcare



The GE mission of 'Early Health'—using advances in imaging and diagnostics to find and treat disease earlier—was evident throughout the exhibit and in the company's total commitment

to RSNA. In 2007, GE continued its participation in the R&E Foundation's Vanguard program, supporting three scholar grants and one fellow grant. Since 1989, GE has been one of the largest Vanguard supporters.

“Our support of the Foundation is critically important and one of the many things we do to support RSNA and the industry as a whole,” said Sean Burke, Chief Marketing Officer, Diagnostic Imaging. “Our partnership with the R&E Foundation allows us to invest in clinical practice and in the future of the radiologic profession.”

.....
“The Vanguard Program brings us together with today's thought leadership in radiological research and allows us to affect patient care.”

SEAN BURKE, GE HEALTHCARE

“Foundation awards to young investigators have helped launch many academic careers.”

Ritsuko Komaki, M.D. & James D. Cox, M.D.
Silver Visionary Donors



EXHIBITORS CIRCLE PROFILE

Partnering with Radiologists, NightHawk Helps Practices Run Smoother

NIGHTHAWK RADIOLOGY SERVICES IS accomplishing its mission to improve both patient care *and* the lives of radiologists. Founded by Paul Berger, M.D., in 2001, the company has grown more than 1,000 percent in little more than five years.

When he retired as the head of the largest radiology group in California, Dr. Berger realized he could provide a service to other radiology groups by using teleradiology in a way that would eliminate the need for radiologists to work through the night while allowing other radiologists to live and work in attractive cities.

Half of the company's 115 United States board-certified, state-licensed radiologists are located in Sydney, Australia, and Zurich, Switzerland, where they read imaging

examinations performed in U.S. hospitals during the night. The company has also expanded stateside with facilities in San Francisco to help its radiologist partners with daytime overflow readings, as well as a 3-D imaging facility in Austin, Texas, where CT reconstructions of the heart are performed.

“One of Dr. Berger's goals has always been to improve patient care and the lives of radiologists,” said Scott Giordanella, Director of Marketing. “Eliminating overnight reading makes a big difference in a practice. We become an extension of the radiology group and often make it possible for a group to expand and obtain other contracts.”

Using Talon, an advanced, proprietary clinical workflow technology, NightHawk has quickly gained a reputation for high efficiency and quality. The company also has a new

business services unit offering revenue cycle management, human resources, contract negotiation and other consulting services to help radiology practices in their day-to-day management.

“Being fast and efficient helps both the radiologist and patient care,” said Mr. Giordanella. “We're able to save our radiologists a lot of administrative work and give them more time to do what they do best—read studies.”

In 2007, NightHawk was a member of the R&E Foundation Exhibitors Circle at the Platinum level. Dr. Berger has been an RSNA member for more than 25 years.

“One of the reasons we've grown as a company is our participation in RSNA,” said Mr. Giordanella. “NightHawk will continue to partner with our radiologists and the Research and Education Foundation of the RSNA to advance the practice of Radiology.”



NEWS

RRRE Continues to Revitalize Academic Research Programs

Since its launch in 1999, it has been the goal of the RSNA-supported Revitalizing the Radiology Research Enterprise (RRRE) to invigorate the research programs of academic departments of radiology, radiation oncology, and nuclear medicine around the country. Held every 2 years, RRRE consists of a 1.5-day program at RSNA headquarters in Oak Brook, IL, followed by an on-site visit to a selected group of departments by a team of experts to help guide those departments

in developing a research plan. The program is designed to help academic radiology departments strengthen their research infrastructure and clarify their strategic direction in regard to radiology research. Strong academic departments are the cornerstone of successful grant funding and subsequent research.

Numerous members of R&E Foundation leadership participated in the most recent workshop to show their support of this important program.

New Pacesetters Keep Campaign Going Strong

The Foundation welcomed the following individuals as Campaign Pacesetters at RSNA 2007.

- Teresita L. Angtuaco, M.D. & Edgardo J. Angtuaco, M.D.
- Betty & O. Wayne Houser, M.D.
- Bonnie Barnett & Robert L. Kagan, M.D.
- Lilian Leong, M.D. & C.H. Leong, M.D.
- Hedvig Hricak, M.D., Ph.D. & Alexander Margulis, M.D.

- Thomas N. McCausland
- Barbara Carter, M.D. & Jeffery Moore, M.D.
- Sherry & Michael Raskin, M.D., M.P.H., J.D.

The Foundation is looking for individuals to help keep the pace of the campaign steady until it reaches the \$15 million goal. Individuals making pledges of \$25,000 will be recognized as Pacesetters and receive special benefits through the campaign's end in 2009.

EXHIBITORS CIRCLE PROFILE

Medtronic: Bridging the OR and Imaging Suite

FOLLOWING IN THE FOOTSTEPS OF THE ENGINEER and inventor who founded the company in 1949, Medtronic, Inc., is keeping the spirit of collaboration alive. With a division called Navigation, the \$12.3 billion company is developing yet another area of therapy and building a bridge between the surgical suite and radiology.

"Medtronic specializes in a wide array of medical device technologies that treat various chronic conditions. The Navigation division is focused on surgical tools and we look to partner with the radiology community," said Brent Ness, Vice-President, Global Sales and Marketing Services.

The Navigation division at Medtronic has introduced two intra-operative solutions that provide immediate and dynamic decision sup-

port in the operating suite. The PoleStar® iMRI Navigation Suite provides compact intra-operative MR image guidance for cranial tumor resections.

The O-ARM® Intra-Operative Imaging System is a multi-dimensional surgical imaging platform that offers 2D fluoroscopy and 3D volumetric imaging for spine and orthopedic surgeries.

"The O-ARM® System is one of the most exciting inventions because it provides full 360-degree, volumetric 3-D imaging in the OR with the ergonomic advantage of the C-arm," said Mr. Ness.



Medtronic

Alleviating Pain • Restoring Health • Extending Life

Radiologists got a first look at the intra-operative imaging systems at the 2007 RSNA annual meeting, where the Navigation business was a first-time exhibitor.

"To advance the frontier of healthcare we must recognize that information is a principal component to improving lives," said Mr. Ness. "And radiology is all about information."

Each year, Medtronic spends more than

\$1 billion in research and development—an investment that now includes

support of the R&E Foundation. Medtronic became a Platinum member of the Exhibitors Circle in 2007.

EXHIBITORS CIRCLE PROFILE

Photoshop CS3 Helps Physicians Prepare DICOM Images for Publication, Presentation

SINCE IT WAS INTRODUCED 17 YEARS ago, the digital image editing and creation software known as Photoshop® has become the preferred tool for graphic designers and photographers all over the world. At the same time, Photoshop also began migrating into the desktops of all types of working professionals, from architects and concept designers to moviemakers in Hollywood—and now, members of the medical community.

Adobe Systems, Inc., has responded by engaging in an ongoing dialog with medical users and creating a special version of the software that meets their unique needs. Photoshop CS3 was introduced last spring with a host of new features—and a special extended version with extra capabilities for image analysis and video support just for the medical community.



"Photoshop CS3 Extended meets the needs of medical providers to print, publish and share medical images," said Chitra Mittha, Senior Product Marketing Manager at Adobe. "It can make significant improvements in the quality of images used in medical research

and education."

Photoshop CS3 Extended allows DICOM images to be imported directly into Photoshop, where they can be prepared for publication.

That's great news for researchers and educators who serve as their own photographer and image processor.

"Until now, it has been woefully difficult to improve medical images," explained Joseph M. Bailey, M.D., a radiologist from Montgomery, Alabama. "It's a task that requires a different

set of tools than what we've had."

Dr. Bailey is a member of the Biomedical Imaging Advisory Group, a voluntary group of medical professionals and researchers that help Adobe fine-tune its offerings to the medical community.

"Authors need to be able to control the

..... images they use for education because it's easy for subtle findings to get lost in the publication process," he said. "Photoshop gets you the best images possible."

CHITRA MITTHA, ADOBE

Adobe is also supporting radiologists by investing in RSNA by becoming a first-time annual meeting exhibitor and a Gold member of the R&E Foundation Exhibitors Circle in 2007.

"We want to support what's important to the medical community," said Ms. Mittha.

Seed Grant Launches Career of Pioneering Researcher

MR Angiography Expert Martin Prince Began with R&E Grant

MARTIN PRINCE, M.D., PH.D., RECEIVED HIS FIRST GRANT, to attend an astronaut training program, as a high school student. But it was his second grant, this time from the RSNA R&E Foundation, that was life changing for Dr. Prince—and anyone who has needed MR angiography in the last decade or so.

Dr. Prince's career, which has progressed like a series of perfectly placed dominos, began with a Research Resident Grant from the R&E Foundation that enabled him to study laser atherectomy—a treatment for the build up of plaque in the body's major arteries. That award, which Dr. Prince received as a resident at Massachusetts General Hospital in 1991, led to an R01 grant from the National Institutes of Health.

When the laser procedure collapsed as a viable treatment option during the young doctor's studies, he focused instead on MR angiography and the use of the contrast agent gadolinium to help produce vascular images without the use of a catheter.

"A lot of people were trying to use gadolinium to get pictures of blood vessels but it was problematic in that all the veins and vessels and capillaries would light up," explained Dr. Prince.

Using a computer purchased with grant money, he performed modeling of the contrast distribution throughout the body and eventually adjusted the dose and timing of the contrast injection to produce spectacular high-contrast angiograms.

His pioneering work not only led to a significant change in the profession—making noninvasive MR angiography a routine procedure—it also launched Dr. Prince's career, which has included nearly 100 published papers and books, 26 patents and a full professorship at the Weill Medical College of Cornell University.

And it all began with one small grant.



MARTIN PRINCE, M.D., PH.D.

"I could never have made these discoveries and had an impact of this magnitude without the kind of support and recognition of a grant from the RSNA R&E Foundation," said Dr. Prince, who is also Chief of MRI at New York Hospital.

Today, Dr. Prince is helping residents, fellows and junior faculty develop their careers by investing in both teaching and in the R&E Foundation.

"Because of my success, I've been able to give back to the Foundation the funding I got early on in my career," said Dr. Prince, who is a member of the Presidents Circle and a Bronze Visionary Donor.

He believes the opportunities are endless for the next generation of researchers.

"There's an explosion of ideas for solving imaging problems with more technologies, different types of equipment and people with various types of expertise," said the scientist.

At the same time he acknowledges the hurdles, including reductions in NIH funding and greater bureaucracy involved in patient consent and privacy.

"It can be difficult for radiologists to get funding because many foundations are not radiologic-oriented," he added. "RSNA's R&E Foundation fills that void."

.....
"It can be difficult for radiologists to get funding because many foundations are not radiologic-oriented. RSNA's R&E Foundation fills that void."

MARTIN PRINCE, M.D., PH.D.



End-of-Year Success Helps Campaign Reach \$9 million

RSNA 2007 PROVED TO BE A GREAT SUCCESS for the R&E Foundation. In addition to acclaimed presentations by current and former grant recipients, hundreds of donors enjoyed relaxing and meeting friends in the Donor Lounge. The grand display of current projects funded by the R&E inspired many attendees to donate at the meeting and help support future research projects.

The annual R&E Foundation Report, presented by Chair Anne G. Osborn, M.D., showcased the link between individual donations, funded grants, and changing standards of practice. Nearly one hundred Presidents Circle members appeared on-stage to be recognized

for their commitment to supporting radiology research today and encourage the thousands of audience members to start supporting research for tomorrow.

Over \$100,000 in donations and pledges from Pacesetters at the end of 2007 helped the Silver Anniversary Campaign reach \$9 million of the \$15 million goal. The pledges of the 36 Pacesetters will endow a Seed Grant following the campaign.

The R&E Foundation also celebrated its Vanguard and Exhibitors Circle companies at RSNA 2007 with special sign recognition and receptions. Over \$600,000 was donated

by companies in 2007 to support the Silver Anniversary Campaign.

With less than two years remaining in the campaign, it will take the support of the entire radiologic community to reach the \$15 million goal. The research and subsequent funding this campaign will ensure, and its impact on the practice of medicine, are immeasurable. The Foundation is asking everyone to think about how radiology has impacted their lives, and how much of that would be possible without research and education. To make a special gift in honor of the campaign, please go to RSNA.org/campaign.

**Celebrating
25 Years of Funding
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SILVER ANNIVERSARY CAMPAIGN

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