JOHNS HOPKINS
MEDICINE

Radiology Update

THE RUSSELL H. MORGAN DEPARTMENT OF RADIOLOGY AND RADIOLOGICAL SCIENCE

CHAIR'S MESSAGE

It has been another remarkable year of growth and transformation in the Johns Hopkins Russell H. Morgan Department of Radiology and Radiological Science. We have embraced change, welcomed new faces, and celebrated the enduring commitment of our long-serving faculty and staff members who have ventured into new roles. With every stride, we have made significant headway in enhancing patient services, propelling our research initiatives, and enriching our educational programs for residents and fellows.

Amidst the expansion in volume, locations, and the diverse scope of our department, one unswerving priority remains-- our people, who constitute the heart of Johns Hopkins Radiology. It gives me immense pleasure to introduce several new and existing leadership role changes that underscore our commitment to this priority. Dr. Kelvin Hong has assumed the role of Executive Vice Chair, alongside Dr. Robert (Bud) Liddell leading the Interventional Radiology Division, Dr. Lilja Solnes leading Nuclear Medicine and Molecular Imaging, and Dr. Stefan Zimmerman leading the Diagnostic Imaging Division. For a complete update on faculty leadership roles, please refer to page 4.

Our department's talent extends beyond faculty, and we are thrilled to welcome Mary Fasano as the Director of the Schools of Medical Imaging, a vital pipeline for technologists. Cheryl Shoats, who returned to the Johns Hopkins Hospital from Bayview

Medical Center, now serves as the Director of Operations. Michelle Casler is embarking on a new role as Director of Education.

CLINICAL

Across our outpatient sites in the greater Baltimore and National Capital Region, our commitment to patient care remains unwavering. We have introduced significant equipment improvements, expanded operating hours, and broadened the range of services. At Green Spring Station, we successfully installed a new PET/CT facility, greatly satisfying our referring providers. Further enhancements are underway, with equipment upgrades and replacements, along with plans to open another imaging site in Columbia, MD.

Within our reading rooms, our dedication to staying at the forefront of clinical applications is evident. We are pioneering the integration of Artificial Intelligence into clinical work flow. Drs. Tony Lin, Emily Ambinder, and Lisa Mullen are leading the charge, with negotiations underway for AI software that will support the interpretation of mammograms, serving as a second "expert reader."

RESEARCH

Our support for research excellence is also unwavering. The Radiology Physician-Scientist Incubator program continues, with this year's recipient, Dr. Christopher Bailey, benefitting from additional protected time and resources to advance his research.

Karen M. Horton

Dr. George Sgouros has received national recognition from the American Association of Physicists in Medicine for his contributions to radiopharmaceutical therapy.

Additionally, plans are underway to install a state-of-the-art research PET/CT scanner, thanks to the successful NIH HEI Grant application spearheaded by Dr. Martin Lodge.

It's a source of immense pride to witness our Radiology faculty members receiving recognition on institutional, national, and global fronts for their invaluable work.

EDUCATION

Our residency program continues to flourish, offering new clinical, educational, and research opportunities to our residents. The Resident Research Lead Program, guided by Dr. Vivek Yedavalli and Dr. Farzad Sedaghat, provides crucial support by helping residents identify their research interests and connecting them with faculty mentors.

Thanks to the dedicated efforts of faculty members such as Dr. Pamela Johnson and the generosity of donors like Dr. Sheldon Bearman, a state-of-the-art ultrasound simulation lab has been established, enabling our residents to hone their clinical skills through cutting-edge simulation equipment.

Our faculty and staff eagerly embrace new projects that push the boundaries within our clinical, research, and educational missions. The future of Johns Hopkins Radiology is filled with exciting opportunities and advancements.

As always, we welcome the continued engagement of our alumni and donors. Please feel free to reach out if you have any questions or if there is any way you would like to be involved in our department's ongoing journey.

Sincerely,

Karen M. Horton, M.D.
Martin W. Donner Professor of Radiology
Director, Russell H. Morgan Department of Radiology and Radiological Science

Mr. Johns Hopkins changed the course of history with one bold stroke of his pen by signing a will that would create The Johns Hopkins University.

What Will Your Legacy Be?
Your support ensures the future of the Russell H. Morgan Department of Radiology and Radiological Science. Consider these opportunities to leave a meaningful legacy while taking into account your personal goals.

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Avoid the double taxation incurred if designated to heirs.

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To learn more about these and other creative ways to support the Department of Radiology and Radiological Science, contact:

Christie Vera
Director of Development
Russell H. Morgan Department of Radiology and Radiological Science
443-287-7958 | cvera3@jhmi.edu
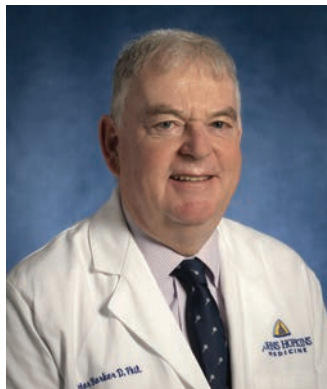**rising.jhu.edu/giftplanning**

New Faculty Leadership

As we welcome new faculty leaders appointed in the 2023 academic year, we also thank past leaders for their years — often decades — of dedication to leading clinical divisions and research groups with great success. Our priority throughout all these changes remains adapting to the future and changing needs while providing support to all members of the Russell H. Morgan Department of Radiology and Radiological Science.

Peter Barker, D.Phil.
Director of Magnetic Resonance Research
Barker has been serving as interim director of the Division of Magnetic Resonance (MR) Research for the past year. During that time, he spearheaded the merging of magnetic resonance research with the former neuroradiology research division. As an internationally renowned expert in clinical MR spectroscopy, clinical perfusion MR, and clinical MR neuroimaging, Barker will be the official director of MR research. The MR research division is composed of over 130 members, and collectively receives more than $9 million annually from various funding agencies, including the National Institutes of Health, to support its research efforts.

John Eng, M.D.
Vice Chair of Faculty Academic Development
As the inaugural vice chair of faculty academic development, Eng will focus on facilitating the academic progress of our faculty by working alongside and supporting our division chiefs to help them understand the requirements and process for promotion at the Johns Hopkins University School of Medicine. He will develop systems to track progress according to established metrics, and will provide individualized coaching regarding promotion requirements. Eng is ideally qualified for this position with his long history of serving in leadership roles and on promotion committees within the department and the school of medicine.

Kelvin Hong, M.B.B.Ch., M.B.B.S.
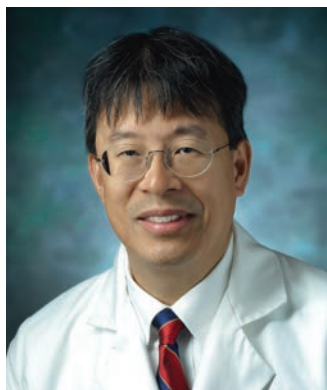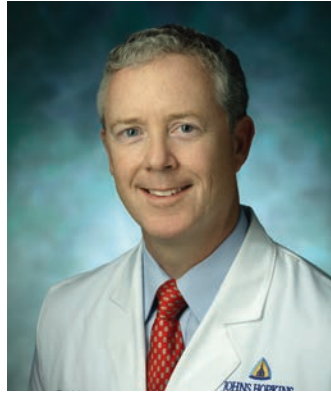*Executive Vice Chair of Radiology and Radiological Science*
To ensure that radiology leadership can fully address needs within and outside the department, Hong has been appointed as the new executive vice chair of radiology and radiological science. He has served as the interventional radiology division chief for the past eight years, and has demonstrated exceptional leadership and team-building, particularly during the height of the COVID-19 pandemic when interventional radiology was on-site 24/7. In this new role, Hong will support select day-to-day department functions and duties, particularly regarding faculty, trainees and staff.

Robert Liddell, M.B.B.Ch., M.S.
Division Chief of Interventional Radiology
Liddell has served as the director of medical student education for the Johns Hopkins Division of Interventional Radiology and as faculty adviser for the Seldinger Society, the Johns Hopkins medical student interventional radiology interest group. He has been acting as the interim division chief for interventional radiology since March 2023, and has exhibited the skills and vision required to continue leading the division to excellence. Before joining Johns Hopkins, Liddell was the vice chair of diagnostic radiology and director of interventional radiology at Mercy Medical Center.

Lilja Solnes, M.D., M.B.A.
*Division Chief of Nuclear Medicine and Molecular Imaging*
Solnes joined Johns Hopkins in 2014, and has served in several leadership roles, including program director for the nuclear medicine residency, PET/CT fellowship and diagnostic radiology residency programs, for which she has received numerous recognitions — including the American College of Nuclear Medicine President's Award. She has collaboratively developed a new theranostic service line, as well as a new ACGME-accredited residency program in molecular imaging that offers dual board certification in radiology and nuclear medicine. Solnes serves as the JHM site principal investigator for multiple national and international clinical trials, and plans to continue her focus on incorporating new agents into clinical practice.

Harjit Singh, M.D.
Director of Radiology Supply Chain
Singh will be continuing his work in developing an unprecedented supply chain process in the radiology department in his new role as Director of Radiology Supply Chain. Over the past four years, he has established a process that includes extensive vetting, critical value analysis, onboarding with integrated education and utilization review to ensure financial resources are being effectively utilized. The radiology department has been held up as a model for an inclusive physician-led supply chain process that values the input of a broad set of health system constituents.

Stefan Zimmerman, M.D.
Division Chief of Diagnostic Imaging
An international leader in cardiac imaging, Zimmerman has served as the director of cardiac imaging since 2016, and has developed a dedicated cardiothoracic subsection, fellowship program and resident cardiac rotation. As a world expert in interpreting ARVD MRI scans, Zimmerman is often invited to speak at national and international meetings, and serves in leadership and review committees in numerous national organizations. His dedication to collaboration and excellence in patient care, education and research positions him well to lead the diagnostic radiology division. ■
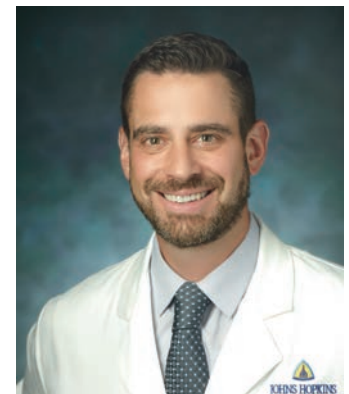
Cheng Ting (Tony) Lin in a conference room

Johns Hopkins Radiology Explores the Potential of AI in the Reading Room

Interest in artificial intelligence (AI) has exploded this year as tools such as ChatGPT make AI programs more accessible than ever before. AI has touched nearly every field as researchers begin to look at what the technology can do and how it can improve our lives. Radiology is no exception.

At Johns Hopkins, radiology faculty and operational managers have come together to explore this novel technology through the Radiology Artificial Intelligence Development (RAID) Subcommittee. An offshoot of the Radiology Department's Value Added Analysis Steering Committee, RAID is chaired by **Cheng Ting Lin**, an associate professor of radiology specializing in cardiothoracic imaging and a certified imaging informatics professional.

RAID has over a dozen members, including representatives from radiology faculty, departmental administrators, and medical imaging information technology professionals, and regularly consults external groups such as the JHM Data Trust Council, institutional review board and the Johns Hopkins Health System supply chain system.

At each monthly meeting, RAID members discuss the progress of several clinical and research AI projects. The group's aim is to create a physician-led governance structure to evaluate, prioritize, implement and monitor the use of AI in the radiology department, ranging from investigational algorithms to FDA-approved medical devices.

Artificial intelligence in radiology involves using algorithms to analyze large quantities of data and medical imaging. This has the potential to help radiologists by triaging cases, highlighting abnormalities, and improving diagnostic confidence in the reading room.

Right now, Lin said, medical imaging AI offerings are highly variable in quality, which limits their widespread adoption. Among the chief responsibilities of the RAID subcommittee is evaluating third-party AI algorithms that could, one day, be deployed in our clinical environment.

According to **Andrew Menard**, executive director of radiology strategy and innovation and a member of the RAID subcommittee, there are currently 400 radiology AI products on the market that are cleared by the Food and Drug Administration, and more are cleared every month. These products focus on different areas, from improving image acquisition to triage, but, as Menard explained, "the most important algorithms are those that make life better for practicing radiologists."

Radiologists today face ever-increasing volumes and clinical demands, along with diminishing reimbursements. AI technology, he said, "will be a vital

component of the Johns Hopkins radiology response to these needs."

"AI has the potential to automate lower-value work so radiologists can focus on higher-value work," Menard said, adding, "Implemented properly, this should boost productivity and professional satisfaction while maintaining the quality of radiologic care."

Lin echoed this sentiment, noting, "AI also has the potential to improve the quality of patient care by adding to radiologists' confidence in interpretation."

Emily Ambinder, an assistant professor in radiology and radiological science specializing in breast imaging, joined RAID to help figure out how best to incorporate new AI tools into mammography.

She is working with **Lisa Mullen**, breast imaging fellowship director, who is spearheading RAID's first physician-led initiative focusing on AI-assisted analysis of screening mammography. Ambinder, Mullein and team have completed an initial evaluation of two leading AI algorithms, and negotiations with the preferred vendor are ongoing.

According to Ambinder, there are many promising FDA-approved AI mammography tools on the market, and many large healthcare organizations are already using AI to analyze mammograms.

While Ambinder understands concerns that AI might "take over" and replace human faculty, she is excited about bringing AI into the reading room. AI is meant to aid radiologists, Ambinder explained, not to replace human intelligence in the reading room.

As such technology is incorporated into routine radiologist workflow,

radiologists expect to see both an increase in cancer detection and a decrease in callbacks.

"Envision it as a second set of eyes or a second radiologist looking at the mammogram with you," Ambinder said.

AI programs do not run autonomously, Ambinder noted. Radiologists will continue to review all cases and findings — AI is just a new tool to aid in detection, diagnosis and triage.

"We are looking for tools to increase the value of radiologists, not replace them," Lin explained.

That said, there are some limitations to current AI technology.

Third-party algorithms from outside of Johns Hopkins may not be as accurate, Dr. Lin said, noting that such programs were trained using patient data with different demographics and characteristics from those who seek care at Johns Hopkins. As such, the algorithm may not perform as well once implemented and require ongoing monitoring.

However, as home-grown, in-house AI tools are developed, such issues can likely be overcome.

For Lin, the future of AI in the radiology reading room looks bright. He foresees Johns Hopkins one day becoming a premiere institution of artificial intelligence that uses such machine-learning programs to identify conditions and potential treatments faster and more accurately.

An equally important goal, Dr. Lin explained, is to support internally-developed algorithms and work with experts at Johns Hopkins to bring their AI tools from bench to bedside.

One effort to expand the use of AI in medical imaging analysis is RAIL (Radiology AI Lab), a partnership among

the Johns Hopkins radiology department, the Malone Center for Engineering in Healthcare, the Applied Physics Laboratory and the Whiting School of Engineering.

Headed by **Haris Sair**, director of the division of neuroradiology, RAIL works with departments across Johns Hopkins to develop machine learning applications to better aid medical image classification and analysis.

However, just as Rome wasn't built in a day, so too does building an AI program take time.

As Lin noted, it is imperative t have a robust governance structure in place,

Emily Ambinder in a reading room.

allowing methodical development, piloting and evaluation of AI tools across the department and system.

"There are no shortcuts for this process," Lin said.

Lin envisions a future when, due to assisted analysis, detection and diagnosis, more lives are saved than ever before. ■

Residents Prepare for Return of Oral Board Exams

Residents studying in the Johns Hopkins Hospital Resident Lounge

The ability to quickly analyze and interpret medical images is a critical skill that radiologists must develop during their training and hone throughout their careers.

In an effort to better assess residents' readiness for the demands of clinical practice, the American Board of Radiology (ABR) has announced changes to the Diagnostic Radiology Certifying Exam, including the return of the oral DR Certifying Exam. Currently, the Certifying Exam is multiple choice.

The changes are slated to begin in 2028 and will first apply to residents completing training in June 2027. Trainees beginning residency July 1, 2023, will be the first class to participate in the new oral boards.

Currently, all residents take the Diagnostic Radiology CORE Exam and the Diagnostic Radiology Certifying Exam. According to **Erin Gomez**, program director of the diagnostic imaging and molecular imaging residencies, details are still forthcoming, but only the Diagnostic Radiology Certifying Exam will change. The CORE Exam will remain the same.

The CORE Exam is taken after 36 months of residency. The three-day, multiple-choice test is administered virtually.

Dave Gullotti is in his 5th year of post graduate training within the Johns Hopkins Integrated Diagnostic and Interventional Radiology Residency Program. He sat for his Core Exam this past spring. He will not take the new oral exam, since he will sit for his Certifying Exam prior to 2028.

According to Gullotti, the Core Exam includes more than 600 questions that cover a variety of specialties across radiology.

The Certifying Exam is taken about 18 months after completing residency. Currently, the test consists of a one-day, virtually administered, multiple-choice exam. This test was introduced several years ago, after the previous oral exam was phased out. Beginning in 2028, the multiple-choice Certifying Exam will be replaced with the new Diagnostic Radiology Oral Exam.

In years past, Gomez noted, residents had to travel to ABR headquarters in Kentucky to take the oral exam face to face. During the exam, residents would go from room to room, interpreting cases and answering questions asked by various in-person examiners.

The new Diagnostic Radiology Oral Exam will be virtual, though no less rigorous.

Using a secure proctoring software, residents will meet with examiners, who will present images and cases for the trainee to assess.

According to Gomez, the new oral exam should provide a more comprehensive assessment of trainees' skills, especially in communication and working with colleagues.

"One thing that was diminished somewhat during the COVID pandemic is the ability to communicate with people effectively," she said.

For Gullotti, the return of the oral exam format may benefit residents.

"The oral exam is likely more representative of the real world where thinking critically about differential diagnoses and conveying them clearly to other providers is more valued than a question with only one right answer" he noted.

While Gomez noted that there is some work to do to prepare residents for the new oral exam format, she knows they will be ready.

The already-rigorous nature of Johns Hopkins' diagnostic radiology residency means that residents will be well-prepared to share their skills in various formats, written or oral.

"We're really lucky," said Gomez, noting, "We have a very robust program for residents here."

This consists of simulation labs that allow residents to practice with real-world equipment, as well as immersive experiences designed to mirror conditions such as overnight work. Similar experiences will likely be adapted to better prepare residents for the new Diagnostic Radiology Oral Exam.

Gomez is excited about the chance to share the talents of the residents and faculty of Johns Hopkins Radiology.

She concluded, "I think this is an opportunity for our program to show how great we can be." ■

Erin Gomez lecturing in the Stoll Conference Room

Updates in Outpatient Imaging Sites

Johns Hopkins Medical Imaging (JHMI) outpatient sites continue to bring expanded imaging services and Johns Hopkins expertise to communities. In 2023, **Danielle Karavedas** was confirmed as president of JHMI, and the PET/CT center at Green Spring Station Pavilion I officially opened. In this brand-new clinical suite, patients can receive the latest in nuclear medicine imaging from a team of dedicated nurses, technologists and Johns Hopkins faculty radiologists. PET/CT scans include dotatate for neuroendocrine cancers, a first-time outpatient scan for Johns Hopkins Radiology, along with PSMA and FDG oncology imaging.

The second JHMI site in Columbia at Wilde Lake is well underway, with construction planned to start in 2023. Phase I will open with MRI, CT and X-ray services. Additional locations will see an upgrade in services, with a new PET/CT scanner and new mammography units planned for Bethesda; a new MRI, CT and DEXA scanner for White Marsh; and new mammography units at Green Spring Station. Throughout these changes, technologists, educators, radiologists and physicists have been in close collaboration to ensure new scanners are calibrated and equipped to the Johns Hopkins standards for high-quality and safe imaging. ■

The PET/CT scanner at Green Spring Station

Research Leads Help Guide Residents in Fulfilling Goals

If you asked **Vivek Yedavalli** to recount the remarks he hears most from new radiology residents, this sentiment would top the list, "I don't know where to start."

So, when **Erin Gomez**, director of the Diagnostic Radiology and Molecular Imaging residency programs, and several senior residents began developing a program to better guide new residents in their research goals, Yedavalli was on board.

The result — the Residency Research Lead Program — was established last year. The program aims to guide each resident toward realizing their own research and career goals.

Yedavalli currently serves as a research lead for the program. He shares the role with **Farzad Sedaghat**, assistant professor of radiology.

Chief of neuroradiology at Johns Hopkins Bayview Medical Center and an assistant professor of radiology, Yedavalli is a well-known researcher with a focus on stroke and perfusion imaging, and he has earned several national research awards, including the Radiological Society of North America Roentgen Research Award.

Sedaghat earned his medical degree from the Johns Hopkins University School of Medicine, later returning after residency and fellowship to join the diagnostic radiology faculty. He has expertise in abdominal imaging and intervention.

In their roles, research leads help residents determine their research aims and how best to reach them.

"The goal is to facilitate opportunities for residents' exposure to the world of clinical research," Yedavalli said.

Each resident must complete a research project to successfully graduate from residency. Part of the research leads' work is to help new residents determine what research they may want to pursue and find the faculty member best equipped to work with them.

However, as Yedavalli explained, it isn't just about fulfilling the research requirement. While some residents will naturally be more inclined toward research than others, exposure to research benefits every new radiologist.

"Research exposure translates to clinical research and helps develop problem-solving skills," Yedavalli said.

Additionally, exposure to a variety of types of research in residency can be vital for helping residents select a subspecialty later, in their fellowship.

But direction on how to get this exposure, or whom to seek out for which specialty, can be hard for residents to come by.

Enter the residency research leads.

The program offers a more formal, structured process for exposing trainees to different types of research and projects, rather than putting the onus on residents to seek out a project and mentor on their own.

Within six months of starting residency, trainees are given a detailed survey to determine their research interests and career goals. The survey asks how interested a resident is in research, how they would like to satisfy their research requirement and at what speed. The survey also includes questions on what types of research residents are interested in, what type of practice setting they are ultimately looking for and what they are looking for in a mentee/mentor experience.

Likewise, faculty are also surveyed on their interests and what they are looking for in a mentee. The research leads then work to match residents and faculty based on a variety of criteria, including research interests and schedule constraints.

Once a resident and faculty member are matched, they can connect on their own to determine a plan for how to proceed. From there, logistics such as how often meetings occur and what research topics will be pursued are determined by the resident and their faculty mentor.

For Sedaghat, the program is especially helpful at Johns Hopkins, which offers many opportunities and draws trainees from a wide variety of backgrounds and experiences.

"Johns Hopkins is a large institution, and it can be challenging for newcomers to navigate," he said.

The Research Leads Program, however, helps radiology residents of all interests and backgrounds find their place at Johns Hopkins.

This is especially important to Sedaghat, who has successfully leveraged his background in economics to collaborate with Hopkins scientists in translational research, thanks to the mentorship of senior faculty. Now he hopes to pay it forward, helping, as he explained, "we want to show trainees that their diverse academic backgrounds

can be a major asset when it comes to research."

In addition to linking residents and faculty mentors to facilitate research projects, the program also plans to offer special guest speakers and social events designed to connect trainees and faculty across the department.

According to Sedaghat, many residents are also interested in attending conferences. One initiative currently in progress is the development of a database that will list conference opportunities across the nation.

Sedaghat and Yedavalli also plan to offer open office hours for residents, giving them an open door to inquire, in person, about logistical issues or share concerns.

"It is important to have a sounding board, to have a person who knows what residents are going through and can relate and offer guidance," Yedavalli said.

If this program goes well, it may serve as an example for others to follow, in radiology and across Johns Hopkins.

According to Yedavalli, they are looking to implement a similar program with neuroradiology fellows.

"This really does serve as a great template for other training programs," he noted.

At the end of the day, for Yedavalli, it is all about fostering those relationships between mentors and mentees.

"A lot comes down to direction and having someone as a guide to help navigate residency and navigate what their interests might be," he said.

He recalled his own experience with mentors throughout his career, some of whom he still calls on for guidance.

"I personally have a number of mentors I look up to," he said, adding, "They have helped mold my career and continue to do so. I wouldn't be here without them.

He concluded, "Mentors are pivotal to the success of our residents." ◼

Martin Lodge Awarded NIH Grant to Bring New PET/CT to Johns Hopkins

A recently approved grant from the National Institutes of Health (NIH) is bringing the latest in imaging equipment to the Johns Hopkins Positron Emission Tomography (PET) Center.

PET is a noninvasive molecular imaging technique used to study biological processes and disease states through the use of various radiopharmaceuticals.

Leading the project is **Martin Lodge**, director of physics at the Johns Hopkins PET Center. With 30 years of experience in medical imaging physics, Lodge works alongside medical professionals on the technical aspects of PET/CT scanning.

In his search to continue improving Johns Hopkins' PET capabilities, Lodge applied to the NIH's High-End Instrumentation (HEI) Grant Program. The program encourages groups of NIH-supported researchers to apply for grants to purchase high-end, specialized, commercially available equipment.

Motivated by the center's need for new equipment, Lodge reached out to NIH-funded researchers across Johns Hopkins who use PET imaging. Working together, they applied and were approved for a $2 million grant.

The funding will purchase a state-of-the-art PET/CT scanner that will be used in research at The Johns Hopkins Hospital. The Johns Hopkins Department of Radiology and Radiological Science will fund renovations to the PET Center space prior to the scanner's arrival.

Martin Lodge

Slated to be in use by spring 2024, the new PET/CT scanner will offer researchers across Johns Hopkins — from radiology to oncology, neurology and more — access to substantially improved image quality and more accurate quantitative data. The scanner's capabilities will allow for a broader range of studies than currently possible, opening opportunities for new research applications across Johns Hopkins. ◼

Christopher Bailey Selected for 2023 RAD PSI Program Award

Christopher Bailey

Across Johns Hopkins Radiology, faculty and staff members work daily to fulfill each aspect of our tripartite mission: education, clinical care and research. A key part of this undertaking is developing well-rounded physician-scientists who have both clinical and research experience.

But, for junior faculty, knowing where to start and how to secure funding for research can be a challenge.

One way the department is helping to kick-start young faculty members' research careers is through the Johns Hopkins Radiology Physician-Scientist Incubator (RAD PSI) Program.

Established in 2021, the RAD PSI Program is a competitive, peer-reviewed program designed to identify, develop and support a select cadre of talented junior academic clinical faculty who will continue the department's long-standing mission of developing physician-scientists to advance and translate imaging research into human health.

The 2023 recipient of the RAD PSI Program award is **Christopher Bailey**.

Bailey is an assistant professor in the Department of Radiology and Radiological Science, where he also serves as associate program director for the Interventional Radiology Residency Program.

He has been at Johns Hopkins since medical school, going on to an internship and, later, an integrated diagnostic and interventional radiology residency at The Johns Hopkins Hospital.

Bailey's current research interest is in vascular malformations and interventional oncology. His research has focused on biomedical engineering, centering on the design of novel devices for percutaneous and endovascular interventions.

He is just starting out in this work; when he received the request for applications for the 2023 RAD PSI Program award, he was inspired by the opportunity.

Candidates were asked to submit a six-page application detailing their three-year research plan, plus letters of recommendation. During the selection process, applicants were also asked to present their research plan. One candidate is selected each year. Candidates may renew support for up to three years based on annual progress.

Applications are reviewed by a selection committee consisting of radiology department faculty. Selected awardees receive a number of benefits, including mentorship opportunities, an additional 20% of protected research time, $20,000 per year for imaging costs and $10,000 per year for discretionary funds to cover supplies and other needed items.

By the end of the three-year period, awardees are better positioned to compete for funding through national radiological societies or NIH funding agencies.

Bailey's project is titled "Soft Robotic Steerable Microcatheters for Arterial Interventions in Interventional Radiology."

Soft robotics is a subspecialty of robotics focused on designing robotics that are more flexible and pliable. Such devices move in a way that mimics biological motion.

Nature inspires much of the design of soft robotics, Bailey noted, with designs similar to those of octopus tentacles or worms. Such devices will be useful in endovascular procedures, allowing for steering to a specific location within the arterial vasculature.

Current technology is more rigid, Bailey explained, consisting largely of non-steerable wires and catheters.

Applying steerable soft robotic technology to microcatheters would allow physicians to reach and treat farther arterial targets.

Now in the first year of the award, Bailey is looking to parlay the RAD PSI award into larger national and international grants as he continues his work.

The importance of the boost provided by the additional research time, funding and — critically — mentor support for Bailey cannot be overstated.

He concluded, "I am grateful, as a young faculty member, to be given the time and opportunity to grow my career." ■

HISTORY
Retired X-Ray Tech Reflects on Changes in Field

Elsie Protani (second row, first from left) with her class at Baltimore City Hospitals, now Johns Hopkins Bayview Medical Center, 1949

X-ray imaging technology has changed a lot over the past 74 years — just ask **Elsie Protani**. The 93-year-old former X-ray tech has witnessed much of it with her own eyes.

Protani had the chance to visit her old stomping grounds during a recent visit to Johns Hopkins Bayview Medical Center. While in the imaging department for fluoroscopy, Protani shared stories with staff members of her days as an X-ray tech. When she was asked if she would like to watch the procedure on the screen, she jumped at the opportunity. She was fascinated by what she saw, and at how far imaging has come within her lifetime.

"I think my mouth stayed open for a couple of weeks after," she said.

Protani began training at the then-Baltimore City Hospitals (now Johns Hopkins Bayview Medical Center) in February 1948.

"Things were so different then," she said. During an interview, the superintendent of Baltimore City Hospitals warned Protani of the "wild residents" just out of medical school.

Life as a student tech was tough. After the first two months of training, Protani began working on-call at night. It was there, she said, that you "learned to figure things out yourself."

The night shift was often chaotic. A variety of mishaps and illnesses kept techs busy, while orderlies — many of them former merchant marines — helped keep tabs on unruly patients.

"If you worked there at the time, you could work anywhere," she noted.

There were stark differences in X-ray techniques then versus now.

To take an angiogram, they had a school chalkboard 14- to 16-inches wide with a sawtooth wooden bottom. Putting an 8x10 cassette in one end, one tech would hold a stopwatch and another held a broom handle. When the radiologist said shoot, the tech would use the broom handle to push the films through.

"We thought we were being sophisticated," Protani recalled with a chuckle.

During those early years, Protani worked 5½ days a week and on-call weekends, often getting by on catnaps while exposures were developing in the darkroom. During those years, she also married and started a family, which would grow to include four children.

Starting out in the late 1940s, Protani was in the minority as a female X-ray tech. Many of the students coming in were men fresh off the front lines of World War II, taking advantage of the GI Bill.

She recalled that the Johns Hopkins program had more female techs than most other programs. This built upon the historical precedent set by the Johns Hopkins University School of Medicine at its founding in 1893 that women should be given opportunities on an equal basis with men. Today, Johns Hopkins remains committed to fostering female leadership, within the radiology department and across the health system.

By the 1960s, more women were entering imaging, Protani said, and female X-ray techs became more common across the field.

In the early 1950s, Protani left Baltimore City Hospitals. She would go on to be the first female X-ray tech at the now-closed Ft. Howard Veterans Hospital. She would then work in private practice until retiring in 1970 to help her husband run a family business.

Looking back on her career as an X-ray tech, Protani explained that it was truly her calling.

"I loved every minute of it," she said.

"I have a lot of fond memories," she said, adding, "If I had to do it over again, I would." ∎

Pamela Johnson, Recipient of Bearman Professorship, Supports Residents

Pamela Johnson and residents at the ultrasound simulation lab opening

Pamela Johnson has spent much of her career supporting the next generation of radiology leaders.

Formerly director of the Diagnostic Radiology Residency Program, Johnson is a professor in the Department of Radiology and Radiological Science, where she also serves as vice chair of quality and safety and as vice president of care transformation for the Johns Hopkins Health System. In these roles, she focuses on strategies for improving the quality, safety and cost of health care.

For Johnson, one of the most important ways to offer high-quality care is by investing in training young radiologists.

It is fitting work for the inaugural recipient of the Sheldon B. Bearman, M.D. Professorship. Johnson received the honor in 2020, though ceremonies were postponed until last spring due to the COVID-19 pandemic.

The Bearman Professorship is endowed by the Herbert Bearman Foundation, a Baltimore-based philanthropic organization that provides funding for projects that seek to improve the lives of individuals living in Greater Baltimore,

South Florida and Israel.

The endowment is established in honor of Sheldon Bearman, a now-retired diagnostic radiologist who completed his residency at Johns Hopkins and would later serve as a part-time faculty member.

He became a well-known expert in ultrasound and, later, CT and MRI. During his career, Bearman served as president of the medical staff of Franklin Square Hospital, chairman of the department of imaging of Northwest Hospital Center, president of the Baltimore County Medical Society and treasurer of the Medical and Chirurgical Faculty of Maryland.

Bearman credits his training at Johns Hopkins with kick-starting his career. In establishing a professorship endowment at Johns Hopkins, he sought a recipient invested in offering that same support to the next generation.

The endowment provides funding each year for the recipient to pursue radiological research and support resident research.

Johnson has taken this mission to heart. During the first year of the endowment, she contributed funds to help the interventional radiology

residency program create a simulation lab equipped with phantoms to practice biopsy skills.

During the second year, Johnson used the funding to create a dedicated ultrasound simulation lab, complete with human body phantoms with scannable organs.

"These are resources that most residency programs in the country don't have," Johnson said.

For the third year — this year — Johnson is focused on boosting residents' research success through the Health Care Innovation Accelerator Program.

Trainees from diagnostic, interventional and molecular imaging and nuclear medicine residencies submitted proposals for innovative health care solutions. Their ideas will be pitched to a panel in a Shark Tank-style event, and the highest-scoring projects will receive seed grants of up to $5,000.

Bearman lauded Johnson for her work and commitment to residents. "I am honored that Pamela Johnson agreed to serve as the inaugural recipient of the professorship," he said. "She has tremendous experience in resident training and has made enormous progress

George Sgouros Recognized for Contribution to Medical Physics

George Sgouros has always believed in radiopharmaceutical therapy. A pioneer in the field, Sgouros is a professor of radiology at Johns Hopkins, where he also serves as director of the Radiological Physics Division.

In recent years, research into radiopharmaceutical therapy (RPT) has exploded as researchers develop ways to destroy malignant cells using targeted delivery of radiation. Sgouros has dedicated his nearly 40-year career to the imaging and dosimetry physics that make RPT possible.

In recognition of his contributions to the field, Sgouros was recently named a fellow of the American Association of Physicists in Medicine. He was inducted during an awards ceremony held in Houston in July.

RPT shows promise for patients whose cancer has already spread. Once cancer is metastatic, a patient's treatment options are reduced and become more systemic.

Traditional treatment options, like chemotherapy, are not targeted and may destroy healthy cells as well. Even when treatment is effective, patients may suffer severe side effects.

RPT involves placing a radioactive isotope into a targeting molecule. Researchers then inject the drug into the patient. Over time, the radiation leaves healthy tissue, but it sticks with the cancer cells, eradicating them.

RPT is an improvement over traditional treatments in that it is more targeted with fewer side effects. The FDA has approved three radiopharmaceuticals, though more will come.

Sgouros' lab focuses on calculating the dosages of radiation needed for RPT. It is exacting work — and critical, as each

George Sgouros

treatment is tailored specifically to each individual patient to ensure maximum benefit and minimal side effects.

For Sgouros, it is gratifying to see RPT gain popularity and to see his decades of work built upon in the race to find new and better treatments for cancer.

"This is what I believe in," he explained, concluding, "This modality is going to make a difference to cancer patients that have run out of treatment options". ■

Pamela Johnson and Sheldon Bearman at the Sheldon B. Bearman, M.D., Professorship Installation and Dedication in May 2023

in these first few years," he continued, adding, "I know she will establish an incredible standard for years to come."

For Johnson, as it was for Bearman, supporting radiology residents is a core mission.

"It's a residency where you can become the "go-to" doctor," Johnson said.

In medical school, she explained, students are learning the language of medicine. By the time they are in residency, however, they are applying that knowledge in a real-world clinical setting. A strong residency program with a rigorous curriculum is vital to preparing future radiology leaders for success.

As Johnson explained, "The quality of residency training dramatically influences the caliber of the physician, benefiting the quality and safety of care that patients receive."

It is the backing of radiology faculty and the support of donors like Sheldon Bearman and the Herbert Bearman Foundation that allow Johns Hopkins to develop world-class physicians.

Donors are critical, enabling the work of faculty who, in turn, support the residents who will continue to push the growth of Johns Hopkins Radiology for years to come. ■

RadiologyUpdate

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WAYS TO GIVE...

For those interested in making a tax-deductible contribution in support of any program or research project in the Russell H. Morgan Department of Radiology and Radiological Science, please contact the Development Office at 443-287-7958 or **cvera3@jhmi.edu**, or visit **hopkinsmedicine.org/radiology/charitable-giving.**

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