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**The Academy Coalition for Imaging and Bioengineering Research  
Research Roundtable  
Tuesday, September 28, 2021  
Sofitel Lafayette Square, Washington DC**

**Roundtable Materials: <https://www.acadrad.org/the-academys-11th-annual-medical-imaging-technology-showcase-fall-events/>**

**Summary**

Drs. Hedvig Hricak and Michell Schnall welcomed the Roundtable participants, comprising 35 in-person and upwards of 125 virtual attendees, by making their opening remarks. Dr. Hricak introduced Dr. Bruce Tromberg, Director, National Institute for Biomedical Imaging and Bioengineering, as the Roundtable keynote speaker. The title of Dr. Tromberg's address was *NIBIB and the pandemic response: New opportunities for accelerating innovation from in vitro diagnostics to imaging*.

Dr. Tromberg provided a high-level overview of the history and mission of NIBIB and then focused on the opportunities and accomplishments that have arisen over the past year. Dr. Tromberg's slides are currently available from the Academy. A large allocation of new funding for NIBIB programs to address the COVID-19 pandemic opened the door to significant technologic advancements in at home and point of care testing, diagnosis, and treatment monitoring. These advancements, in turn, led to multifold increases in capacity, lowered costs, and significantly decreased turnaround times for COVID testing. NIBIB was able to capitalize on its existing and in development capabilities to dramatically accelerate funding awards that have led to vital scientific and engineering breakthroughs. These capabilities included the [Rapid Acceleration of Diagnostics \(RADx\) Initiative](#) and the first instantiation of the [Medical Imaging and Data Resource Center \(MIDRC\)](#), a cooperative project supported by NIBIB and implemented by the American Association of Physicists in Medicine (AAPM), the American College of Radiology (ACR), the Radiological Society of North America (RSNA), and the

University of Chicago. Dr. Tromberg expressed appreciation for the ongoing support for and promotion of the NIBIB by the Academy's community and optimism for continuing breakthroughs in the sciences of medical imaging and bioengineering.

## **Roundtable Discussions**

### ***Diagnostic Cockpit Initiative (DxCP) 2.0***

Dr. Schnall opened discussion of the first roundtable topic, the [Diagnostic Cockpit Initiative \(DxCP\) 2.0](#). He provided a brief history of the project, which he characterized as a metaphor for integrating multiple data streams to generate diagnostic information that is readily consumable by medical care professionals and provides information relevant to clinical decision-making. Methodologic approaches to data acquisition, aggregation, and analytics are needed to inform clinical guidance. Major barriers to progress that require solutions are the need for clinical and synthetic datasets to support the development and validation of integrated diagnostic algorithms; procedural and dataset standardization; as well as approachable use cases. As the search for a first use case was under way, the first presented itself through the pressing needs of the COVID-19 pandemic. [MIDRC](#) has begun to make progress on aggregating x-ray and CT images with accompanying clinical data in a repository that has cases for public access as well as segregated datasets for developing and validating diagnostic algorithms. It is approaching 60,000 cases in various stages of curation and publication. Discussion among participants led to the following observations and considerations:

- There are four major challenges:
  - Alignment of stakeholders
  - Development of a data sharing infrastructure, including universal data standards that support the integration of diagnostic information across source
  - Resources to support research and development
  - Validation of proof-of-concept demonstrations.
- There needs to be an environment for industry cooperation and information-sharing in the pre-proprietary space.
- National guidelines are needed to support data-sharing while still protecting patients.
- Much research that has been done in this domain has not been translated/deployed—each algorithm must be individually applied on an institution-by-institution basis.
- There is very little academic recognition of and support for creating data infrastructure.
- Even partner institutions with a common data platform (e.g., Epic electronic medical records) have different instantiations that make data sharing and integration impossible.
- Where research is done can unintentionally worsen health disparities among disadvantaged populations due to the limited data capabilities of safety net hospitals

### ***Point of Care (POC) Technologies***

Dr. Kristen DeStigter opened discussion of the second roundtable topic, **Point of Care (POC) Technologies**. Rapid advances have been made in POC technologies across many medical disciplines. These bear the promise of more accessible, rapid, and potentially lower cost medical diagnosis and treatment. As an example, Dr. DeStigter provided an overview of wireless and handheld ultrasound devices, which rely on chip-based technology. As these technologies evolve, significant challenges include the need for standardized credentialing of devices and operators, appropriate use criteria that evolve with the technology, quality control parameters, hidden costs, healthcare disparities in access, and common mechanisms for data capture and integration into the medical record.

Roundtable participants made the following observations:

- Concern has been expressed over practitioner loss of control and perceived impact/value
- POC may be a solution to address the volume of routine tests and studies, leaving complex cases to humans
- Standards must be put in place for training, credentialing, and appropriate documentation of results
- Radiologists must bear in mind the potential relevance to POC technologies for image-guided interventions in addition to diagnostics
- Use of POC testing by clinicians may increase referral to radiologists for expert consultation
- POC is patient-friendly—how can we lead vs. resist?

### ***Theranostics***

Dr. Woodward opened discussion of the final roundtable topic, presented by Dr. Thomas Hope, **Theranostics**. The term theranostics refers to use of radiopharmaceuticals, using radioisotopes and radioligands to treat disease processes. It can be said that this rapidly growing field is the vanguard of precision medicine and targeted therapies. The following comments and observations were made:

- Most of the cutting-edge work in this field is being done in Germany and Australia. How can the US become a leader as well?
- What is the appropriate approach to training theranostic practitioners? Should this be a fellowship? Should general radiology residencies include some exposure to the field? How do we encourage more trainees to pursue this emerging discipline?
- Dose tolerance is critical—the dose to the target cells must be maximized while dose to normal tissues must be minimized. There is a need for expertise in personal dosimetry.
- Who should fund theranostic training and research? National Cancer Institute (NCI)? Department of Energy? NIBIB? Is this an appropriate focus for a T32 grant?
- There is a significant gap between the research funding available to support development of theranostic radioisotopes and the funding available to support data collection sufficient for FDA consideration.
- Sourcing existing radioisotopes is already often difficult. Who will supply a broader deployment of theranostic agents?
- Does this field belong in radiology, radiation oncology, or nuclear medicine?
- What kind of support is needed from medical physicists, particular in reference to dosimetry, and what should the qualifications be of physicists performing these functions?
- Perhaps the NCI should convene a meeting to begin to grapple with some of these questions.

The Academy will begin to review the information generated from these discussions and identify its appropriate role and next steps.

***Follow up questions or comments from this meeting can be directed to Academy Executive Director, Renee Cruea, [rcruea@acadrad.org](mailto:rcruea@acadrad.org).***

## **2021 Roundtable Participants**

\*Includes both in-person and virtual attendees.

Mariam Aboian, MD, PhD	Yale School of Medicine	Assistant Professor
Katherine Andriole, PhD	MGH & BWH Center for Clinical Data Science	Director of Research Strategy and Operations
Christina Arenas, JD, MPH	Society of Nuclear Medicine and Molecular Imaging	Associate Director, Health Policy
Jakob Asslaender, PhD	NYU Langone Health	Assistant Professor, Department of Radiology
Hediyeh Baradaran, MD	University of Utah	Assistant Professor, Department of Radiology
Anton Becker, MD, PhD	Memorial Sloan Kettering Cancer Center	Faculty, Department of Radiology
Julia Bellinger, MA	Society of Nuclear Medicine and Molecular Imaging	Director of Government Affairs
Marc Benayoun, MD, PhD	Wake Forest Baptist Medical Center	Assistant Professor of Neuroradiology
Denis Bergeron, Ph.D.	National Institute of Standards and Technology	Research Chemist in the Radiation Physics Division
Lisa Bodei MD, PhD	Memorial Sloan Kettering Cancer Center	Director, Targeted Radionuclide Therapy, Molecular Imaging and Therapy Service
Miriam Bredella, MD	Massachusetts General Hospital	Professor of Radiology, Vice Chair
Sara Brenner, MD, MPH	U.S. Department of Health & Human Services; FDA	Diagnostic Data Lead, Data Strategy & Execution, National COVID-19 Response, Associate Director of Medical Affairs, Chief Medical Officer for In-Vitro Diagnostics
Christine Buckley	Brain Aneurysm Foundation	Executive Director & Board President
Linda Budzinski	Society of Nuclear Medicine and Molecular Imaging	Director of Outreach
Ruth Carlos, MD, MS.	University of Michigan	Academy Vice President, Professor of Radiology, Assistant Chair for Clinical Research
Majid Chalian, MD	University of Washington	Assistant Professor of Radiology
Aisling Chaney, PhD	Stanford University	Postdoctoral Fellow at Stanford University
Peter Chang, MD	University of California Irvine	Co-Director, Center for Artificial Intelligence in Diagnostic Medicine, Radiological Sciences
Patricia E. Cole, MD, PhD	Bayer U.S., LLC	Senior Director, Clinical Pharmacology at Bayer Pharmaceuticals
Angela Colmone, PhD	Radiological Society of North America (RSNA)	AED: Science & Publications
Dorin Comaniciu, PhD	Siemens Healthineers	Senior VP, Artificial Intelligence and Digital Innovation
Emily Conant, MD	University of Pennsylvania Health System	Professor of Radiology, Vice Chair Faculty Development, Chief Breast Imaging
Anders Dale, PhD	University of California, San Diego	Professor of Neuroscience and Radiology

Mark DeLano, MD	Michigan State University	Director, Division of Radiology and Biomedical Imaging
Colin Derdeyn, MD	University of Iowa Hospitals & Clinics	Professor and Chair
Swati Deshmukh, MD	Beth Israel Deaconess Medical Center	Assistant Professor
Kristen DeStigter, MD	University of Vermont	Chair, Department of Radiology
Kirsten Doerfert	Konica Minolta Healthcare	Senior Vice President of Marketing
Georges El Fakhri, PhD	Massachusetts General Hospital; Harvard Medical School	Director, Gordon Center for Medical Imaging, Professor of Radiology
Emerald Elder, M.A.	The Prospective Group (TPG): NIH	Research Assistant
Christian Eusemann, PhD	Siemens Healthineers	VP Research and Innovation, Collaboration Officer
Carlos Faraco, PhD, MS	National Institute of Neurological Disorders & Stroke (NINDS)	Health Program Specialist
Arthur Fleischer, MD	Vanderbilt University	Professor of Radiology
Jeffrey Foote	Time Medical Systems	Senior Vice President, General Manager Americas
Judy Wawira-Gichoya, MD, MS	Emory University School of Medicine	Assistant Professor in the Department of Radiology
Sharon Gleason, M.Sc., M.Ed, EdD	Society of Nuclear Medicine and Molecular Imaging	Senior Director Development & Marketing
Daniel Gossett, Ph.D.	National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)	Project Scientist
Viaks Gulani, MD, PhD	University of Michigan	Chair of the Department of Radiology
John Haller, PhD	National Heart Lung and Blood Institute, NIH	Clinical Research Scientist
Glynis Harvey, CAE	American Institute of Ultrasound in Medicine (AIUM)	CEO
Jennifer Hobin, PhD	National Institute on Drug Abuse	Deputy Director, Office of Science Policy and Communications
Patrick Hope, MA, JD	Medical Imaging and Technology Alliance (MITA)	Executive Director
Thomas Hope, MD	University of California San Francisco	Director of Molecular Therapy in the Department of Radiology and Biomedical Imaging
Hedvig Hricak, MD, PhD, Dr(hc)	Memorial Sloan Kettering Cancer Center	CIBR Chair, Chair of the Department of Radiology
Keith Hume, MA	Society of Interventional Radiology (SIR)	Executive Director
Jana Ivanidze, MD, PhD	Weill Cornell Medicine	Assistant Professor
Shanshan Jiang, MD, PhD	Johns Hopkins Medicine	Assistant Professor of Radiology and Radiological Science
Sampath Kandala, MS, MBA	GE Healthcare	GM, Oncology Solutions (Therapy Guidance)
Krishna Kandarpa, MD, PhD	National Institute of Biomedical Imaging and Bioengineering (NIBIB)	Director, Research Sciences & Strategic Directions
Neena Kapoor, MD	Brigham and Women's Hospital	Staff Radiologist Musculoskeletal Imaging and Intervention
Brad Keller, Ph.D.	Hologic, Inc.	Director, Clinical Research
Mary Beth Kester, M.S.	National Institutes of Health/NCCIH	Director of the Office of Policy, Planning, and Evaluation (OPPE)
Paul Kinahan, PhD	University of Washington	VC for Research & Professor of Radiology and Bioengineering

Miata Koroma Ekanem, MS, MBA	Society of Interventional Radiology (SIR)	Senior Director, Clinical and Practice Affairs
Elizabeth Krupinski, PhD	Emory University	Professor & Vice Chair for Research
Helene Langevin, MD	National Institutes of Health/NCCIH (NIH)	Director
Nick Langhals, PhD	National Institutes of Health (NIH)/ NINDS	Program Director
Curtis Langlotz, MD, PhD	Stanford University	Prof. & Director, Center for AI in Medicine & Imaging
Suzanne Lapi, PhD	University of Alabama at Birmingham	Professor
Benjamin Larimer, PhD	University of Alabama at Birmingham	Assistant Professor
Maren Laughlin, PhD	National Institutes of Health (NIH)/ NIDDK	Senior Advisor for Integrative Metabolism
Gayle Lester, PhD	National Institutes of Health (NIH)/ NIAMS/DHHS	Director of Extramural Research
Weili Lin, PhD	University of North Carolina at Chapel Hill	Professor and Director
Megan Lipford, PhD	Wake Forest School of Medicine	Assistant Professor, Radiology
Natacha Lorius, MHA	Siemens Healthineers	Grant Administrator
Kathryn Lowry, MD	University of Washington School of Medicine	Assistant Professor, Radiology
Mahadevappa Mahesh, MS, PhD	Johns Hopkins University School of Medicine	Professor Department of Radiology and Radiological Science and the Division of Cardiology
David Mankoff, MD, PhD	University of Pennsylvania	Professor and Vice Chair of Research
Rich Mather, PhD	Canon Medical Research, USA	President
Jamie McCoy, MBA	GE Healthcare	GM, Molecular Imaging
Khaja Minhaj, MD, MBA	University of Virginia	Associate Professor of Radiology
Anna Moore, PhD	Michigan State University	Professor, Assistant Dean
Rustain Morgan, MD, MS	University of Colorado	Assistant Professor, Radiology-Nuclear Medicine
Elizabeth Morris, MD	University of California, Davis, School of Medicine	Professor & Chair
Levon Nazarian, MD	Thomas Jefferson University	Professor, Vice Chair for Education
Kiel D. Neumann, PhD	University of Virginia Assistant	Professor of Radiology and Medical Imaging
Mimi Newell, MD	Emory University	Professor, Department of Radiology & Imaging Sciences
Katelyn Nye, B.S.E.E.	GE Healthcare	General Manager, Mobile X-ray & AI
Virginia Pappas, CAE	Society of Nuclear Medicine and Molecular Imaging	Chief Executive Officer
Abhijit Patil, PhD	GE Healthcare	Senior Director, Data Science
Elizabeth Philips, MS	GE Healthcare	Senior Research Manager, Machine Intelligence
Etta Pisano, MD	ACR and Harvard Medical School	Chief Research Officer and Professor
Donna Plecha, MD	University Hospitals Cleveland Medical Center	Chair of Department of Radiology
Hollis Potter, MD	Hospital for Special Surgery	Chairman, Department of Radiology and Imaging
Alison Pouch, PhD	University of Pennsylvania	Assistant Professor of Radiology and Bioengineering
Tina Young Poussaint, MD, FACR	Harvard Medical School, Boston Children's Hospital, ASNR	Chair, Professor of Radiology, ASNR President

Rebecca Rakow-Penner, MD, PhD	University of California, San Diego	Assistant Professor
Tannaz Rasouli, MPH	Association of American Medical Colleges (AAMC)	Senior Director, Public Policy & Strategic Outreach
Lenny Reznik, MBA	Agfa HealthCare	Vice President, Marketing
Neil Rofsky, MD, MHA	University of Texas, Southwestern Medical Center	Professor and Chair of Radiology
John Sabol, PhD,	Konica Minolta Healthcare	Clinical Research Manager
Gunnar Schaefer	Flywheel	Co-Founder and CTO
Mitch Schnall, MD, PhD	University of Pennsylvania	Academy President, Chair, Department of Radiology
Steven Seltzer, MD	Brigham and Women's Hospital	Chair Emeritus, Department of Radiology
Lalitha Shankar, MD, PhD	National Cancer Institute at the National Institutes of Health	Acting Chief of the Clinical Trials Branch in the Cancer Imaging Program
Karun Sharma, MD, PhD	Children's National Medical Center	Director of Interventional Radiology
Nasim Sheikh-Bahaei, MD	Keck School of Medicine of USC	Assistant Professor of Clinical & Neurology Radiology
Vipul Sheth, MD	Stanford University	Assistant Professor of Radiology
Vignesh Shetty, MS	GE Healthcare	VP & GM, AI& Performance Intelligence Analytics
Daniel Sodickson, MD, PhD	NYU Langone Health	Vice Chair for Research, Department of Radiology
Judy Squires, MD	University of Pittsburgh Medical Center	Pediatric Radiology Specialist
Bram Stolk, PhD, MBA	Flywheel	Senior VP Sales
Daniel C. Sullivan, MD	Duke University School Of Medicine	Professor Emeritus of Radiology
Tina Tailor, MD	Duke University School Of Medicine	Assistant Professor of Radiology
Daniel Thorek, PhD	Washington University in St. Louis	Assistant Professor of Radiology
William Thorwarth, MD	American College of Radiology	Chief Executive Officer
Sampath Tielikicherla Kandala, MS, MBA	GE Healthcare	GM, Oncology Solutions
Chip Truwit, MD	Philips	Chief Medical Officer for Precision Diagnosis
Richard Wahl, MD	Mallinckrodt Institute of Radiology, WUSTL	Professor and Director
Adam Wang, PhD	Stanford University	Assistant Professor of Radiology
David Widmann, MBA	Konica Minolta Healthcare	President & CEO
Moses Q. Wilks, PhD	Massachusetts General Hospital	Instructor in Radiology
Max Wintermark, MD	American Society of Neuroradiology	Chair of the Research Committee
Pamela Woodard, MD	Washington University School of Medicine	Professor of Radiology & Biomedical Engineering, Sr. VC, Division Director of Radiology Research Facilities
Vivek Yedavalli, MD, MS	Johns Hopkins Hospital	Assistant Professor of Neuroradiology, Director of Stroke Imaging
Maggie Zhang, MD, PhD	University of Michigan	Assistant Professor of Radiology