

RADIOLOGY RESEARCH UPDATE *October 2021, Issue 21*

Department of Diagnostic Radiology and Nuclear Medicine

FACULTY SPOTLIGHT



Professor **Vikas Kundra, MD, PhD** recently joined the abdominal imaging section of the department after a twenty-year academic affiliation with The University of Texas MD Anderson Cancer Center, most recently as Professor in the Department of Abdominal Imaging and Department of Cancer Systems Imaging in the Division of Diagnostic Imaging, with a joint appointment in the Department of Diagnostic and Interventional Imaging at The University of Texas Health Science Center at Houston – McGovern Medical School. He also served as the Director of Molecular Imaging in the Department of Abdominal Imaging at the MD Anderson Cancer Center. He is a Fulbright Scholar. He went to Harvard Medical School and did his residency and fellowship at Brigham and Women's Hospital. He grew

up in the area and attended college nearby at Loyola University Maryland.

Dr. Kundra's clinical activities focus on abdominal imaging, particularly CT and MR. He initiated bringing coronal and sagittal reconstructions to the PACS workstation for point-of-care reading, harmonized oral and IV contrast usage to decrease cost, and helped to bring the PET-MR system and hyperpolarization system to MD Anderson as well as to start an MR-guided prostate biopsy program.

Dr. Kundra spends a good portion of his time in research-related activities and has received federal, institutional, and industry funding since 2003. A principal area of interest is deploying imaging methods to personalize nanoparticle chemotherapy. He holds several patents, issued and pending, in the United States and abroad for somatostatin receptor-based imaging and therapy, including for imaging of delivered gene expression with applications such as in gene and cellular therapy. He is the coauthor of over 100 peer reviewed original research publications. Recently Dr. Kundra was awarded a five year ~\$3.1 million RO1 grant

from the National Cancer Institute for "Multimodal Imaging and Therapy of Ovarian Cancer." He and his team will test the accuracy of proposed methods for detecting ovarian tumor implants and hypothesize that pre-surgical MR imaging and surgical optical imaging/photodestruction employing DM-Dual-Gd-based nanoparticles can improve overall survival. This proposal seeks to create a new paradigm for approaching ovarian cancer that enables presurgical planning, surgical resection, and tumor photodestruction after a single nanoparticle injection.

GRANTS

Peiyong Liu, PhD, was awarded ~\$2.6M from NIH/NINDS for a 4-year R01 grant entitled "Gas-free Cerebrovascular Reactivity (CVR) MRI in Vascular Cognitive Impairment." Also, Dr. Liu's \$1.3M NIH/NINDS 3-year R01 grant entitled "Assessment of Brain Oxygen Consumption in Neonates using MRI" was transferred from Johns Hopkins University.

Ze Wang, PhD, was awarded \$2.3M from NIH/NIA for a 4-

year R01 grant entitled “Brain Entropy Mapping in Alzheimer's Disease.”

Bruce Wasserman, MD, was awarded \$722K from NIH/NIA for year 5 of an R01 grant transferred from Johns Hopkins University entitled “The Role of Intracranial Atherosclerosis in the Development of Alzheimer's Disease.”

Edna F. R. Pereira, PhD, Associate Professor, from the Department of Epidemiology and Public Health and **Rao P. Gullapalli, PhD**, were awarded a \$386K supplement for their NIH R01 grant entitled, “Targeting M1/M3 Muscarinic Receptors to Treat Gestational Pesticide Poisoning.”

Yajie Liang, PhD, was awarded \$155K from NIH/NINDS for a 2-year R03 grant entitled “Intravital 2-Photon Microscopy Enabling 6D Single Cell RNA Seq in Immunocompetent Glioblastoma Xenografts.”

Dheeraj Gandhi, MD, Radiology; Graeme Woodworth, MD, Neurosurgery; **Benjamin Pierce**, Radiology (MRI); **Kelsey Norfolk**, Radiology (MRI); **Alex Young**, Radiology (MRI); **Pamela Janocha**, Interventional Radiology; **Timothy Miller, MD**, Radiology; **Sijia Guo, PhD**,

Radiology; **Rao Gullapalli, PhD**, Radiology; **Ranyah Almadawi, MBBS**, DISPA Radiology, were awarded \$125K by the UMMC Innovation Challenge program for “Towards Painless and Non-invasive Low-intensity MR Guided Focused Ultrasound (MRgFUS) Treatments: Development, Testing and Clinical Implementation of Maryland MR Head and Neck Restrainer System.”

WARRES LECTURE



Dr. Davatzikos (left) and Dr. Melhem

The 41st annual **Warres Lecture**, held in memory of H. Leonard Warres, MD (1912-2011) was held virtually and in person on September 17, 2021. The keynote speaker was **Christos Davatzikos, PhD**, Director, Center for Biomedical Image Computing and Analytics (CBICA) Director, Artificial Intelligence in Biomedical Imaging Lab (AIBIL), University of Pennsylvania. The topic of Dr. Davatzikos' talk was “AI-Driven Neuroimaging: Applications to Neurodegenerative and

Neuropsychiatric Disorders and to Neuro-oncology.”

FEATURED PUBLICATIONS

Gao Y, Jablonska A, Chu C, Walczak P, Janowski M. Mesenchymal Stem Cells Do Not Lose Direct Labels Including Iron Oxide Nanoparticles and DFO-⁸⁹Zr Chelates through Secretion of Extracellular Vesicles. *Membranes (Basel)*. 2021 Jun 29;11(7):484.

Alafeef M, Moitra P, Dighe K, Pan D. Hyperspectral Mapping for the Detection of SARS-CoV-2 Using Nanomolecular Probes with Yoctomole Sensitivity. *ACS Nano*. July 2021 Epub ahead of print.

Ahmed N, Gandhi D, Melhem ER, Frenkel V. MRI Guided Focused Ultrasound-Mediated Delivery of Therapeutic Cells to the Brain: A Review of the State-of-the-Art Methodology and Future Applications. *Front Neurol*. June 2021 17;12:669449

Walczak P, Janowski M. The COVID-19 Menace. *Glob Chall*. 2021 May 7:2100004. Epub ahead of print.

DeVience SJ, Lu X, Proctor JL, Rangghran P, Medina JA, Melhem ER, Gullapalli RP, Fiskum G, Mayer D. Enhancing Metabolic Imaging

of Energy Metabolism in Traumatic Brain Injury Using Hyperpolarized [1-¹³C]Pyruvate and Dichloroacetate. *Metabolites*. 2021 May 24;11(6):335.

IN THE NEWS

Dheeraj Gandhi, MBBS was featured in the Focused Ultrasound Foundation's September 30, 2021 publication describing his treatment of a woman with neuropathic pain. For more, <https://www.youtube.com/watch?v=hNSjTRhLEEs>

CHEERS TO...

The Emergency and Trauma Imaging Section was well represented at the American Society of Emergency Radiology's Annual Meeting

held September 21-24 as a hybrid event attended virtually and in-person in Tampa, Florida. **Clint Sliker, MD** was the Annual Meeting Program Committee Chair. **Thomas Ptak, MD, PhD** presented "FASER: Penetrating Head Injuries: Forensic Analysis." **Uttam Bodanapally, MBBS** presented "Imaging of Head in Emergency/Trauma Department: Emerging Role of DECT." **David Dreizin, MD** presented "Pelvic Vascular Trauma," and **Matthew Dattwyler, MD** presented "Penetrating Spine Trauma." **Elana Smith, MD** was the Moderator of Neuroradiology: Non-trauma.

Piotr Walczak, MD, PhD, and **Mirosław Janowski, MD,**

PhD, Co-Directors of the Program in Image Guided Neurointerventions (PIGN), were highlighted in the newsletter of Children Brain Tumor Drug Delivery Consortium, headquartered in Nottingham, UK.

Separately, **Dr. Janowski** was selected as one of *Neurocritical Care's* Top Reviewers.

Associate Professor **Omer Awan, MD, MPH** was named by Aunt Minnie as one of the semifinalists for Most Effective Radiology Educator 2021.

A FOND FAREWELL

Best wishes to **Shiyu Tang, Ranyah Almardawi, and Erma Owens** who are moving on from the department. We thank them for their contributions and wish them well!

