

RADIOLOGY RESEARCH UPDATE *October 2017 Issue 6*

Department of Diagnostic Radiology and Nuclear Medicine

FACULTY SPOTLIGHT

As part of the School of Medicine's Initiative, Vision 2020, Drs. Linda Chang and Thomas Ernst have been recruited to join the Department of Diagnostic Radiology and Nuclear Medicine. Drs. Chang and Ernst are Principal Investigators in the Adolescent Brain Cognitive Development (ABCD) study and The University of Maryland is one of 21 institutions (and one of the 11 hubs) nationwide recruiting approximately 10,000 children, ages 9-10, to participate in the multimillion dollar study. The children's biological and behavioral development will be tracked using developmental assessments, advanced multi-modal neuroimaging techniques, and genetic and epigenetic studies. Brain development, cognition, emotion, executive function, mental health, substance use, physical health, and environment all will be examined over this ten year longitudinal study.



Linda Chang, MD, MS, FAAN, FANA, has been appointed Professor and Vice Chair of Faculty Development in the Department of Diagnostic Radiology and Nuclear Medicine, with a secondary appointment in the Department of Neurology. Prior to joining the department, Dr. Chang was a Professor of Medicine (Neurology) and the Director of the Neuroscience and

MR Research Program at the University of Hawaii. She also was the Co-Director of the UH-MR Research Center, which she co-founded with Dr. Thomas Ernst, at the Queen's Medical Center in Honolulu. As a board certified practicing neurologist, Dr. Chang's primary focus is in transdisciplinary clinical-translational research and mentoring. She has published extensively in the areas of dementia, brain injury, and neurological complications of HIV infection, as well as substance use disorders and their impact on the brain—both during development and aging. She collaborates with investigators at numerous institutions, and has an adjunct appointment in the Department of Neurology at the Johns Hopkins School of Medicine.



Thomas Ernst, Dr rer nat, has been appointed Professor in the Department of Diagnostic Radiology and Nuclear Medicine. Before this appointment, Dr. Ernst was a Professor of Medicine and Adjunct Professor of Physics at the University of Hawaii, where he served as the Technical Director of the Neuroscience and MR Research Program. Dr. Ernst has been involved in multiple clinical-translational research studies involving numerous brain disorders, including those on how the brain might be impacted by substance use and some co-occurring conditions (e.g., HIV-associated neurocognitive disorders), both in the settings of

brain aging and brain development. Dr. Ernst also invented novel methods to track and correct for motion during brain MRI scans, and leads an international bioengineering research program to further refine the prospective motion correction methods.

Drs. Chang and Ernst, along with their research staff, are actively recruiting for the ABCD study from Baltimore area public schools. For more information on the ABCD study, Drs. Chang and Ernst, and their research faculty and staff, visit:

<https://abcdstudy.org/sites/umaryland.html>

Grants!

Qi Cao, BM, PhD, Assistant Professor, was awarded a K08 grant for \$952,560 over five years to study: 18F Proline Preclinical PET Imaging in the Diagnosis of Early Stage Alcoholic Liver Fibrosis. The sponsor is the National Institute on Alcohol Abuse and Alcoholism.

Brenda Hanna-Pladdy, MA, PhD, Visiting Associate Professor, was awarded a 5 year R01 grant (\$2,373,041 total costs) from the National Institute of Neurological Disorders and Stroke for: Functional MRI Biomarkers Predicting Cognitive Progression in Parkinson's Disease. (Co-Investigator, **Rao Gullapalli, PhD**)

For assistance with grant submissions, contact:

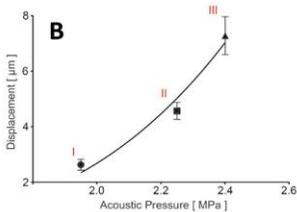
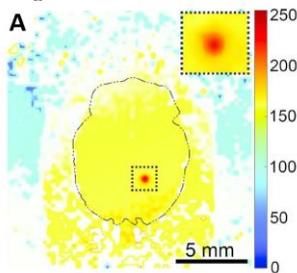
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TECHNIQUE HIGHLIGHT: Acoustic Radiation Force Impulse Imaging

By **Victor Frenkel, PhD**, and
Pavlos Anastasiadis, PhD

We are employing a relatively new approach for target validation in preclinical MRI-guided focused ultrasound (MRgFUS) studies. Currently in clinical practice, low energy continuous FUS exposures are used for this purpose to generate low temperature elevations in the tissue that are monitored with MR-thermometry. In this newer procedure, known as acoustic radiation force impulse (ARFI) imaging, pulsed FUS exposures are used to generate micron-scale displacements in the tissue (red spot in Fig 1A below), while creating negligible heat. Another advantage of this method is that the displacements measured are proportional to the applied acoustic pressure (B), hence, they allow for the determination of mechanical tissue properties (e.g., the elastic modulus) as well as treatment-induced changes (e.g., thermal ablation).

Fig 1



FEATURED PUBLICATIONS

Bodanapally UK, Dreizin D, Issa G, Archer-Arroyo KL, Sudini K, **Fleiter TR.** Dual-Energy CT in Enhancing Subdural Effusions that Masquerade as Subdural Hematomas: Diagnosis with Virtual High-Monochromatic (190-keV)

Images. *AJNR Am J Neuroradiol.* 2017 Oct;38(10):1946-1952.Epub 2017 Aug 10.

Jiao Y, Wang XH, **Chen R,** Tang TY, Zhu XQ, Teng GJ. Predictive Models of Minimal Hepatic Encephalopathy for Cirrhotic Patients Based on Large-scale Brain Intrinsic Connectivity Networks. *Sci Rep.* 2017 Sep 14;7(1):11512

Sourwine M, **Judy J,** Miller B, Vunnam R, Imanli H, Mesubi O, Etienne-Mesubi M, See V, Shorofsky S, Dickfeld T. Location, Variations, and Predictors of Epicardial Fat Mapping Using Multidetector Computed Tomography to Assist Epicardial Ventricular Tachycardia Ablation. *Pacing Clin Electrophysiol.* 2017 Jul 19.

For more faculty publications, visit: <http://department.radiology.umm.edu/?q=node/1151>

NEW RESEARCH FACULTY

Dinesh Shukla, PhD, has been appointed Assistant Professor having previously served in the same role in the Department of Psychiatry. His most recent grant awards have focused on MRI-guided focused ultrasound to develop therapies for neurotropic viral biothreat pathogens and diffusion basis spectrum imaging of traumatic axonal injury in mild TBI. He will be part of Drs. Chang and Ernst's group and assist their ongoing work on the ABCD study.

Also joining the department's ABCD research team as a Research Associate is **Christine C. Cloak, PhD.** Her past academic appointments include Assistant Professor (2004-2013) and Associate Professor (2013-2015) in the Department of Medicine at the University of Hawaii, Manoa. Prior to that, Dr. Cloak was a Fellow at Brookhaven National Laboratory in Upton, NY. Dr. Cloak was the recipient of an NIH/NIDA Career Development Award to study the impact of marijuana exposure on brain maturation. She holds a PhD in neuroscience from UCLA.

Brenda Hanna-Pladdy, MA, PhD, has been appointed Visiting

Associate Professor. Prior to her current appointment, Dr. Hanna-Pladdy was an Associate Professor in the Department of Neurology. She has held academic appointments as an Assistant Professor at Emory University School of Medicine, University of Kansas Medical Center, and Northwestern School of Medicine. At all of these institutions she also worked as a clinical neuropsychologist, providing neuropsychological consultation for patients with neurodegenerative diseases including movement disorders, Alzheimer's dementia, and stroke. In addition to the grant listed in the box above, she is currently Co-I on an R01 (Department of Neurology, with Steven Kittner, MD) titled "Ethnic/Racial Variations with Intracerebral Hemorrhage - Recovery." She was previously awarded an NIH Career Development (K01) grant for "Plasticity of Audiovisual Movement Representations: Implications for Limb Apraxia."

In other news...

Here we present a new column highlighting a member of the department's work or interest unrelated to radiology research, but nevertheless interesting, possibly intriguing. This issue's contribution is courtesy of **Prashant Raghavan, MBBS.** It is a copy of Rembrandt's *The Anatomy Lesson of Dr. Nicolaes Tulp* (1632). Dr. Raghavan's painting is oil on board 48x60 inches.



We encourage all members of the department to submit items to this and all columns of the newsletter. Email [Brigitte Pocta](mailto:Brigitte.Pocta@umm.edu) bpocta@umm.edu