NMR imaging of molecular and thermal diffusion

Presented by: David H. Gultekin PhD, Physicist and Research Scientist, Imaging Center, HMRI

TUESDAY, NOVEMBER 15, 2016
4:00 – 5:00 P.M.

WHERE: Research Conference Center, 734 Fairmount Avenue, Pasadena, CA 91105

ABOUT THE TALK: Molecular and thermal diffusion processes are important in a wide range of fields such as physics, chemistry, engineering, materials science, biology and medical sciences. Magnetic resonance imaging (MRI) techniques such as diffusion weighted imaging (DWI), diffusion tensor imaging (DTI) and diffusion kurtosis imaging (DKI) are important for a number of applications ranging from materials to medical sciences. Diffusion weighted MRI is widely used in radiology practice and research. This talk will review the fundamentals of molecular and thermal diffusion, image acquisition and processing techniques, and the applications of diffusion imaging for diagnosis and evaluating response to therapies in neurological diseases and cancer.

TARGET AUDIENCE: Physicians and clinicians practicing in radiology, neurology, oncology, radiation oncology, medical oncology and surgery.

LEARNING OBJECTIVES:

- Understand the fundamentals of molecular and thermal diffusion imaging.
- Understand the basics of diffusion imaging data acquisition and processing techniques.
- Understand the role of diffusion weighted imaging for diagnosis and evaluation of response to therapies.

ABOUT THE SPEAKER:
Dr. David Gultekin recently joined the staff at HMRI’s imaging center, from Memorial Sloan Kettering Cancer Center and Cornell Medical College where he was jointly appointed as an Assistant Professor. He has broad expertise in physics and engineering for medical imaging technology and participated in multi-institutional clinical trials including studies of response to radiation, chemical cytotoxic and targeted therapies such as monoclonal antibodies and anti-angiogenic therapies. He studied non-invasive MRI techniques to measure mass and energy transport processes with high spatial and temporal resolutions and developed methods for measuring thermal diffusivity, thermal conductivity, heat transfer coefficients, specific heat, specific absorption rate, thermal power and heat of reaction in substances. He received a BS degree at ITU-Istanbul, an MS degree at Stevens, and did graduate work at MIT, all in Materials Science and Engineering and then received MS, MPhil and PhD degrees at Yale University in Engineering and Applied Science. He held postdoctoral and fellowship positions at Duke, Caltech, and Johns Hopkins. Dr. Gultekin currently collaborates with his colleagues at NASA-JPL, Caltech, City of Hope, USC, UCLA and UCSD to develop advanced medical technologies for the detection and therapy of a wide range of diseases.

This activity has been planned and implemented in accordance with the accreditation requirements and policies of the Institute for Medical Quality/California Medical Association (IMQ/CMA) through the joint providership of Huntington Hospital and Huntington Medical Research Institutes. The Huntington Hospital is accredited by the IMQ/CMA to provide continuing medical education for physicians.” Huntington Hospital designates this live activity for a maximum of 1 hour of AMA PRA Category 1 Credit™. Physicians should claim only the credit commensurate with the extent of their participation in the activity. Disclosure: None of the Planners, Reviewers, CME program staff, or Speakers (nor their spouses or partners) have any financial relationships with commercial interest.