Currently Available Tools for using MRI to Monitor Gene Expression

A Talk by

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About the Speaker

Dr. Michael T. McMahon, a Full Professor at Johns Hopkins, is renowned for his pioneering work in CEST MRI contrast agents for cancer and kidney imaging. With a Ph.D. in Physical Chemistry from the University of Illinois at Urbana-Champaign, he transitioned from solid-state NMR research to MRI, working under Peter van Zijl's guidance. Dr. McMahon's contributions include techniques for measuring chemical exchange rates and introducing multiple-color MRI. He edited the sole textbook on CEST MRI and held leadership roles in ISMRM's Molecular Imaging Study Group.

Talk Abstract

For those suffering from hereditary diseases caused by gene mutations, viral gene delivery, and specifically the use of gene therapy holds great promise for the future of healthcare and the treatment of hereditary diseases. There are a number of new therapeutic strategies which involve the targeted manipulation of gene expression including virus based gene therapy, silencing RNA and use of small molecular inhibitors. A significant obstacle is the exorbitant expense.. We've developed MRI tools including genetically encoded reporter genes for direct monitoring of therapeutic gene expression. Oncolytic viruses, engineered with our MRI reporter genes, show promise in targeting and replicating within tumors. Additionally, we've explored MRI-based pH mapping to indirectly detect changes in tumor microenvironment related to cancer aggressiveness.

Hosted By

Prof. Kavita Dorai, Dept. of Physical Sciences & Convener NMR Facility, IISER Mohali

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