



Engineering
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Biomedical Engineering
Wallace H. Coulter Foundation
Seminar Series

“Energy footprint of cortical function: A unified perspective on brain networks”

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LECTURE: 9:00 am – 10:00 am
ENGINEERING CENTER
ROOM EC 1107
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Abstract: Burden of undiagnosed neurological disorders is significant. Translational neuroimaging need is met by calibrated fMRI, which has good spatiotemporal resolution and brain coverage, and converts the BOLD response into functional energy demand. Two instances are discussed to see if energy footprint reflects cortical function. First, I use an energy budget, with species-specific physiologic and morphologic data, to show that cortical signaling is accurately predicted by oxidative demand. Second, I examine regional cortical energy, with PET data of glucose oxidation, to illustrate that metabolic variations across resting networks are small. These results extend confidence in energy-based neuroimaging for health and disease.

Biography: Fahmeed Hyder is the founder and director of Yale’s QNMR Core Center (qnmr.yale.edu). He is also the director of high field animal systems at Yale’s MRRC (mrrc.yale.edu). He received a bachelor’s degree in physical chemistry in 1990 from Wabash and a doctoral degree in biophysical chemistry from Yale in 1995. He has been a faculty at Yale since 1999 and currently holds dual professor appointments in Biomedical Engineering and Diagnostic Radiology. He is a founding member of Yale’s Department of Biomedical Engineering. His primary focus is to use various imaging techniques, specifically magnetic resonance imaging and spectroscopy, to visualize molecular processes of the functioning brain at the laminar level by combining electrophysiology and optical imaging. He has four active funded projects in functional brain imaging, design of molecular agents, translation of molecular agents, and a resource core center. His work has produced over 100 publications in peer-reviewed journals with an h-index ranking of >40, and recently several patents have emerged out of his work. He has also written and edited books on functional brain imaging. Outside the laboratory he enjoys family, music, sports, and travel.

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