



Microstructural Imaging with Diffusion MRI



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Abstract

Magnetic Resonance Imaging (MRI) is one of the most important medical Imaging tools for clinical diagnosis. Nevertheless, current MRI technique is limited in its imaging resolution, e.g., clinical MRI is in the scale of millimeters, which is insufficient to detect fine structures in the brain or tiny lesions, not to mention to capture the microscopic pathological changes. Diffusion MRI provides the possibility to probe tissue microstructures noninvasive by detecting the restrictive diffusion of water molecules in the biological tissue which reflects the microscopic environment. There have been a number of diffusion MRI-based microstructural imaging developed in the past decade. Particularly, our group has been working on the diffusion-time-dependent diffusion MRI (TDDMRI) that captures the cellular microstructure as well as the cellular function. TDDMRI has demonstrated its clinical potential in prostate cancer, breast cancer, brain glioma, Alzheimer's disease, etc., and has been used in over 60 institutes both domestically and internationally. Furthermore, we have asl been working on specialized hardware, in particular, the ultrahigh gradient performance MRI system to improve the accuracy of diffusion MRI based microstructural mapping..

Biography

Dr. Dan Wu obtained her Bachelor's degree at Zhejiang University and master and PhD degrees at Johns Hopkins University. She served as an Assistant Professor at the Department of Radiology, Johns Hopkins University School of Medicine between 2016-2018. Her research focuses on developing diffusion MRI pulse sequences, microstructural models, as well as pediatric neuroimaging. She has published over 100 articles on top-tier journals including Science Advances, Nature Communications, PNAS, Radiology, and 28 authorized patents domestically and internationally. Dr. Wu is the PI of over 10 national and provincial grants in China, including the Major Scientific Instrument Development grant and the Key Joint Research grant of NSFC. She was also the PI of the NIH R01, R21 and R03 grants in the US. She is serving as the associate editor of Human Brain Mapping, and secretary of the diffusion study group of the International Society of Magnetic Resonance in Medicine.

*** ALL ARE WELCOME ***

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