**R-fMRI spontaneous low frequency fluctuations: making measurements more robust and a theoretical framework of the underlying electrophysiological “mechanisms”**

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As a research tool to investigate ongoing brain activity in basic, translational and clinical neuroscience studies, the use of resting-state fMRI (R-fMRI) has grown rapidly due to its sensitivity to developmental, aging and pathological processes, ease of data collection in challenging populations, and amenability to aggregation across studies and sites. Although R-fMRI has substantial potential to support novel clinical applications, its methodologies are still confronted with significant challenges. Here I would like to present our work on addressing head motion impact on R-fMRI measures, and how the standardization methods make R-fMRI measures more robust in combining data across sites. Furthermore, as fMRI BOLD signal is not a direct measure of neuronal electrical activity, the underlying mechanistic understanding of ongoing slow brain activity remains unclear. I would like to present my recent work on bridging R-fMRI and electrophysiological methods, and propose a theoretical framework, modulation of low frequency fluctuations (MLFF), to tap into the underlying electrophysiological “mechanisms” of spontaneous low frequency fluctuations and the R-fMRI measures.

***About the Speaker****:*Dr. Chao-Gan Yan is a research scientist at the Nathan Kline Institute for Psychiatric Research, and a research assistant professor at the Department of Child and Adolescent Psychiatry / NYU Langone Medical Center Child Study Center, New York University. His main research interests are focused on computational methodology of R-fMRI, electrophysiological significance of R-fMRI measures and mechanical understanding of ongoing low frequency fluctuations. Dedicated to the R-fMRI-related fields, he has published 28 peer-reviewed journal articles, achieving an h-index of 21 (http://scholar.google.com/citations?user=lJQ9B58AAAAJ). His prior work focused on addressing the methodological issues related R-fMRI measures. Recently, his research interest focused on the mechanical understanding of spontaneous low frequency fluctuations and the R-fMRI measures, and proposed a theoretical framework about underlying electrophysiological “mechanisms”: modulation of low frequency fluctuations (MLFF). To facilitate the application of R-fMRI to brain disorder studies, Dr. Yan created a user-friendly pipeline called Data Processing Assistant for Resting-State fMRI (DPARSF) and leads the maintaining group in updating the Resting-state fMRI Data Analysis Toolkit (REST). He also initiated the R-fMRI Network (rfmri.org) for connecting researchers, sharing resources and supporting tools, and created multimedia courses on R-fMRI data processing (http://rfmri.org/Course). He is an academic reviewer for scientific journals including *Journal of Neuroscience, Human Brain Mapping, NeuroImage, PLoS ONE, Brain Connectivity, Neuroinformatics and Frontiers in Neuroscience*.