Mechanistic Aspects of Resting-State Functional Connectivity

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Abstract:
Resting-state functional Magnetic Resonance Image (rsfMRI) signal correlation has been widely used for mapping brain connectivity. Empirical findings from a large number of rsfMRI studies have revolutionized our understanding of the organization of large-scale brain networks and their abnormalities in many brain diseases. However, the neurophysiological basis underlying this images-base measure remains elusive. In this seminar, I describe three research projects that aimed at promoting mechanistic understanding of the resting-state fMRI connectivity. Combining multi-modal recordings from animals and humans under various brain conditions, these projects suggest the neural origin of the resting-state connectivity under deep anesthesia, provide insight into the dynamic nature of the resting-state connectivity, and reveal the electrophysiological correlates of network-specific and global non-specific components of fMRI correlations, as well as their behavioral relevance.

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