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Sommario/riassunto

There is a growing appreciation that many psychiatric (and neurological) conditions can be understood as functional disconnection syndromes - as reflected in aberrant functional integration and synaptic connectivity. This Research Topic considers recent advances in understanding psychopathology in terms of aberrant effective connectivity - as measured noninvasively using functional magnetic resonance imaging (fMRI). Recently, there has been increasing interest in inferring directed connectivity (effective connectivity) from fMRI data. Effective connectivity refers to the influence that one neural system exerts over another and quantifies the directed coupling among brain regions - and how they change with pathophysiology. Compared to functional connectivity, effective connectivity allows one to understand how brain regions interact with each other in terms of context sensitive changes and directed coupling - and therefore may provide mechanistic insights into the neural basis of psychopathology. Established models of effective connectivity include psychophysiological interaction (PPI), structural equation modeling (SEM) and dynamic causal modelling (DCM). DCM is unique because it explicitly models the interaction among brain regions in terms of latent neuronal activity. Moreover, recent advances in DCM such as stochastic and spectral DCM, make it possible to characterize the interaction between different brain regions both at rest and during a cognitive task.