UConn BIRC Virtual Seminars

Tuesday, May 5th from 12–1:15pm EST via Zoom

Explorations into the default network of the human brain

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Abstract: The default network has been one of the most robustly observed features of the brain and is implicated in a vast array of cognitive abilities, neurological and psychiatric disorders, as well as typical and atypical development. Yet the specific functional role of the default network has remained controversial. Long-held perceptions of the default network has suggested that it is "task-negative," or behaviorally relevant only in its deactivation. My work has argued that, far from being 'task negative', these brain regions are active and necessary for flexible goal pursuit. In this talk I will outline a series of studies demonstrating that the default network of the brain supports spontaneous and stimulus-independent thought. Next, I review recent work suggesting that the default network is not solely internally-focused, but rather interacts with other large-scale brain systems to support externally-directed cognitive control abilities. I will then shift towards a more translational focus, demonstrating how the architecture of the default network changes across the lifespan, and how these changes predict individual differences in the trajectory of cognitive aging. To conclude, I look forward from these explorations of default network function to formulate a broader conceptualization of the shifting architectures of brain and cognitive function across the lifespan and suggest that drawing these parallels can help redefine our perceptions of human aging.

Bio: *Dr. Nathan Spreng is an associate professor and the director of the Laboratory of Brain and Cognition at the Montreal Neurological Institute in the Department of Neurology and Neurosurgery at McGill University. His research examines large-scale brain network dynamics and their role in cognition. Currently, he is investigating the links between memory, attention, cognitive control, and social cognition and the interacting brain networks that support them. He is also actively involved in the development and implementation of novel multivariate statistical approaches to assess activity and interactivity of large-scale brain networks. His work adopts a network neuroscience approach to investigating complex cognitive processes as they change across the lifespan, both in normal aging and brain disease.*

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