## Seminar/Talk

# Restless engrams: the origin of continually reconfiguring neural representations

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During learning, populations of neurons alter their connectivity and activity patterns, enabling the brain to construct a model of the external world. Conventional wisdom holds that the durability of a such a model is reflected in the stability of neural responses and the stability of synaptic connections that form memory engrams. However, recent experimental findings have challenged this idea, revealing that neural population activity in circuits involved in sensory perception, motor planning and spatial memory continually change over time during familiar behavioural tasks. This continual change suggests significant redundancy in neural representations, with many circuit configurations providing equivalent function. I will describe recent work that explores the consequences of such redundancy for learning and for task representation. Despite large changes in neural activity, we find cortical responses in sensorimotor tasks admit a relatively stable readout at the population level. Furthermore, we find that redundancy in circuit connectivity can make a task easier to learn and compensate for deficiencies in biological learning rules. Finally, if neuronal connections are subject to an unavoidable level of turnover, the level of plasticity required to optimally maintain a memory is generally lower than the total change due to turnover itself, predicting continual reconfiguration of an engram.

**Friday, March 5, 2021 03:00pm - 04:00pm**
Online

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