



Talks by rising stars of neuroscience

**Learning and updating structured knowledge**

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During our everyday lives, much of what we experience is familiar and predictable. We typically follow the same morning routine, take the same route to work, and encounter the same colleagues. However, every once in a while, we encounter a surprising event that violates our expectations. When we encounter such violations of our expectations, it is adaptive to update our internal model of the world in order to make better predictions in the future. The hippocampus is thought to support both the learning of the predictable structure of our environment, as well as the detection and encoding of violations. However, the hippocampus is a complex and heterogeneous structure, composed of different subfields that are thought to subserve different functions. As such, it is not yet known how the hippocampus accomplishes the learning and updating of structured knowledge. Using behavioral methods and high-resolution fMRI, I'll show that during learning of repeated and predicted events, hippocampal subfields differentially integrate and separate event representations, thus learning the structure of ongoing experience. I then move on to discuss how when events violate our predictions, there is a shift in communication between hippocampal subfields, potentially allowing for efficient encoding of the novel and surprising information. If time permits, I'll present an additional behavioral study showing that violations of predictions promote detailed memories. Together, these studies advance our understanding of how we adaptively learn and update our knowledge.

Event link:

<http://www.crowdcast.io/e/wwneurise/>