

# IGSN - COLLOQUIUM

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### How does the brain forget?

Eventually, most memories will be forgotten. The reasons for this ubiquitous memory loss remain to be identified. Addressing this issue, we will present our recent research on possible mechanisms mediating the loss of short-term and long-term memory.

(1) Short-term memories have been proposed to be specifically vulnerable to subsequent encoding of other experiences, which may interfere with their stabilization and long-term retention. We will report results of a series of experiments that partly confirm this hypothesis, yet demonstrate that short-term memories are more likely to benefit from subsequent encoding, which can extend their retention, paradoxically, even more so when both experiences are highly similar.

(2) Based on the assumption that the brain promiscuously forms new long-term memories, we have suggested that a dedicated well-regulated active decay mechanism will be necessary to systematically erase these mostly superfluous records of insignificant experiences. We proposed that a dedicated decay mechanism exists that involves activation of NMDARs and subsequent increase in intracellular  $Ca^{2+}$ , promoting synaptic removal of GluA2-containing AMPA receptors, thereby reducing synaptic potentiation and eventually erasing memories (*Hardt et al TiCS 2013; Hardt et al Phil Trans Roy Soc B 2014*). We will discuss several studies that provide empirical support for this active decay theory.

#### Host:

DENISE MANAHAN-VAUGHAN

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**Guests are welcome**