"Implementation of flexible learning in the brain"

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Adaptive behavior critically depends on re-adjusting to alternative goals when new evidence contradicts previous conclusions and cost-benefit considerations favor alternative learning. How such flexible learning might be implemented in the brain is not well understood, but a possible framework could involve systems dedicated to evaluating current experience against expectations, and downstream learning systems recruited for assignment of new feature/item-value associations. Within this hypothetical systems framework, the hippocampus has been shown to establish and update context-related memories, individual cortical areas have been related to mismatch detection and decision making within a particular aspect of experience, and dorso-medial striatum (DMS) has been related to flexible goal-directed behavior relying on response-outcome associations. I will discuss recent studies from our lab identifying a specific hippocampal-cortical-striatal subnetwork involved in the implementation of adaptive context-related flexible learning.