Pallidal spiking activity reflects learning dynamics and predicts performance

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The basal ganglia (BG) are a set of interconnected nuclei deeply buried within the brain that are involved in action selection and habit formation. Classically considered motor nuclei, their role in cognitive performance has become widely appreciated over time. Current models of learning in the BG focus on striatal neurons and the neurotransmitter dopamine, but these do not fully account for observed behaviors. In this paper, we considered the learning-related activity of the external globus pallidus (GPe), a downstream BG nucleus. We show that GPe spiking activity predicts future performance, corresponds with learning dynamics, and decreases as performance becomes more automatic. Taken together, our data reveal the role of GPe in learning and open new avenues for research.

Full article: http://www.pnas.org/content/113/41/E6281.abstract

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