

# Neural codes for physical and visual navigation in food-caching birds

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## Abstract

Food-caching birds, such as black-capped chickadees, have the remarkable ability to store many food items across their environment and later retrieve them using memory. This ability depends on the hippocampus, a brain region that is critical for memory function in humans. Also as in humans, food-caching birds depend heavily on vision to navigate. I will first describe our discovery of spatial representations in the avian hippocampus, suggesting a remarkable similarity between the hippocampus of birds and mammals despite 300 million years of independent evolution. I will then describe our recent development of a system to estimate gaze in freely moving birds, allowing us to behaviorally dissociate physical location from viewed location. Results using this system suggest that the hippocampus rapidly coordinates representations of physical and viewed locations during active vision. These studies lay a foundation for investigation of how memory and perceptual neural circuits interact to guide behavior.



Dr. Hannah Payne is a postdoctoral research scientist at Columbia University in New York City. She studies the hippocampus in the black-capped chickadee, a visual-navigator that caches food in an impressively large number of hiding spots.