Dopaminergic Signals for Reward, Performance and Social Outcomes are Dynamically Gated During Courtship

March 7

Tuesday, 12:30 pm

Zoom Only

SPEAKER:

Jesse H. Goldberg, M.D., Ph.D.
Associate Professor and Robert R. Capranica Fellow
Neurobiology and Behavior
Director of Graduate Studies
Cornell University, Ithaca, NY

Host: Edmund Hollis II, Ph.D.

For more information contact
Darlene White
daw9085@med.cornell.edu

Abstract

How does courtship affect dopaminergic (DA) responses to reward and motor performance outcomes? We used electrophysiology and fiber photometry to record DA signals in two mesostriatal pathways as thirsty male songbirds sang alone and to females. When alone, water reward signals were observed globally but singing-related performance error signals were restricted to a song-specialized mesostriatal pathway. During courtship singing, DA responses to both water-predicting cues and song performance outcomes diminished, and DA signals in the song pathway were instead driven by female calls timed with the male song. Thus DA signals are dynamically gated and routed through distinct mesostriatal pathways as animals change their priorities in response to a courtship opportunity.

Publications

1 - Alison Duffy, Kenneth W. Latimer, Jesse H. Goldberg, Adrienne L. Fairhall, Vikram Gadagkar. ***Dopamine Neurons Evaluate Natural Fluctuations in Performance Quality.*** Cell Rep. 2022 Mar 29;38(13):110574. doi: 10.1016/j.celrep.2022.110574. pdf

Bollu T,* Ito B*, Whitehead SC, Kardon B, Liu MH, Goldberg JH. ***Cortex-dependent corrections as the tongue reaches for and misses targets.*** Nature. 2021 Jun;594(7861):82-87.

Chen R and Goldberg JH. ***Actor Critic Reinforcement Learning in the Songbird.*** Current Opinion in Neurobiology. 2020 Sep 5;65:1-9. doi: 10.1016/j.conb.2020.08.005.

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