



**University of
Zurich** ^{UZH}

Department of Economics – Neuroeconomics Seminar

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Running on dopamine:

An integrated perspective on reinforcement, action, and metabolism

A major purpose of motivated behavior is to maintain energy homeostasis by securing rewards such as energy-dense food that pay the total metabolic cost of the body. Dopamine is a key neurotransmitter in reinforcement learning and action control subserving allostasis by regulating goal-directed behavior. However, it is not well understood how learning and action control are integrated in dopamine signaling and if they are differentially affected by alterations in metabolism. In this talk, I will provide several cases demonstrating the necessity to decompose learning and action from integrated brain signals and behavior. Moreover, I will provide emerging evidence for metabolic regulation of brain response to reward. Lastly, by applying connectomic “fingerprinting”, I will show that taking the individual functional architecture of the brain into account might help to reduce heterogeneity of effects elicited by a dopamine challenge. Collectively, these elements might help to better unravel the intricate coupling between aspects of action and learning in reward-related behavior and their correspondence with energy metabolism and body-weight control.