Paper Summaries – Britt Lab Summer 2018

**P1: Midbrain dopamine neurons encode decisions for future action – SNc // irrelevant**

o   Recorded DA neuron activity during a decision-making task

o   Used a micro electrode to record from the macaque monkey VTA/SNc

* Monkey was fixed and could only move its arm
* State action pairs that were assigned a value

o   Expectation of reward was modulated by the chosen action, DA expectation signal was less or more depending on the reward associated with the chosen action

o   Activity was noted 122 ms after the action commenced

**P2: Optogenetic interrogation of dopaminergic modulation of the multiple phases of reward-seeking behavior**

o   Channel R mice and controls did a two-lever operant task, both paired with a food pellet

o   One of the levers was paired with DA stimulation, these mice exhibited higher responses on the active lever compared to controls

o   Stimulation was paired to the lever press

o   Food consumption was not affected however, reward seeking behavior only

o   Also no ICSS like effect

o   Phasic dopamine neuron activation in the VTA may have positive reinforcement properties

o   Optogenetic activation of DA neurons was sufficient to reinstate previously extinguished reward seeking behaviors

**P3: Subsecond dopamine fluctuations in human striatum encode superposed error signals about actual and counterfactual reward**

o   Paper found a neural correlate of a CPE (counterfactual prediction error) that estimates how good or bad something was compared to the best or worse case scenario

o   Relief and regret

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o   Implants in human patients with parkinson’s disease allowed the researchers to measure changes in DA concentration in the brain