Effects of Inactivation of the Corticostriatal Pathway Projecting from Infralimbic Cortex to Posterior Dorsomedial Caudate-Putamen on Learning in Male Rats

An attempt to demonstrate the relation between the corticostriatal pathway and learning in rats using the newer and less invasive DREADDS technology for pathway inactivation. Using standard Med Associates operant chambers, rats were lever trained before undergoing two surgeries; a cranial infusion of the DREADDS mRNA on either end of the desired pathway, and an exterior accessible catheter implanted in the jugular. Following recovery, rats participated in daily learning sessions where random infusions of nicotine would correspond to a presentation of a positive reinforcer – sucrose. The learned association between reinforcers was measured against test sessions where inactivation of the corticostriatal pathway using the DREADDS would often decrease or inhibit the learned behavioral responses associating nicotine and sucrose. Upon completion of the testing phase rats were perfused, the brain removed, sectioned, stained, and imaged to visualize the changes observed in behavior.

My involvement included daily husbandry and care of the rats and participating in (and on occasion leading) surgeries. I also led daily learning sessions, collecting and interpreting the data. I conducted perfusions.