

Submitter Name: Sharona Sedighim
Submitted email: ssedighi@ucsd.edu
PI Name (if different): Olivier George
PI email (if different): olgeorge@ucsd.edu

HS rats with high addiction-like behaviors choose cocaine over palatable food in a discrete choice test

Sharona Sedighim¹, Lieselot Carette¹, Giordano de Guglielmo¹, Olivier George¹

¹Department of Psychiatry, University of California San Diego

Recent studies have shown that most rats prefer non-drug rewards over cocaine when given a mutually exclusive choice between cocaine and palatable foods. However, these studies were performed using strains of rats lacking the genetic and behavioral diversity found in humans. To address this issue, we used a unique outbred group of rats (heterogenous stock) that mimic these variations, and characterized individual differences in addiction-like behaviors using an Addiction Index, incorporating key criteria of cocaine use disorder: escalated intake and compulsive-like responding. We tested whether animals with high addiction-like behaviors exhibit a shift in reward choice. Rats self-administered cocaine (0.5mg/kg/infusion) or palatable food (five 45mg pellets per reward) in short (2h) and long (6h) access conditions, with discrete choice sessions performed periodically throughout training. We also assessed progressive-ratio responding and compulsivity for cocaine by pairing 30% of rewards with a footshock. Afterwards, we assessed cocaine and food preference for 1 week. We then inserted a delay for food and tested choice right after a cocaine session. Rats with high addiction-like behaviors exhibited a preference for cocaine when exposed to a cocaine session immediately before the discrete choice session and only if the food reward was associated with a 90s delay. In contrast, rats with low addiction-like behavior strongly preferred the palatable food over cocaine in all testing conditions. These results indicate that individual differences in addiction-like behaviors in HS rats result in a shift in preference toward cocaine over a non-drug reward.