

## **The Effect of Neuropeptide Y on Food-Induced Reinstatement and Vocalization in Rats**

Neuropeptide Y (NPY) is a polypeptide neurotransmitter which is released in a number of nuclei in the central nervous system (e.g., hypothalamic nuclei, basal ganglia, and nuclei of the autonomic nervous system). The most notable function of NPY is that it is orexigenic, meaning it increases food intake. However, increasing evidence suggests that it may also play a role in the neurochemical motivation, emotional regulation, and vulnerability to addiction relapse. Drug -induced reinstatement of a previous operant self-administration response to the drug is a common model used to study relapse behavior in rats. Our laboratory recently found that administration of NPY reduces cocaine-induced reinstatement in this model suggesting it may suppress cocaine-induced relapse. In addition, NPY reduced the increase in 50 KHz ultrasonic vocalizations (USVs) that typically follows exposure to cocaine. USVs in this range are thought to indicate a “positive” emotional state in rats. We wondered if the NPY-induced suppression of these responses to cocaine could be due to an increase in motivation to seek food and tested that idea by evaluating food-induced reinstatement and food-induced USVs in rats with a history of cocaine self-administration. It was hypothesized that, due to its natural orexigenic effects, administration of NPY would enhance the magnitude of food-induced reinstatement and increase the number 50 KHz USVs made during food reward. The results suggest that that food-induced reinstatement was unchanged by the administration of NPY. Additionally, significantly fewer USVs were emitted during food-induced reinstatement compared to cocaine-induced reinstatement. The results suggest that NPY induced decreases in cocaine-induced reinstatement and cocaine-induced USVs are not due to an increase in food seeking behavior.

*Keywords: Neuropeptide Y (NPY), ultrasonic vocalizations (USVs), self-administration, food-induced reinstatement, cocaine-induced reinstatement, drug addiction*