THE EXPRESSION OF 5-HT_{2A}R AND THE 5-HT_{2C}R IN THE DORSAL AND VENTRAL HIPPOCAMPUS.

Kiara M. Serrano-ruiz[1,3], Erica Holliday[1], Kathryn A. Cunningham[1,2],. [1]Center of Addiction Research, [2]Department of Pharmacology and Toxicology, [3]SURP and Florida International University, University of Texas Medical Branch, Galveston TX 77555-1102.

Cocaine use disorder (CUD) affects 17 million people worldwide. The success in recovery from CUD is challenged by vulnerability to relapse driven in large part by cue reactivity (sensitivity to cues previously linked with drug-taking experience) and craving. Recently, the Cunningham group has demonstrated that the 5-HT_{2A} receptor (5-HT_{2A}R) and the 5-HT_{2C} receptor (5-HT_{2C}R) have oppositional effects on cue reactivity. Specifically, 5-HT_{2C}R agonists and 5-HT_{2A}R antagonists reduce cue reactivity in cocaine self-administration supporting the idea of that these two receptors act in opposition to control behaviors related to CUD. Previous work has demonstrated that higher expression of the 5-HT_{2A}R coupled with lower expression of the 5-HT_{2C}R in the medial prefrontal cortex (mPFC) is associated with heightened cue reactivity following a period of abstinence. In addition to the mPFC, the hippocampus is another key brain region that plays a critical role in the development of drug-cue associations. It is currently unknown if the expression patterns of the 5-HT_{2A}R and the 5-HT_{2C}R are different along the dorsal-ventral axis of the hippocampus. Given the functional differences between the dorsal (dHipp) and ventral hippocampus (vHipp), (i.e. the dHipp regulates cognitive functions and vHipp regulates mood and anxiety), we tested the hypothesis that there would be an increase in 5-HT_{2A}R in the dHipp and an increase of the 5-HT_{2C}R in the vHipp. We used immunohistochemistry methods to detect 5-HT_{2A}R and 5-HT_{2C}R expressions in the hippocampus in fixed rat brains. Our results indicate that vulnerability to relapse could be driven by altered interactions of the 5-HT_{2C}R and the 5-HT_{2A}R within the hippocampus formation.

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