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Analysis of Neuronal Stem Cell Vesicle Packaging After Treatment with Drugs of Abuse.

Drugs of abuse reduce neuronal cell numbers in the CNS and alter normal plasticity processes. These changes are accumulative over time and increase with repetitive doses. CNS plasticity allows for the adaptation of nerves to new stimuli and/or cellular loss and damage. The consequence from drug insult are lost neural connections within the brain likely effecting memory and cognition. Addicts increased tolerance and compulsivity are linked to neuroplasticity. Substances such as methamphetamine and opioids have been known to alter the dopamine circuitry in the limbic system by reducing connectivity. We examined the effects on non-differentiated neuronal stem cells when treated with DAMGO (opioid agonist), cocaine, methamphetamine, and alcohol followed with 5 days' differentiation (Limited differentiation time). Specifically, we see alterations in vehicular packaging and changes in expression of the neurotransmitter GABA. Research sponsored by WV-INBRE grant P20GM103434.