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Decreased hyperpolarization-activated cation current (I<sub>h</sub>): a response mechanism to reduce cocaine-induced excitability in VTA DA neurons.

Cocaine addiction is a neurobiological disorder that has the capability to change the brain's anatomy, functionality and circuit excitability. An important goal of addiction research is to understand the neurobiological mechanisms underlying this pathology. The hyperpolarization cation activated current (H-current) has been studied as a modulator of neural excitability since its discovery in neurons in 1980's. Chronic cocaine induces a 40% reduction in the H-current of dopaminergic neurons of the Ventral Tegmental Area (VTA). My research project consists of exploring the decreased H-current as a response mechanism to reduce cocaine-induced excitability on dopaminergic neurons of the VTA. The overall goal is to elucidate a functional role of the H-current in excitability during the development of cocaine dependence and therefore contribute to the understanding of neuroadaptations underlying cocaine addiction.