Brain Circuit Mechanisms for Self-Control Failure

Abstract: Dominant models of prosocial and antisocial behavior emphasize the role of ‘self-control.’ However, despite clear evidence for multidimensionality, self-control is often conflated with response inhibition and conceptualized as a ‘brake’ on ‘bad’ behavior. In turn, prefrontal cortex is often considered a neurobiological instantiation of this self-control brake; in this light, prefrontal dysfunction in antisocial individuals is commonly interpreted as reflecting a deficit in inhibitory control. I will propose an alternative model of self-control failure in impulsive-antisocial individuals that is grounded in the systems neuroscience of value-based decision-making. Using PET, fMRI and brain stimulation, I will provide evidence that ventromedial and dorsolateral cortex modulates value-related representations within the striatum, and that dysregulated corticostriatal connectivity is associated with aberrant value signaling in incarcerated antisocial offenders during reward pursuit, choice behavior and feedback learning.