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Inhibitory Plasticity of Mesocorticolimbic Circuits in Addiction and Mental Illness.

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Abstract

Behavioral adaptations occur through remodeling of brain circuits, as arising, for instance, from experience-dependent synaptic plasticity. Drugs of abuse and aversive stimuli, such as stress, act on the mesocorticolimbic system, dysregulating adaptive mechanisms and leading to a variety of aberrant behaviors associated with neuropsychiatric disorders. Until recently, research in the field has commonly focused on experience-dependent synaptic plasticity at excitatory synapses. However, there is growing evidence that synaptic plasticity within inhibitory circuits is an important contributor to maladaptive behaviors. We speculate that restoring normal inhibitory synaptic transmission is a promising therapeutic target for correcting some of the circuit abnormalities underlying neuropsychiatric disorders.

KEYWORDS: Drugs of abuse; GABA; KCC2; chloride; dopamine; mesolimbic; nucleus accumbens; stress; ventral tegmental area

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