

[Learn Mem.](#) 2009 Apr 20;16(5):279-88. doi: 10.1101/lm.1041309. Print 2009 May.

Extinction circuits for fear and addiction overlap in prefrontal cortex.

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Source

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Abstract

Extinction is a form of inhibitory learning that suppresses a previously conditioned response. Both fear and drug seeking are conditioned responses that can lead to maladaptive behavior when expressed inappropriately, manifesting as anxiety disorders and addiction, respectively. Recent evidence indicates that the medial prefrontal cortex (mPFC) is critical for the extinction of both fear and drug-seeking behaviors. Moreover, a dorsal-ventral distinction is apparent within the mPFC, such that the prelimbic (PL-mPFC) cortex drives the expression of fear and drug seeking, whereas the infralimbic (IL-mPFC) cortex suppresses these behaviors after extinction. For conditioned fear, the dorsal-ventral dichotomy is accomplished via divergent projections to different subregions of the amygdala, whereas for drug seeking, it is accomplished via divergent projections to the subregions of the nucleus accumbens. Given that the mPFC represents a common node in the extinction circuit for these behaviors, treatments that target this region may help alleviate symptoms of both anxiety and addictive disorders by enhancing extinction memory.

PMID:

19380710

[PubMed - indexed for MEDLINE]

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