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Medial prefrontal cortex determines how stressor controllability affects behavior and dorsal raphe nucleus.

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Source

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Abstract

The degree of behavioral control that an organism has over a stressor is a potent modulator of the stressor's impact; uncontrollable stressors produce numerous outcomes that do not occur if the stressor is controllable. Research on controllability has focused on brainstem nuclei such as the dorsal raphe nucleus (DRN). Here we find that the infralimbic and prelimbic regions of the ventral medial prefrontal cortex (mPFCv) in rats detect whether a stressor is under the organism's control. When a stressor is controllable, stress-induced activation of the DRN is inhibited by the mPFCv, and the behavioral sequelae of uncontrollable stress are blocked. This suggests a new function for the mPFCv and implies that the presence of control inhibits stress-induced neural activity in brainstem nuclei, in contrast to the prevalent view that such activity is induced by a lack of control.

Comment in

- [Controlling stress: how the brain protects itself from depression](#). [Nat Neurosci. 2005]

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