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# The prefrontal cortex as a key target of the maladaptive response to stress.

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## Source

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## Abstract

Research on the detrimental effects of stress in the brain has mainly focused on the hippocampus. Because prefrontal cortex (PFC) dysfunction characterizes many stress-related disorders, we here analyzed the impact of chronic stress in rats on the integrity of the hippocampal-PFC pathway, monitored by behavioral and electrophysiological function and morphological assessment. We show that chronic stress impairs synaptic plasticity by reducing LTP induction in the hippocampal-PFC connection; in addition, it induces selective atrophy within the PFC and severely disrupts working memory and behavioral flexibility, two functions that depend on PFC integrity. We also demonstrate that short periods of stress exposure induce spatial reference memory deficits before affecting PFC-dependent tasks, thus suggesting that the impairment of synaptic plasticity within the hippocampus-to-PFC connection is of relevance to the stress-induced PFC dysfunction. These findings evidence a fundamental role of the PFC in maladaptive responses to stress and identify this area as a target for intervention in stress-related disorders.

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