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How traumatic and stressful events affect our brains?

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Stress affects both physiological and psychological processes, including brain function and memory. The hippocampus, which is pivotal for memory, is particularly vulnerable to stress. The relationship between stress, the hippocampus, and memory is complex and varies depending on the stress level.

Neurobiological research focuses mainly on the hypothalamic-pituitary-adrenal (HPA) axis and the release of glucocorticoids in response to stress. Although acute stress can enhance cognition, chronic stress can dysregulate the HPA axis, harming the structure and function of the hippocampus. Studies investigating the effects of chronic stress have demonstrated changes in hippocampal morphology and synaptic plasticity. Chronic stress is consistently associated with dendritic atrophy, reduced spine density, and synaptic remodelling in the hippocampus, particularly in the CA1 region.

It is crucial to understand the neurobiological mechanisms underlying stress-induced hippocampal dysfunction to develop therapeutic interventions that mitigate the cognitive consequences of chronic stress and promote resilience in vulnerable populations.

Field

Biosciences

Length

Short 15 min

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