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Mechanisms of cognitive vulnerability to stress: synapses, Spine and a symphony of mediators

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Learning and memory processes carried out within the hippocampus are influenced by stress in a complex manner, and the mechanisms by which stress modulates the physiology of the hippocampus are not fully understood. Here we demonstrate that short (hours-long) modern-life like stress consisting of concurrent psychological and physical stresses affect memory profoundly. Among the several stress-mediators involved, we focus on the release of the neuropeptide corticotropin-releasing hormone (CRH) within the hippocampus during stress and the mechanisms by which it influences synaptic structure and hippocampal function. These involve both actin dynamics and activity driven, calcium-dependent processes. Future challenges are to uncover how the dynamic actions of CRH integrate with the well-established roles of adrenal-derived steroid stress hormones to shape the cognitive f