

Endocannabinoids and Emotional Memory Modulation: The Key Role of the Basolateral Complex of the Amygdala

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The activation of neuromodulatory systems affecting the amygdala, and its projections to other brain regions, plays a key role in enabling emotionally significant experiences to be well remembered. Enhanced memory for emotional events is a well-recognized phenomenon, which has obvious adaptive value in evolutionary terms, as it is vital to remember both dangerous and favorable situations. However the efficient encoding of emotional memories can, in certain conditions, become maladaptive, thus playing a crucial role in the pathogenesis and symptomatology of anxiety disorders, such as posttraumatic stress disorder (PTSD). The endocannabinoid system plays an important regulatory role in several brain functions, including emotionality and cognition, also exerted by means of a tight crosstalk between the endocannabinoid and several other neuromodulatory systems. The basolateral complex of the amygdala (BLA), which expresses high densities of cannabinoid type 1 receptors (CB1), is a key structure in a memory-modulatory system that regulates, in concert with other brain regions, stress and emotional arousal effects on memory functions. In this talk, I will present the results of preclinical studies that addressed the effects induced by the manipulation of the endocannabinoid system within the BLA in the modulation of memory for emotional experiences, showing how this system interacts with others in the regulation of such processes. Moreover, I will show the key role played by the BLA in the cognitive regulation of endocannabinoid response to stressful events in other limbic brain structures. In view of this, I will present results addressing the effects induced by exogenous manipulation of the cannabinoid system on memory consolidation for emotionally arousing experiences within the BLA, hippocampus and medial prefrontal cortex, pointing out at the crucial interactions between these three limbic regions in the regulation of memory for emotional events.