

Stress and endocannabinoid modulation of aversive memory: Potential relevance to the development of psychiatric disorders

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Stress and emotions have potent impact in the modulation of memory so that emotional events tend to be well remembered and typically leave long-lasting and vivid memories in our brain. An appropriate emotional response to an aversive event requires fine-tuned neurotransmitter release regulation and functional neuronal circuits. Interestingly, one of the endogenous systems controlling these processes is represented by the endocannabinoid system. Cannabinoid type 1 receptor (CB1) is indeed widely expressed throughout the limbic system, playing an important role in the modulation of synaptic plasticity and memory function. Unfortunately, literature evidence on the effects of cannabinoid compounds on emotional and cognitive behaviors is often controversial, with cannabinoid compounds often inducing biphasic or even opposite effects. In this context, a new line of evidence is emerging and demonstrates that the level of stress associated to the environmental conditions plays a crucial role in modulating emotional behavior. Therefore, in this talk I will discuss to what extent the level of stress, associated to the training-induced emotional arousal, might have implications on cannabinoid effects on memory performances in rats. In particular, I will present data demonstrating that variations in the level of emotional arousal associated to the experimental conditions might shape cannabinoid effects on memory functions. Given that, I will present results indicating that exogenous manipulation of endocannabinoid system might differently affect both memory consolidation and memory retrieval depending on the level of stress associated to different environmental stimuli.