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Cerebellar Contributions to Emotional Networks

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The central neural pathways involved in fear-evoked behaviour are highly conserved across mammalian species and there is a consensus that understanding them is a fundamental step towards developing effective treatments for emotional disorders in man. The periaqueductal grey (PAG) has a well-established role in fear-evoked freezing behaviour and is part of a distributed network of structures including the amygdala, hypothalamus and prefrontal cortex involved in emotional behaviours. However, an increasing body of studies suggest that the cerebellum is an additional key node in this network. This presentation will summarise some of the anatomical, electrophysiological and behavioural work our group has undertaken to explore PAG-cerebellar interactions during fear behaviour in adult rats. This includes our most recent findings that suggest that PAG encoding of conditioned fear is dependent on cerebellar output during consolidation.