

The basal forebrain contributes to default mode network regulation

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The basal forebrain is a collection of nuclei that project to many cortical and subcortical areas, whereby they exert a pronounced influence on brain state and behavior. For example, contributions to attentional functions, as well as wake-sleep regulation have been described for these circuits. I shall present findings suggesting that the basal forebrain also plays an important role in the default mode network (DMN). Accordingly, strong gamma band LFP activations are seen in the basal forebrain when rats in a state of quiet wakefulness that is associated with the default brain state, and these oscillations exhibit functional coupling to the cingulate cortex, a main hub of the DMN in rodents. Effects of electrical BF stimulation on behavior further support the idea that the BF may in fact play a key role in internally directed brain states that have been linked to DMN activation. Preliminary evidence suggests that the DMN related functions of the BF may be due to GABAergic, not cholinergic projections. Our findings highlight a novel and largely unexplored facet of BF function.