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The basomedial amygdala to bed nucleus of stria terminalis projection reduces defensive behaviors

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The bed nucleus of stria terminalis (BNST) has been implicated in the regulation of anxiety, fear, and reward-related behaviors. Lesions of BNST reduce anxiety-like behaviors and fear generalization. Furthermore, BNST mediates sustained fear and apprehension. This sustained state of fear and apprehension is present in PTSD. Activation of the anterodorsal BNST (adBNST) reduces different features of anxiety through distinct projections to the lateral hypothalamus and ventral tegmental area. The adBNST receives projections from the basomedial amygdala (BMA). Neuronal activity in the BMA has been shown to encode safety and its activation has been shown to reduce freezing and anxiety-like behavior. However, the downstream neural circuits responsible for these effects have not yet been identified. One possible connection that could be mediating these effects is the BMA-adBNST pathway. Our data shows that activation of BMA-adBNST projection reduces open-arm avoidance in the elevated plus maze and reduces both conditioned and innate freezing in mice. Furthermore, activation of BMA to BNST neurons increases the number of neurons expressing the activity marker cFOS in adBNST. Thus, the BMA to BNST projection could be an important pathway that engages to reduce defensive behaviors by increasing adBNST activity.

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