

Sexual Dimorphism of Norepinephrine Neuron Projections and Calcitonin Gene-Related Peptide Expression within the BNST

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Background: Norepinephrine (NE) neurons, which play a significant role in short and long-term stress responses, show well-documented sex differences in expression both in regions containing cell bodies and in regions containing NE projections, such as the bed nucleus of the stria terminalis (BNST). NE neurons regularly interact with calcitonin gene-related peptide (CGRP), a neuromodulator that increases anxiety and also displays differences in effect based on sex. Despite the presence of CGRP in the BNST, little research has been done on the effects of CGRP in this brain region.

Methods: Immunohistochemistry was used to determine both the presence of NE projections and CGRP in the BNST. Imaging analysis was then used to quantify CGRP expression within the BNST.

Conclusions: Following imaging analysis, it was found that there is relatively little CGRP expression in the BNST indicating that the CGRP may not be significantly involved in the mediation of stress and fear responses linked to the BNST. Additionally, our results indicate that there were no significant sex differences in CGRP expression in the BNST. This absence of sex differences in CGRP expression suggests that the established sex differences linked to the BNST are not due to differences in CGRP gene expression.