

Sex Differences in the Expression of CGRP in C2/A2 Norepinephrine Neurons

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Norepinephrine, among other functions, raises blood pressure in the vascular system through the sympathetic nervous system which has implications in migraines and hypertension. Calcitonin gene-related peptide (CGRP) has been shown to mitigate these effects, protecting cells from norepinephrine-induced apoptosis. Previous research has shown that there are differences in CGRP expression in the locus coeruleus (LC), a large norepinephrine subpopulation, between male and female mice. Our study aimed to investigate the potential antagonistic effects and possible sex differences between these two systems in a different norepinephrine subpopulation, C2/A2. We used a dual immunohistochemistry protocol to evaluate sex differences in the expression of CGRP in the cell bodies of C2/A2 norepinephrine neurons of male and female mice. Based on previous research of CGRP expression in the LC, we hypothesized that female mice would have a higher expression of CGRP in norepinephrine cell bodies of the C2/A2 region. After performing an imaging analysis of our stained brain sections, no statistically significant differences were found in the expression of CGRP in C2/A2 cell bodies. Our study was limited by our sample size ($n = 4$ for each sex) and novel protocol for determining fluorescence in regions of interest, so future studies should be conducted to confirm these results with greater power. Although our study was unable to provide novel results, future research should focus on the expression of the CGRP receptor rather than the peptide as these may be synaptic partners and interact to produce the initially observed antagonistic functions.