

Exploration of Molecular Sex Differences in CGRP-Expressing Noradrenergic Neurons in A1 and A2

Tyra Silaphet, Elliot Evans, Urvi Patel, Farah Naser

The calcitonin gene-related peptide (CGRP) is a peptide vasodilator known to be highly implicated in migraine pathogenesis, which is more prevalent in females than males¹. Recent studies have identified a genetically defined subpopulation expressing CGRP that plays a functional role in sex differentiation within the Locus Coeruleus (LC), a key nuclei of the norepinephrine system which regulates multiple diverse behaviors and psychological processes^{2,3}. Although there is evidence of CGRP's sex-differential response in LC-NE neurons, there is limited research exploring CGRP's interaction within other NE subpopulations. Additionally, due to the historic sex bias and sex omission present in neuroscience literature, research surrounding sex differences within the NE system is also lacking. In this study, we aim to quantify CGRP expression in the A1 and A2 noradrenergic nuclei using a dual IHC method on a transgenic strain of female and male mice. We hypothesize that expression of CGRP in the noradrenergic anatomical subpopulations of A1 and A2 will be higher in female mice as compared to male mice. The norepinephrine system is involved with many common neurological disorders that are mediated by molecular sex differences in distinct neuronal populations; therefore, this study could contribute to the possible mechanisms of treatment for these disorders and broaden our understanding of the relationship between CGRP and the norepinephrine system.