

## Abstract

The norepinephrine (NE) system has long been of interest for its modulatory role in sleep, attention, inflammation, and the stress response. As a result, its dysregulation can lead to various symptoms associated with neuropsychiatric disorders such as generalized anxiety, major depressive, and other affective disorders. Historically, these disorders are more prevalent in females than males. Within the NE system, it is known that the activation of  $\mu$ -opioid receptors (MOR1) in the locus coeruleus (LC) through the release of endogenous agonists negatively modulates its activity and attenuates the stress response. Motivated by a lack of past research on MOR1 expression of LC subpopulations, research was conducted to analyze differences in MOR1 expression within the ventral subcoeruleus (SubCV) anatomical region of the NE system across male and female transgenic mice. To do this, immunohistochemistry experiments were conducted to apply fluorescent tags to coronal slices of transgenic male and female hindbrains. NE expression was visualized via eGFP fluorescence and MOR1 expression was visualized via mCherry fluorescence. The results do not indicate a statistically significant difference of MOR1 expression in NE neurons between male and female subjects. However, both males and females show greater expression of MOR1 in NE neurons relative to control neurons of the SubCV.