

OSSD Paper Pick 02/22/2022

by Dr. Aras Petrulis, Georgia State University
OSSD Councilor

Sex differences in anxiety and depression: circuits and mechanisms

Nature Reviews Neuroscience. 2021 Nov;22(11): 674-684.

<https://doi.org/10.1038/s41583-021-00513-0>

Debra A. Bangasser & Amelia Cuarenta

Abstract:

Epidemiological sex differences in anxiety disorders and major depression are well characterized. Yet the circuits and mechanisms that contribute to these differences are understudied, because preclinical studies have historically excluded female rodents. This oversight is beginning to be addressed, and recent studies that include male and female rodents are identifying sex differences in neurobiological processes that underlie features of these disorders, including conflict anxiety, fear processing, arousal, social avoidance, learned helplessness and anhedonia. These findings allow us to conceptualize various types of sex differences in the brain, which in turn have broader implications for considering sex as a biological variable. Importantly, comparing the sexes could aid in the discovery of novel therapeutics.

Significance:

This review paper provides a detailed survey of how sex differences in neural systems can lead to sex differences in vulnerability to stress-related anxiety- and depression-like syndromes. It explores the different ways that sex differences in the nervous system can generate both similar and sexually differentiated outcomes in emotional behavior. Although the bulk of the paper focuses on sex-different cellular/molecular mechanisms that underlie preclinical models of emotional behavior, the authors highlight how these mechanistic findings inform clinical outcomes and the development of novel, sex-specific therapeutics. A common theme that winds through the paper is the critical importance of considering sex in experimental design and in the development of behavioral assays, without which many sex differences in brain/behavior relationships would be missed.