

Undergraduate Presenter: Harry Cheung ('17)

Sexual motivation is mediated by vasopressin in the brain, but does so differently in males than in females

Authors: Harry K. Cheung, Brett T. DiBenedictis, Alexa H. Veenema

The neuropeptide arginine vasopressin (AVP) regulates various social behaviors, including sexual behavior. Here, we focused on the role of AVP in the ventral pallidum (VP), because this is a critical brain region mediating social motivation and reward. We aimed to characterize the AVP system in the VP and to test the functional role of the VP-AVP system in sexual motivation of adult male and female rats. Using immunohistochemistry (IHC), we showed that males have a two-fold higher AVP-immunoreactive (AVP-ir) fiber density in the VP than females. Combining IHC with retrograde tract tracing, we then showed that AVP fibers in the VP originate from the posterior bed nucleus of the stria terminalis (pBNST) and the posterior-dorsal medial amygdala (MePD). Finally, a pharmacological approach was used to block AVP signaling in the VP to determine the role of the sex difference in AVP-VP on sexual motivation. To measure sexual motivation, adult male and female rats were tested for their preference to investigate an adult male rat or an estrus female rat. Interestingly, blocking AVP signaling in the VP decreased opposite sex preference in males, but increased opposite sex preference in females. These results demonstrate for the first time a link between a sex difference in the VP-AVP system and a sex difference in the regulation of sexual motivation in adult rats.