

Speaker: Mengyu Liu, Graduate Student, Anderson lab

Talk title: Make war not love: The neural substrate underlying a state-dependent switch in female social behavior.

Abstract: Female mice exhibit opposing social behaviors toward males depending on their reproductive state: virgins display sexual receptivity (lordosis behavior), while lactating mothers attack. How a change in reproductive state produces a qualitative switch in behavioral response to the same conspecific stimulus is unknown. Using single-cell RNA-seq, we identify two distinct subtypes of estrogen receptor-1-positive neurons in the ventrolateral subdivision of the female ventromedial hypothalamus (VMHvl) and demonstrate that they causally control sexual receptivity and aggressiveness in virgins and lactating mothers, respectively. Between- and within-subject bulk-calcium recordings from each subtype reveal that aggression-specific cells acquire an increased responsiveness to social cues during the transition from virginity to maternity, while the responsiveness of the mating-specific population appears unchanged. These results demonstrate that reproductive-state-dependent changes in the relative activity of transcriptomically distinct neural subtypes can underlie categorical switches in behavior associated with physiological state changes.