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Title:

Oxytocin, synaptic plasticity, and maternal behavior.

Abstract:

Oxytocin is important for social interactions and maternal behavior. However, little is known about when, where, and how oxytocin modulates neural circuits to improve social cognition. Here I will discuss recent results and unpublished data from our lab on how oxytocin enables maternal behavior in new mother mice. I will focus on experience-dependent plasticity in auditory cortex related to recognizing the significance of pup distress calls, which are important for mother mice retrieving lost pups back to the nest. Surprisingly, this behavior, neural responses, and oxytocin receptor expression were lateralized to the left side of the auditory cortex, perhaps similar to the lateralization of language abilities in humans. I will also describe a new system we have built to combine neural recordings from the auditory cortex and oxytocin neurons of the hypothalamus in vivo, synchronized with days-to-weeks long continuous video monitoring of homecage behavior to identify when oxytocin release and cortical plasticity might occur during natural social and maternal experience.