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Poster Sessions

The amygdalohippocampal area that projects to the medial preoptic area mediates aggression toward the infant

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Parental behaviors are necessary for the development of mammalian infants. The medial preoptic area (MPOA) is thought to be the most important region for parental behaviors because lesions, cell-type specific ablation, and inactivation of the MPOA disrupt parental behaviors. Tracing studies reveal that the MPOA receives inputs from multiple brain regions including the amygdala, hypothalamus, and cortex. Among them, we focused on the amygdalohippocampal area (AHi), a brain region that contains MPOA-projecting neurons and expresses oxytocin receptors, which have been shown by genetic mutation and pharmacological studies to play crucial roles in social behaviors. However, little is known about the function of AHi-MPOA projection and the role of the intra-AHi oxytocin receptors in social behaviors. In this study, we found that MPOA-projection AHi neurons were activated by the social contact with pups. The electrophysiological experiments revealed that oxytocin enhanced inhibitory inputs to these neurons. Interestingly, this effect of oxytocin was potentiated in the paternal mice, which had experienced mating and parenting, compared with that in the virgin mice. Finally, chemogenetic activation of MPOA-projection AHi neurons with Gq-DREADD disrupted the expression of parental behaviors.

In conclusion, the current study demonstrated the presence of input from the AHi to the MPOA that promotes male's behavior choice toward aggression. Oxytocin could reduce the tone of MPOA-projection AHi neurons, which suppress pup-directed aggression.