Seminar/Talk

Social transmission of maternal behavior

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Host: Tim Vogels

Maternal care is profoundly important for mammalian survival, and in many species requires the contribution of non-biological parents, or alloparents. In the absence of partum and post-partum related hormonal changes, alloparents acquire maternal skills from experience, by yet unknown mechanisms. One critical molecular signal for maternal behavior is oxytocin, a hormone centrally released by hypothalamic paraventricular nucleus (PVN). Do experiences that induce maternal behavior act by engaging PVN oxytocin neurons? To answer this, we used virgin female mice, animals that in the wild live in colonies with experienced mothers and their pups, helping with pup care. We replicated this setup in the lab, and we continuously monitored homecage behavior of virgin mice co-housed for days with a mother and litter, synchronized with recordings from virgin PVN cells, including from oxytocin neurons. Mothers engaged virgins in maternal care in part by shepherding virgins towards the nest, ensuring their proximity to pups, and in part by self-generating pup retrieval episodes, demonstrating maternal behavior to virgins. The frequency of shepherding and of dam retrievals correlates with virgin's subsequent ability to retrieve pups, a quintessential mouse maternal skill. These social interactions activated virgin PVN and gated behaviorally-relevant cortical plasticity for pup vocalizations. Thus, rodents can acquire maternal behavior by social transmission, and our results describe a mechanism for adapting brains of adult caregivers to infant needs via endogenous oxytocin.

Friday, December 11, 2020 03:00pm - 04:00pm
Online

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