

## Psychiatry and Neuroscience Seminar Series 2024



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(Host A Marzo/MO Krebs)

*The Francis Crick Institute, London, UK*

# Hormone-mediated neural remodeling orchestrates parenting onset during pregnancy

**Friday, February 9<sup>th</sup>, 2024, noon**

Room D Levy, 102-108 rue de la santé - 75014 Paris

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During pregnancy, physiological adaptations prepare the female body for the challenges of motherhood. Becoming a parent also requires behavioral adaptations that include changes in the brain and underlying networks. Such adaptations can occur as early as during pregnancy, but how pregnancy hormones remodel parenting circuits to instruct preparatory behavioral changes remains unknown. We used patch clamp recordings of Galanin neurons in the Medial Preoptic Area of the Hypothalamus (MPOAGal) neurons to unravel the synaptic changes that sustained pregnancy induced changes. We found that action of estradiol and progesterone on galanin (Gal)-expressing neurons in the mouse medial preoptic area (MPOA) is critical for pregnancy-induced parental behavior. Whereas estradiol silences MPOAGal neurons and paradoxically increases their excitability, progesterone permanently rewires this circuit node by promoting dendritic spine formation and recruitment of excitatory synaptic inputs. This MPOAGal-specific neural remodeling sparsens population activity in vivo and results in persistently stronger, more selective responses to pup stimuli. Pregnancy hormones thus remodel parenting circuits in anticipation of future behavioral need.

**Keywords:**

**Estradiol, Hypothalamus, Pregnancy, Synapse**

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