Neuroprotective effects of agmatine on dysregulation of major matrix metalloproteinase (MMP) isoforms induced by chronic maternal separation in a rodent model of developmental stress

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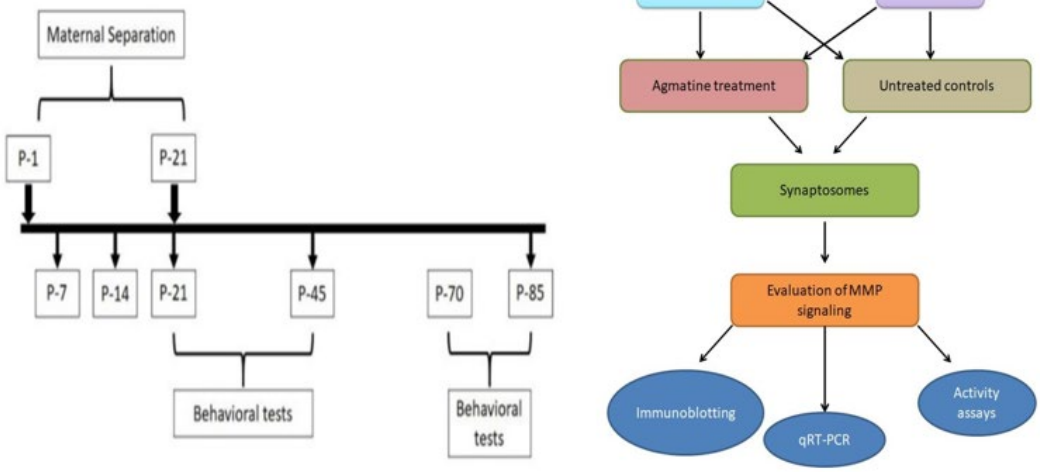
3

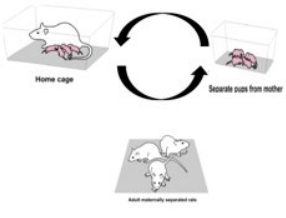
Graphical Abstract/ Layout



Project Description

Adverse early life experiences, such as psychological stress, can lead to permanent changes in neurodevelopment, cognitive deficits, and increased vulnerability to stress and anxiety. Maternal separation (MS) stress is a significant concern in society, affecting mother-infant interactions and brain development. The proposed project focuses on the role of matrix metalloproteinases (MMPs) in the long-term effects of MS-induced early-life stress. MMPs are crucial for synaptic functions and are implicated in various neuronal disorders. Animal models are valuable for evaluating the molecular mechanisms linking MS anxiety to cognitive, social, and behavioral effects. The study aims to investigate the impact of neonatal psychiatric stress on MMP levels and inhibitor proteins at different developmental stages, evaluate MMP substrates involved in synapse signaling and plasticity, and assess the effects of agmatine on deficits in MMP signaling and behavioral attributes caused by maternal separation. The results will help identify downstream molecular targets of MMPs, aiding in the design of effective therapeutic interventions for neurological conditions.

Products/ Instruments/ Results/ Outreach Activities (Pictures)



Neuroprotection by agmatine: Possible involvement of the gut microbiome?

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