

Impact of Prenatal Polystyrene Microplastic Exposure on Neurodevelopment and Hippocampal Neurogenesis

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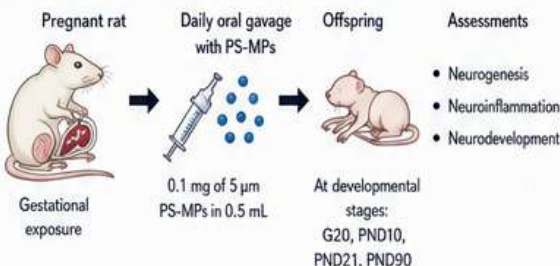
1. INTRODUCTION & AIM

Microplastic pollution, particularly polystyrene microplastics (PS-MPs), is a growing environmental concern. Prenatal exposure may interfere with brain development, but its impact on hippocampal neurogenesis and neuroinflammation remains poorly understood.

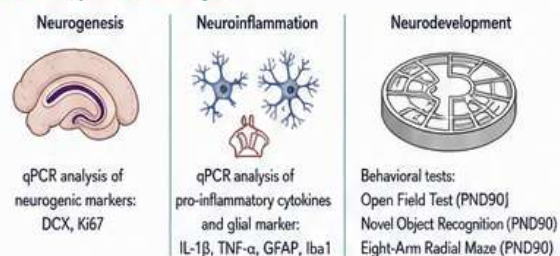
AIM: To investigate the effects of gestational exposure to PS-MPs on hippocampal neurogenesis, neuroinflammation and neurodevelopmental outcomes in offspring.

2. METHODS

2.1 Experimental Design



2.2 Endpoints & Analyses

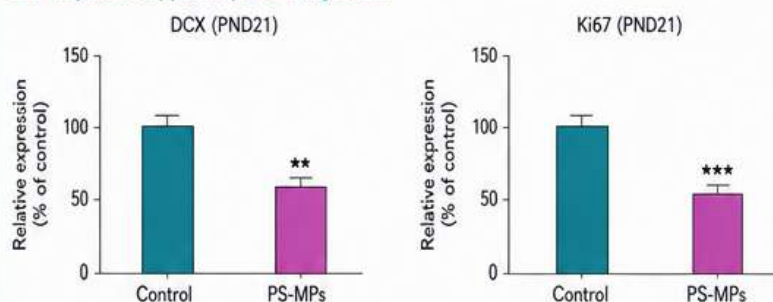


2.3 PS-MPs Characterization

- Polystyrene microplastics
- Size: 5 μ m
- Pristine, spherical particles
- 0.1 mg in 0.5 mL sterile suspension

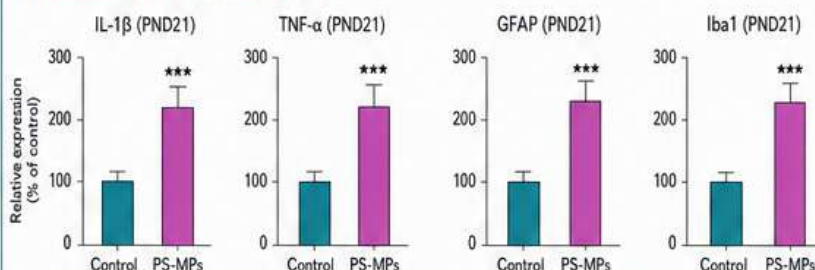
3. RESULTS

3.1 Impaired Hippocampal Neurogenesis



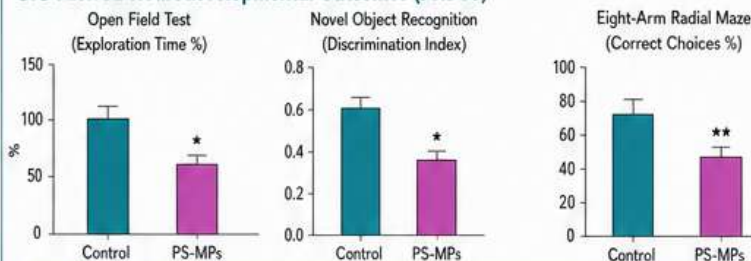
Prenatal exposure to PS-MPs significantly decreased hippocampal neurogenesis markers at PND21.

3.2 Enhanced Neuroinflammation



Significant upregulation of pro-inflammatory cytokines and glial activation markers in PS-MPs exposed offspring.

3.3 Altered Neurodevelopmental Outcomes (PND90)



Offspring exposed to PS-MPs exhibited deficits in exploration, recognition memory, and spatial working memory, indicating long-term neurodevelopmental impairments.

4. CONCLUSION



Gestational exposure to polystyrene microplastics **disrupts hippocampal neurogenesis** and **enhances neuroinflammation**. These alterations are associated with **long-lasting deficits in cognitive functions**. Our findings highlight the **developmental neurotoxicity of microplastics** and underscore the need for further investigation.

5. FUTURE PERSPECTIVES



- Elucidate underlying mechanisms and molecular pathways.
- Assess transgenerational effects.
- Investigate the role of microplastic physicochemical properties on neurotoxicity.

