# Maresin Like 1 Treatment: Curbing the Pathogenesis of Behavioral Dysfunction and Neurodegeneration in Alzheimer's Disease Mouse Model

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**Abstract :** Aims: Neurodegeneration and behavior dysfunction occurs in patients with Alzheimer's Disease (AD), and as the disease progresses many patients develop cognitive impairment. 5XFAD mouse model of AD is widely used to study AD pathogenesis and treatment. This study aimed to investigate the effect of maresin like 1 (MaR-L1) treatment in AD pathology using 5XFAD mice. Methods: We tested 12-month-old male 5XFAD mice and wild type control mice treated with MaR-L1 in a battery of behavioral tasks. We performed open field test, beam walking test, clasping test, inverted grid test, acetone test, marble burring test, elevated plus maze test, cross maze test and novel object recognition test. We also studied neuronal loss, amyloid β burden, and inflammation in the brains of 5XFAD mice using immunohistology and Western blotting. Results: MaR-L1 treatment to the 5XFAD mice showed improved cognitive function of 5XFAD mice. MaR-L1 showed decreased anxiety behavior in open field test and marble burring test, increased muscular strength in the beam walking test, clasping test and inverted grid test. Cognitive function was improved in MaR-L1 treated 5XFAD mice in the novel object recognition test. MaR-L1 prevented neuronal loss and aberrant inflammation. Conclusion: Our finding suggests that behavioral abnormalities were normalized by the administration of MaR-L1 and the neuroprotective role of MaR-L1 in the AD. It also indicates that MaR-L1 treatment is able to prevent and or ameliorate neuronal loss and aberrant inflammation. Further experiments to validate the results are warranted using other AD models in the future.

**Keywords :** Alzheimer's disease, motor and cognitive behavior, 5XFAD mice, Maresin Like 1, microglial cell, astrocyte, neurodegeneration, inflammation, resolution of inflammation

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