

# Beneficial Effect of Fingolimod in a Lafora Disease Mouse Model

## AUTHORS

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## RESEARCH SIMPLIFIED

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## AIMS AND METHODS

In this study, researchers tested the ability of fingolimod (FGD) in mouse models to reduce neuroinflammation and immune cell infiltration into the brain, key issues in Lafora disease (LD). Fingolimod (FGD) modulates the reactivity of glial cells, stabilizes the blood–brain barrier (BBB), and decreases peripheral immune cell recruitment into the CNS. Originally used to treat multiple sclerosis, fingolimod has shown beneficial effects in various neurological disorders, including stroke, hypoxia, and epilepsy. Due to its ability to suppress inflammation and immune response, researchers are exploring its repurposing to alleviate neuroinflammation in LD patients. Neuroinflammation, a hallmark of LD, is exacerbated by immune cells infiltrating the central nervous system (CNS). In LD mouse models, reactive glia and astrocytes in the brain increase neuroinflammation, negatively impacting neuronal function.

## RESULTS

Researchers examined the potential beneficial effects of fingolimod on the disease progression in *Epm2b*<sup>-/-</sup> mice. Fingolimod was found to reduce neuroinflammation caused by astrocyte hyperactivation in the brain and decrease immune cell infiltration. These effects correlated with improved short-term memory, motor skills, and reduced stress in the treated *Epm2b*<sup>-/-</sup> mice. Additionally, researchers tested a similar compound, diethyl fumarate on *Epm2b*<sup>-/-</sup> mice and observed that while it also reduced astrocyte activation, it was less effective at preventing neuroinflammation and immune cell infiltration, and did not improve behavioral performance to the same extent as fingolimod.

## CONCLUSION

Overall, this study highlights the effectiveness of fingolimod, a drug originally intended for the treatment of multiple sclerosis, in reducing neuroinflammation in LD mice. It successfully prevented astrocyte hyperactivation and decreased levels of inflammation associated with LD. Previous research has shown that the combined action of multiple repurposed drugs is more beneficial than that of a single compound. Researchers aim to repurpose fingolimod alongside other drugs that could improve quality of life for LD patients, hoping to achieve a better treatment strategy for LD.

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