Effect of Peripheral Inflammation on Microglia in the Dentate Gyrus and Primary Motor Cortex of MMTV-PyMT Carrier Mice

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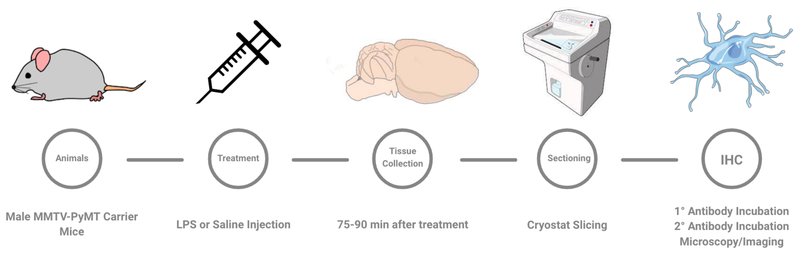
Introduction

- Immunohistochemistry with Iba-1 staining can be used to stain for microglia, which are the innate immune cells of the central nervous system.
- Using the regions of the dentate gyrus with the primary motor cortex, comparisons can be made between inflammatory microglial responses to peripheral immune challenges, such as lipopolysaccharide (LPS).
- The microglial response of transgenic mice that are carriers of the MMTV-PyMT oncogene has not been studied.
-Activated microglia tend to have retracted processes and increased somatic area.

We hypothesized that the primary motor cortex would elicit a stronger and more active microglial response, when compared to the dentate gyrus, due to its role in sickness behavior and reduced locomotion.

Materials and Methods



-**Subjects:** 8 transgenic male mice, MMTV-PyMT carriers are
genetically prone to develop breast cancer.
-**Condition:** 0.5 mg/kg of LPS(mice 1-4) or saline(mice 5-8) solution
-**Antibodies:** Primary antibody of Iba-1, Secondary antibody of AlexaFluor 568 Streptavidin

Results

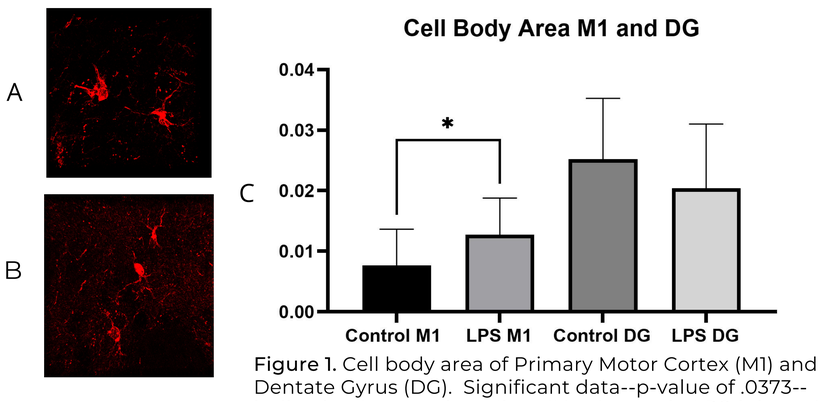


Figure 1. Cell body area of Primary Motor Cortex (M1) and Dentate Gyrus (DG). Significant data--p-value of .0373--indicating larger microglia cell body area in LPS-injected mice.

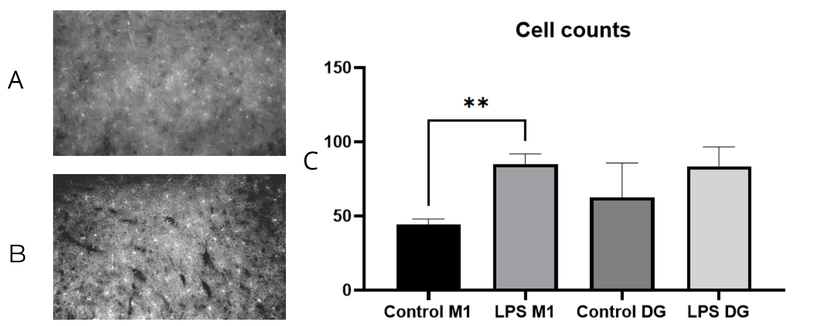


Figure 2. Cell count analysis for the control and LPS groups in the Primary Motor Cortex (M1) and Dentate Gyrus (DG). p-value of .0051 indicates significant value for M1 samples.

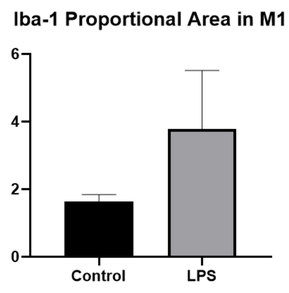


Figure 3. Proportional Area of Iba-1 in the primary motor cortex (M1). No significant data (p>0.05)

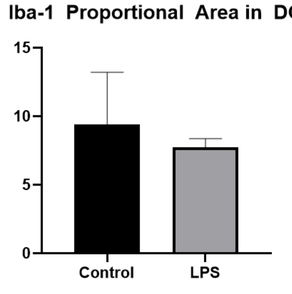


Figure 4. ba-1 proportional area in the dentate gyrus (DG). No significant data (p>0.05)

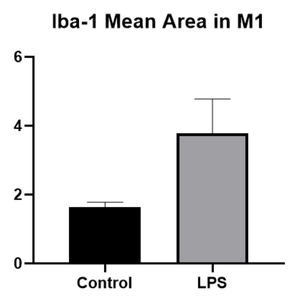


Figure 5. Mean Area of IBA-1 in the M1 region. No significant data was found (p>0.05)

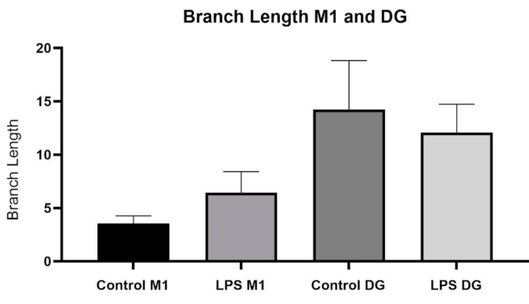


Figure 6. The measured branch length of control vs. LPS injected mice in the Dentate Gyrus (DG) and the Primary Motor Cortex (M1).

Conclusion

-Some evidence supports our hypothesis and shows that LPS (compared to control) led to a stronger microglial response in M1. No such differences were found in the DG.

-More research on the effects of peripheral inflammation on MMTV-PyMT carrier mice is warranted, potentially focusing on different immune challenges.

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