INTRODUCTION

• Microglia are the major innate immune cells of the central nervous system.
• During an immune challenge, microglial activation within specific brain regions have been shown to elicit aspects of the sickness response such as decreased locomotion and spatial learning deficits.
• This study focuses on the differential expression and activation patterns of microglia in the motor cortex (M1) and the dentate gyrus (DG) in control and immune-challenged male MMTV-PyMT carrier mice.
• Our study works to establish a model to discover which brain regions are more vulnerable to microglial activation and how that translates to the extent of sickness behavior in hopes to provide valuable information in prevention and treatment plans for infections and neurodegenerative diseases.

Is there variation in the microglial activation response in the DG and M1 following LPS injection in immune-challenged mice?

METHODS & MATERIALS

A timeline of the procedure, the materials used, and the dilutions for the created solutions.

RESULTS

Figure 1. Sample images from wide-field and confocal microscopy. Wide-field images were taken at 568nm excitation at 20x magnification with a Nikon ECLIPSE Ts2 Microscope. Confocal images were taken at 568nm excitation at 63x magnification with a Zeiss LSM 800 Confocal Microscope.

Figure 2. Significant difference in microglia process length between M1 and DG within control group (left). Paired two-tailed t-test between control groups of M1 and DG (p = 0.0049). No significance among the other groups.

Figure 3. Significant increase in cell body area following LPS injection in DG no significant difference between regions (right). Unpaired t-test between Control and LPS conditions for M1 (p=0.927) and DG (p=0.005). Paired t-test for control (p=0.07) and LPS mice (p=0.052).

Figure 4. No significant difference in cell count between regions (left). Unpaired, two-tailed t-tests between Control and LPS conditions for M1 (p = 0.1263) and DG (p = 0.2894).

Figure 5. No significant difference in microglial proportional area between or regions (right). Unpaired two-tailed t-test between Control and LPS conditions for M1 (p = 0.8252) and DG (p = 0.2848).

CONCLUSION

The results gathered did not provide many significant relationships, and the ones that manifested did not relate to supporting or refuting our hypothesis.

We were able to draw conclusions, however, such as cell body area increasing in the DG following LPS injection (Figure 3). Process lengths of microglia were also greater in the motor cortex than the DG. (Figure 2)

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REFERENCES

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