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"The effects of EM1 on LPS activated microglia"

Purpose: Microglia, the resident brain defense cells activated during brain inflammation due to gut bacteria and/or their toxins entering the brain through the circulatory system. In this instance, lipopolysaccharide (LPS) is the main endotoxin in the blood from Gram-negative bacteria in cases of gut dysbiosis commonly observed in obesity, hypertension, and aging. In this study, we determined whether a novel exercise metabolite (EM1) would attenuate *in vitro* LPS-induced activation of mouse microglial (BV2) cell line.

Methods: BV2 cells were cultured and treated with 1µg of LPS (for activation) in addition to EM1 in different concentrations (0.1, 0.3 or 1 µM) for 24 hrs. The cell viability test was done to assess the effect of EM1 on the live/dead population of BV2 cells. Immunofluorescent cytology and micrograph analyses were performed to quantify the population of proinflammatory/activated (M1) microglia IBA1+MHC-II) and anti-inflammatory/ non-activated (M2) microglia (IBA1+CD206).

Results: EM1 at 1 µM significantly decreased ($p<0.05$) the number dead cells while and there was no difference in the number of live cells between cells. Results of immunofluorescent cytology are underway (and will be ready by Thursday this week).

Conclusion: We expect to find that EM1 at 1 µM will decrease LPS-activation of BV2 cells as well as improve their viability. If EM1 decreases LPS-activation of BV2 cells, the next logical step will be to investigate its effect on microglia activation, cognition, and mood-associated behaviors in an *in vivo* model of gut dysbiosis.

Keywords: BV2, LPS, Microglia, Immunofluorescence, inflammation

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