The effects of EM1 on LPS Activated Microglia **NEW ORLEANS** School of Medicine Abdallah Jwayyed, Pallavi Shrivastava, Ifechukwude Biose Cardiovascular Center of Excellence, LSU Health Sci. Center, New Orleans, LA

Introduction

- Gut dysbiosis defines the imbalance between health promoting and pathogenic bacteria as observed in obesity.
- Gut dysbiosis results in "leaky gut", allowing bacteria and its endotoxins into bloodstream.
- Lipopolysaccharide (LPS) is the main endotoxin of Gram-negative bacteria increased in blood due to gut dysbiosis.



- In the brain, LPS activates microglia and transforms it from anti-inflammatory to proinflammatory state.
- Exercise has been linked to improved gut health and decreased pro-inflammatory state. ✤ We tested whether a novel exercise metabolite (EM1) shown to decrease appetite in obese mice will decrease pro-inflammation in cultured microglia.

Hypothesis: EM1 will decrease the expression of pro-inflammation in LPS-activated microglia.



Method



Fig.2 Immunostaining for IBA1+MHC-II (M1 microglia). A. Representative micrograph of BV2 cells stained for IBA1 (green), MHC-II (red) and DAPI as a nuclear stain. B. Quantification o IBA1 expressed. C Quantification of MHC-II (M1 marker). Data shown as Mean±.SD. *p<0.05, **p<0.01 ***p<0.001.

IBA1+CD206: EM1 (0.1 μM) increased anti-inflammatory microglia





for 24 h.

p<0.05.

Results

Cell Viability Assay: EM1 1µM decreased the number of dead cells





Conclusion and Next Step

 \clubsuit EM1 (0.1 and 1 μ M) significantly decreased the number of dead cells treated with LPS. • Low dose EM1 (0.1 μ M) significantly increased both anti- and pro-inflammatory microglia. • High dose EM1 (1 μ M) significantly decreased pro-inflammatory microglia. • EM1 at 0.1 μ M is ambivalent for anti- and pro-inflammatory microglia population.

Fig.1 Cell viability Assay. A. Representative micrographs of BV2 cells stained with Calcien AM (green cells/Live) and Propidium Iodide (red cells/Dead) dyes with DAPI as a nuclear stain. B. Quantification of live cells stained with Calcien AM. Fig. C Quantification of dead cells stained with Propidium Iodide.). Data shown as Mean±.SD. **p<0.01



To determine the effect of EM1 on inflammatory states of microglia in obese mice.