

Effects of Lipopolysaccharide Immune Challenge on Microglial Activation and TNF- α Colocalization in the Nucleus Accumbens of Female Rats

Harshita Gudipudi, Vidya Gadikota, Marissa Jeganathan, Sarah Smith

Abstract: This research investigates the effects of lipopolysaccharide (LPS) immune challenge on microglial activation and TNF- α colocalization in the nucleus accumbens of female rats. Microglia are essential regulators in the nervous system that release pro-inflammatory cytokines such as TNF- α in response to compromised immune systems. Existing literature examines the role of TNF- α in the stress response and addiction within the nucleus accumbens, a key region of the mesolimbic reward pathway, and suggests potential sex differences in response to LPS challenge. While the influence of LPS challenges on male rodents has been well-studied, research concerning female rodents is lacking. This study aims to examine the role of TNF- α in stress-induced neuroinflammation and addiction, contributing to the understanding of microglial responses to immune challenges in the nucleus accumbens of female rats. Findings from this study indicate that there is not a statistically significant difference between the control group and the LPS group, suggesting potential sex-related differences in peripheral and central neuroinflammatory responses to LPS.

Keywords: TNF- α , lipopolysaccharide (LPS) immune challenge, microglia, nucleus accumbens, pro-inflammatory cytokines