

EFFECT OF ELLAGIC ACID ON MICROGLIAL CULTURES EXPOSED TO LIPOPOLYSACCHARIDE

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INTRODUCTION: Neuroinflammation is a central nervous system (CNS) response to injury, characterized by the activation of glial cells and the release of inflammatory mediators. When exacerbated, it may cause significant neural damage and is closely linked to neurodegenerative diseases such as Alzheimer's and multiple sclerosis. To mimic neuroinflammatory conditions *in vitro*, lipopolysaccharide (LPS), a component of Gram-negative bacterial membranes, is widely used due to its ability to trigger pro-inflammatory cytokine production and oxidative stress. Oxidative stress plays a critical role in the progression of neuroinflammation, making antioxidant and anti-inflammatory compounds promising therapeutic candidates. Ellagic acid (EA), a polyphenol found in fruits and medicinal plants, has shown notable neuroprotective properties. **OBJECTIVE:** This study aimed to evaluate the effects of EA on markers of inflammation and oxidative stress in BV-2 microglial cells exposed to LPS, assessing its potential to modulate inflammatory responses and redox imbalance in the CNS. **METHODS:** BV-2 cells were cultured and exposed to LPS (1 µg/mL) for 6, 12, or 24 hours. Following LPS stimulation, cells were treated with varying concentrations of EA (1, 10, 50, 100, and 500 µM). Cell viability and proliferation were analyzed using the MTT assay. ATP hydrolysis was measured as a marker of purinergic pathway activation, often associated with inflammation. **RESULTS AND CONCLUSION:** LPS exposure significantly increased ATP hydrolysis in BV-2 cells, indicating a robust inflammatory response. Treatment with EA at all tested concentrations reduced this effect, suggesting a protective and anti-inflammatory role. These findings indicate that EA may modulate microglial inflammatory responses and protect against excessive purinergic signaling, contributing to oxidative stress control. Overall, ellagic acid shows therapeutic potential for managing neurodegenerative and chronic inflammatory conditions affecting the CNS.

Keywords: Neuroinflammation; Ellagic Acid; BV-2 Cells; Lipopolysaccharide; Neurodegenerative Diseases.

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