

Increased expression of the transient receptor potential melastatin 7 channel is critically involved in lipopolysaccharide-induced reactive oxygen species-mediated neuronal death

Nuñez-Villena, Felipe

Becerra, Alvaro

Echeverría, Cesar

Briceño, Nicolás

Porras, Omar

Armisen, Ricardo

Varela, Diego

Montorfano, Ignacio

Sarmiento, Daniela

Simon, Felipe

Aims: To assess the mechanisms involved in lipopolysaccharide (LPS)-induced neuronal cell death, we examined the cellular consequences of LPS exposure in differentiated PC12 neurons and primary hippocampal neurons. **Results:** Our data show that LPS is able to induce PC12 neuronal cell death without the participation of glial cells. Neuronal cell death was mediated by an increase in cellular reactive oxygen species (ROS) levels. Considering the prevalent role of specific ion channels in mediating the deleterious effect of ROS, we assessed their contribution to this process. Neurons exposed to LPS showed a significant intracellular Ca²⁺ overload, and nonselective cationic channel blockers inhibited LPS-induced neuronal death. In particular, we observed that both LPS and hydrogen peroxide exposure strongly increased the expression of the transient receptor protein melastatin 7 (TRPM7), which is an ion channel directly implicated in neuronal cell death. Further, both LPS-induced TRPM7 overe