

Inhibition of Nuclear Factor- κ B Reduces Brain Inflammation in Rats

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Introduction: A large body of evidence suggests that inflammation is involved in the pathophysiology of several neurological disorders, including psychiatric illnesses, neurodegenerative diseases and stroke. Nuclear Factor- κ B (NF- κ B) is a cellular pathway that plays a prominent role in numerous immune and inflammatory responses in mammals.

Aims: This study was undertaken to examine the effects of a selective NF- κ B inhibitor, JSH-23, on lipopolysaccharide (LPS)-induced inflammation in rats.

Materials and Methods: Rats were treated with JSH-23 (10 mg/kg) through a single intraperitoneal (ip) injection. JSH-23 was administered at (i) 2.5 h before or at (ii) 1.5 h after LPS (1 mg/kg, ip) injection. At 4 h (i) and 2.5 h (ii) after JSH-23 administration, rats were sacrificed, blood was collected and different brain regions were excised. Levels of the inflammatory constituents interleukin (IL)-6, prostaglandin (PG) E₂, tumor necrosis factor (TNF)- α and nuclear phosphorylated p65 (P-p65) in plasma and brain were examined by specific ELISA kits.

Results: The effects of JSH-23 on plasma and brain inflammatory mediators' levels differed between the pre- and - post-LPS administration schedule and between the various brain regions. Mostly, JSH-23 treatment reversed the changes in IL-6, PGE₂, TNF- α and P-p65 levels in plasma, frontal cortex, hippocampus and hypothalamus of LPS-treated rats.

Conclusions: These results suggest that inhibition of NF- κ B may have a therapeutic potential for the treatment of inflammation-associated brain disorders.

Biography:

Dr. Jacob Kaplanski completed his Ph.D. in pharmacology in the Department of Pharmacology in the Hebrew University in Jerusalem (Israel). There after, he completed his post-doctoral fellowship in the Department of Pharmacology in the Free University of Amsterdam (The Netherland). He mentored numerous M.Sc. and Ph.D. students in the fields of Pharmacology and exercise physiology. He has authored more than 100 peer-reviewed research papers.