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Olajide, Olumayokun A., Velagapudi, Ravikanth, Kumar, Asit, Schindler, Simon and Fiebich, Bernd L

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## **Thymoquinone Inhibits Inflammation in IL-1 $\beta$ -Stimulated SK-N-SH cells**

Thymoquinone is a phytochemical antioxidant compound in the oil obtained from the seeds of *Nigella sativa* (black cumin seed oil). Studies have suggested that thymoquinone produces anti-inflammatory property. Previously, we have shown that thymoquinone inhibited neuroinflammation in LPS-activated rat primary microglia. However, nothing is known about its direct effect on neurons. In this study, we have investigated the effects of thymoquinone on inflammation induced in SK-N-SH neuroblastoma cells stimulated with interleukin-1beta (IL-1 $\beta$ ). Cultured SK-N-SH cells were treated with thymoquinone (0.5, 1 and 2.5  $\mu$ M) prior to stimulation with IL-1 $\beta$ . Levels of prostaglandin E<sub>2</sub> (PGE<sub>2</sub>) production was measured using enzyme immunoassay (EIA), while ELISAs were used to detect levels of pro-inflammatory cytokines tumour necrosis factor-alpha (TNF $\alpha$ ) and interleukin-6 (IL-6). Levels of cyclooxygenase-2 (COX-2, microsomal prostaglandin E synthase-1 (mPGES-1) were measured with western blot. Further experiments were carried out on I $\kappa$ B phosphorylation and degradation using western blots. Results showed that thymoquinone (0.5, 1 and 2.5  $\mu$ M) produced concentration-dependent and significant inhibition of PGE<sub>2</sub>, TNF $\alpha$  and IL-6. These concentrations of the compound also reduced protein levels of COX-2 and mPGES-1. At 1 and 2.5  $\mu$ M, there was marked inhibition of I $\kappa$ B phosphorylation and degradation by this compound. Taken together, these results demonstrate that thymoquinone suppressed inflammation in neurons, suggesting its therapeutic potential in inflammation-mediated neuronal damage found in neurodegenerative disorders.