Oroxylin A Inhibition of NO Production in BV-2 Microglia

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Overproduction of pro-inflammatory cytokines and nitric oxide (NO) upon activation of microglia has been implicated in pathogenesis of neurodegenerative diseases. Oroxylin A (Oro-A), a purified compound from a Chinese herb Scutellariae baicalensis, exhibited its beneficial effects in suppressing the expression of inducible nitric oxide synthase (iNOS) and cyclooxygenase-2 in RAW264.7 macrophage. Thus, we examined whether Oro-A inhibited NO production in BV-2 microglia using biochemical and molecular biological methods. Our results indicated that Oro-A (3 µM to 100 µM), co-treatment with LPS (100 ng/mL), in a concentration-dependent manner inhibited LPS-induced NO production without affecting the cell viability. Oro-A administered 3 hours or 6 hours after LPS challenge (post-treatment) also significantly reduced LPS-induced NO production in BV-2 microglia. In parallel, LPS-induced expression of iNOS mRNA and protein were attenuated by Oro-A co-treatment and post-treatment. This attenuation was not resulted from inhibition of nuclear factor kappa B translocation or c-jun phosphorylation. Neither was the time-dependent degradation of iNOS mRNA affected by Oro-A. These results suggest that Oro-A via blocking iNOS mRNA synthesis attenuates the production of NO in BV-2 microglia. Although the exact mechanism of transcriptional pathway remains to be determined, Oro-A may be beneficial in reversing LPS-induced neurodegeneration of the central nervous system.