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In vitro immunomodulatory activity of chrysin (5, 7-dihydroxyflavone) isolated from *Indigofera tinctoria* on macrophage via NF- κ B signaling pathway

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In the present investigation, *in vitro* immunomodulatory effect of natural flavonoid chrysin isolated from *Indigofera tinctoria* leaves was evaluated on murine macrophages (RAW 264.7 cells). The chrysin was purified and structure was elucidated by spectroscopic analysis including UV- visible, FTIR, NMR (13C, 1H) and GC-MS. The immunomodulatory activity of different concentrations of chrysin (25, 50, 75 and 100 μ g/mL) was analyzed on normal and LPS(10 μ g/mL) stimulated macrophage with various assays including cell proliferation, nitric oxide (NO) production, phagocytosis, ROS generation, gene expression and NF- κ B nuclear translocation. The results revealed that, chrysin was significantly increased the proliferation of macrophages as well as phagocytic function of macrophages in dose dependently. Moreover, the preliminary and essential features of phagocytosis such as superoxide anions production, lysosomal and pinocytic activity of macrophages was significantly enhanced upon chrysin treatment. On the other hand chrysin significantly debited the ROS generation, NO production and increased the arginase activity on LPS stimulated macrophage. The expression of pro-inflammatory cytokine such as TNF- α & IL-6 and pro-inflammatory mediators such as iNOS & COX-2 and the expression also dose dependently decreased by chrysin in LPS treated macrophages. Moreover, the chrysin treatment was greatly reduced the NF- κ B activation and subsequently decreased the NF- κ B nuclear translocation. Collectively, the present findings suggested that a natural flavonoid chrysin can increased the innate immune response by enhancing macrophages functions through NF- κ B signaling pathway and explored the strong immunomodulatory potential.

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