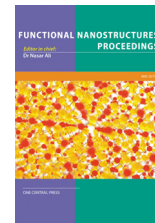


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Effect of Gold Nanoparticles on Proinflammatory Cytokines mRNA Expression in Mouse Brain

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ABSTRACT

Gold nanoparticles (GNPs) have been recognized as a potentially useful tool for drug delivery and imaging. Because of the ability of GNPs to cross the blood brain barrier [1], their use can be extended for imaging and therapy of nervous system disorders. Recent reports indicated an acute phase induction of proinflammatory cytokines in liver and kidneys of GNP-treated rats [2-4] whereas a priming dose prevented such immune activation [5]. In this study, we tested the effect of GNPs (5, 20 and 50 nm diameter) on mRNA expressions of IL-1 β , IL-6 and TNF- α in mouse brain. A single injection of 5 nm diameter GNPs significantly increased the mRNA expression of IL-1 β and IL-6 in mouse brain on day 7, which was not increased further by the second dose of the same GNPs. There was no significant change in the expression of proinflammatory cytokines by 20 nm and 50 nm GNPs. In conclusion, small sized GNPs induced a proinflammatory cascade in mouse brain indicating a crucial role of GNPs size on immune response.

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