

Abstract

Gold nanoparticles (AuNPs) have tried to apply in many fields such as biological research, cosmetic, and medicine as clinical diagnostics because it has been reported to be safe for various applications and decrease severity of inflammation. Although the several advantages of AuNPs have been reported, but they still have found to cause in many cytotoxicity tests. However, mechanisms inside the cells requiring deeper investigation. Toll-like receptors are one of the key factors that play an important role in the innate immunity, which provide immediate responses to invading pathogens. The main aim of this study was to examine the effect of AuNPs on inflammatory response via TLR2 and TLR4. Using hTLR2 and hTLR4-Hek 293 cell lines, treatment with various size of citrate-stabilized AuNPs for 24 h. In our findings, small size of AuNPs has been shown to be able to up-regulate TLR2/4 gene expression, while 20 nm AuNPs do not change the expression level of TLR2/4 genes. Next, we investigated down-stream of TLRs, NF- κ B activation and pro-inflammatory cytokine have been studied. Inductions of NF- κ B activity and expression of pro-inflammatory were observed in 10 nm AuNPs treated cells. However, the level of both NF- κ B activity and expression of pro-inflammatory is reduced after exposure with 20 nm AuNPs. Ours result conclude that TLR2/4-mediated cytotoxicity of AuNPs by size dependent pattern. These findings suggest that AuNPs may have important guideline the treatment of inflammations application.