

Effects of small and medium sized gold nanoparticles on the inflammatory mediators in rat liver and kidney

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Background: Gold nanoparticles (GNPs) have emerged as important carriers for drug delivery. However, immunological response of GNPs is complex and poorly understood.

Objective: To investigate the effects of small and medium sized gold nanoparticles on the inflammatory mediators in rat liver and kidney.

Methods: We studied the effects of small (10 nm) and medium (50 nm) sized GNPs on expression of proinflammatory cytokines, interleukin-1 beta (IL-1b), interleukin-6 (IL-6) and tumor necrosis factor-alpha (TNF- α) in the liver and kidneys of rats.

Results: We observed that the expression of these cytokines in the liver was significantly higher than kidneys of rats exposed to GNPs. Both 10 and 50 nm GNPs significantly increased the cytokines gene expression in liver on day 1 which was reduced on day 5. In the kidney, only the medium sized GNPs significantly increased the expression of IL-6 and TNF- α on day 1, which was subsided on day 5.

Conclusion: These results show that GNPs exposure only transiently increases the expressions of proinflammatory cytokines that gradually subside with time. The current data on the biocompatibility of GNPs are limited and their interpretation is controversial.

Biography:

I have completed the Ph.D. in December 18, 1993 from the University of Akron, Ohio, USA and has joined King Saud University, Dept of Biochemistry, College of Science, Riyadh, Saudi Arabia since 1994. In 2002-2006 I became the Chairman of the Department of Biochemistry and in 2010-2012 I became the Vice-Dean of Graduate Studies and Scientific Research. I have published more than 115 papers in reputed journals and more three book-chapters.

Currently I have been serving as an Editor-in-Chief of Saudi Journal of Biological Sciences, Associate Editor of the Jordan Journal of Biological Sciences and as editorial board member of repute.

I am currently working in the area of carnitine metabolism and its implication in human diseases. I am also studying the role of the carnitine pathway of energy metabolism in the Arabian camel (*Camelus dromedarius*), in order to explore the relationship between carnitine and the camel's superior ability to subsist in the harsh desert climate compared to other animals.

Another research area of my interest is to study the biochemical and molecular of nanomaterials, using both in-vivo and in-vitro models. More recently, my research interest extends in the area of diabetic retinopathy.

Ongoing Research Projects include: Neurodegeneration and neuroprotection studies in diabetic retinopathy, Hyperglycemia-induced oxidative stress in diabetic retina, glutamate excitotoxicity: a potential role in neurovascular damage in diabetic retinopathy.