

Short Communication

Transient increase in IL-1 β , IL-6 and TNF- α gene expression in rat liver exposed to gold nanoparticles

H.A. Khan¹, M.A.K. Abdelhalim², A.S. Alhomida¹ and M.S. Al Ayed²

¹Department of Biochemistry, College of Science, King Saud University, Riyadh, Saudi Arabia

²Department of Physics and Astronomy, College of Science, King Saud University, Riyadh, Saudi Arabia

Corresponding author: H.A. Khan

E-mail: khan_haseeb@yahoo.com

Genet. Mol. Res. 12 (4): 5851-5857 (2013)

Received March 8, 2013

Accepted July 4, 2013

Published November 22, 2013

DOI <http://dx.doi.org/10.4238/2013.November.22.12>

ABSTRACT. Most studies have used *in vitro* systems to test inflammatory responses of nanoparticles; these may not reflect the real biological response of body organs. In fact, certain nanoparticles have provoked opposite effects under *in vitro* and *in vivo* conditions. Current understanding of the biocompatibility of gold nanoparticles is controversial. We studied the acute (1 day) and sub-chronic (5 days) effects of gold nanoparticles (10 and 50 nm in diameter) on expression of interleukin-1 beta (IL-1 β), IL-6 and tumor necrosis factor alpha (TNF- α) in rat liver. Real-time PCR analysis showed that gold nanoparticles of both sizes significantly increased cytokine gene expression on day 1; this had subsided by day 5. The 50-nm gold nanoparticle produced more severe inflammation than the smaller gold nanoparticle. These findings indicate a possible biocompatibility of medium-sized gold nanoparticles, as they caused only a transient

increase in proinflammatory cytokines, followed by normalization during sub-chronic repeated exposure.

Key words: Gold nanoparticles; Inflammation; *In vivo* toxicity; Rats; Cytokines