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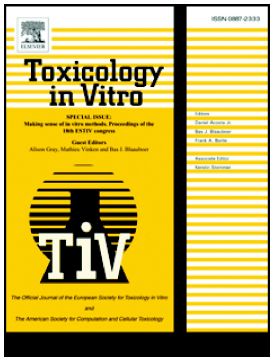

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Biological response of HeLa cells to gold nanoparticles coated with organic molecules

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Abstract

In this work, gold nanospheres functionalized with low weight organic molecules (4-Aminothiphenol and cysteamine) were synthesized in a one-step method for their in vitro cytotoxic evaluation on HeLa cells. To enhance the biocompatibility of the cysteamine-capped GNPs, BSA was used due to its broad PH stability and high binding affinity to gold nanoparticles. Besides, the widely reported silica coated gold nanorods were tested here to contrast their toxic response against our nanoparticles coated with organic molecules. Our results shown, the viability measured at $1.9x10^{-5}$ M did not show significant differences against negative controls for all the samples; however, the metabolic activity of HeLa cells dropped when they were exposed to silica gold nanorods in the range of concentrations from $2.9x10^{-7}$ M to $3.0x10^{-4}$ M, while in the cases of gold nanospheres, we found that only at concentrations below $1.9x10^{-5}$ M metabolic activity was normal. Our preliminary results did not indicate any perceivable harmful toxicity to cell membrane, cytoskeleton or nucleus due to our nanospheres at $1.9x10^{-5}$ M. Additional test should be conducted in order to ensure a safe use of them for biological applications, and to determine the extent of possible damage.

Keywords Gold nanoparticles · Functionalization · SERS · HeLa cells · Cytotoxicity

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