

Abstract

Polyvinylpyrrolidone-Coated Silver Nanoparticles Induce the Expression of Inducible Nitric Oxide Synthase in Intestinal C2BBE1 Cells [†]

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Abstract: Silver nanoparticles (AgNP) have gained access to our daily life, resulting in exponential and inevitable human exposure, namely by the oral route. Despite this, the adverse effects of AgNP on intestinal cells are still unexplored. Thus, this study aimed to investigate the potentially toxic and pro-inflammatory effects of polyvinylpyrrolidone (PVP)-coated AgNP (5 and 50 nm) in intestinal epithelial C2BBE1 cells. For this purpose, the effects of PVP-AgNP on cellular metabolic activity and viability, and also on the expression levels of inducible nitric oxide synthase and $\text{i}\kappa\text{B}\alpha$, were evaluated. It was observed a decrease in cellular metabolic activity, associated with the occurrence of early and late apoptotic events, for the 50 nm PVP-AgNPs. The expression levels of inducible nitric oxide synthase and $\text{i}\kappa\text{B}\alpha$ levels increased and decreased, respectively, after exposure to 50 nm PVP-AgNP. Ultimately, it was also observed an increase in nitric oxide levels. Therefore, it can be concluded that the larger PVP-AgNP induce prominent activation of a putative inflammatory response by intestinal cells. However, further studies are needed to disclose the mechanistic pathways involved in the intestinal pro-inflammatory effects of AgNP.

Keywords: silver nanoparticles; intestinal C2BBE1 cells; toxicity; inflammation

Supplementary Materials: The poster can be downloaded at: <https://www.mdpi.com/article/10.3390/ECMC2022-13196/s1>.

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