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The effects of silver nanoparticles on RAW 264.7. Macrophages and human whole blood cell cultures

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ABSTRACT:

Silver nanoparticles (AgNPs) are commonly found in consumer products due to their antimicrobial properties. This study evaluated the effects of AgNPs on the murine macrophage cell line RAW 264.7 and human whole blood cell cultures (WBCs). Effects of AgNPs on RAW cells were assessed in the presence or absence of lipopolysaccharide (LPS). Effects of AgNPs on WBCs were monitored under basal conditions and in the presence of either LPS or phytohaemmagglutinin (PHA). AgNPs were cytotoxic to WBCs at 250 µg/ml. Under basal conditions, RAW cells = 62.5. µg/ml and WBCs > 25 µg/ml AgNPs induced biomarkers associated with inflammation. Under LPS stimulated conditions, 250 µg/ml AgNP inhibited biomarkers associated with inflammation for both cultures. Under basal conditions, and in the presence of 250 µg/ml AgNP, WBCs produced acquired immune system cytokines IL-10 and IFN . IL- 10 synthesis by WBCs was partially inhibited by 250 µg/ml AgNP in the presence of PHA. Proteome profiles of RAW cell supernatants show that AgNPs modulate biomarkers associated with inflammation. WBCs proteome analysis shows modulation of biomarkers associated with anti-inflammatory effects.