Kim Lategan et al., Madridge J Immunol. 2017
http://dx.doi.org/10.18689/2638-2024.a1.002

madridge CONFERENCES

International Conference on
Immunology and Immunotechnology

November 1-3, 2017 Barcelona, Spain

The Effects of Silver Nanoparticles on RAW 264.7 Macrophages and Human Whole Blood Cell Cultures

Kim Lategan[1*] and **E. Pool[2]**
[1,2]University of the Western Cape, South Africa

Silver nanoparticles (AgNPs) are commonly found in consumer products due to their antimicrobial properties. However, very little is known about the effects of AgNPs on the immune system. This study evaluates the effects of AgNPs on the murine macrophage cell line RAW 264.7 and human whole blood cell cultures (WBCs). The effects of AgNPs were assessed in the presence or absence of a mitogen, lipopolysaccharide (LPS). The effects of AgNPs on WBCs were monitored under basal conditions, LPS or phytohaemmagglutinin (PHA). A number of parameters were evaluated for both cultures, which included cytotoxity, biomarkers of inflammation, cytokines of the acquired immune system and a proteome profile analysis. AgNP concentrations tested had no effect on RAW cell viability. However, cytotoxicity of WBCs was evident at 250 µg/ml AgNP. Under basal conditions, AgNPs concentrations ≥ 62.5 µg/ml and > 25 µg/ml induced inflammation in RAW cells and WBCs respectively. Under a simulated inflammatory response (+ LPS), 250 µg/ml AgNP inhibited the inflammatory response for both RAW and WBCs. The acquired immune cytokines IL-10 and IFNγ were both induced by 250 µg/ml AgNP in the absence of PHA. While IL-10 was partially inhibited by 250 µg/ml AgNP in a simulated (+ PHA) acquired immune response. Proteome profiles of RAW cell supernatants show that AgNPs do in fact modulate specific protein synthesis. Upregulated RAW cell proteins due to AgNP exposure indicate induction of proteins associated with inflammation and wound and tissue healing. The mitogen activated WBCs proteome analysis indicates the partial inhibition of inflammatory proteins. Monitoring those proteins in future experiments will give a better indication of the effects of AgNPs.

Biography:

Currently concluding her PhD research project in the Medical Bioscience Department at the University of the Western Cape. She is also currently the lab manager for our Ecotoxicology/Immunotoxicology Laboratory. Her work includes investigating the *in vitro* effects of heavy metals and nanoparticles on the immune system. She has previously presented work at various international conferences. These include the 16th International Symposium on Toxicity Assessment (ISTA), 7th Society of Environmental Toxicology and Chemistry (SETAC) Africa conference and the ChinaAfrica Water Forum.