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Biological effects of nanoparticles on fishZeinab H Arabeyyat
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It is important to develop early warning tools of nanoparticle-induced biological effects for aquatic species to be able to monitor any possible impacts. In this study, early zebrafish (*Danio rerio*) embryos have been experimentally exposed *in vitro* to 1.925 mg/L of 4 nm, 10 nm AgNPs and to silver ions (0.018 mg/L) alone, up to 96 hpf. Five targeted genes have been employed for analysis: Peroxisomal membrane protein 2 (Pxmp 2), hypoxia inducible factor (HIF), superoxide dismutase (SOD), mucosal secretion protein (Muc) and catalase (CAT) genes. A global approach employing suppression subtractive hybridization (SSH) has also been used in parallel to identify novel genes that may be involved in the fish embryo response as a result of exposure to nanoparticles. The results show that 4 nm AgNPs are taken up by zebrafish embryos at a concentration of 1.925 mg/L. AgNP uptake resulted in significantly up-regulated Pxmp 2 and HIF mRNA transcript levels in exposed embryos. An increased trend in up-regulation of SOD was also observed, while, Muc and CAT remained unchanged. No corresponding significant differences were observed in any of the transcript levels analyzed following exposure to larger sized 10 nm AgNPs or silver ion exposure alone. An up-regulation of solute carrier family 25, membrane 5 and Cytochrome c oxidase subunit I; and down-regulation of spermatogenesis associated protein 2 and Actin alpha, cardiac muscle 1b mRNA expressions identified by SSH approach have also been observed. These results suggest that 4 nm AgNPs are available for uptake and, as a result cause changes in mRNA expression in developing embryos.

Biography

Zeinab H Arabeyyat has completed her MSc in Biotechnology from Jordan and is currently a final year PhD student in Aquatic Toxicology Research Group at the University of Hull in UK. She has attended many international conferences in Norway and local conferences in Jordan and UK. She is a Lecturer in the Faculty of Marine Sciences at the University of Jordan.

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