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Effects of Gold Nanoparticles on Marine Species

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Gold nanoparticles have been increasingly used in several areas of human activities due to their small size and unique properties. However, with the increased use of these particles its entrance into the environment may be expected. One of the main challenges that ecotoxicologists currently face is to understand how these nanomaterials will affect the environment health, and ultimately human health. Among the most commonly used nanoparticles, gold nanoparticles (AuNPs) are being increasingly used in areas such as medicine, being designed for increased stability, according to intended applications which may result in potential interactions with biological systems and other emerging contaminants present in the environment (e.g. human pharmaceuticals). One of the prerequisites for using gold nanoparticles is their non-toxic and biocompatible nature to both in vivo and in vitro systems. However, some concerns on their possible impact in the environment have been risen with few studies addressing the effects of the particles in marine organisms. This work will present data on the biochemical effects of gold nanoparticles in marine organisms (bivalves and fish), alone and combined with other environmental contaminants. Overall, results demonstrated that the stability of AuNPs in high ionic strength media and the observed effects are highly dependent on the surface coating. AuNPs displayed the ability to induce peroxidative damage both in bivalves and fish and to induce alterations in the activity of acetylcholinesterases as well as antioxidant defences. Although the benefits of these nanomaterials are widely proven, their unintentional release or disposal deserve more care and precaution.

Biography

Maria de Lourdes Pereira, Associate Professor with Habilitation at Department of Biology, University of Aveiro, and member of the Associate Laboratory CICECO-Aveiro Institute of Materials, got her PhD in Biology at the University of Aveiro (1991). Her teaching activities include essentially Cytology and Histology, and Cell Biology. She is Director of the Master on Molecular and Cell Biology. Research has been focused on the effects of some heavy metals, pesticides, and nanomaterials on different target organs of mice and fish. She co-authored several publications in the area of toxicology, collaborating with some journals as referee.

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