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Response of marine microalgae towards short single-walled carbon nanotubes

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Abstract

Nanoparticles have vast applications in industrial and consumer products such as household detergents, sunscreen, anti-bacterial clothing, electrical and telecommunication devices, sports equipment, medical treatment tools and others. The production of nanomaterials is increasing remarkably with an expected resultant increase in the distribution of nanoparticles in the environment. Many health problems have been correlated to the exposure of nanoparticles. For instance, engineered carbon nanotubes cause inflammation, fibrosis and oxidative stress in both in vitro and in vivo models and titanium dioxide nanoparticles could lead to chronic airflow obstruction. Marine microalgae play a pivotal role in all marine ecosystems as they form the food and energy base for all organisms living in lakes, ponds, streams and sea. They provide 75% of oxygen content in the atmosphere. Therefore, an effect on algal population may have an important impact on the whole ecosystem. The aim of this study is to assess the toxicity of short single-walled carbon nanotubes (SWCNT) and amount of reactive species oxygen (ROS) released in two marine microalgae *Dunaliella tertiolecta* and *Isochrysis* sp using pigment quantification method and H_2DCFDA dye. We found that SWCNT reduced the algal cell number by 50% at 30 mg/L and 50 mg/L after 96 h of exposure in *Isochrysis* sp. and *Dunaliella tertiolecta* respectively. In addition, 6-10 folds of ROS were released by these marine microalgae when exposed to SWCNT (50 mg/L). In conclusion, the presence of nanoparticles in the environment causes ecotoxicity and its impact to biodata should not be neglected.

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