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# Physiological and biochemical impacts of graphene oxide in polychaetes: the case of *Diopatra neapolitana*

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## Abstract

Graphene Oxide (GO) is an important carbon Nanomaterial (NM) that has been used, although limited literature is available regarding the impacts induced in aquatic organisms by this pollutant and, in particular in invertebrate species. The polychaete *Diopatra neapolitana* has frequently been used to evaluate the effects of environmental disturbances in estuarine systems due to its ecological and socio-economic importance but to our knowledge no information is available on *D. neapolitana* physiological and biochemical alterations due to GO exposure. Thus, the present study aimed to assess the toxic effects of different concentrations of GO (0.01; 0.10 and 1.00 mg/L) in *D. neapolitana* physiological (regenerative capacity) and biochemical (energy reserves, metabolic activity and oxidative stress related biomarkers) performance, after 28 days of exposure. The results obtained revealed that the exposure to GO induced negative effects on the regenerative capacity of *D. neapolitana*, with organisms exposed to higher concentrations taking longer periods to completely regenerate and less regenerated segments. GO also seemed to alter energy-related responses, especially glycogen content, with higher values in polychaetes exposed to GO which may result from a decreased metabolism (measured by electron transport system activity), when exposed to GO. Furthermore, under GO