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Biochemical changes induced in vivo by Si/SiO in liver tissue

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Quantum dots (QDs) are nanocrystalline semiconductor materials that have been recently tested for biological applications such as cancer therapy, cellular imaging and drug delivery. The purpose of this study was to evaluate in vivo the degree of oxidative stress generated at the liver level following administration of Si / SiO_2 QDs. Silicon QDs toxicity was investigated by injection into the codified vein of these Si / SiO_2 QDs in Swiss mice, being tested in 3 different concentrations (1, 10 and 100 mg QDs / kg body weight). After 24 hours of nanoparticle administration, the mice were sacrificed and liver tissue was sampling. From the total protein extracts, were measured the specific activities of the antioxidant enzymes (superoxide dismutase (SOD), catalase (CAT), glutathione peroxidase (GPX), glutathione reductase (Gred), glutathione S-transferase (GST), glucose 6-phosphate dehydrogenase (G6PDH), as well as reduced glutathione (GSH) and malonaldehyde (MDA) concentration, the results have been reported to mice injected with phisiological serum. The analyzes showed that the highest dose (100 mg QDs / kg body weight), 30% decrease in CAT activity, 22% G6PDH activity, 15% GST activity, and 20% GPX and GSH concentration. The determinations performed demonstrate the lack of toxicity of Si / SiO_2 QDs to concentrations of 10 mg/kg body, not affecting the redox balance at the liver.

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