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**LS-7-P-5732 Toxicity parasite cell response by CdTe nanoparticles**


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Nanotoxicity by quantum dots (QD) has been extensively studied in prokariote and eucaryote cells. The toxicity of QDs is associated with their physicochemical properties. Several attempts have been made to reduce particle size by (a) selecting the capping of the nanoparticles; (b) using minimal doses; and (c) modulating nanoparticle size. All these factors are important for cell toxicity response and consequently to the use of QDs as fluorescent marker. The potential effects of CdTe in T. cruzi epimastigotes were evaluated by our group showing that high doses of QDs (200 µM) led to a decrease in T. cruzi growth pattern through the decreasing of the percentage of duplicated-DNA parasites (14.5%) and increased of the percentage of fragmented-DNA parasites (36.7). Ultrastructural data showed extensive mitochondrial swelling and abnormal chromatin condensation, moreover endoplasmic reticulum profiles surrounding the subcellular structure and myelin-like structures, were also observed leading us to suggest autophagy. To confirm the hypothesis parasites were incubated with monodansylcadaverin (MDC) a lisossomotropic fluorescent compound useful for identifying cadaverin protein, present in the autophagic vesicles and observed by fluorescence microscopy. The images revealed many autophagic vacuoles within parasite cells, which could confirm the autophagy developing. At the same time, experiments were performed with 3 methyladenine (3MA) a phosphatidylinositol 3 kinase (PI3K) inhibitor that showed a dose-dependent reversion of cell death. Taken together our results show that high QDs concentrations are toxic to T. cruzi, inducing cell death by autophagy.

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Fig. 1: A- T. cruzi control; b- T. cruzi treated with 200μM of QDs + 100 μM of monodansylcadaverine. These head arrows represent vacuoles MDC (+) expressing the cadaverine protein labeled, visualized by Zeiss Axioplan Microscope (fluorescence).

Fig. 2: Transmission electron microscopy analysis of Trypanosoma cruzi CdTe labeled A- T. cruzi control presenting typical morphology, B and C T. cruzi labeled with 200 uM QDs. Bars = 1 μm