Trypanosoma cruzi' ROS induction by CdTe nanoparticles

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Trypanosoma cruzi is a parasite protozoan that causes Chagas's disease which represents a severe public health problem in Latin America. Therefore, the study of parasite cellular metabolism is fundamental to understand the biochemical mechanisms, to develop more specific and sensitive diagnostic methods, vaccine and alternative chemotherapy. In searching for tools for data acquisition in biological systems, nanoparticles or quantum dots (QDs) emerge as important fluorescent probes for in vitro and in vivo cell studies. However, to ensure applicability in living organisms, several tests are still needed. Cell death, free radical production and DNA damages are some of the toxic events caused by QDs, in which mitochondria is considered the main target of toxicity. In this context, in this work were used CdTe nanoparticles funcionalized by acid mercaptoacetic in order to identify citotoxicity effects in *T. cruzi* such as induction of oxidative stress. The cells were marked with different concentrations of QDs (0.2-200μM) and the levels of Reactive Oxygen Species (ROS) were monitored by spectrofluorimeter using 2, 7-dichlorodihydrofluorescein diacetate (H2DCFDA) and Electron Paramagnetic Resonance Spectroscopy (EPR).The results were recorded on fluorescence intensity curves and decay intensity signal curves as a function of time, respectively. Both assays demonstrated a greater induction of ROS levels in the parasites treated with 20 and 200μM in comparison with control parasites. In this way, we can infer that the toxic effects of QDs in *T. cruzi* are dose-dependent

and that high levels of ROS are involved in cellular toxicity promoted by higher concentrations of QDs. Our results suggest that QDs should be used in low concentrations to avoid changes in cellular metabolism and consequent damage to the target cell. As perspectives, we intend to deepen QD studies by evaluating other toxic effects in *T. cruzi*.

Key words: *Trypanosoma cruzi*, Quantum dot, nanoparticles