Is There a Functional Heme Oxygenase in *Trypanosoma cruzi*?

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Heme is an ubiquitous molecule present in organisms of all kingdoms. The heme oxygenase (HO) is an important mechanism to control heme homeostasis. HO catalyzes the degradation of heme to biliverdin (Bv), carbon monoxide and iron. HO is absent in *T. cruzi* genome, thus we have been investigating the presence of a functional HO in this parasite, since our previous results showed a presence of biliverdin in heme-treated epimastigotes. So, we evaluated the effect of SnPPIX, a HO-1 inhibitor, CoPPIX, a HO inducer, and Bv upon epimastigotes proliferation. SnPPIX impared parasite proliferation in a dose-dependent manner and this effect was reversed in the presence of Bv. Differently, CoPPIX did not interfere on proliferation. Furthermore, we showed through western blotting a 45 kDa protein with affinity by the HO-1 antibody, differently of the mass found in HO from mammals (32 kDa). We also observed the increase of HO-1 expression in heme-treated epimastigotes. In order to investigate the HO sequence, we used Mass Spectrometry from unidimensional electrophoresis and the analysis of 45 proteins found did not show a typical sequence when compared to already described HO-1. Subsequently, we isolated genomic DNA from *T. cruzi* for amplification of HO-1 gene using primers designed as from the *T. cruzi* genome based on the hypothetical protein from *Theileria annulata*. We found as amplification products bands of 369, 492 and 738 bp. According to the primers, a 720 bp fragment was expected, thus, the presence of a 738 bp amplicon could be an evidence of a successful amplification. Taken together, these results suggest the presence of a functional HO-1 in *T. cruzi*. Supported by CAPES, FAPERJ.