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*Trypanosoma cruzi* epimastigotes propagates in the triatomine insect crop. These hematophagous insects usually ingest about 10mM of heme bound to hemoglobin. Heme is a generator of reactive oxygen species (ROS). In several organisms, porphyrins are transported by ATP-binding cassette (ABC) transporters, such P-glycoproteins (Pgp). These proteins are involved in multidrug resistance and cyclosporin A (CsA) is a Pgp inhibitor. Here, we investigated the pro-oxidant property of CsA and its involvement in *T. cruzi* metabolism. Epimastigotes were incubated with CsA in the presence of heme and the cell growth was evaluated. A decrease in parasites growth was observed when treated with 10 µg/mL CsA in the presence of heme. Previous results (Lara *et al.*, 2007) show that Pd-mesoporphyrin IX (Pd-mPP IX a fluorescent heme-analog) accumulates on the surface of *T. cruzi* when CsA was used, suggesting a strong inhibition of PgP. Once PgP is inhibited, heme would be trapped in the parasite membranes yielding ROS thus, we analyzed it by flow cytometry of CMH<sub>2</sub>DCFDA fluorescence. A huge increase in ROS was observed when cells were incubated with CsA. Our data suggest that CsA is able to decrease epimastigotes proliferation and promotes oxidative stress by the inhibition of the PgP decreasing the heme detoxification. Supported by FAPERJ and CNPQ