Evidences for Detoxification of Peroxynitrite by Thiol Peroxidases in *Saccharomyces Cerevisiae*.

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Introduction: Peroxynitrite and its derived oxidant species damage biomolecules and are involved in several pathologic conditions. Peroxiredoxins and Glutathione peroxidases (TP) members react rapidly and directly with peroxynitrite in cell free systems, but, despite the favorable kinetics, there is no evidence that this reaction takes place intracellularly. In fact, TP catalytic cycles is NADPH dependent and involve multiple thiol exchange reactions, and it is not obvious if such system operates at relevant rates in cells. **Objective:** To investigate if TP members react with peroxynitrite in yeast *Saccharomyces cerevisiae* (SC). **Material and Methods:** We set up a kinetic competition model with the rationale that the higher the relevance of TP at reducing peroxynitrite in cells, the lower the oxidation of the fluorescent peroxynitrite indicator boronate (CBA), which was followed by conventional fluorescence spectroscopy using a multiwell plate reader in real time. CBA loaded SC were exposed to fluxes of peroxynitrite generated by the peroxynitrite "donor" SIN-1 or the combination of nitric oxide donors (Sper/NO or Deta/NO) and the superoxide generator paraquat. The relevance of TP and peroxynitrite reaction was evaluated by comparisons of boronate oxidation rate between two *SC* strains, wild type (WT) and Δ8, a strain where all eight TP genes have been deleted. **Results and Discussion:** Peroxynitrite dependent oxidation of CBA is always higher for the Δ8 strain as compared to WT under all conditions tested. In addition, WT strain gains more resistance to peroxynitrite than Δ8 under respiratory conditions (glycerol), where TP expression levels are expected to increase, suggesting a role for TP members in peroxynitrite detoxification. Furthermore, TP seems to relevantly detoxify peroxynitrite under oxidative stress simulated by high concentrations of hydrogen peroxide. **Conclusions:** TP members collectively represent a relevant antioxidant cellular system that removes peroxynitrite rapidly and catalytically under both normal and oxidative stress conditions. **Keywords:** peroxynitrite, peroxiredoxin, *Saccharomyces cerevisiae*. **Supported:** by FAPESP, CNPq and CAPES.