Antioxidant Activity of Mononuclear Fe(III)-complex

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Oxidative stress is a result of disequilibrium between pro-oxidant and antioxidant states causing continuous ROS generation and accumulation of damages in biomolecules. Recently, great attention has been paid to the study of metal compounds in the pharmaceutical industry in order to treat several diseases associated with oxidative stress. Using cells of *Saccharomyces cerevisiae* grown aerobically and anaerobically, as an eukaryotic cell model, we evaluated the benefits of Fe(III)-complex treatment against oxidative agents (H_2O_2 and menadione). Determinations of cellular viability and lipid peroxidation were performed in cells exposed to oxidative agents, before and after treatment with the complex. According to results, aerobic and anaerobic cells of wild type strain acquired tolerance to H_2O_2 and menadione after treatment with Fe(III). The induction of tolerance against H_2O_2, after treatment with Fe(III) seemed to be related to decrease in lipid peroxidation levels. However the acquisition of tolerance to menadione stress is not clear, since cells did not show decrease in the levels of MDA, a final product of lipid peroxidation analyzed. In order to study the potential of Fe(III)-complex as a compound which would mimic catalase and superoxide dismutases, we carried out experiments using strains deficient in Ctt1 and Sod1 synthesis. Similar results were obtained using these deficient strains. Catalase deficient strain became tolerant to H_2O_2, after Fe(III) treatment while exposure of *sod1* null mutant, showed increased survival levels under stress conditions. Taken together, these results suggest that mononuclear Fe(III)-complex seems to have potential to replace metalloenzymes, catalase and superoxide dismutase, protecting yeast cells against severe oxidative stress.

Palavras Chaves: metalloenzymes, Fe(III)-complex, oxidative stress, tolerance, antioxidant.