

Review Article

Dual molecular mechanism of catalase in cancer and resistance to chemotherapy

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Abstract

Catalase is the one of the most important antioxidant enzymes that is found abundantly in liver and kidney. The alteration in activity and function this latter enzyme are widely investigated in various types of cancer to understand the cancer mechanism and its treatment. The changes in the catalase activity levels in a variety of cancer cells is as a specific property of tumor tissues due to the reducing catalase activity at mRNA level. In this review, various reports that examined the alterations in catalase activity and resistance to chemotherapy and its complications in the literature are summarized and discussed. Due to the important role of hydrogen peroxide in various stages of cancer process, catalase alters this process by detoxification of hydrogen peroxide. Chemotherapy increase free radicals to destroy the tumor cells, then, catalase activity reduced their impact on cancer cells. On the other hand, it might be concluded that production of drug resistance in chemotherapy is resulted due to increasing catalase activity. Therefore it seems catalase has contradictory influence on the treatment and development of cancer.

Keywords: Catalase, Cancer, Hydrogen peroxide, Chemotherapy

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