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The dual role of reactive oxygen species in experimental RS-1 hepatocellular carcinoma measured during an anti-angiogenic treatment

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Full text:

Abstract

Reactive oxygen species (ROS) have been identified as important signaling molecules in many cell types including endothelial cells, and have been associated with endothelial cell proliferation and new vessel formation in response to growth factors including VEGF and PDGF.

The elucidation of the mechanisms underlying the angiogenesis in cancer cells is necessary for the development of agents to be used in combination with/instead of standard chemotherapy. To achieve this goal, it must be taken into consideration also the strong role played by the redox environment in cancer cells survival, growth, progression, relapse and drug resistance. Reactive oxygen species, indeed, play both positive and negative roles in cellular proliferation and survival; this feature has been exploited by different modified cells to promote the hallmarks of cancer phenotype, either through phosphorylation events or transcriptional alteration.

In this paper we try to identify reactive oxygen species production in hypoxic conditions and their role in angiogenesis signaling process. For this purpose we were used hepatoma cells derived from an experimental tumor, maintained in culture and treated with Avastin, following in the dynamics of treatment and in successive administrations; the ROS production in real time were measured by flow cytometry techniques.

Keywords: *reactive oxygen species (ROS), angiogenesis signaling process, experimental hepatoma*