

2<sup>nd</sup> International Congress on

# EPIGENETICS & CHROMATIN

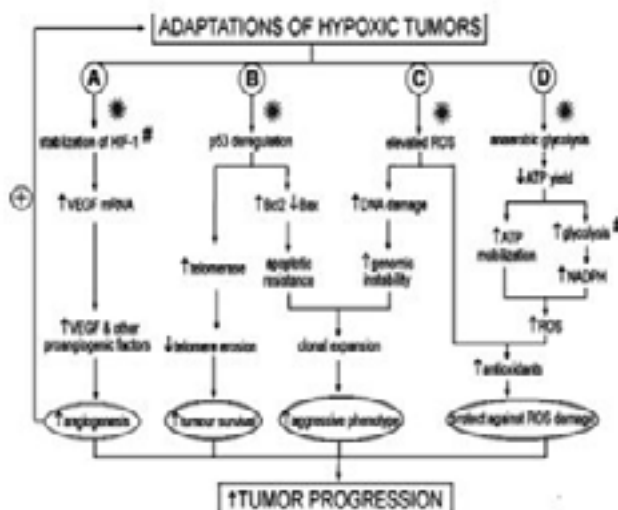
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## Hypoxia as an epigenetic factor and hyperbaric oxygen therapy

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Cancer is still one of the most leading causes of the declining survival and life quality. Oxygen deprivation causes significant stress in mammalian cells. Hypoxic cancer cells survive via the adaptation to the unfavorable conditions. Moreover, they are related with tumor recurrences and interfere with treatment success in many types of malignancies. Hypoxia affects angiogenesis, apoptosis and many gene products that are involved in glycolysis directly. The target genes regulated by hypoxia mediate tumor progression through an epigenetic mechanism. Hypoxia is essential for hypoxia-inducible factor (HIF) -1  $\alpha$  stabilization and following vascular endothelial growth factor (VEGF) expression. Tumor oxygenation can be increased via hyperbaric oxygen therapy (HBOT). HBOT is a treatment in which a patient breathes 100% oxygen in a pressure vessel or treatment chamber at a pressure that is higher than sea level atmospheric pressure. There is some concern about the possibility of unfavorable effects of HBOT on the stimulation of tumor cells via angiogenesis and reoxygenation of hypoxic cells. The drug interaction is the other issue that shows up with the doxorubicin treatment. According to the results of the study on Adriamycin extravasation treated with HBOT, it is suggested that adjuvant hyperbaric oxygen in the management of Adriamycin extravasation may prevent patient morbidity and long and complicated hospitalization. In addition, in an experimental study, HBOT didn't potentiate doxorubicin-induced cardiotoxicity. The effects of hyperbaric oxygen on the breast cancer cell culture were studied. Hyperbaric oxygen on MCF-7 breast cancer cell culture decreased cell number and proliferation. HBOT theoretically has the potential to stop all the adaptation mechanisms of tumor cells in a hypoxic environment (Figure 1). HBOT increases oxygen perfusion of the tumor tissues, changes hypoxic microenvironment, can increase apoptosis via ROS production and abolish antioxidant defense mechanisms of the tumors.



### References

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## **Biography**

Aslıcan Çakkalkurt is a Medical Doctor and has her expertise in Underwater and Hyperbaric Medicine and is interested primarily in patients and diseases that require increased tissue oxygenation. In addition to the conventional indications of hyperbaric oxygen therapy, she has conducted researches about the relationship between cancer and hyperbaric oxygen. She is interested in Integrative Medicine and is experienced in Ozone therapy, Phytotherapy and medical coaching as well. She has given many poster and oral presentations in different fields at national or international conferences.

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**Notes:**