
POS-MON-040**THE THIOREDOXIN SYSTEM UNDER INTERMITTENT HYPOXIA IN CANCER CELLS**

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The oxygen environment is an important determinant of carcinogenesis. Cancer cells are mostly in flux between low and high oxygen availability, experiencing cycling between hypoxia and reoxygenation, a phenomenon termed as intermittent hypoxia. The thioredoxin system, comprising thioredoxin and thioredoxin reductase, is an important antioxidant system that maintains the cellular oxygen homeostasis by eliminating harmful oxidants. It also regulates several important transcription factors. High levels of thioredoxin have been observed in cancer cells and are linked to their growth and progression. Due to its immense importance in the cancer cell biology, the thioredoxin system is also considered a potential anticancer target. Surprisingly, very few studies involving the thioredoxin system have been performed under intermittent hypoxia. We used MDA-MB-231, a model breast cancer cell line to characterize the expression of the thioredoxin system under intermittent hypoxia. Cells were exposed to prolonged hypoxia followed by different lengths of reoxygenation alongside normoxic conditions. Additionally, hypoxic cycling preconditioning prior to exposure to prolonged hypoxia and reoxygenation were also used. Cellular viability, ROS levels, thioredoxin protein levels and promoter activity were measured under all the conditions. We also observed the thioredoxin reductase specific activity under normoxia, hypoxia and hypoxia followed by 4 hours of reoxygenation. Our results indicate that reoxygenation provides cells with growth stability. A 4-hour reoxygenation significantly increases the ROS levels, thioredoxin protein levels and promoter activity, and thioredoxin reductase specific activity. Better understanding of mechanisms involved in the regulation of the thioredoxin system under different oxygen conditions will enable designing of improved therapeutics that are more effective in the in vivo tumor microenvironment.