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FLUORESCENCE-ACTIVATED CELL SORTING ANALYSIS OF THIOREDOXIN IN CANCER CELLS UNDER DIFFERENT OXYGEN CONDITIONS

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Thioredoxin is a redox capable protein that is integral to the functioning of cells. It performs several roles within the intracellular environment, including the scavenging of reactive oxygen species or ROS. Oxidative stress is caused when the cell contains excessive levels of ROS, which can lead to inflammation, ischemic tissue damage, carcinogenesis and cancer progression, or even cell death. Thioredoxin expression increases under conditions of oxidative stress, which can also cause thioredoxin to be secreted into the extracellular environment. Another condition that causes an increase in thioredoxin levels is hypoxia, which is defined as a loss of oxygen in cells and tissues and is widespread in solid tumours. While it is not known how hypoxia leads to an increase in thioredoxin expression, there is evidence that ROS has roles to play within the hypoxic cellular environment, which may be related to the increased thioredoxin levels. There is not much known about the increase of thioredoxin in hypoxic conditions, or whether intracellular thioredoxin increase corresponds to increased thioredoxin on the surface of cells. Therefore, the aim of this project is to quantitatively look at the levels of thioredoxin both within and on the surface of cancer cells under different oxygen conditions (oxidative stress, normoxia, hypoxia) via FACS analysis. Immunoflourescence was performed as a visual complement to the FACS analysis.