Introduction

Main Topic: Cellular aging and predicting the life span of cells

Hypothesis: If the yeast cells come in contact with different doses of hydrogen peroxide their oxidative stress will be induced then the cells will age faster.

Abstract: *Saccharomyces cerevisiae*, also known as the budding yeast, can be used to study the cellular aging process as a model for aging of human cells. Past studies have concluded that there is a strong connection between the presence of superoxides, and cellular aging. This study investigates how the presence of hydrogen peroxide on the outside of the cell influences the amount of hydrogen peroxide inside of the cell. The hydrogen peroxide acts as a stress inhibitor and the cell wants to the keep a balance of between the levels of intercellular and extracellular peroxide by trying to maintain homeostasis. The intracellular levels are detected by dihydroethidium (DHE) and the intracellular levels are detected by dihydrorhodamine (DHR). DHR and DHE are florescent probes that can be detected by flowcytometry —the use of lasers to detect different aspects between cells.

Introduction: One of the main causes for cellular and physiological aging is the introduction of reactive oxygen species. They are chemical reactive ions that contain oxygen, and in this case H2O2, hydrogen peroxide,induces the production of reactive ions. Once the yeast cells have been placed in hydrogen peroxide, the cells begin to rapidly produce superoxide hydroxy radicals because they recognize the peroxide as a threat(?). The overproduction of the radicals creates damage in macromolecules such as proteins, DNA and RNA. DNA and RNA function as the instructions for the production of specific proteins that keep the cell healthy and function properly, but as the instructions are destroyed, the cell begins the age due to its lack of stability. As the cell ages, the probability of developing diseases, such as cancer and Alzheimer’s, increases.