According to the article written by Qin, "cellular aging is an emerged property of gene/protein networks at the cellular level." Caloric restriction extends the lifespan of different types of eukaryotic organisms. Many different experiments have been performed to test different levels of cellular aging. Through studying the article written by Qin and the article written by Rizzetto and Zanni, I learned many different concepts that will hopefully help me to understand the aging process more.

In the article written by Qin, Saccharomyces cerevisiae was the organism chosen to study. Different topics such as Chronological life span (CLS) and replicative life span (RLS) were discussed. Chronological life span is defined as how long cells can survive without dividing in stationary phase, were discussed in this article. Replicative life span is defined as the number of cell cycles that individual mother cells produce before they senesce and cease dividing. Reactive oxygen species (ROS) was a concept that was lightly discusses in this article. To better understand reactive oxygen species I decided to gather information outside of this article. I defined reactive oxygen species as chemically active molecules containing oxygen. Two forms of reactive oxygen species involving aging are intracellular levels of H2O2 and superoxide anions (O2); which are studied in order to understand caloric restriction. This article basically explains the research that will be performed in the laboratory. Two aims of this experiment are to examine the effects of genes on lifespan and to examine the robustness of cellular aging. A concept discussed in this article was robustness. Robustness can be defined as the ability of cells to maintain homeostasis despite stochastic fluctuations, environmental changes, or polymorphic and mutation changes. Qin discusses how robustness can be achieved by using a network buffering mechanism or using gene duplication. From reviewing this article, I hypothesize that cellular aging has an important, but positive impact on genes/proteins.

In the article written by Rizzetto and Zanni, Kluyveromyces lactis was the organism chosen to study. This experiment concluded with the glucose causing a reduced viability compared to glycerol. Calorie restriction caused an increased longetivity without raising respiration. Also, there was an increase in the copy number of HSP60 extended lifespan at the same level as rag5 (RAG5 gene encodes for hexokinase) mutation. Although in S. cerevisiae the mutation in HXK2 showed an increase in lifespan, it is not entirely true for K. lactis. In K. lactis, there was not an increase in cell viability; which suggests that the rag5 mutation does not contribute to the reduced glucose. This experiment was the complete opposite of the experiment discussed in Qin's article due to many factors. Some of the factors were the different organisms’ used, S. cerevisiae and K. lactis; and the opposite concluding effects the two organisms enquired.

The Project Summary article is completely different than the article written by Rizzetto and Zanni because they are studying two entirely different species. The Project Summary article studied S. cerevisiae while the article written by Rizzetto and Zanni studied K. lactis. S. cerevisiae is a crabtree-positive yeast, while K. lactis is a crabtree-negative yeast. Qin states “Saccharomyces cerevisiae has proven to be a good model system for studying aspects of cellular aging.” S. cerevisiae was used because it is very close to the human genome. k.lactis was used because the respiratory function is not affected by glucose repression. S. cerevisiae caused an increase in glucose level, while K. lactis caused a decrease in glucose levels.

As we aim to examine aging, robustness, and the rate of cellular aging we must first understand the main idea of these concepts. All of these concepts are an important part of cellular aging. Aging is a process difficult process in which scientists and researchers cannot seem to find a common answer for because it is continuously revolving. The articles written by Qin and Rizzetto and Zanni have both been a guide to help me understand the main concept of this entire experiment. In the future, rather than just studying the basic concepts of this experiment I would like to study a little further. I am interested to learn why each concept makes up an important part of cellular aging, as well as how all of these concepts connect together. I not only learned about this experiment, but I also learned about the complete opposite of this experiment by studying the article written by Rizzetto and Zanni.

Works Cited

Qin, H. "Project Summary." (2012): n. pag. Print.

Rizzetto, Lisa, and Elena Zanni. "Extension of Chronological Lifespan by Hexokinase Mutation in Kluyveromyces Lactis Involves Increased Level of the Mitochondrial Chaperonin Hsp60." Journal of Aging Research (2012): n. pag. Print.