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Bio 320

February 17, 2012

Proposal Reflection

Cellular aging is seen as the result of decreased function in the molecules of cells. From The experimentation of cellular aging in budding yeast, specific genes have been identified as significant in the aging process. For instance, SIR2 and TOR1 are known to increase the amount of stability of the genome in the cell during aging. I liked the proposed definition of aging. The thought of aging being an emergent property really does make it easier to understand the inconsistent data that has been produced experimentally. Robustness is seen as the cell’s tolerance to environmental changes, fluctuations, and mutations. This project states that the robustness is proportional to cellular aging. However, I do not understand this concept. I think that if the robustness is increased, the aging process would decrease. This states that the more the cell is tolerant to mutations and environmental changes, the longer it will live. This project is saying that the reduction in robustness causes a decreased in the aging cycle. In comparison to previous studies, many genes have been found to extend and shorten life span. Tumor suppressor genes have been found to extend life span while oncogenes shorten life span. This is inherent when making the connection between aging and cancer. Figure 2 shows the use of the Gompertz survival curve. In class, we talked about the relation of these curves to real life. We stated that the increase in robustness, or the healthier the population, the faster they will age when they begin to age. Hence, the decrease in robustness, or a population that is not very healthy, will age slower over a longer period of time. I understand this concept, but I don’t understand the actual biology or the reasoning behind this. I want to know why that is. It just doesn’t make sense that a healthy person with stronger cells, muscles, and bone would age faster than a sick person who is weak, dying, and malnourished. The test done of haploid and diploid cells was interesting. It showed that due to the fact that diploid cells are bigger and have more proteins and molecules as compared to haploid cells, diploid cells will age faster. This, once again, does not make sense to me. I would think that the more equipped something is, the better off it will be. So the fact that the diploid cell has more molecules, I see that as more resources to help it survive. Contrary to my belief, the data from table 2A and 2B coincide with the hypothesis made. The computational and experimental portions both showed that there are many genes that need to remain in the cell in order to promote aging, and some that can be deleted to also promote cellular aging. I enjoyed the proposal very much, and am very excited to see what things are done next to further the study of cellular aging.