



**CALIFORNIA STATE SCIENCE FAIR
2006 PROJECT SUMMARY**

Name(s) Tony A. Lu	Project Number S0413
Project Title Importance of Drosophila eIF4E-Binding Proteins in Lifespan Regulation	
Abstract Objectives/Goals Aging is unclear to scientists worldwide and yet people continue to be interested in ways to live longer; in Drosophila, when insulin levels fall, due to either genetic interventions or lack of nutrients a lifespan extension is seen. My previous research suggests that longer lifespan correlates with activation of the dFoxo gene, which is regulated by insulin levels, and reduced amounts of nutrients. This project therefore tests whether or not 4E-BP, which is downstream of the dFoxo pathway, is responsible for the increase in lifespan. Thus, it is hypothesized that if there is a lack of nutrition and if 4E-BP is upregulated, then 4E-BP will stimulate an increase in lifespan. Methods/Materials In this study, Drosophila lifespan was studied with respect to various overexpressions of 4E-BP that differ in their composition of Gal4#PO163, or 109#drivers, which are Drosophila lines that express the yeast transcriptional activator Gal4 in a tissue specific manner. In addition, the Drosophila were fed protein in the form of yeast ranging from 0-4% yeast concentrations. Results I saw complex interactions between the levels of 4E-BP and the nutritional content of the food for the phenotype of lifespan. The results show overexpressed 4E-BP on low yeast has a 50% increase in lifespan while 4E-BP on high yeast, a 15% decrease in lifespan. Conclusions/Discussion Because the Drosophila genome shares 77% of their genes with the human genome, these findings may be applied to increasing human lifespan and allow us to study human mortality.	
Summary Statement Since my previous research suggests that longer lifespan correlates with activation of the dFoxo gene, this project therefore tests whether or not 4E-BP, which is downstream of the dFoxo pathway, is responsible for the increase in lifespan.	
Help Received Used lab equipment at Caltech Benzer labs under the supervision of graduate student Brian M. Zid; Participant in the Alhambra Biomed Program	