



**CALIFORNIA STATE SCIENCE FAIR  
2015 PROJECT SUMMARY**

<b>Name(s)</b> Caleb Smith	<b>Project Number</b>  35667
<b>Project Title</b> Creation of a <i>Drosophila melanogaster</i> Strain Capable of Discovering Lifespan-Extending Genes in the Hsp22 Pathway	
<b>Abstract</b> <b>Objectives/Goals</b> The objective is to genetically engineer a line of flies that are capable of highlighting the genes responsible for extending lifespan in the <i>Drosophila melanogaster</i> Hsp22 genetic pathway. This line of flies can help scientists not only learn about the Hsp22 pathway, but also help scientists learn about the mechanisms of aging in the <i>Drosophila</i> . <b>Methods/Materials</b> This experiment utilizes crosses of varying <i>Drosophila</i> lines in order to create a final strain of flies with the capability to fluoresce brightly when a gene that is part of the Hsp22 pathway has been over-expressed. Each subsequent cross adds the genetic building blocks that are needed to create the final strain. <b>Results</b> A line of flies was bred that have a mechanism that randomly over-expresses genes in the fly, and if those over-expressed genes are part of the Hsp22 pathway, the fly will fluoresce brightly under fluorescent light. <b>Conclusions/Discussion</b> Because the Hsp22 is thought to play a key role in the lifespan of the <i>Drosophila</i> , it is imperative that scientists discover the actual genes that make up this pathway. These flies are an invaluable tool that scientists can use to shed more light on the questions, "Why and how do <i>Drosophila</i> age?" and "How can lifespan be increased in the <i>Drosophila</i> ?" More importantly, the flies open the door for scientists to discover even more about how humans age, as well as how human lifespan can be increased.	
<b>Summary Statement</b> A line of flies was created that makes it easy for scientists to discover genes that make up the lifespan-extending Hsp22 pathway in the fruit fly.	
<b>Help Received</b> Mentor from USC taught me techniques	