



**CALIFORNIA STATE SCIENCE FAIR
2012 PROJECT SUMMARY**

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Project Title The Effect of Natural Solar UV Radiation on the G1 Checkpoint in S. pombe	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of my project is to test whether natural solar UV radiation is energetic enough to damage DNA to the point where cell cycle checkpoints are required.</p> <p>Methods/Materials I took advantage of the fact that caffeine is known to override cell cycle checkpoints, allowing cells to divide with damaged DNA. If the damage is great enough, death will occur. I grew the fission yeast <i>Schizosaccharomyces pombe</i> in liquid YES medium. I then exposed diluted cultures cells to natural solar UV radiation in Whirlpack bags (control dark, control light, 10 mM caffeine light, 10 mM caffeine dark) to allow damage the DNA in the yeast cells. I took 10 μL subsamples throughout the day and plated them on agar. I incubated the plates for two days at 36°C and saw that there was a gradation in the presence of colonies throughout the day. No growth represented the cells that died because the caffeine overrode their checkpoints when the DNA was damaged. I did this on Aug 27, 2011. To model annual variation in solar UV damage, I took light readings at different times of the year and compared them to my readings taken during the survival experiments.</p> <p>Results My results showed that different amounts of UV do have an effect on the cell growth, as shown clearly with the caffeine-treated cells.</p> <p>Conclusions/Discussion From this I conclude that natural solar UV radiation is strong enough to damage the DNA and the checkpoints are needed to make sure that DNA is not replicated when it is damaged.</p>	
Summary Statement To see if natural solar UV radiation is sufficient to damage DNA to the point where cell cycle checkpoints are crucial in cellular division.	
Help Received Mother helped come come up with experimental design and proofread	