The Use of Fluorescent Proteins GFP and EBFP2-BFP for Enhanced Solar Energy Production Through the Usage of Magnifiers

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The purpose of this experiment was to test the ability of magnifiers such as SiO2, lenses and mirrors to increase the energy produced by fluorescent proteins GFP and EBFP2-BFP, a UV protein. The presented null hypothesis stated the magnifiers would not affect the energy produced by the fluorescent proteins via solar panels. To test this, I used fluorescent proteins I transformed and purified the previous year. To measure energy output, I placed two solar panels in a “V” formation with the proteins suspended 12 inches above the panels, and dual UV lights suspended above the proteins. I ran three control trials including only the UV lights and panels, then individual sets of three trials with the lenses, mirrors and SiO2 in combination with the proteins. From this point, I ran trial sets combining the different magnifiers. I also ran a set of trials using only the proteins. I collected measurements in volts (V) and amperes (Amps), and used Ohm’s Law to calculate power (Watts). Using one-tailed independent t-tests, all results were found to be statistically significant. The trial set using all magnifiers with the fluorescent proteins proved to be the most significant, showing a p-value of .0015. These results discredit the null hypothesis therefore supporting the alternative hypothesis. In conclusion, the data proves that the use of fluorescent proteins can increase the production of clean solar energy. This discovery could potentially result in a stable, lasting source of energy having exponentially positive applications for the future of our world.

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