Sorry, I Didn't See You: Testing the Effects of Photosensitive Medications on Crystallin Alpha to Study the Development of Cataracts

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Cataracts, the decomposition of crystallins found in the lens of the eye, are increasingly common among today's population of aging and diabetic patients. Photosensitive medications can increase the chance of developing cataracts. It was hypothesized that: 1. Aspirin would cause the most gel decomposition with a p-value of 0.05; 2. Ibuprofen would cause the least amount of decomposition with a p-value of 0.05; and 3. The experimentation set with UV-B exposure would have more gel decomposition than the set without UV-B exposure with a p-value of 0.05. Crystallins from bovine lenses were purified (using agarose gel and EDTA) and incubated at 37C for 30 minutes. Lenses were then centrifuged at 3,000 rpm at 4C until gelatinized and then dialyzed overnight with Tripotassium Phosphate. The gel was divided into spectrophotometer vials and the medications, Benadryl, ibuprofen, and aspirin were used. One set was exposed to UV-B light for three weeks. Data was recorded weekly using a spectrophotometer (at 950 nm) and a refractometer. Data was analyzed using the ANOVA test. The first and second hypotheses were rejected. Ibuprofen caused the most decay (via spectrophotometer and refractometer) with a p-value < 0.01, and Benadryl caused the least amount of decay (via refractometer) with a p-value < 0.01. The third hypothesis was accepted as the set exposed to UV-B had more decay (via spectrophotometer and refractometer) than the set without UV-B exposure with a p-value of < 0.01.

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