Additionally, because of the technological restrictions of working in a typical high school laboratory, much of the biological results were limited to qualitative observations. However, due to the particular strain of yeast used, we were able to make inferences. The HA1 strain contains a mutation in its genome, disrupting the biosynthesis of adenine, an essential nucleobase used to construct DNA. When grown in excess of adenine such as in YEAD media, the HA1 strain obtains adenine from its surroundings and bypasses the biosynthesis pathway, leading to a wild-type phenotype (seen by white colonies). However, in the adenine-deficient YED media, the strain will turn red as it switches to use the adenine biosynthesis pathway through an intermediate metabolite contained within the agar. Essentially, if any mutations occur in the yeast cells that disrupt the biosynthesis pathway, the phenotype reverts back to its wild-type, turning from red to white. This clearly visible change in color makes it possible for researchers to observe the occurrence of certain mutations without the need for more advanced genetic analysis techniques.

The experimental design for the seeds also could have been improved. With greater planting space, more results could have been explored, such as the height, growth rate, and time it took to sprout. Due to COVID-19 and district resource availability, the seeds were planted at home instead of a more suitable lab. Planting more seeds would have been better to have a larger sample size.

The hypothesis that UV light and cosmic rays would cause observable genetic mutations among the yeast and seeds is mostly not supported by the data. The yeast data showed strong evidence that UV and cosmic radiation had an effect on genes involved in the ADE1 pathway as seen by the changes in coloration. However, because only two out of eighteen seed scenarios were significantly different from the ground data, we do not believe this is enough evidence to reject the null hypothesis.

Because it was concluded that UV light and cosmic rays at the altitude reached likely did not result in genetic mutations, it is possible that groups interested in space travel may have greater flexibility. Though more testing would need to be done, these results pose promising suggestions for crops in space. If humans live in space in the future and have sufficient seed planting conditions, their crops would likely still grow if they are receiving a similar amount of UV light and cosmic rays. All of these implications would need to be confirmed with future research.

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