A Novel Approach to a Mutagenic Study of Carcinogenic Properties and Dietary Supplementation Using Reverse Mutation to Test the Toxicity of Iron Chloride and Ascorbic Acid on Salmonella typhimurium

Choudhury, Myesha (School: Canterbury School)

The purpose of this experiment is to find potential mutagenic properties within the pairing of Iron Chloride and Ascorbic Acid in vitamin supplementation, and to create an application towards the potential increased risk of cancer from the use of vitamin supplementation. The researcher hypothesizes that the pairing of Ascorbic Acid and Iron Chloride is mutagenic. This was tested by conducting an AMES test. This test uses an experimental plate with the Ascorbic Acid and Iron Chloride, defective mutated strains of Salmonella typhimurium, and a glucose minimal plate, where the bacteria is unable to survive on; therefore, the bacterial cell evolution of reverse mutation would nullify the effects of the original mutation, allowing them to process nutrients available on the plate. This reverse mutation is only successful when given proper mutagens. By observing the number of wild-type colonies surviving on the minimal glucose plates, the researcher would be able to understand how effective the Ascorbic Acid and Iron Chloride are as mutagens, to help conclude the mutagenic properties of the pairing. Control test groups were also created using combinations of the Wild-Type strain, defective strain, glucose minimal plates, and nutrient-rich plates. The data supports the hypothesis because the defective colonies were able to successfully reverse mutate when Iron Chloride and Ascorbic Acid were added to the minimal plates as mutagens. It can be concluded that the mixture of Ascorbic Acid and Iron Chloride present in multivitamins may be carcinogenic to the consumer. Further research into the role of reverse mutation to test for carcinogenic properties and the combination of Ascorbic Acid and Iron Chloride may assist in a major new role in the prevention and cure of cancer.