ECOTEK
Science at Work!

Students Improve Protocol for the Enzyme Hydrolysis of Starch

Photo: left, Amber Young, right, Alisha Boyd

An enzyme is made up of a group of proteins that perform different biochemical functions. They serve as catalysts to speed up chemical reactions. An enzyme is formed by stringing together between 100 and 1,000 amino acids.

The shape of an enzyme allows it to carry out specific chemical reactions. Enzymes are very important to human biological functions. For example, people that are lactose intolerant can not drink milk because their bodies lack the enzyme *lactase* which is needed to breakdown lactose into glucose.

Innovation is defined as the improvement or enhancement of an existing process through the use of technology or alternative methods. It can happen when you least expect it. Student scientists, Amber Young, 9th grader and Alisha Boyd, 10th grader, can attest to this fact. While investigating how enzymes affect biochemical processes, the student scientists were able to develop a simple one step process to analyze the catalytic traits of diastase enzymes when converting starch into glucose.

One common approach to assessing enzymatic processes is to bind an amylase enzyme to a starch substrate and identify the reducing sugars using iodine. Starch is manufactured by green plants during the process of photosynthesis. It forms part of the cell walls in plants and serves as a source of energy. The enzyme binding process works well when the starch molecules are broken down in an aqueous solution. This approach, however, can produce false positive results if starch molecules are not synthesized.

Amber and Alisha started noodling around with the idea of how to prevent an inaccurate detection of the enzyme catalytic process. They kicked around a few ideas and decided that placing a combined aqueous solution (oxidane + starch substrate+ amylase enzyme+ benedict solution) in a hot water bath would make the analysis process more reliable. After performing their protocol multiple times and assessing the results, they found that it was not only more reliable, but it also was easier to perform.

About the Ecotek Science Program
Ecotek is a science research lab program for young inventors and researchers in grades 5 thru 12. Student scientists work on projects aligned with the issues being addressed by world leaders at the United Nations. To learn more about Ecotek Lab go to http://www.ecotek-us.com

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