Will Fluorescent Dyes Be Able to Detect the Saccharide D-galactose on Parasites, such as Trypanosoma cruzi?

Soliven, Abigail (School: Melbourne High School)

The research project's purpose is to use fluorescent dyes to identify the outer coatings of parasites, aiding vaccine development. Depending on the change in the spectrum, the glycoprotein would be identified. Two fluorophores were used, fluorescein and rhodamine-B, and two sugars, galactose and fructose. For each dye one solution contained no sugar, .05 M Galactose, .25 M Galactose, .05 M Fructose, .25 M Fructose, and 45 µL of the respective fluorophore. The fluorescein solutions showed a decrease in fluorescence intensity once the sugar was added. Emission in water showed 3.74 x 106 cps, 0.25 M Fructose showed 2.18 x 106 cps, 0.05 M Galactose showed 2.09 x 106 cps, 0.05 M Fructose showed 2.05 x 106 cps, and 0.25 M Galactose showed 1.32 x 106 cps. The rhodamine solutions showed an increase in fluorescence intensity once the sugar was added. Emission in water showed 1.45 x 106 cps, 0.05 M Galactose showed 1.59 x 106 cps, 0.05 M Fructose showed 1.70 x 106 cps, 0.25 M Galactose showed 1.81 x 106 cps, and 0.25 M Fructose showed 2.09 x 106 cps. It was hypothesized that saccharides mimicking the glycoprotein coating of parasites could be detected by comparing the change in fluorescent spectra of several fluorescent dyes. Both fluorescein and rhodamine showed a significant differences in intensity, 0.25 M Galactose showing the greatest significance for fluorescein and 0.25 M Fructose for rhodamine. The data supports the hypothesis, rejecting the null hypothesis.

Awards Won:

University of Arizona: Tuition Scholarship Award