

## Roundup™ components alteration of caffeine concentration linked to drug metabolism inhibition

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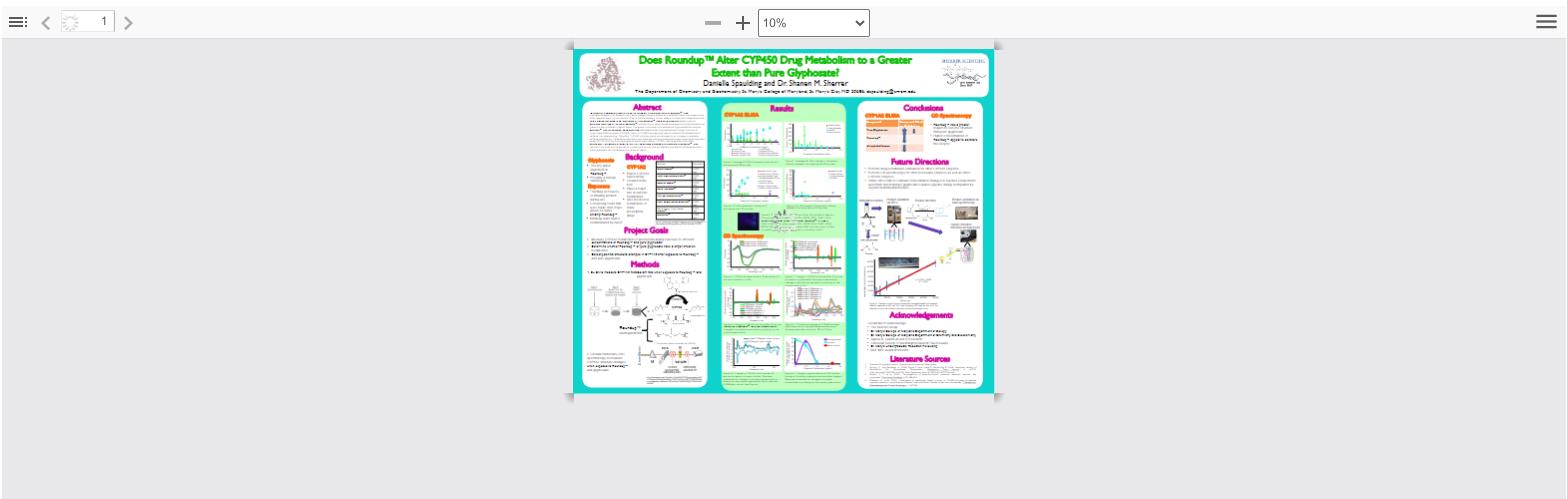
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### Abstract

Glyphosate is commonly used as an active ingredient in herbicides such as Roundup™. The International Agency for Research on Cancer categorizes glyphosate as a possible human carcinogen while other research says it is non-harmful. Due to this discrepancy, further research is required to determine what safety precautions need to be taken when utilizing Roundup™ and other glyphosate-based products. Herbicide runoff and utilization of Roundup™-resistant crops have caused trace amounts of glyphosate to be present in many different types of foods. The goal of this project is to determine if glyphosate and another Roundup™ inactive ingredient polyethoxylated tallowamine alter drug metabolism through inhibition of cytochrome P450 enzymes (CYP450). Here, a CYP450 enzyme was used to catalyze the metabolism of caffeine into paraxanthine. Therefore, CYP450 inhibition would be indicated by an increase in available caffeine post-reaction. Caffeine concentration was detected utilizing a caffeine enzyme-linked immunosorbent assay (ELISA) and liquid chromatography-mass spectrometry (LC-MS). Native gel electrophoresis determined if the molecular weight or purity of the enzyme changed after exposure to Roundup™. The results of this study can be applied to humans and portray how accidental consumption of and exposure to these chemicals can be dangerous in terms of health.

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