# CALIFORNIA STATE SCIENCE FAIR
# 2016 PROJECT SUMMARY

**Name(s)**

**Daniela A. Nieva**

**Project Number**

36147

**Project Title**

## Sanitization of Black Tea Using Ultraviolet Radiation

**Abstract**

**Objectives/Goals**

This purpose of this project is to sanitize tea of harmful microorganisms to make for safer consumption by immunocompromised persons.

**Methods/Materials**

Twenty 5 gram tea leaf samples were collected from tea bags and UV irradiated for varying amounts of time. Half of the samples were agitated as they were UV irradiated. The UV irradiated tea samples were plated on Sabouraud agar plates and placed in an incubator. Once a day, the plates were inspected to see if any mold spores appeared. Once I proved that UV light sanitizes tea of harmful microorganisms, I created a device that could sanitize larger quantities of tea. The experiment was repeated using the device, rather than UV treating each sample by hand. Each sample was plated, incubated, and inspected for spores.

**Results**

Black tea was irradiated for various time periods and plated on agar plates to see if UV light sanitizes black tea of harmful microorganisms. Half the tea was agitated as it was irradiated. The black tea that was agitated while being UV irradiated showed a significant decrease in harmful microorganisms. UV irradiation and agitation for over thirty-five minutes result in the sanitation of black tea of harmful microorganisms.

**Conclusions/Discussion**

My hypothesis that UV irradiation and agitation would sanitize black tea of harmful microorganisms was strongly supported by the results. I plan to extend my project and patent a device that will sanitize tea in individual portions for consumption by immunocompromised persons. Black tea was used in this experiment, but UV light also sanitizes other food products such as pepper. The findings of this experiment demonstrate a concrete way to improve the quality of life for immunocompromised persons by expanding their dietary options.

**Summary Statement**

My experiment shows that UV light can be used to sanitize food products of microorganisms harmful to immunocompromised persons.

**Help Received**

I designed and conducted the experiment myself. However, I was invited to conduct my experiments in the lab of Dr. Maria Elena DeBellard at CalState Northridge.