

**WIU CENTENNIAL HONORS COLLEGE**  
**Thomas E. Helm Undergraduate Research Day 2022**

**Abstract**

Poster

Major Chemistry

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**Ultraviolet-Visible (UV-Vis) Spectroscopy Analysis of Antioxidants in Brewed Teas**

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Antioxidants are a type of chemical that can prevent damage to living cells by free radicals. Free radicals are uncharged molecules with an extra electron that is unpaired, which can cause heart disease and cancer. Antioxidants have the ability to interact with these free radicals to prevent them from causing damage is very important. Teas, especially green and black teas, fruits, and vegetables contain various levels of antioxidants. These teas have been found to have health effects such as increasing metabolism, strengthening immune systems, and preventing negative health effects, including those caused by free radicals. The focus of the research being conducted is determining the antioxidant activity of various green and black teas by their quenching ability of a stable free radical, 2,2-diphenyl-1-picrylhydrazyl (DPPH). When DPPH is prepared in ethanol, a purple solution is produced. As this radical becomes quenched by antioxidants, the solution changes from violet to yellow. The analysis of this reaction is performed using ultraviolet-visible (UV-Vis) spectroscopy. The antioxidant activity of the teas is determined by comparing UV-Vis spectroscopy absorbance readings at 517 nm with a standard absorbance curve of ascorbic acid, which is able to quench twice its mass in DPPH. The antioxidant concentration in hot and cold brew teas is being determined and compared to other black and green teas. A couple of the notable findings are the Organic Breakfast Tea, Longjing Dragonwell Tea, and Jade Snail Spring Tea have the highest antioxidant activity for hot and cold brew black teas, hot brew green teas, and cold brew green teas, respectively.