

## **Research Week Proposal**

**Title** - Antimicrobial Activity of Modified Oregano Oil-based Compounds

**Program of Study** – Biology and Chemistry

**Presentation Type** – Print Poster

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**Category** – Basic

### **Abstract**

This presentation seeks to analyze the antimicrobial impact of modified oregano oil constituents. Essential oils such as oregano oil are used throughout the world for medicinal purposes and as components of therapeutic lotions and perfumes. Their list of uses is extensive and is still undergoing augmentation. Current study of essential oils has largely focused on their antioxidant abilities. However, many essential oils are prized for their ability to reduce the presence of microbes. Chemical modification of these oils can help in determining the specific constituents of a given oil that are responsible for the antimicrobial activity and give insights into the aspects of their molecular structure that lead to the observed antimicrobial effect. The goal of this experiment is to determine whether the chemical modification of oregano oil and its individual compounds, using enzymes such as Horseradish Peroxidase, or using other chemical reactions, can improve the effect that the oil or oil constituent (i.e. carvacrol, thymol, gamma-terpinene) has on eliminating *Staphylococcus aureus* and *Escherichia coli* bacteria. Reactions are performed with organic chemistry techniques and analyzed for structure modification by observation and various analytical methods. Various enzymatic environments are explored to seek to improve the effect of the enzymatic reaction. The antimicrobial impact is measured by utilizing the disc diffusion method. Comparison of the zones of inhibition of unmodified controls to the enzymatically modified counterparts provides the information sought in this experiment. This research provides a new level of depth to the studies performed on essential oils and what specifically causes their observed effects. Further research can be done with the same techniques on other essential oils; in addition, further analysis could be performed to determine what specific aspect of the molecular structure causes the antimicrobial effects and why.