



**CALIFORNIA SCIENCE & ENGINEERING FAIR
2019 PROJECT SUMMARY**

Name(s) Marie Huitt	Project Number J1605
Project Title Honey, There's No More Infection! The Effects of Manuka Honey, Nature's Defense!	
<p style="text-align: center;">Abstract</p> <p>Objectives The objective of this study is to see if the antimicrobial properties of Manuka Honey can combat bacteria to the same extent as your common Turmeric, Tea Tree Oil or Garlic oil naturally. I studied the efficacy of all four with an emphasis on Manuka Honey, and determined their effectiveness against a nonpathogenic strain of E. Coli by measuring their zones of inhibition.</p> <p>Methods I mixed Agar and put it into Fifteen petri dishes, then labeled them and allowed them to cool. I used an inoculating loop to streak liquid E. Coli to all of my petri dishes and waited a week till the bacteria had grown to a healthy amount. Used Manuka Honey, tea tree oil, turmeric, and garlic oil to stop the growth of the bacteria. I left 3 of the petri dishes as a control group to compare the growth of the normal growth.</p> <p>Results The testing of the E. Coli was compared to the control group after the different treatments have been introduced to the petri dishes. The Manuka Honey treatment killed most of the bacteria and it neutralized the bacteria from letting any more grow. The other treatments would slowed the growth of bacteria or neutralize the bacteria. They didn t have as good of a success rate as the Manuka Honey which had a 95% success rate.</p> <p>Conclusions The Manuka Honey neutralized and killed the most bacteria which is very beneficial to the medical world. Manuka Honey will help to heal cuts and scrapes because of the two antimicrobial compounds of hydrogen peroxide and Methylglyoxal (MGO) for healing. The Methylglyoxal releases more glucose into the cells to help them heal faster and keeps a moist wound environment and gives a protective barrier which prevents microbial infections in wounds. Manuka Honey helps with inflammation and healing wounds. Manuka Honey promotes healing because of the 3.2 to 4.5 pH that it contains. The UMF of Manuka Honey has to be plus 15 to kill bacteria faster. This significant discovery may lead the medical community to use Manuka Honey more commonly to heal wounds naturally.</p>	
Summary Statement My project showed how using different treatments affect the way that the bacteria was killed and that Manuka Honey was the best to neutralize and heal wounds.	
Help Received My mom helped me to buy the materials and to make the agar and my brother helped me to use the inoculating loop to streak the E. Coli onto the agar.	