



CALIFORNIA STATE SCIENCE FAIR 2015 PROJECT SUMMARY

Name(s) Hannah O. Cevalco	Project Number 35034
Project Title Honey, I Found A Cure! Nature's Healing Agent	
Objectives/Goals A scratch wound heal assay using primary human dermal fibroblasts was conducted to determine if using Manuka honey as a topical healing agent promotes faster in vitro wound closure compared to a wound that is left untreated.	
Abstract Methods/Materials All work was conducted in a biosafety hood to prevent contamination. Dual-chambered silicon culture inserts were placed in each well on two 12-well microplates using sterile forceps. Then, 70µl of primary human dermal fibroblasts suspended in DMEM liquid media were dispensed into each well at a concentration of 500,000 cells per chamber. The cells were allowed to grow to confluency in a 37 °C incubator, 5% CO ₂ for 24 hours. After the incubation period, the culture inserts were removed and specific wells were flooded with Manuka honey solutions at concentrations of .5%, 1% and 2% as well as a control solution, a sugar solution, and a 1% Manuka honey solution that was extracted and replenished at each time interval. Images of each well were taken using an inverted microscope at a 5x magnification at 0,2,4,6,8,12, 24, and 32 hours.	
Results The results of this experiment show that Manuka honey (MH) at a 1% concentration has a significant effect on cell migration while the 0.5% and 2% concentrations have a minimal effect. The process of cell migration was photographed using a 5x inverted microscope and the images were uploaded to Wimasis Image Analysis software for data quantification. Several T tests were conducted at the time points where there was a significant difference between the cell covered area in trials with the 1% MH and the control. Statistical analysis shows that the 1% MH solution was significantly more effective than the control at the 12 and 24-hour time point. The p-values for these T tests were .0344 and .0157 respectively, which indicates that the superior performance of MH at a 1% concentration in comparison to the control can be confirmed with a 95% confidence interval.	
Conclusions/Discussion The use of Manuka honey as a topical healing agent promotes faster in vitro cell migration. This study is a continuation of an experiment conducted last year that proved that Manuka honey is also a powerful antibiotic. Further studies will continue to explore the antibacterial and anti-inflammatory properties of Manuka honey as well as its potential for cancer treatment.	
Summary Statement This study proved that the use of Manuka honey as a topical healing agent promotes faster cell migration in an in vitro scratch wound heal assay.	
Help Received Butte Lab at Stanford University graciously allowed me to conduct my experiment in their lab, Kevin Meng (a graduate student) monitored my activities in the lab, and of course, my mom was always there for me and shuttled me to and from the lab at any hour. :-)	