



**CALIFORNIA STATE SCIENCE FAIR
2016 PROJECT SUMMARY**

Name(s) Meera Kashyap	Project Number J1611
Project Title 1000 Year Old Recipe: Can It Kill Today's MRSA?	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals A thousand year old recipe from Bald's Leechbook, which is an English medical text from the Anglo-Saxon period, contains a remedy for treatment of a "wen" or a lump in the eye. This bacterial infection is caused by Staphylococcus aureus. Methicillin resistant staph aureus (MRSA) is now one of the most common cause of wound infections and highly resistant to treatment. I decided to test this thousand year old recipe on today's MRSA and compare it to other home remedies that are believed to kill MRSA. My controls were clindamycin, an antibiotic used against MRSA, and chlorhexidine, a surgical scrub and cleaning agent used in hospitals.</p> <p>Methods/Materials The Bald's eyesalve was reconstructed as stated in the Leechbook. Equal amounts of oxgall (bovine bile salts), wine, and crushed yellow onion and garlic. These were placed in a brass vessel and kept refrigerated at 4 degrees Celsius for 9 days. My own recipe of turmeric, wine and crushed yellow onions and garlic were also placed in a brass vessel and kept refrigerated at 4 degrees Celsius for 9 days. These 2 recipes and Manuka honey (known for its antibacterial properties) were taken to a lab. MRSA lawns were made on blood and Mueller-Hinton agar plates. Fifty microliter drops of each of the three home remedies and chlorhexidine were put on sterile disks and these were placed in the center of different plates. A clindamycin antibiotic disk obtained from the lab was also plated. These were incubated for 18 hours and checked for zones of inhibition. The zones of inhibition were measured. The experiment was repeated with all the home remedies, controls and the individual ingredients.</p> <p>Results The thousand year old recipe was effective in inhibiting MRSA growth but not as well as the control, chlorhexidine. My own turmeric concoction was even more effective in inhibiting MRSA than the thousand year old recipe. Manuka honey by itself also inhibited MRSA growth but the fresh crushed garlic by itself was the most potent inhibitor of MRSA. This MRSA strain was resistant to clindamycin.</p> <p>Conclusions/Discussion Herbal home remedies can in the future provide novel and effective treatments for MRSA without the side effects that are associated with present day antibiotics. My data shows that these can be used topically as safe and cheap alternatives to topical antibiotics for wounds or as washes for decolonizing MRSA from skin and noses and even as antibacterial soaps.</p>	
Summary Statement The thousand year old recipe showed that it can kill today's MRSA as well as my own recipe of turmeric, garlic, onion and wine which proved to be even more effective however, garlic alone was the most potent inhibitor of MRSA.	
Help Received Dr. Freya Harrison from England advised me on my experiment via e-mail. Ms. Nielson the head microbiologist at SVMC lab showed me how to use the equipment. Ms Hembree my science teacher proof read my write up. My mom helped with buying materials and contacting lab.	