

## Honey Can Reverse Antibiotic Resistance, Study Suggests



Manuka honey could be an efficient way to clear chronically infected wounds and could even help reverse bacterial resistance to antibiotics, according to research presented at the Society for General Microbiology's Spring Conference in Harrogate.

Professor Rose Cooper from the University of Wales Institute Cardiff is looking at how manuka honey interacts with three types of bacteria that commonly infest wounds: *Pseudomonas aeruginosa*, Group A Streptococci and Methicillin-resistant *Staphylococcus aureus* (MRSA). Her group has found that honey can interfere with the growth of these bacteria in a variety of ways and suggests that honey is an attractive option for the treatment of drug-resistant wound infections.

Honey has long been acknowledged for its antimicrobial properties. Traditional remedies containing honey were used in the topical treatment of wounds by diverse ancient civilisations. Manuka honey is derived from nectar collected by honey bees foraging on the manuka tree in New Zealand and is included in modern licensed wound-care products around the world. However, the antimicrobial properties of honey have not been fully exploited by modern medicine as its mechanisms of action are not yet known.

Professor Cooper's group is helping to solve this problem by investigating at a molecular level the ways in which manuka honey inhibits wound-infecting bacteria. "Our findings with streptococci and pseudomonads suggest that manuka honey can hamper the attachment of bacteria to tissues which is an essential step in the initiation of acute infections. Inhibiting attachment also blocks the formation of biofilms, which can protect bacteria from antibiotics and allow them to cause persistent infections," explained Professor Cooper. "Other work in our lab has shown that honey can make MRSA more sensitive to antibiotics such as oxacillin -- effectively reversing antibiotic resistance. This indicates that existing antibiotics may be more effective against drug-resistant infections if used in combination with manuka honey."

This research may increase the clinical use of manuka honey as doctors are faced with the threat of diminishingly effective antimicrobial options. "We need innovative and effective ways of controlling wound infections that are unlikely to contribute to increased antimicrobial resistance. We have already demonstrated that manuka honey is not likely to select for honey-resistant bacteria," said Professor Cooper. At present, most antimicrobial interventions for patients are with systemic antibiotics. "The use of a topical agent to eradicate bacteria from wounds is potentially cheaper and may well improve antibiotic therapy in the future. This will help reduce the transmission of antibiotic-resistant bacteria from colonised wounds to susceptible patients."

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