2016 年臺灣國際科學展覽會
優勝作品專輯

作品編號　**090020**

參展科別　醫學與健康科

作品名稱　**Totarol**

得獎獎項　二等獎

國　　家　**New Zealand**

就讀學校　**St.Peter's School, Cambridge**

作者姓名　**Shehnaz**

Abstract

Research Question: To what extent does totarol show antibiotic potency against significant strains of *Staphylococcus aureus* causing skin and soft tissue infections in New Zealand, compared with commonly prescribed drugs used to treat the specific strain of *Staphylococcus aureus* being tested?

Purpose of research: This essay will investigate the antibacterial potency of totarol against significant strains of *Staphylococcus aureus* (*S.aureus*) causing skin and soft tissue infections (SSTIs) in New Zealand. Only a small amount of research on totarol has been conducted. They all suggest totarol possesses antibiotic potency against various species of bacteria. The mode of action of totarol is currently unknown.

Procedure 1: The totarol I ordered from Mende Biotech Ltd arrived in two forms; a powder called Totarol™ and a viscous brown liquid called Liquid K7 (LK7) in which the Totarol™ powder was dissolved in mostly sunflower oil.

The investigation took place in two stages. In the first stage, the MIC value of the LK7 against reference strain *S.aureus* 29213 was determined by following the CLSI methodology for MIC testing (M07-A9 Clinical and Laboratory Standards institute). The MIC test was also conducted to identify whether any major ingredients in the LK7 possessed significant antibacterial potency. MIC values where compared with that of flucloxacillin.

Data from stage 1 testing: LK7 had an MIC value of 1µg/mL, which was very similar to flucloxacillin's MIC value of 0.5µg/mL. No other major ingredients in LK7 showed antibacterial potency. Totarol™'s antibacterial activity could not be accurately measured, due to the powder resisting even mixing.

Procedure 2: In the second stage, disc diffusion tests were conducted against various *S.aureus* clinical isolates obtained from SSTIs in the Waikato community. The discs that were placed for each clinical isolate included LK7, cefoxitin, fusidic acid, mupirocin and erythromycin discs.

Data from stage 2: 75% of LK7 discs produced double zones of inhibition. I hypothesized that this was due to two active ingredients found in the LK7. I predicted

the one that produced larger zones of inhibition to be Totarol™. The other more stable ingredient producing the inner zones of inhibition is unknown.

Conclusion: I proposed a breakpoint of outer zone sizes that were ≥ 15 mm in diameter to signify that that particular clinical isolate was 'susceptible' to LK7. From this breakpoint, LK7 and fusidic acid both had the same number of clinical isolates that were classified as 'susceptible'. LK7 was the median of the number of susceptible clinical isolates. This data answered my research question; totarol in the LK7 form specifically, would be just as effective in treating SSTIs caused by S.aureus, as even the most commonly prescribed antistaphylococcal drugs currently being used.

【評語】090020

To essay the antibacterial potency of totarol against strains of S. cureus causing skin and soft tissue infection. However, is it also effective on other strains of bacteria? The Totarol's antibacterial potency should compare with known antibiotics.