

The purpose of the study was to demonstrate the antimicrobial property of integrating taurolidine, a taurine derivative, into the matrix of two types of monofilament fibers to simulate sutures with e-caprolactone (the major component of Monocryl) and p-dioxanone (PDS II).

Taurolidine was successfully loaded at 2, 6 and 10% by weight throughout the matrix of the fibers. 400 ul of early phase *Pseudomonas aeruginosa* (PAO1), the *Staphylococcus epidermidis* (S.epi 35984), and the multidrug resistant *Staphylococcus aureus* strain SA BAA-44) were plated separately into square plates. 200 ul of each were introduced into 25cmX25cm plates. Four pieces of each fiber were individually placed in the plates. The fibers tested were taurolidine loaded at 2, 6 and 10% dispersed in poly e-caprolactone and 2, 6, and 10% dispersed in p-dioxanone. After 24 hours of exposure the zone of Inhibition surrounding each fiber sample was measured in mm. In order to demonstrate quantitative bacteria kills with living microorganisms, each of the fibers were placed in 12 well bottom culture discs that had 1 ml Tryptic Soy Buffer containing 100 ul of Early Phase Culture of each of the 3 bacteria: *Pseudomonas aeruginosa* (PAO1), *Staphylococcus epidermidis* (S.epi 35984) and multidrug resistant *Staphylococcus aureus* strain SA BAA-44). After 24 hours of exposure, kills were measured for each micro-organism tested using a quantitative analysis.

Results from the zone of inhibition study revealed a statistically significant increase in the zone of inhibition, as measured in mm, of all three bacteria tested in 6% and 10% taurolidine loaded e-caprolactone fibers and in 2%, 6% and 10% taurolidine loaded p-dioxanone fibers versus control fibers containing 0% taurolidine. Quantitative determination of *Pseudomonas aeruginosa* bacteria showed total kills for fibers that contained 6% or greater taurolidine in e-caprolactone fibers. Measurements for *Staphylococcus aureus* total kills were observed for all the e-caprolactone fibers that contained 2% or greater taurolidine and 6% or greater taurolidine in p-dioxanone fibers. Quantitative analysis of *Staphylococcus epidermidis* cultures demonstrated total bacteria kills for fibers containing 6% or greater taurolidine in e-caprolactone.

Taurolidine loaded fibers resist growth of bacterial in the vicinity of fibers as evidenced by zone of inhibition studies. Taurolidine loaded fibers have the ability to kill representative microorganisms that have great clinical significance. Taurolidine is an effective anti-microbial, non anti-biotic, where organisms are unlikely to develop resistance.