

IN VIVO AND IN VITRO EVALUATION OF THE PROPERTIES OF DRAWTEX® LEVAFIBER™ WOUND DRESSING IN AN INFECTED BURN WOUND MODEL

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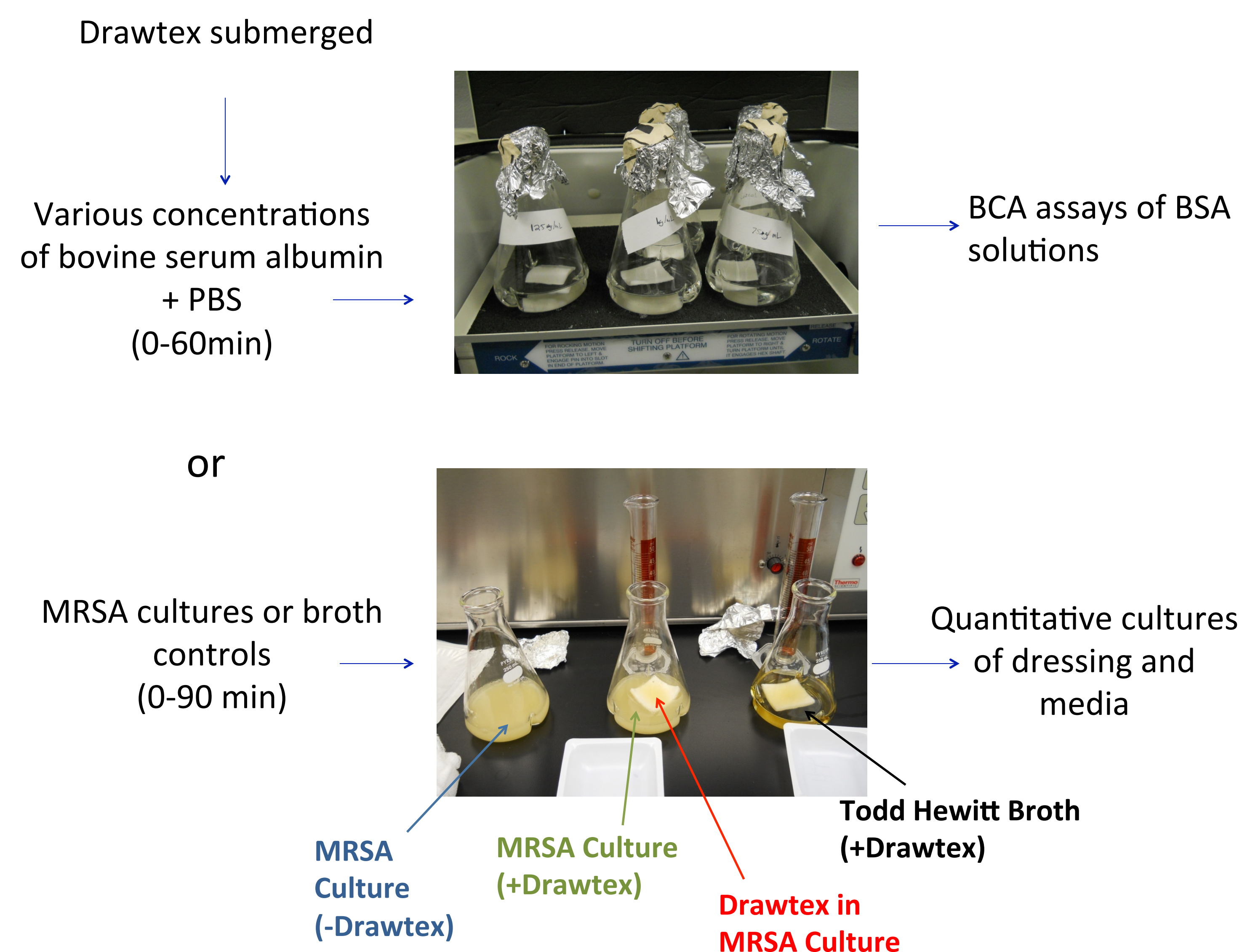
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INTRODUCTION

Burn wounds cause loss of the protective function of the skin as a barrier to infection. Infectious complications are a major cause of morbidity and mortality in burn patients and can be complicated to treat. Drawtex has been reported to lift and transfer wound debris and exudate from wound to dressing via "Leva Fiber Technology". Both in vitro and in vivo data are needed to provide insight into this product's ability to treat infected burn wounds.

Below: Experimental setup for protein absorption assay (top) and bacteria absorption assay (bottom)



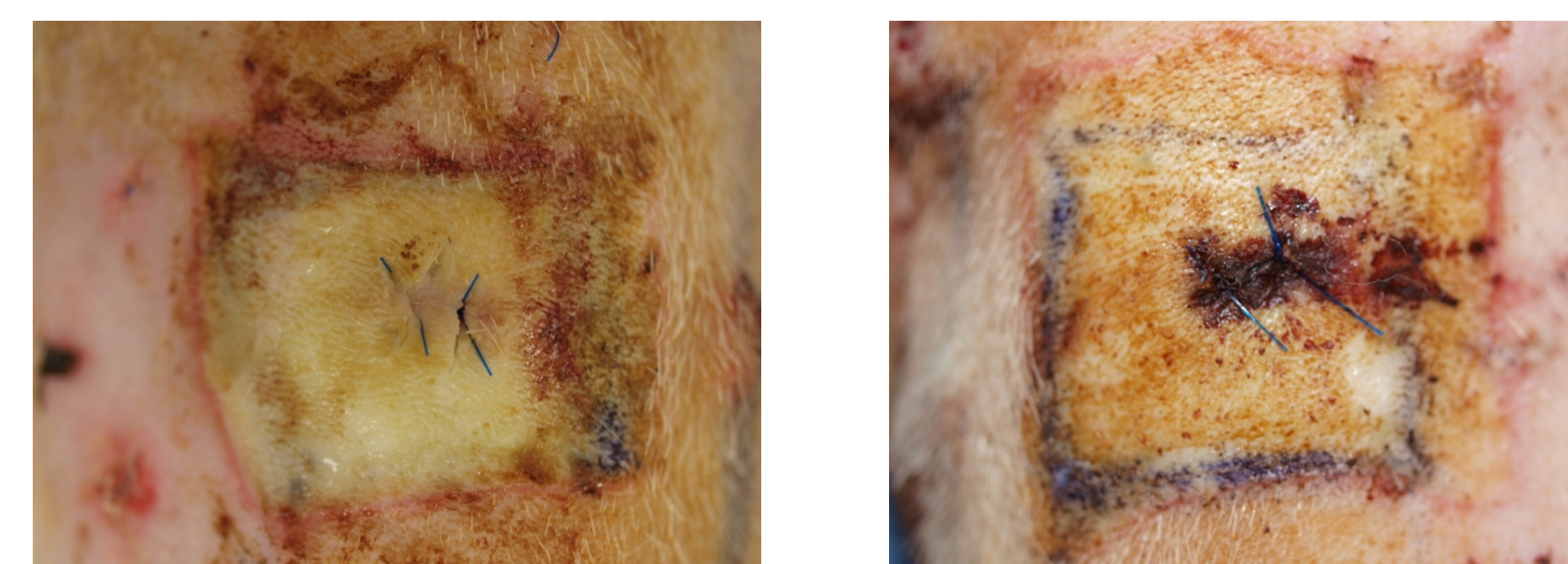
METHODS

Male Sprague Dawley rats (3) were anesthetized, and dorsal burn wounds were created. After injury (on Day 1), wounds were inoculated with 200 µl of a culture of MRSA. Twenty four hours post inoculation, wounds were dressed with test product (Drawtex) or a commonly used non-impregnated burn dressing (standard of care, SOC). Digital images were taken and 2mm punch biopsies of wounds obtained 24, 48 and 72 hours after inoculation (on days 2-4). In vitro studies examined the ability of the test product to absorb protein or bacteria (Figure above).

Day 0: Burn Wound Creation
2cm x 2cm 100°C branding irons
Day 1: Inoculation with MRSA
0.2ml, 1 x 10⁸ CFU
Day 2: Wounds Dressed with SOC (left) or Drawtex (right)



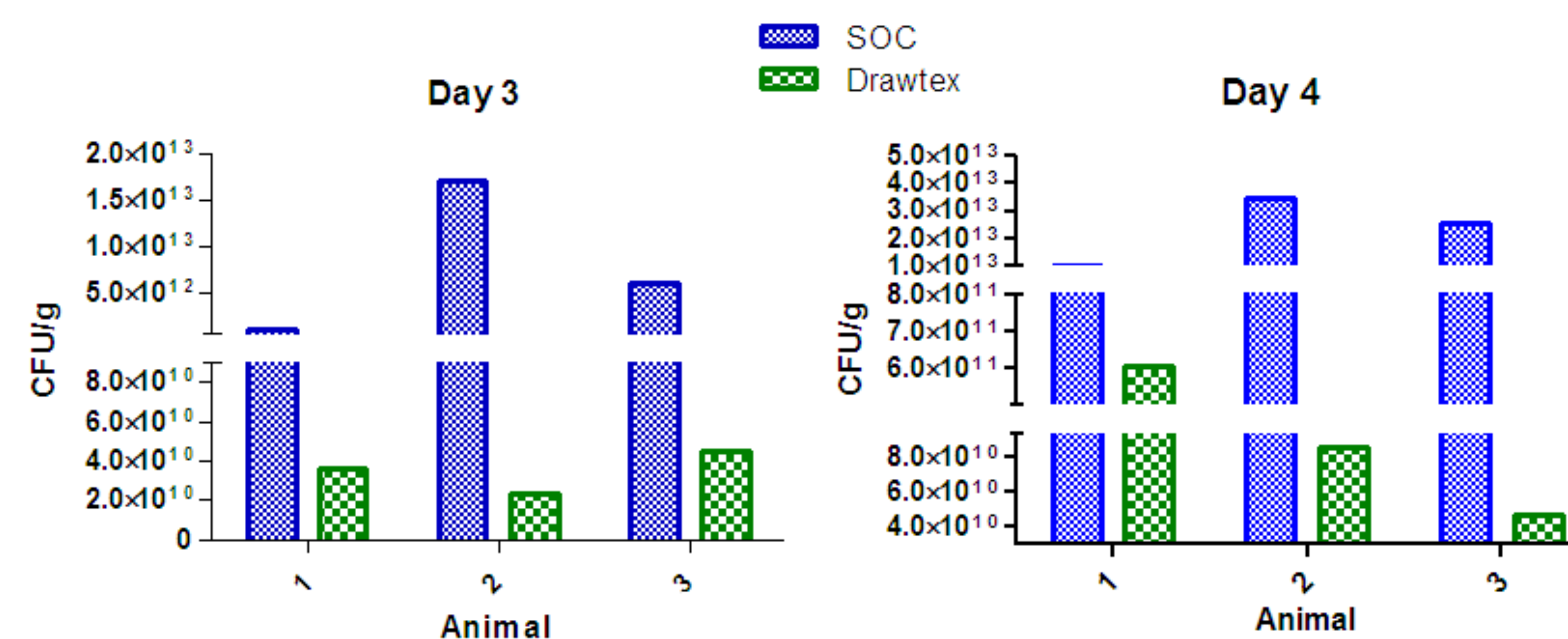
Daily Imaging and Wound Biopsies



SOC

Drawtex

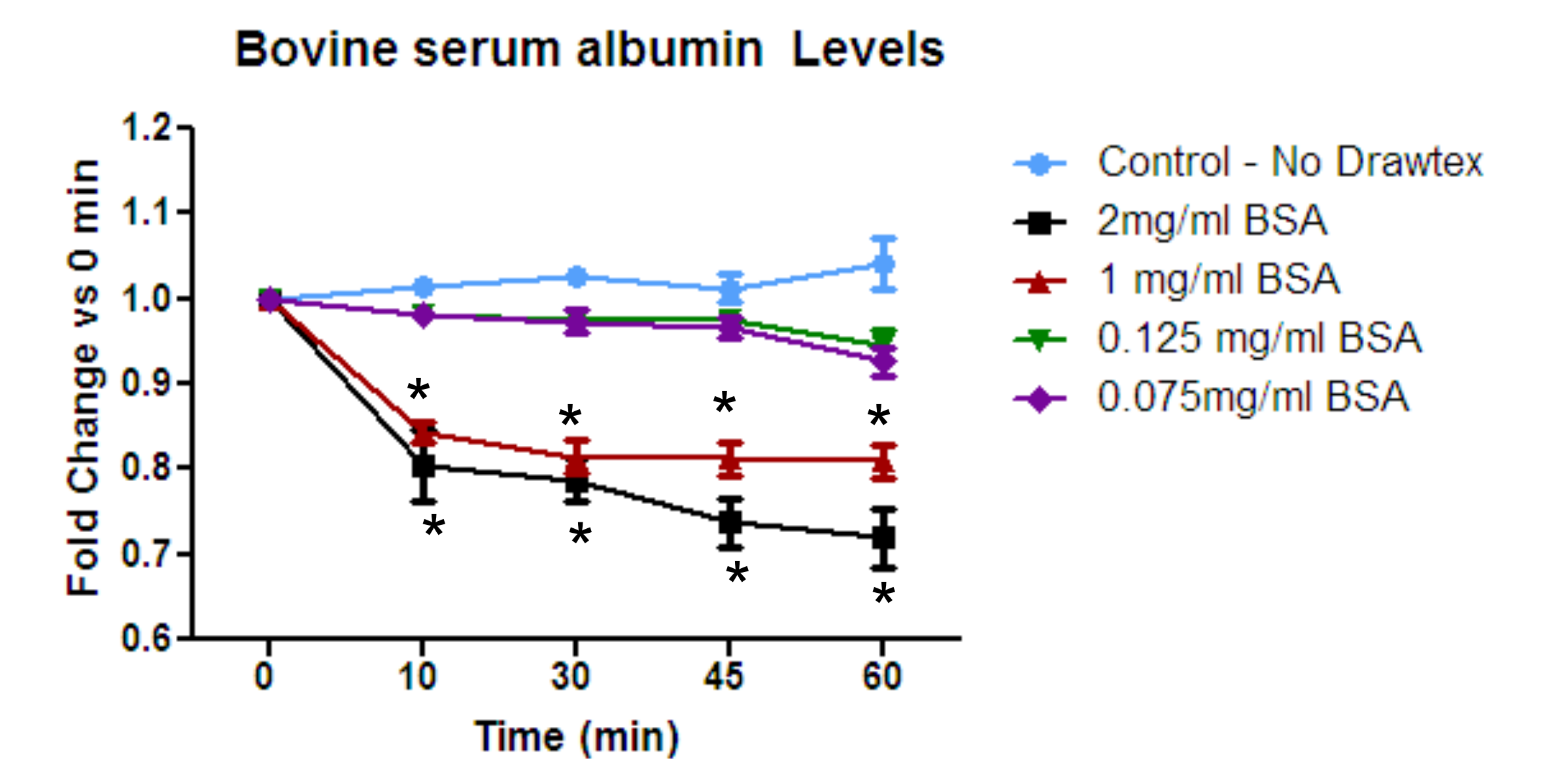
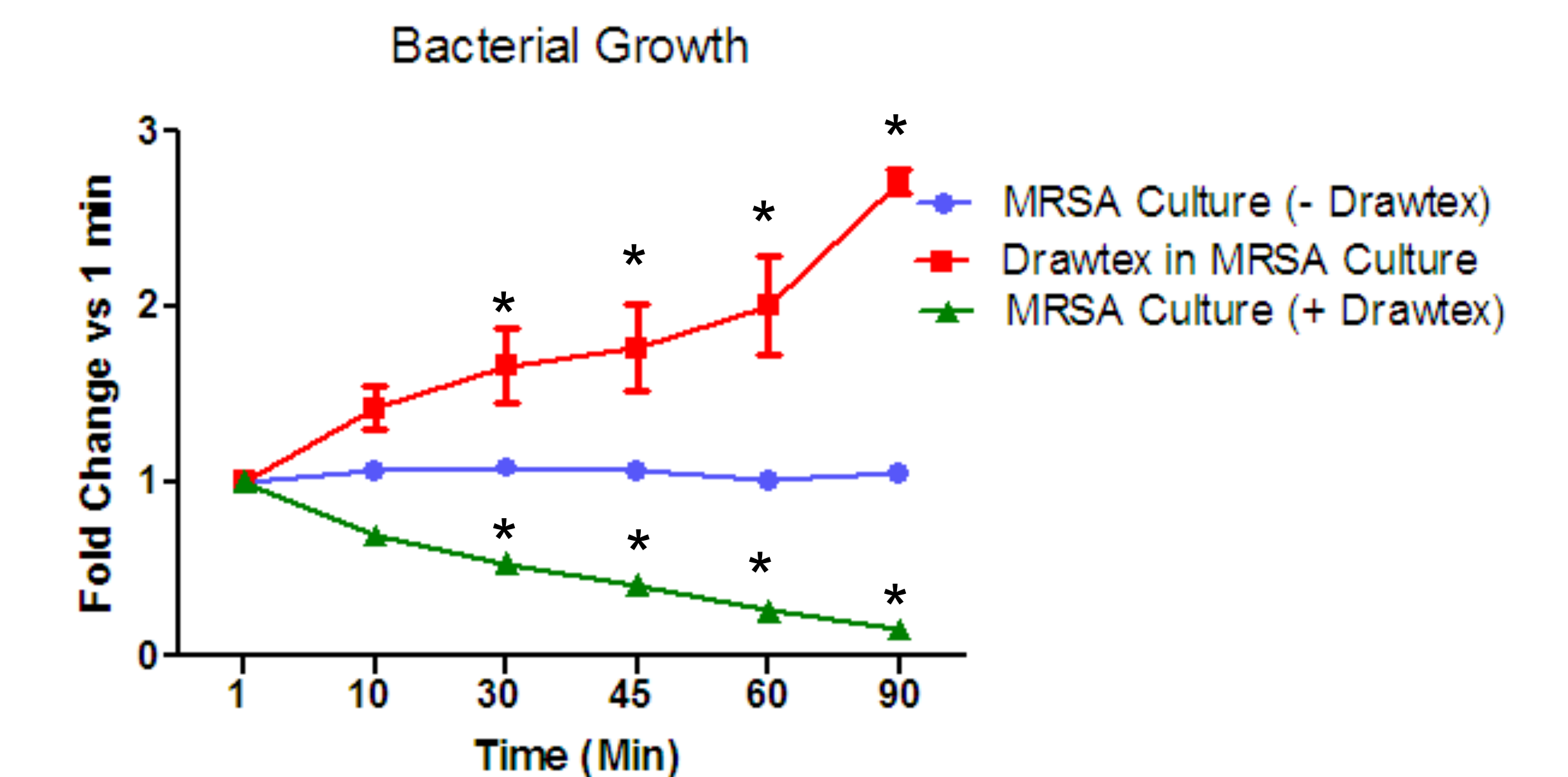
Above: Digital images of burn wounds on Day 4 (72 hours after inoculation)



Above: Quantitative culture data from wound biopsies obtained on Days 3 and 4

RESULTS

Noticeably less moisture, eschar, and bacterial growth were present in the Drawtex-treated burn site compared to the control on both Days 3 and 4. In vitro studies showed that by thirty minutes post Drawtex submergence, bacterial growth significantly increased in the Drawtex that was submerged in MRSA culture, while it significantly decreased in the MRSA culture in which it was submerged (P<0.05). No change was observed in the MRSA culture without Drawtex. There was no bacterial growth in the Todd Hewitt Broth nor the Drawtex in Todd Hewitt broth. Starting at 10 minutes post Drawtex submergence, assay results showed a significant decrease in BSA concentration in both the 2 mg/ml solution and the 1 mg/ml solution (p<0.05). Significance (*) was calculated using a two-way ANOVA.



CONCLUSION

The data from both in vitro studies reveal the effectiveness of Drawtex in absorbing protein and bacteria to significant extents. Further, the in vivo study demonstrated the ability of this dressing to reduce bacteria levels in infected burn wounds and promote re-epithelialization as compared to a SOC control. Future work should be done to examine the ability of Drawtex to absorb other relevant proteins (and remove them from burn wounds), including virulence factors produced by pathogenic bacteria.