ABSTRACT

A heat-induced necrosis (HIN) model was adapted based on the Walker-Mason Burn Model1,2 to evaluate by exposing a 10-cm x 4-cm area to 100°C water for 10 seconds, creating a full-thickness burn covering about 20% of the total body surface. Sixty minutes later, the burn area was incubated with 1 mL containing 7.5 log CFU of P. aeruginosa ATCC 27857. Sixty minutes after colonization, E-101 was administered with a fine mist spray and welded under an iodine lamp. At designated time points, the wounds were excised and homogenized in sterile saline, and viable bacteria were quantified by plating dilutions of the homogenate on blood agar.

RESULTS: Bactericidal activity of E-101 was concentration- and time-dependent. For example, at 150 GU MPO/mL, E-101 was able to reduce a starting inoculation of 105 CFU/mL to <5 CFU/mL at 240 minutes, when compared to untreated controls. At designated time points, the wound tissue was sampled and plated for bacterial activity. Inoculated wounds were treated with 1% catalase to stop further microbicidal activity. At 300 GU MPO/mL, rats were treated for 15 and 30 minutes. At the designated time points, the wounds were then sampled with 1% catalase to stop further microbicidal activity. Compared to untreated controls, inoculated untreated wounds were cultured and plated for bacterial activity. The 4-hour data represent an average of less than 150 CFU recovered from the wound.

RESULTS (cont)

The Exoxemis Haloperoxidase Mechanism of Action Utilizes Singlet Oxygen

METHODS

Figure 1. The exoxen body is produced in situ through a glucose-glucose oxidase reaction. The myeloperoxidase-catalyzed oxidation of chloride by hydrogen peroxide generates hypochlorous acid. Once hypochlorous acid is generated, it further participates in non-enzymatic reactions, leading to the direct halogenation of target compounds in solution with a second agent, capable of reacting with a broad spectrum of electron-rich compounds.

RESULTS

The Exoxemis Solution Effectively Reduces Pseudomonas aeruginosa in a Rat Heat-Induced Necrosis Model

CONCLUSIONS

The results from two E-101 treatments are summarized in Table 1. The number of viable organisms present 15 minutes after a single application decreased with both 150 GU MPO/mL and 300 GU MPO/mL, resulting in a Log10 reduction of 2.5 Log10 at 15 minutes, 3.0 Log10 at 30 minutes, and 3.5 Log10 at 4 hours compared to untreated controls.

E-101 treatments at 15 and 240 minutes were statistically superior to the untreated control.

The statistical analysis of the data was conducted using SAS PROC MIXED and limited to comparisons within a experimental day. Top and lower 95% confidence intervals were calculated along with least square mean log CFU(-1) survivors. Statistical significance of differences were set at P ≤ 0.05.

The authors recognize John Davis, Kathy Bell, Sherry Parker, and Ann O’Leary (Ricerca Biosciences, LLC, Concord, OH) for their technical assistance.