PREFACE

Chronic wounds, by definition, are those that remain in a chronic inflammatory state and therefore fail to follow normal patterns of the healing process. The chronic wounds present a challenge to physicians and patients alike because they are very difficult to heal, inflict a huge cost to society and impair the quality of life for millions of people. There are many factors, that contribute to the development of chronic wounds. One of the most clinically significant impediments to wound healing is infections.

The growth of large aggregates of cells on a surface encased within a matrix of extracellular polymers produced by the sessile bacteria is known as a biofilm. In man, one of the surfaces that are available for attachment is ulcer beds. Bacteria biofilm formation in wounds is the best unifying explanation for the failure of chronic wounds to heal. It has been estimated that biofilms are associated with 65 percent of nosocomial infections. Biofilm bacteria are protected from host defenses, antibiotics, and antiseptics.

Using good bacteria to obstruct bad ones—a strategy known as bacterial interference—is one application of so-called probiotics, a field with growing medical promise. Beyond using probiotics to replenish missing bacteria on digestive tract and vagina, we and other authors are working to interfere to pathogenic bacteria in infected wounds. Furthermore, it has been demonstrated in vitro that cells and/or the metabolic by-products of lactobacilli have antagonistic effects on pathogens; these results have also been found in vivo during trials with urinary and genital infections in humans and mice and in wounds infected with S. aureus.

We demonstrated that *L. plantarum* interferes with the pathogenic activity of *P. aeruginosa* (quorum sensing, biofilm, virulence factors, and growth).

Topical treatment with *L. plantarum* cultures is currently being carried ou by our medical team with infected burns and chronic venous ulcers in human with encouraging results. The cells from ulcer beds collected after treatmen with *L. plantarum* showed a decrease in the percentage of polymorphonuclea apoptotic and necrotic cells and a modulation of IL-8 production. The mod of action of *L. plantarum* on infection and wound healing seems to be relate to acidity, presence of lactic acid, interference with *P. aeruginosa* quorum sensing signals, perhaps inter-species communication through type autoinducer and modification of tissue repair process.

Our findings will be useful for the formulation of effective a inexpensive products to resolve infected chronic wounds with biofil producing bacteria.