



## THE DYNAMICS OF THE INFLAMMATORY PHASE OF SKIN WOUND HEALING IN RATS

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### Abstract

The skin wound healing is a complex process divided into three overlapping and interdependent phases (inflammatory, proliferative and remodelling). The inflammatory response must occur rapidly to avoid chronic inflammation and it depends on biochemical, molecular and cellular events. The effective crosstalk between leukocytes and cytokines (proinflammatory and anti-inflammatory) lead to correct healing of the lesions. We considered a system of ordinary differential equation to model the skin wound healing process under *Copaifera langsdorffii* oleoresin treatment. In order to verify the treatment efficiency we compared the results of the oleoresin against Lanette cream (the base of oleoresin). Thus, we analysed the roles among the main leukocytes (neutrophils and macrophages), present in the inflammatory phase, and the proinflammatory cytokine (interleukin 6). The model can exhibit two stable steady states corresponding to healthy or unhealthy skin. The model solution reproduced the dynamics of the neutrophils and macrophages during inflamamatory phase, however there was a delay between numeric and biological results and it fitted better to Lanette cream than to oleoresin, therefore suggesting the necessity to improve the model. One possible strategy to enhance this model is to consider the interaction with the anti-inflammatory cytokine in the wound healing process.

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