



A commentary on 'Potential of nanoemulsions for accelerated wound healing: innovative strategies'

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Dear Editor,

With tremendous attraction, we have thoroughly investigated the review article entitled, 'Potential of nanoemulsions for accelerated wound healing: innovative strategies' by Chhabra *et al.*^[1]. This article investigates the potential of nanoemulsions in enhancing wound healing. It begins by detailing the four pivotal stages of wound healing. Various wound healing techniques, such as hydrogels, electrospun membranes, wafers, nanoparticles and nanoemulsion-based hydrogels, are briefly discussed, as the integral role of nanoemulsions in minimizing scar formation and promoting tissue regeneration during the remodelling phase of wound healing. Nanoemulsions are considered promising nanocarriers with numerous advantageous attributes, including enhanced permeability, controlled drug delivery, stability, targeted action, and robust binding interaction with the skin's lipid layer. The use of nanoemulsions is associated with improved antibacterial efficacy, accelerated wound healing due to reduced droplet size dispersion, and increased drug solubility, enhancing therapeutic efficacy against wounds (Figure 1). The benefits of nanoemulsions as drug delivery carriers in wound treatment include high drug loading capacity, improved solubility, bioavailability, simple preparation and scale-up, controlled drug release, and protection from enzymatic degradation. The article accentuates that nanoemulsions provide thermodynamic stability by lowering surface and interfacial tension, thereby enhancing overall

system viscosity and spreadability. The preparation methods for nanoemulsions are categorized into high-pressure methods (high-pressure homogenization, ultrasonication) and low-pressure methods (phase inversion, spontaneous emulsification).

Moreover, we would like to bring this prospect to discourse-specific concerns that have stemmed from this review paper. First, this review failed to address the potential challenges and limitations associated with the proposed nanoemulsion-based drug delivery system. A thorough examination of factors such as stability under varying storage conditions, potential toxicity concerns, and the long-term effects on wound healing outcomes is necessary for a balanced evaluation of the technology's practical applicability. Acknowledging these challenges will not only enhance the transparency of the study but will also guide future research endeavours aimed at surmounting these obstacles^[2]. Furthermore, the article could benefit from an exploration of the scalability and cost-effectiveness of the nanoemulsion preparation methods discussed. A comprehensive analysis of the cost-effectiveness of these methods will illuminate the economic feasibility of implementing them on a larger scale. By incorporating this examination, the article will contribute to the overall comprehension and feasibility of the proposed drug delivery system^[3]. A comprehensive review and analysis of the economic feasibility and practical factors involved in the production of nanoemulsions on a large scale would yield invaluable and significant knowledge, information, and understanding for a wide range of individuals, including researchers, medical professionals, and individuals associated with the industry^[4]. Finally, to comprehensively address the subject at hand, the review should consider and carefully analyze the potential variability that may exist in the responses to treatments based on nanoemulsion among different types of wounds and diverse patient populations. It is crucial to delve into the investigation of the adaptability and effectiveness of the proposed system across a wide range of wounds, including both acute and chronic cases, while also considering patient-specific factors, as this would undoubtedly contribute to a much more detailed and clinically significant understanding of the therapeutic potential possessed by nanoemulsion^[5]. By taking into consideration and exhaustively examining these particular aspects, the review article has the potential to not only enhance and reinforce its scientific underpinnings but also to cultivate and stimulate a more knowledgeable and discerning discourse within the scientific community, thereby clearing the path for further progress and developments in the realm of drug delivery systems based on nanoemulsion technology, specifically in the context of wound healing.

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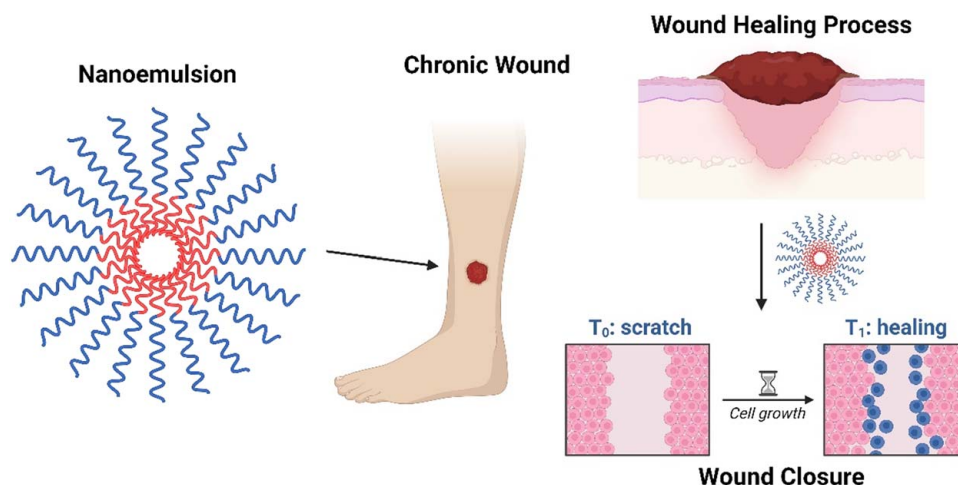


Figure 1. Role of nano emulsions in the accelerated wound healing process (Created with BioRender.com).

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The authors declare no conflicts of interest.

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