

Abstract

Pipeline to Develop and Characterize a Potential Regenerative Topical Treatment Based on Lavender Essential Oil and the CW49 Peptide †

Valentina Jaramillo ^{1,*}, Erika Diaz ¹, Laura N. Muñoz ², Andrés González ², Juan C. Cruz ¹ and Carolina Muñoz-Camargo ¹

¹ Biomedical Engineering Department, Universidad de los Andes, Bogotá, Colombia; ea.diazr@uniandes.edu.co (E.D.); jc.cruz@uniandes.edu.co (J.C.C.); c.munoz2016@uniandes.edu.co (C.M.-C.)

² Grupo de Diseño de Productos y Procesos (GDPP) Department of Chemical and Food Engineering; ln.munoz10@uniandes.edu.co (L.N.M.); andgonza@uniandes.edu.co (A.G.)

* Correspondence: v.jaramillom@uniandes.edu.co

† Presented at the 2nd International Electronic Conference on Biomolecules: Biomacromolecules and the Modern World Challenges, 1–15 November 2022; Available online: <https://iecbm2022.sciforum.net/>.

Abstract: Wound healing in adult mammals results in scar formation, which prevents recovering the full functionality of the original skin. This dermatology area is constantly evolving and specially focuses on aging, and the design of recovery treatments upon skin burns. Due to the previously reported regenerative, healing, and anti-inflammatory effects of *Lavandula angustifolia* essential oil and the CW49 peptide. We selected these two natural compounds to formulate a topical treatment with potential regenerative capability. This was accomplished by synthesizing oil-in-water (O/W) emulsions 10:90% *w/w* with lavender oil and the CW49 peptide. The formulations were characterized physicochemically and evaluated in terms of biocompatibility, antibacterial activity, and wound healing potential. The results showed that emulsions exhibited a droplet size of about 1 µm, a marked pseudoplastic behavior and a superior shelf stability of over 9 months. Additionally, they induced 35% hemolysis when compared with the positive control (similar to commercially available controls), induced platelet aggregation and has a potent antibacterial activity against *Staphylococcus aureus* (20% of growth inhibition). The wound healing potential was preliminary evaluated for the CW49 peptide in a 2D scratch wound model of human keratinocytes, demonstrating an effective concentration for closure of 20 µg/mL. Thus far, we established a pipeline to develop and characterize the regenerative potential of bio-based topical treatments and particularly those based on lavender essential oil and the CW49 peptide.

Keywords: *Lavandula angustifolia*; CW49 peptide; wound healing; skin regeneration

Citation: Jaramillo, V.; Diaz, E.; Muñoz, L.N.; González, A.; Cruz, J.C.; Muñoz-Camargo, C. Pipeline to Develop and Characterize a Potential Regenerative Topical Treatment Based on Lavender Essential Oil and the CW49 Peptide. *Biol. Life Sci. Forum* **2022**, *2*, x. <https://doi.org/10.3390/xxxxx>

Academic Editor(s):

Published: date

Publisher's Note: MDPI stays neutral with regard to jurisdictional claims in published maps and institutional affiliations.



Copyright: © 2022 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC BY) license (<https://creativecommons.org/licenses/by/4.0/>).

Author Contributions:

Funding:

Institutional Review Board Statement:

Informed Consent Statement:

Data Availability Statement:

Conflicts of Interest: