Abstract

Genetic Insights into E-Cadherin Modulation: Exploring the Benefits of Synthetic Acetyl Hexapeptide-1 in Wound Healing and Anti-Aging for Dermo-Cosmetics †

Nikoleta Topouzidou, Christos Petrou, Androulla N. Miliotou and Yiannis Sarigiannis

Department of Health Sciences, School of Life and Health Sciences, University of Nicosia, 2417 Nicosia, Cyprus; topouzidou.n@live.unic.ac.cy (N.T.); petrou.c@unic.ac.cy (C.P.)
* Correspondence: miliotou.a@unic.ac.cy (A.N.M.); sarigiannis.i@unic.ac.cy (Y.S.)
† Presented at the 3rd International Electronic Conference on Biomolecules, 23–25 April 2024; Available online: https://sciforum.net/event/IECBM2024.

Keywords: dermo-cosmetics; synthetic peptides; acetyl hexapeptide-1; gene expression analysis; cosmeceuticals

1. Introduction

Dermo-cosmetics are cosmetics combined with bioactive ingredients to impart therapeutic benefits on the skin and have made significant advances in recent decades. Synthetic peptides stand out among these bioactive molecules, exhibiting improved capabilities due to their synthetic nature. Wound healing and cosmetic peptides share similarities in tissue repair and regeneration. Cosmetic peptides enhance fibroblasts, boosting collagen formation, improving skin firmness, and aiding in wrinkle removal. E-cadherin, a key molecule, plays a role in both wound healing and cellular processes. Genetic validation of cosmetic peptides’ effects is often lacking despite clinical trials examining their impact on skin physiology. This study examines acetyl hexapeptide-1’s genetic impact on wound healing and its anti-aging properties.

2. Methods

Acetyl hexapeptide-1 was synthesized in-house, and human hepatocytes (HepG2) were subjected to cytotoxicity assessment. Furthermore, gene expression was evaluated, through qPCR analysis, for the apoptosis-related gene BAX and the wound healing-associated gene CDH-1.

3. Results

In the assessment conducted in cell cultures, the peptide demonstrated a notable absence of cytotoxic effects. Upon comprehensive gene expression analysis, noteworthy observations included a significant increase in E-cadherin expression from the first 24 h and a slight reduction in apoptotic BAX gene expression.

4. Conclusions

The findings of this study provide promising insights into the molecular properties of synthetic acetyl hexapeptide-1, suggesting its potential in cosmeceuticals and dermo-cosmetics. While they have already proven effective in wrinkle reduction through fibroblast activation and collagen enhancement, these cosmetic peptides present vast potential and diverse applications beyond skincare. Further investigations are needed to fully comprehend their benefits and broaden their scope by exploring their molecular mechanisms across various applications.
Author Contributions: Conceptualization, A.N.M. and Y.S.; methodology, N.T., A.N.M. and Y.S.; software, A.N.M. and Y.S.; validation, N.T., A.N.M. and Y.S.; formal analysis, A.N.M. and Y.S.; investigation, N.T., A.N.M. and Y.S.; resources, C.P. and Y.S.; writing—original draft preparation, N.T., A.N.M. and Y.S.; writing—review and editing, C.P., A.N.M. and Y.S.; supervision, A.N.M. and Y.S.; project administration, A.N.M. and Y.S.; funding acquisition, C.P. and Y.S. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author A.N.M.

Conflicts of Interest: The authors declare no conflict of interest.

Disclaimer/Publisher’s Note: The statements, opinions and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of MDPI and/or the editor(s). MDPI and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions or products referred to in the content.