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Botulinum Toxins' Applications in Dermatology and Cosmetology

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Introduction

Gotu Kola, or Centella asiatica, is a medicinal plant that has been used in both traditional and scientific medicine for centuries. Pentacyclic triterpenes, particularly asiaticoside, madecassoside and asiatic and madecassic acids, are among the active ingredients. The treatment of burns, psoriasis and scleroderma, as well as small and hypertrophic wounds, can be improved with the help of Centella asiatica. In addition to improving the tensile strength of newly formed skin and inhibiting the inflammatory phase of hypertrophic scars and keloids, the mechanism of action involves promoting fibroblast proliferation and increasing the content of intracellular fibronectin and collagen. It can be used to treat cellulite, striae and photoaging skin, according to the findings of the research [1].

Description

A 150 kDa toxin, a non-toxic, non-haemagglutininin protein and a non-toxic, non-haemagglutininin protein are all part of the three-protein complex that C. botulinum secretes. The toxin is broken down by bacterial proteases into a di-chain active product with 50 kDa "light" chains and 100 kDa "heavy" chains. The active toxin's heavy chain binds to the synaptic vesicle glycoprotein at the presynaptic nerve terminal, precipitating endocytosis of the toxin–glycoprotein complex and causing the light chain to be released into the synaptic space. Toxin light chains cleave vesicle-associated membrane protein/synaptobrevin (BoNT-B, D, F and G) or synaptosomal-associated protein 25 (BoNT-A, C and E), preventing the release of acetylcholine from motor neuron axons in the peripheral area. This prevents temporary chemical denervation and results in muscle paralysis. In the US, there are four economically accessible, FDA-supported BoNT-A definitions: onabotulinumtoxin A (California, USA), prabotulinumtoxin A-xvfs (California, USA) and incobotulinumtoxin A (Frankfurt, Germany); together with one BoNT-B: Rimabotulinumtoxin B comes from California, USA [2]. The role of BoNT in dermatology was examined in a review by Guida et al.6. However, there have been no reviews of the use of BoNT in dermatology and cosmetology in recent years. As a result, the purpose of this review is to investigate the function that BoNT plays in beauty and dermatology.

Cosmetic skin diseases are among the many dermatological issues that patients bring up that have a negative impact on their mental health and quality of life. By recognizing information pertaining to deep skin lesions, imaging technology has established a role in the diagnosis of cosmetic skin diseases. Diagnostic imaging performance varies greatly due to cosmetic skin diseases' complex physiological and pathological nature. Creating harmless innovation models with wide materialness, especially high-recurrence ultrasound (HFUS), which can accomplish high-goal imaging of the skin from the layer corneum down to the profound sash, is of extraordinary importance to clinical cosmetology. A narrative review of the literature from Indexed at and Web of Science that was published between 1985 and 2022 was carried out in order to investigate the enormous potential of HFUS in cosmetic skin diseases [3]. This narrative review focuses on the development of HFUS imaging in medical cosmetology, particularly its promising use in the quantitative evaluation and differential diagnosis of acne, aging skin, port wine stain (PWS), cutaneous pathological scar and other cosmetic applications.

The diagnosis and treatment of diseases affecting the skin, nails and hair are the focus of the rapidly expanding fields of dermatology and cosmetology. Dermatology is a branch of medicine that focuses on treating diseases of the skin and other organs of the body as well as systemic diseases, particularly those whose symptoms are primarily visible on the skin [4]. Cosmetology, on the other hand, focuses primarily on the care of the skin, hair and nails in various diseases. By treating the various diseases and pathological conditions of the skin, both treatments aim to improve its external appearance. Nowadays, people pay a lot of attention to how they look. A lot of people put a lot of effort into keeping their skin in good shape. All skin conditions have a significant impact on quality of life, despite the fact that reports indicate that rates of skin diseases are lower than those of other diseases. In addition, it is important to note that some of them, particularly skin cancers and serious infections, can be life-threatening. As a result, there is a demand for novel products that can treat skin conditions effectively [5].

Conclusion

The fungal-synthesized nanoparticles are currently paving the way for numerous future technologies in a plethora of applications. In the biomedical and nanomedicine industries, the production of functional nanofibrous scaffolds through electrospinning has the potential to play a significant role in nanobiotechnology. Some examples include the removal of heavy metals from waste water during wastewater treatment, enzyme immobilization, tissue engineering and drug delivery for biomedical and nanomedicine applications. As a result, these nanomaterials are important for the nanotechnology industry because they are biocompatible, biodegradable, sustainable, antimicrobial and non-toxic.

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Conflict of Interest

The authors declare that there is no conflict of interest associated with this manuscript.

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