

Native collagen sheet mask improves skin health and appearance: A comprehensive clinical evaluation

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Key take aways

- Collagen peptides are released from the mask that are small enough to penetrate the skin
- Application of the collagen mask stimulates fibroblast activity, including the growth factor TNFα and collagen type IV, while reducing levels of degrading enzymes and inflammation mediating cytokines.
- The collagen mask exhibits a high similarity to human dermis and shows visible calming and moisturizing effects on irritated skin.
- The collagen mask significantly increases skin hydration and provides prolonged moisturization compared to cellulose masks.
- It demonstrates immediate and prolonged reduction in wrinkles and skin roughness and is more effective compared to cellulose masks.
- The collagen mask shows a significant decrease in skin pH while maintaining a stable skin barrier function.
- It is well-tolerated and safe for use on atopic dermatitis-prone skin.
- The collagen mask significantly reduces UV-induced skin redness compared to other tested products.
- It helps maintain a healthy skin microbiome diversity.

Background

- Collagen is a structural protein found in animal skin and bones.
- It makes up about 30% of the body's protein content and has a unique triple helix structure.
- There are 29 different types of collagen with variations in chain composition and structures.
- Collagen is biocompatible, non-toxic, and biodegradable, making it useful in various industries including cosmetics.
- Native collagen plays a crucial role in maintaining healthy skin by promoting cell adhesion and aiding in wound healing.
- Type I collagen supplementation may help attenuate skin damage caused by sunlight exposure.
- Collagen peptides with lower molecular weights are more easily absorbed by the body.
- Collagen is a natural humectant and moisturizer, making it a primary component in many skincare products.
- Unlike most collagen sheet masks on the market, our collagen sheet mask is unique in that it is composed of over 92% native bovine collagen types I, II, and V.
- The high concentration of native collagen in our sheet mask sets it apart from others that typically contain inert materials infused with ingredients.

Study Goal

- To evaluate the efficacy, safety, and potential benefits of a collagen sheet mask for various applications, including skincare, wound healing, and soothing irritated skin and microbiome balance

Methods

- In-vitro tests were conducted to analyze the soluble protein components, amino acid composition, and size of the collagen mask.
- The influence of soluble collagen components on fibroblast regulation was investigated in an in-vitro study.
- Scanning electron microscope analysis was performed on the collagen mask to examine its physical characteristics.
- The clinical evaluations included assessing the safety of the collagen mask, examining its effect on the skin microbiome, hydration, skin redness after UV radiation, and the treatment of atopic dermatitis.
- Skin hydration, wrinkles, and skin roughness were evaluated in clinical studies comparing the collagen mask to a pre-soaked sheet mask.
- The study employed various measurement techniques such as quantitative protein determination, amino acid analysis, gel permeation chromatography, scanning electron microscopy, DNA extraction, and metagenomics NGS.

Results

Collagen peptides are released from the mask

- The collagen mask also contains smaller collagen peptides with molecular weights below 13 kDa.
- Further analysis reveals the presence of collagen peptides smaller than 2 kDa, corresponding to peptide lengths of approximately 4-18 amino acids, which are small enough to penetrate into the skin

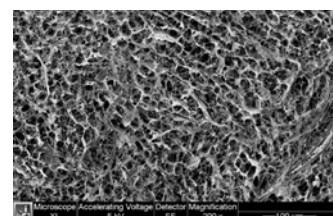
Mask application promotes fibroblast activity

- The study showed that the collagen sheet mask stimulated the growth factor TNF α and collagen type IV.
- It reduced the levels of degrading enzymes MMP7 and MMP9, as well as the precursor of MMP-activating enzymes, Plasminogen.
- Reduction in levels of inflammation mediating cytokines, including Interleukin 1b, 2, 4, 6, and 10.

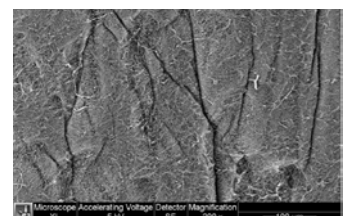
High similarity to human dermis



Mask scanning electron microscope (SEM) image of the collagen fiber and fibril structure of human dermis and collagen mask

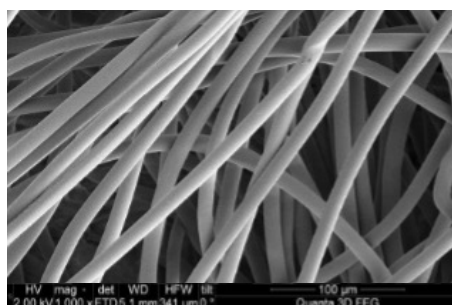


Collagen mask SEM (200x magnification)

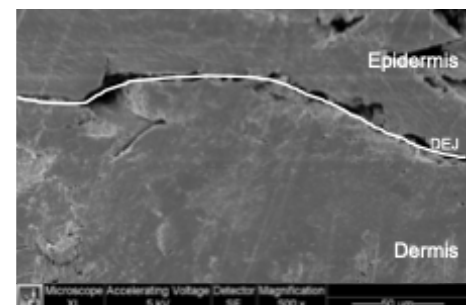
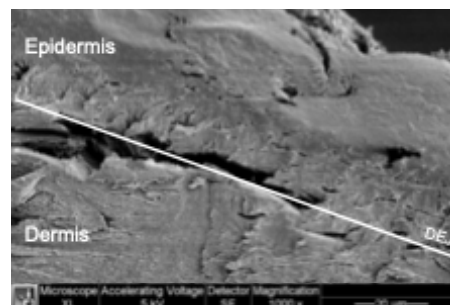


Biocellulose mask SEM (200x magnification)

Visible calming and moisturizing irritated skin



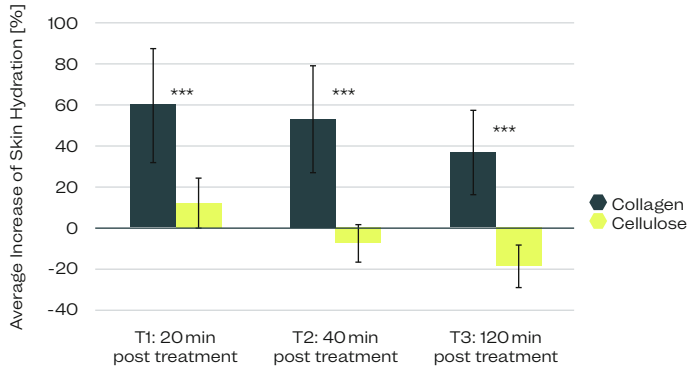
Hydrogel mask SEM (200x magnification)



SEM skin side view before and after application of collagen mask on irritated skin explants.

Results

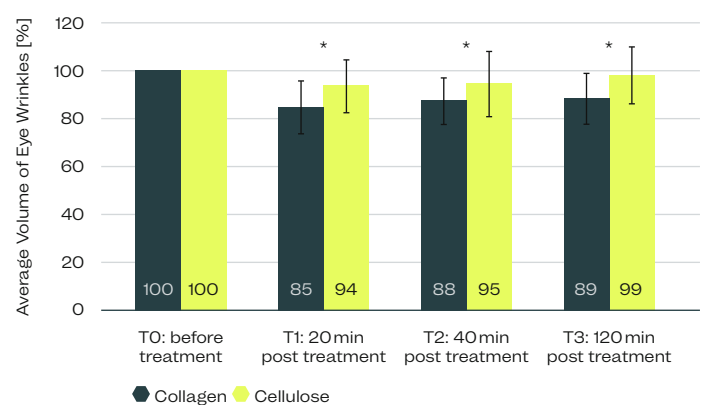
Significant immediate increase in skin hydration and prolonged moisturization effect compared to cellulose mask



Average increase of skin hydration for collagen mask and pre-soaked cellulose mask. ***p ≤ 0.001.

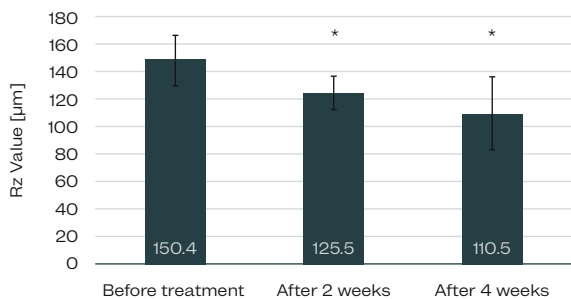
Cellulose mask demonstrates dehydration post treatment

Significant immediate and prolonged wrinkle reduction compared to cellulose mask



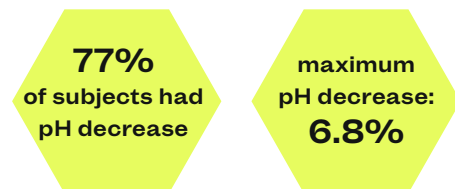
Average volume of eye wrinkles collagen mask and pre-soaked cellulose mask. *p ≤ 0.05.

Significant and long-term reduction in skin roughness



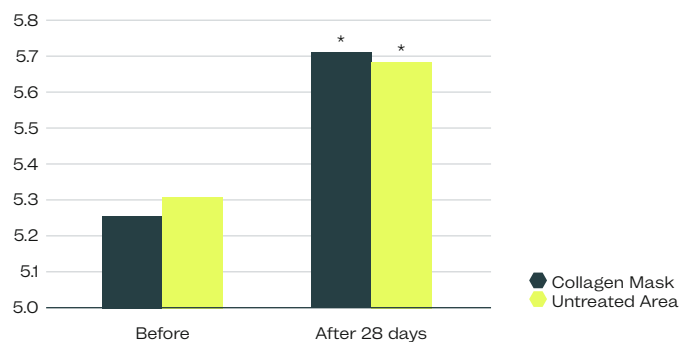
Long-term skin roughness effects in periorbital area after twice a week 15-min application of collagen mask. *p ≤ 0.05.

Significant decrease in skin pH with stable skin barrier function

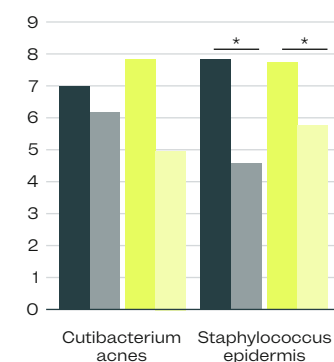


Maintains a healthy skin microbiome diversity

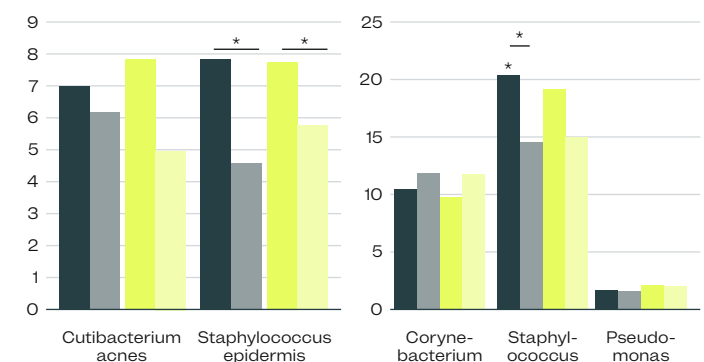
Shannon's Diversity Index Mean Values



Species Relative Abundance [%]

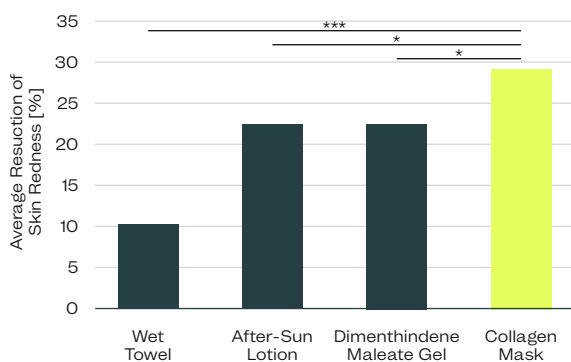


Genus Relative Abundance [%]



*statistically significant

Demonstrates significant reduction of UV-induced skin redness compared to other products



Reduction in skin redness (in %) caused by exposure to UV radiation compared to control area. *p < 0.05 ***p < 0.001.

Collagen mask is well-tolerated and safe for use on atopic dermatitis-prone skin.