

Hyafactor™-PGA

Super High Molecular Weight Sodium Polyglutamate (PGA-SHM)

COSMOS certified · Probiotics fermentation · Super high molecular weight
Silky skin feeling · Film-forming & Protection · Skin barrier improvement · Generation of NMF

Introduction

The super high molecular weight Sodium Polyglutamate (PGA-SHM) is a polypeptide biopolymer produced through the fermentation of the probiotic “Natto *Bacillus*”. The molecular weight of PGA-SHM is more than 2 MDa (GPC-MALLS method), which is 7 times higher than PGA-HM, so PGA-SHM has a nice silky skin feeling and a better film-forming ability which protect the skin barrier from pollution damage. By a series of researches, it has been found that PGA-SHM can effectively promote the maturation of the Cornified Envelope (CE), the generation of Natural Moisturizing Factor (NMF), thus enhancing significantly the skin barrier function.

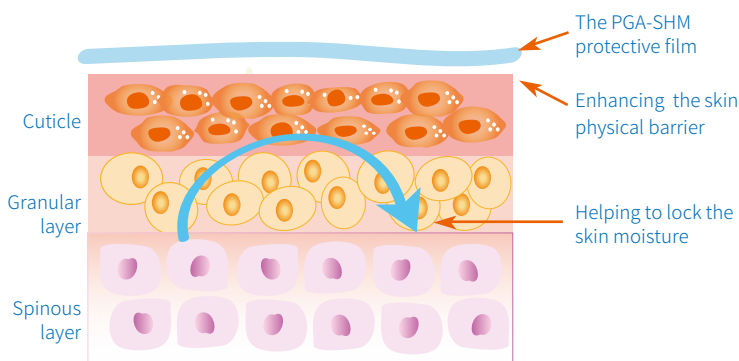
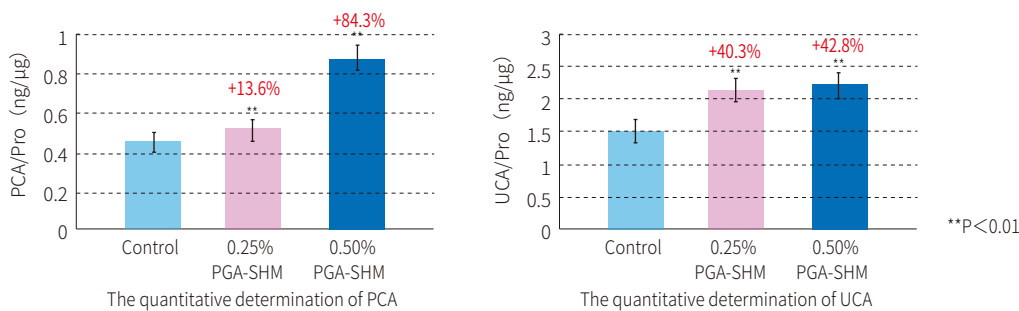


Fig.1 The skin care scheme for PGA-SHM

Efficacy

[Promote the generation of NMF]

NMF are water-soluble substances with a nice hydration ability; Pyrrolidone Carboxylic Acid (PCA) and Urocanic Acid (UCA) are the representative components of NMF. From our studies, the PCA and UCA values are increased by 84.3% and 42.8% respectively when PGA-SHM is used at 0.5% (Fig. 2), this result suggests that PGA-SHM can promote the generation of NMF significantly.

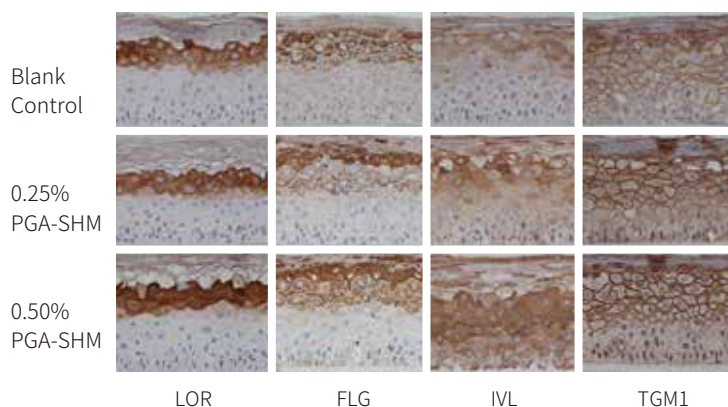


Three-dimensional (3D) skin model, HPLC analysis. PCA/Pro or UCA/Pro represent the PCA or UCA value in every unit protein.

Fig. 2 The influence of PGA-SHM on NMF value

[Improve the skin barrier]

1.Promote the maturation of the cornified envelope



Three-dimensional (3D) skin model, Immunohistochemistry (IHC) analysis.

Fig. 3 The IHC results of protein markers

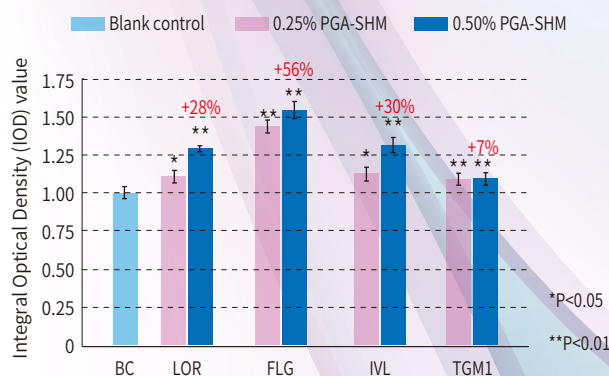
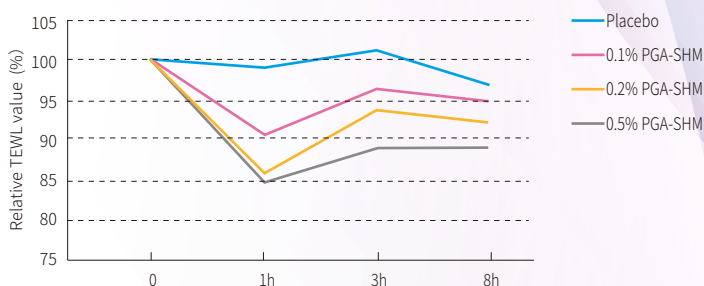


Fig. 4 The IHC quantitative analysis of protein markers

Cornified Envelope (CE) is an important component of the skin barrier and its presence is directly related to the barrier function. Our studies show that the main protein markers related to CE, like Loricrin (LOR), Filaggrin (FLG), Involucrin (IVL) and Transglutaminase 1 (TGM1) are up-regulated by 28%, 56%, 30% and 7% respectively (Fig. 4) by using 0.5% PGA-SHM. These results indicate that PGA-SHM can promote the maturation of CE, thus the skin barrier is strengthened significantly.

2.Reduce the TEWL value

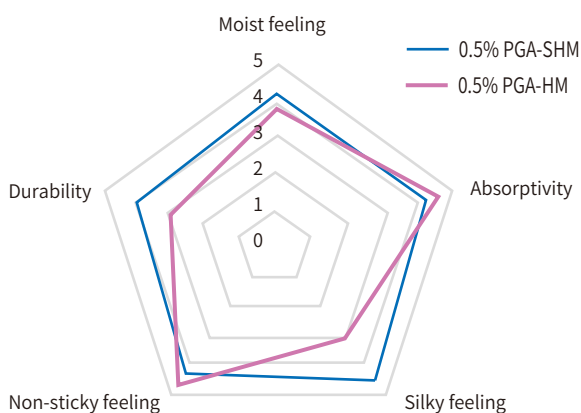
Compared with placebo, the Transepidermal Water Loss (TEWL) is reduced by 9% after 1 hour by using 0.1% PGA-SHM; in addition, the higher the concentration, the lower the TEWL will be. In fact, the TEWL decreased by 15% after 1 hour by using 0.5% PGA-SHM. These results also suggest that the skin barrier is enhanced by using PGA-SHM.



Double-blind, randomized, Tewameter TM300

Fig. 5 The influence of PGA-SHM on the TEWL value

[Silky skin feeling]



Double-blind, Randomized, Sensorial Evaluation

Fig.6 Sensorial Evaluation of PGA-SHM and PGA-HM

The skin feeling of PGA-SHM is better than PGA-HM in relation to smoothness, durability and moisturization.

[Application]

Cream, Emulsion, Serum, Mask, Cleanser and Hair care products, etc.

[Recommended dosage]

0.1% - 1.0%



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