Epidermal Growth Factor (EGF)

Epidermal Growth Factor (EGF) is a powerful protein that, when applied to the skin, accelerates healing and increases the rate of skin renewal on aging skin. We are able to produce this protein with a high level of expertise, and the end result is a high quality product made specifically for skin care applications. This also means that we are able to offer EGF at extremely competitive prices.

Applications

- Accelerates healing of skin and cornea
- Increases the rate of skin renewal (helping aging skin)
- Will help slow down skin thinning which occurs as we age

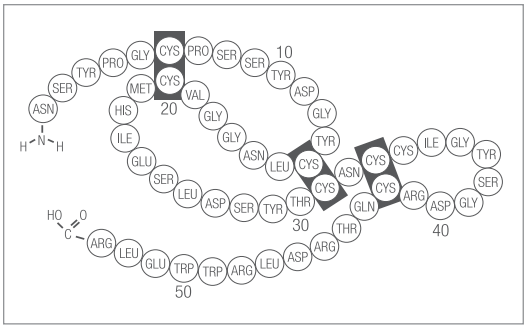
Use

- Avoid extremes of pH and alcohols, and add EGF at the final stage, when the product is cool.
- Do not apply EGF serum on the skin of psoriasis patients, or on pre-cancerous or cancerous lesions. Melanocytes do not have receptors for EGF[3], so EGF should not affect skin pigmentation.

Function

In 1986, Stanley Cohen received the Nobel Prize[4] for his work elucidating the role of the Epidermal Growth Factor (EGF) in the regulation of cell growth and development. This small protein (only 53 amino acids, see Figure 1) was found to enhance epidermal growth and keratinization. Work by Cohen and his collaborators demonstrated that EGF directly stimulated the proliferation of epidermal cells, and this stimulatory action of EGF did not depend on other systemic or hormonal influences.

Cells that respond to EGF do so because they have receptors on the cell membrane that recognize the factor. The binding of the growth factor to the receptor initiates a cascade of molecular events involving the MAPK/ERK pathway that will eventually lead, among other effects, to cell division. EGF needs to be present at very low concentrations to effect major changes in the cell changes because the signal, which starts when a growth factor binds to the receptor on the cell surface is amplified through the MAPK/ERK pathway and ends when the DNA in the nucleus expresses a protein and produces some change in the cell, e.g. cell division.



EGF was found to be an antagonist of reactive nitrogen and reactive oxygen intermediate production by keratinocytes, and reversed the growth inhibitory actions of inflammatory mediators[1]. EGF has also been shown to help healing of diabetic ulcers[2].

Figure 1: The amino acid sequence of EGF with placement of disulfide bonds[4] as presented in the Nobel Lecture by Stanley Cohen[4]

Technical Information

INCI:	rH-Oligopeptide-1 (Skin Conditioning Agent, Miscellaneous).
Synonyms:	rhEGF, urogastrone, URG, beta urogastrone.
Molecular Weight:	6,500, with 55 amino acids.
Purity:	Purity is greater than 95% as determined by analysis using SDS-PAGE.
Formulation:	Suspension in ammonium sulfate (80% saturation).
Production:	Produced in *E. coli* and purified using proprietary chromatographic techniques.
Optimal Concentration:	We suggest a final concentration of EGF of 0.04%.
Storage:	This suspension is stable at 2-8 °C. Do not freeze.
Reconstitution:	Add buffered (pH 7.5) saline solution (about 1:5 to 1:10) to the suspension to redissolve EGF or mix directly into the cooled cream, lotion or gel.

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References

1 Heck, Diane E.; Laskin, Debra L.; Gardner, Carol R.; Laskin, Jeffrey D. (1992) Epidermal growth factor suppresses nitric oxide and hydrogen peroxide production by keratinocytes. Potential role for nitric oxide in the regulation of wound healing. J Biol Chem 267:21277-80.

2 Tsang, Man Wo; Wong, Wan Keung R.; Hung, Chi Sang; Lai, Kwok-Man; Tang, Wegin; Cheung, Elaine Y. N.; Kam, Grace; Leung, Leo; Chan, Chi Wai; Chu, Chung Min; Lam, Edward K. H. (2003) Human epidermal growth factor enhances healing of diabetic foot ulcers. Diabetes Care, 26:1856-1861.

3 Grahn, Jennifer C.; Isseroff, R. Rivkah. (2004) Human melanocytes do not express EGF receptors. Journal of Investigative Dermatology, 123: 244-246.

4 Cohen, Stanley (1993). Nobel Lecture 1986. Epidermal Growth Factor. In: Physiology or Medicine 1981-1990: Nobel Lectures, Including Presentation Speeches and Laureates' Biographies, T. Frangsmyr and J. Lindsten (eds.) World Scientific Pub Co Inc (May 1993) pp 333-345.

5 Photos/Diagrams Figure 1.