

EGF+IGF-1: Synergistic for better efficacy topical growth factor

A **growth factor** is a naturally occurring substance capable of stimulating cellular growth, proliferation and cellular differentiation. Usually it is a protein or a steroid hormone. Growth factors are important for regulating a variety of cellular processes.

Growth factors typically act as signaling molecules between cells. Examples are cytokines and hormones that bind to specific receptors on the surface of their target cells.

They often promote cell differentiation and maturation, which varies between growth factors. For example, bone morphogenic proteins stimulate bone cell differentiation, while fibroblast growth factors and vascular endothelial growth factors stimulate blood vessel differentiation (angiogenesis).^[1]

Epidermal Growth Factor – The Nobel Prize Physiology or Medicine 1988

- **EGF** is a natural active protein in human beings.
- **EGF** binds to EGFR (Epidermal Growth Factor Receptor) on the cell surface and stimulates differentiation and proliferation by signal transduction.
- **EGF** exists at high density in body fluids, especially in saliva, urine, breast milk, gastric juice, tear, semen and cerebrospinal fluid etc.
- Binding of EGF to EGFR has saturation and high-sensitivity.

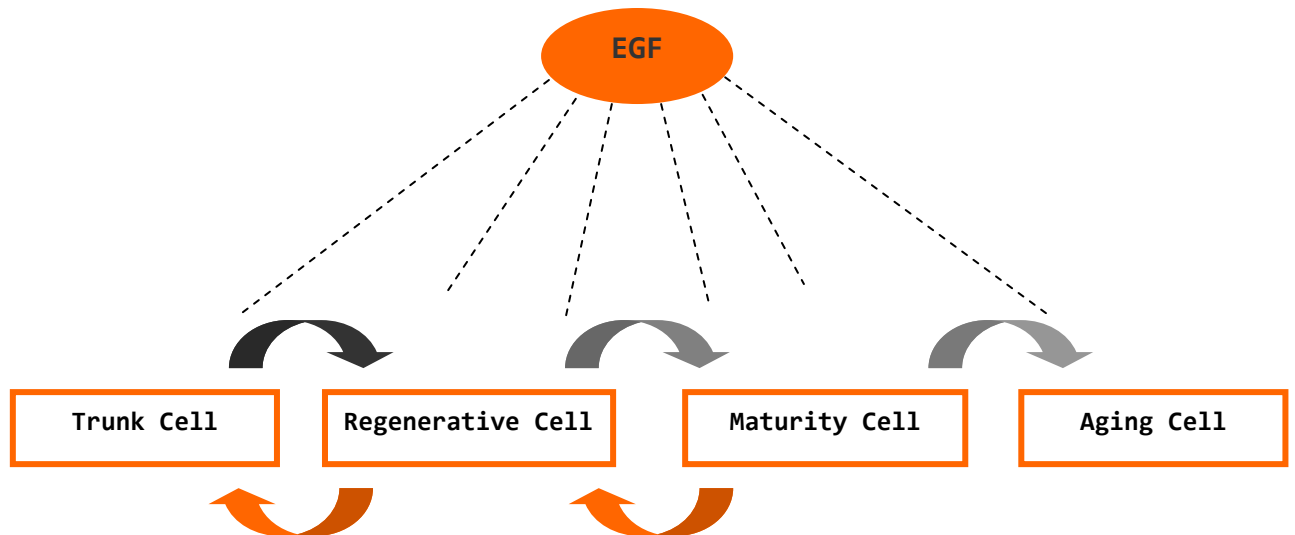
EGF In Human



Though EGF starts decreasing since the infant, but influence doesn't appear on the skin until 23~25 years old.

Exceeding 23-25 years old, skin aging phenomena will happen. Wrinkle and blotch if EGF isn't replenished from the outside.

Why EGF Can Anti-Aging?



EGF Function

- Reduce and prevent lines and wrinkles by actively generating new skin cells
- Enhance tone for skin that brimming with vitality & energy
- Nourish skin that appears smoother, brighter & regains its youthful look
- Eliminate scars on face by forming new skin cells

Insulin-like growth factor 1 (IGF-1)

also known as somatomedin C or mechano growth factor is a protein that in humans is encoded by the *IGF1* gene^{[2][3]}. IGF-1 has also been referred to as a "sulfation factor" ^[4] and its effects were termed "nonsuppressible insulin-like activity" (NSILA) in the 1970s.

IGF-1 is a hormone similar in molecular structure to insulin. It plays an important role in childhood growth and continues to have anabolic effects in adults. A synthetic analog of IGF-1, mecasermin is used for the treatment of growth failure^[5].

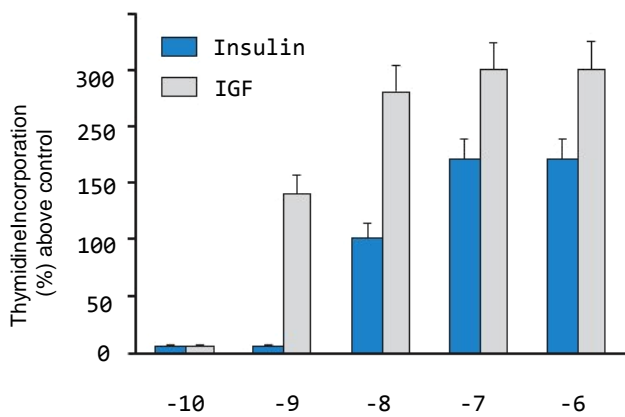
IGF-1 consists of 70 amino acids in a single chain with three intramolecular disulfide bridges. IGF-1 has a molecular weight of 7649 daltons.

IGF-1 Function

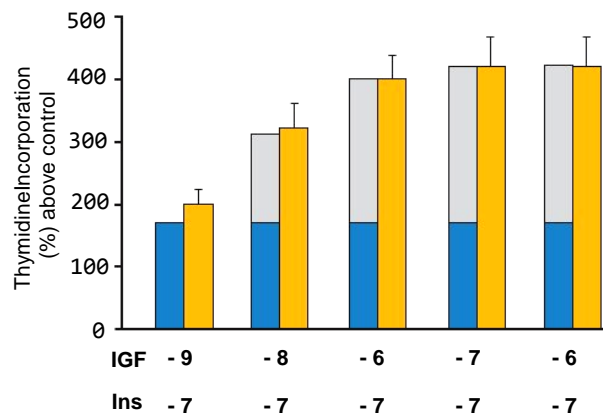
- Treat the appearance of lines and wrinkles
- Increases skin's own collagen & elastin levels and reduce blotchiness
- Refine texture glides effectively and slim your face and body with a fat burning effect

- Strengthen hair while stimulating hair follicles to produce strong hair shaft

IGF-1 has additional effect in conjunction with constant level of insulin on keratinocyte proliferation [6]

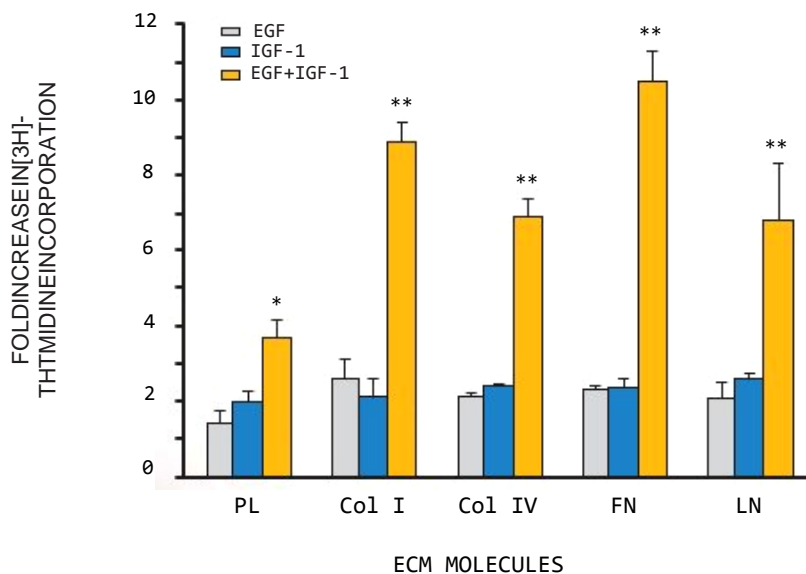


A : 5-day keratinocyte cultures were stimulated for 24 h with insulin or IGF-1 at the designated concentrations.



B : In parallel, keratinocytes were stimulated with 10–7mol/l insulin(Ins) and increasing doses of IGF-1(IGF).

Synergic effect of EGF-plus IGF-1 induced epithelial cell proliferation on the different ECM proteins [7]



EGF and IGF-I increase cell proliferation in relation to ECM composition

References

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