

GHK-CU

History and Background

GHK-Cu (Glycyl-L-Histidyl-L-Lysine-Copper) is a naturally occurring copper-binding peptide first identified in human plasma in 1973 by Dr. Loren Pickart. It consists of three amino acids (glycine-histidine-lysine) bound to a copper ion. GHK-Cu levels decline with age (from ~200ng/ml at age 20 to ~80ng/ml by age 60), correlating with visible aging. It has been extensively studied for wound healing, skin regeneration, anti-aging, and tissue repair. GHK-Cu is one of the most researched cosmetic peptides and is widely used in skincare and regenerative medicine.

Primary Uses

GHK-Cu is used for skin rejuvenation and anti-aging, wound healing and tissue repair, reduction of wrinkles and fine lines, improved skin firmness and elasticity, stimulation of collagen and elastin production, reduction of inflammation and oxidative stress, hair growth and thickness, scar reduction and remodeling, overall tissue regeneration, and cosmetic and aesthetic enhancement.

How It Works

GHK-Cu works through multiple mechanisms: it stimulates collagen and glycosaminoglycan synthesis, promoting skin structure and firmness. The copper ion is essential for enzymes involved in collagen cross-linking and elastin formation. GHK-Cu also acts as an antioxidant, reducing oxidative damage. It modulates gene expression, upregulating genes related to tissue repair and downregulating inflammatory genes. It attracts immune and endothelial cells to injury sites, promotes angiogenesis (new blood vessel formation), and supports stem cell differentiation. It chelates toxic metals and has anti-inflammatory properties.

Standard Protocol

Dosing: Topical: 0.05-2% serum applied 2x daily. Injectable: 1-2mg daily or 3-5mg 2-3x weekly subcutaneously. Hair: topical solution with microneedling.

Administration: Topical: Apply serum to clean skin. Injectable: Subcutaneous injection near target area or systemically. Microneedling: Apply to scalp before needling for hair.

Timing: Topical: Morning and evening after cleansing. Injectable: Morning or evening, consistent timing. Hair: 2-3x weekly with microneedling sessions.

Titration Schedule:

Topical Application: 0.05-2% GHK-Cu serum applied twice daily to skin

Subcutaneous Injection: 1-2mg daily or 3-5mg 2-3x weekly

Scalp (Hair): Topical or microneedling with 1-2mg solution

Duration: Minimum 8-12 weeks for visible results; ongoing for maintenance

Duration: Minimum 8-12 weeks to see visible skin improvements. Hair regrowth: 3-6 months. Can be used indefinitely as maintenance therapy.

What to Expect

Positive Effects (Week 1-2)

Reduced fine lines and wrinkles. Improved skin texture, firmness, and elasticity. Enhanced wound healing and scar reduction. Brighter, more even skin tone. Increased collagen density. Thicker, healthier hair growth. Reduced inflammation and redness. Overall skin rejuvenation and anti-aging.

Timeline to Results

Initial effects: 2-4 weeks (subtle skin texture improvement). Noticeable changes: 6-8 weeks (reduced wrinkles, firmer skin). Significant results: 12-16 weeks (substantial anti-aging effects). Hair growth: 3-6 months. Optimal results: 6+ months of consistent use.

Dose Response

Topical concentrations of 1-2% most effective for skin. Injectable doses of 1-2mg daily very effective. Higher doses not necessarily better—consistency is key. Results cumulative over time.

Pros

- Extensive research supporting efficacy
- Safe and well-tolerated (natural peptide)
- Visible anti-aging results with consistent use
- Multiple mechanisms of action (collagen, antioxidant, etc.)
- Can be used topically or injected
- Improves both skin and hair
- Reduces inflammation and promotes healing
- No significant side effects reported
- Can be used long-term without issues
- Relatively affordable

Cons

- Results take 8-12+ weeks (not immediate)
- Requires consistent daily or frequent use
- Topical formulations less potent than injectable
- Quality varies significantly between suppliers
- Copper sensitivity possible (rare)
- Injectable version requires reconstitution
- Must be stored properly (refrigerated)
- Individual response varies
- Not FDA-approved for anti-aging
- Can be unstable if not formulated properly

Who Should Consider It

Individuals seeking anti-aging and skin rejuvenation, those with visible wrinkles and loss of skin elasticity, people wanting to improve wound healing and scar appearance, individuals with thinning hair or hair loss, those committed to long-term skin health, users looking for research-backed peptides, people wanting both topical and injectable options.

Who Should Avoid It

Individuals with copper allergies or Wilson's disease, pregnant or breastfeeding women, those seeking immediate overnight results, people with active skin infections, individuals unwilling to commit to 12+ weeks of use, those with unrealistic expectations.

GHK-Cu is not FDA-approved for anti-aging or cosmetic use. It is widely used in research and cosmetic formulations. Individual results vary. Topical use is generally recognized as safe. Injectable use should be under professional guidance. This information is for educational purposes only.