GHK-Cu | *Copper Peptide | Tissue Regeneration, Skin Health & Systemic Repair*

One of the body's most powerful naturally occurring repair signals — *with documented effects on wound healing, collagen remodeling, inflammation, and cellular rejuvenation.*

What Is GHK-Cu?

GHK-Cu (Glycyl-L-Histidyl-L-Lysine Copper) is a naturally occurring copper-binding tripeptide found in human plasma, saliva, and urine. It was first identified in the 1970s and has since become one of the most extensively studied peptides in regenerative medicine.

GHK-Cu levels are highest in youth and decline significantly with age — correlating with the loss of skin elasticity, slower wound healing, and reduced tissue repair capacity that characterize aging.

When administered as a therapeutic peptide, GHK-Cu activates over 4,000 human genes involved in tissue remodeling, antioxidant defense, anti-inflammatory signaling, and cellular repair.

Primary Mechanisms of Action

1. Collagen & Extracellular Matrix Remodeling

- Stimulates collagen type I, III, and IV synthesis
- Activates fibroblast proliferation and activity
- Increases elastin and glycosaminoglycan production
- Remodels damaged or fibrotic tissue toward healthier architecture

2. Wound Healing & Tissue Repair

- Accelerates wound closure and re-epithelialization
- Enhances angiogenesis (new blood vessel formation)
- Stimulates nerve regeneration in damaged tissue
- Reduces scar formation and promotes normal tissue remodeling

3. Antioxidant & Anti-Inflammatory Activity

- Activates superoxide dismutase (SOD) and other antioxidant enzymes
- Reduces oxidative stress in aged and damaged tissue
- Downregulates TNF-alpha, IL-6, and other pro-inflammatory cytokines
- Protects cells from UV-induced and free radical damage

Key Benefits

→ Skin Rejuvenation & Collagen Density

Clinically studied for improving skin thickness, firmness, and elasticity. Reduces fine lines and wrinkles by stimulating fibroblast activity and collagen synthesis — addressing the structural cause of skin aging.

→ Wound & Surgical Recovery

Accelerates healing of wounds, surgical incisions, burns, and ulcers. Promotes clean tissue remodeling with reduced scarring and improved cosmetic outcomes.

→ Hair Follicle Stimulation

One of the most well-documented peptides for hair regrowth. Enlarges hair follicles, extends the anagen (growth) phase, and reduces follicular miniaturization associated with pattern hair loss.

→ Systemic Anti-Aging

Addresses age-related tissue decline throughout the body — not just skin. Supports lung tissue integrity, bone density, and connective tissue health at a cellular level.

→ Neuroprotection & Nerve Repair

Stimulates nerve growth factor (NGF) expression and supports axonal regeneration. Relevant for peripheral neuropathy, post-injury nerve repair, and neurological aging.

→ Anti-Fibrotic Effects

Reduces pathological fibrosis in lung, liver, and kidney tissue. GHK-Cu remodels fibrotic tissue back toward normal architecture — a unique and clinically significant property.

→ Antioxidant & Cellular Defense

Activates the body's own antioxidant enzymes to neutralize free radicals and reduce oxidative burden — supporting longevity at the cellular level.

Clinical Applications

- Aesthetic skin rejuvenation and anti-aging protocols
- Post-surgical and wound healing acceleration
- Hair restoration (androgenic alopecia and diffuse thinning)
- Neuropathy and peripheral nerve repair
- Systemic longevity and tissue maintenance protocols

4. Genetic & Epigenetic Regulation

- Upregulates genes involved in tissue repair and longevity
- Downregulates genes associated with cancer progression and inflammation
- Modulates TGF-beta pathways that govern fibrosis and scar formation

What You May Notice

Results vary by application route and individual response. Patients commonly report:

- Visibly improved skin texture, tone, and firmness
- Reduced appearance of fine lines and scars
- Faster healing of wounds, cuts, and abrasions
- Thicker, stronger hair with reduced shedding
- A general sense of tissue vitality and improved recovery

Dosing & Administration

Route	Common Applications	Frequency	Clinical Notes
Subcutaneous injection	Systemic anti-aging, tissue repair, neuroprotection	Daily or per provider protocol	Systemic delivery for whole-body effects. Dose individualized to patient goals and response.
Topical cream or serum	Skin rejuvenation, scar reduction, wound healing	Once or twice daily to affected areas	Applied directly to target area. Can be combined with microneedling for enhanced dermal delivery and collagen stimulation.
Scalp application	Hair restoration, follicle support	Daily to scalp	Often combined with microneedling or other hair restoration protocols for synergistic effect.

Route and dose individualized by your provider based on goals and clinical presentation.

Safety & Tolerability

GHK-Cu has an excellent safety profile across decades of research and clinical use:

- Well-tolerated via subcutaneous, topical, and intranasal routes
- No significant systemic toxicity reported at therapeutic doses
- Mild, transient redness possible at injection or application site
- Copper is an essential trace mineral — GHK-Cu delivers it in a biologically controlled, chelated form
- Use with caution in Wilson's disease or copper metabolism disorders
- Not recommended during active cancer treatment without oncology guidance

Compatibility with Other Protocols

GHK-Cu integrates well with many functional medicine and aesthetic protocols:

- Combines with BPC-157 and TB-500 for comprehensive wound and tissue repair
- Pairs with Epithalon for a complete cellular longevity and anti-aging protocol
- Synergistic with microneedling for dermal collagen stimulation
- Complements hair restoration therapies (PRP, minoxidil, finasteride)
- Compatible with HRT protocols supporting skin and connective tissue quality
- Works alongside MOTS-C and other mitochondrial support peptides