

GHK-Cu 50 mg

Copper Tripeptide

Tissue Remodeling and Regenerative Signaling | Physician Reference

Overview

GHK-Cu is the copper(II) complex of the naturally occurring tripeptide glycyl-L-histidyl-L-lysine (GHK). GHK is present in human plasma, saliva, and urine, and its concentration declines markedly with age, from roughly 200 ng/mL in early adulthood toward approximately 80 ng/mL by the sixth decade. This decline parallels the age-related reduction in regenerative capacity that GHK-Cu is used to address.

The peptide functions primarily as a high-affinity carrier that delivers copper into cells and as a signaling molecule that shifts gene expression toward tissue repair. It is most established in dermatologic and cosmetic applications, where the evidence base is strongest, with broader regenerative use remaining largely preclinical or practitioner-derived.

Mechanism at a Glance

Attribute	Description
Peptide class	Copper-binding tripeptide (Gly-His-Lys) complexed with a copper(II) ion
Primary target	Cellular copper delivery and broad gene-expression modulation rather than a single receptor
Core mechanism	Upregulation of collagen, elastin, glycosaminoglycans, and proteoglycans; fibroblast activation
Secondary activity	Antioxidant and anti-inflammatory effects; modulation of TNF-alpha and NF-kB signaling
Regenerative signaling	Stimulation of angiogenesis, nerve outgrowth, and dermal remodeling; hair follicle support
Administration	Topical formulations (best supported) and compounded subcutaneous injection
Regulatory status	Not FDA-approved as a drug; widely used in cosmetics; not DEA-scheduled

Mechanism of Action

GHK-Cu (Copper Tripeptide)

GHK binds copper with high affinity and mediates its transport across cell membranes, making bioavailable copper available for enzymatic and structural processes. Beyond copper delivery,

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gene-expression studies have associated GHK with modulation of a broad set of genes, generally shifting the transcriptional profile toward tissue repair and away from a pro-inflammatory, degradative state.

In skin, GHK-Cu stimulates dermal fibroblasts to produce collagen and elastin, supports synthesis of glycosaminoglycans and proteoglycans, and promotes angiogenesis and remodeling of the extracellular matrix. It also exhibits antioxidant behavior and dampens inflammatory signaling, which underlies its use in wound, scar, and post-procedure recovery contexts.

Clinical Application Matrix

The table summarizes the role GHK-Cu plays across common clinical goals. Primary indicates a principal driver of the targeted effect; Supporting indicates a meaningful contribution with more limited or earlier-stage evidence.

Clinical Application	Role	Mechanistic Basis
Skin quality and collagen synthesis	Primary	Fibroblast activation; collagen and elastin production
Wound and scar healing	Primary	Matrix remodeling, angiogenesis, anti-inflammatory activity
Antioxidant and anti-inflammatory support	Primary	Modulation of TNF-alpha and NF-kB; free-radical control
Hair follicle support	Supporting	Follicle stimulation and perifollicular remodeling
Systemic tissue repair	Supporting	Regenerative gene signaling; limited human injectable data

Ideal Patient Candidate Profile

GHK-Cu is most appropriate for consideration in patients presenting with one or more of the following:

- Aesthetic goals related to skin quality, fine lines, elasticity, or tone
- Post-procedure recovery where dermal remodeling and reduced inflammation are goals
- Localized wound or scar management as an adjunct to standard care
- Hair thinning where follicular support is a supplementary objective
- Interest in age-associated decline of endogenous regenerative signaling

Copper accumulation is a consideration with excessive or prolonged use, and GHK-Cu is contraindicated in Wilson disease and other disorders of copper handling. Injectable use carries a thinner human evidence base than topical use; physician judgment and informed consent are essential.

Clinical and Compounding Context

- **Formulation** Topical formulations are the best-supported route; compounded subcutaneous injection is available through licensed 503A pharmacies under individual physician prescription.
- **Quality assurance** Physician should verify USP compliance and sterility testing at the sourcing compounding pharmacy.
- **Informed consent** Recommended for all patients; documentation should reflect investigational or off-label status, the available level of human trial data, and an individual risk-benefit discussion.
- **Monitoring** No universally established clinical monitoring protocol; practitioner discretion based on patient profile and treatment goals.

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- **Regulatory** Not FDA-approved as a drug and not DEA-scheduled; possession is not illegal, but products marketed as cosmetics or research chemicals carry quality, purity, and dosing risks.
- **Copper balance** Consider cumulative copper exposure; avoid in Wilson disease and copper-overload states.

Giovane Medical works with physicians to facilitate access to properly sourced, compounded peptide formulations and to support evidence-based protocol development.

For prescribing or physician partnership programs, contact the Giovane Medical clinical team.

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