

GHK-Cu — Research Summary

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1. What It Is

GHK-Cu is a naturally occurring copper-binding tripeptide — glycyl-L-histidyl-L-lysine (GHK) complexed with a Cu(II) ion. It was first isolated from human plasma in 1973 by Dr. Loren Pickart. Naturally occurring GHK-Cu plasma levels decline substantially with age (reported roughly 60% lower by age 60 compared with levels in the 20s), which underlies much of the research interest in it as a topical and injectable research compound.

Research focus areas: wound healing, dermal collagen remodeling, antioxidant/anti-inflammatory activity, and gene-expression modulation.

2. Reported Effects in Research Literature

- Wound healing / tissue remodeling: Foundational studies (Pickart, from 1983) established that GHK-Cu accelerates wound healing and contraction, improves the take of transplanted skin, and has anti-inflammatory actions.
- Antioxidant activity: Reported to inhibit lipid peroxidation by binding to ferritin channels involved in iron release, preventing free-radical generation in damaged tissue.
- Gene expression: Pickart and Margolina's 2018 review reported GHK-Cu modulates expression of roughly 4,000 human genes, many linked to tissue repair and remodeling pathways.
- Human topical/RCT-level data: Studies report increased dermal collagen density (ultrasound-measured, ~28% average increase at 12 weeks in one study) with topical application, and a randomized controlled trial comparing GHK-Cu serum to topical minoxidil for androgenetic alopecia.
- Diabetic ulcer studies: Early pilot and controlled studies reported enhanced healing of diabetic ulcers with topical GHK-Cu treatment.
- Neuroscience (early-stage): Gene-expression studies report effects relevant to nervous system function and cognitive decline; effects in a mouse Alzheimer's model have been studied in preprint form.
- Research limitations: The large majority of GHK-Cu's human-relevant clinical data is in topical/dermatological contexts; injectable/systemic research use is far less studied in controlled human trials. GHK-Cu remains classified primarily as a cosmetic ingredient rather than an FDA-approved drug.

3. Clinical & Preclinical Study References

Pickart L, Vasquez-Soltero JM, Margolina A. "GHK Peptide as a Natural Modulator of Multiple Cellular Pathways in Skin Regeneration." Biomed Res Int. 2015;2015:648108. PMID: 26236730

Pickart L, Margolina A. "Regenerative and Protective Actions of the GHK-Cu Peptide in the Light of the New Gene Data." Int J Mol Sci. 2018;19(7):1987. PMID: 29986520

Park YM, et al. "GHK-Cu serum vs minoxidil for androgenetic alopecia: RCT." J Dermatolog Treat. 2022;33(6):2894-2901. PMID: 35549789

Regulatory/Safety Note: GHK-Cu is not approved by the FDA as a systemic/injectable drug for the diagnosis, treatment, cure, or prevention of any disease. A separate PCAC session on GHK-Cu (non-injectable routes) is expected before the end of February 2027.

Verification Update: No additional human or animal findings beyond what's already documented were identified in this pass — GHK-Cu's literature base is stable and was already comprehensively covered.

This compound has not been evaluated by the FDA and is not intended to diagnose, treat, cure, or prevent any disease in humans or animals.

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