

PRESCRIPTION MONOGRAPH

Compounded Active Ingredients: GHK-Cu/Melatonin

Form: Topical Solution

Drug Class:

- GHK-Cu: Peptide complex (endogenous tripeptide); Copper-binding growth factor analog
 - Melatonin: Eurohormone/chronobiotic with antioxidant and follicular MT1/MT2 receptor activity.
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Mechanism of Action^{1,2,3:}

Together, GHK-Cu and Melatonin may have a potential synergistic effect. GHK-Cu may improve the scalp's condition by boosting circulation and supporting stronger hair follicles, while melatonin may protect follicular cells and stimulate hair growth. Together they can target microinflammation, oxidative stress, and signaling relevant to androgenetic alopecia. This combination is intended to:

- Bind copper(II) ions, delivering them to tissues to support wound healing, tissue remodeling, and antioxidant defense.
 - Upregulate collagen and glycosaminoglycan synthesis in skin and connective tissue.
 - Modulate gene expression involved in inflammation, angiogenesis, hair growth, and cellular repair.
 - Scavenge free radicals, reducing oxidative damage.
 - Increase stem cell activation and supports epithelial regeneration.
 - Counter oxidative/androgen stress by scavenging reactive oxygen species in scalp, modulating MT1/MT2 on follicles, and lowering androgen influence in targeted tissues to help potentially protect dermal papilla cells.
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Indications Commonly Prescribed For:

- Androgenetic alopecia
 - Post-inflammatory shedding
 - Cosmetic hair quality: To improve density, thickness, and retention.
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Before Use: Let your health care provider know if you have any medication allergies before you take this compounded preparation. Let your health care provider know if you have any liver or kidney problems. Let your healthcare provider know of all supplements you are currently taking.

Contraindications:

- Known allergy to GHK, copper compounds, or melatonin
 - Wilson's disease (copper metabolism disorder)
 - Avoid use on broken/irritated skin or active scalp infections.
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Cautions: Let your Healthcare provider know if you experience any adverse side effects.

How to Use: This compounded preparation is provided as a topical solution in a spray bottle. Apply the directed number of sprays evenly to the affected areas of the scalp, usually once or twice daily as instructed by your provider. Gently massage the solution into the scalp if recommended. Wash your hands after application. Avoid getting the solution in your eyes, mouth, or on broken skin. If you miss a dose, apply it as soon as you remember, but do not double the application if it is nearly time for the next one. Consistent use is important, and desired results may take several weeks to become noticeable.

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Warnings and Precautions:

- Monitor for signs of copper overload with prolonged systemic use.
 - Photosensitivity/photoprotection: Routine scalp photoprotection is sensible in AGA; melatonin is antioxidant but not a sunscreen.
 - Sensitive/eczema-prone scalp: start with lowest strengths and cream/serum vehicles; increase frequency gradually.
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Adverse Reactions:

Common:

- Mild skin irritation
- Transient erythema
- Burning/tinging at application site
- Dryness

Rare:

- Nausea
 - Dizziness
 - Contact dermatitis
 - Transient headache
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Interactions:

- Chelating agents (e.g., EDTA) may reduce GHK-Cu effectiveness
 - Avoid combining with high-dose zinc (competes with copper binding)
 - Other active topicals (retinoids/strong acids/alcohol-heavy sprays): may increase irritation—stagger use.
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Use in Specific Populations:

- Pregnancy: Avoid during pregnancy/lactation
 - Pediatrics: Avoid systemic use; topical use unstudied
 - Geriatrics: Frequently used for anti-aging benefit
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Storage:

- Store in original container at room temperature (up to 30°C or 86°F)
 - Store in a cool dry place away from heat, sunlight, and moisture
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Monitoring Parameters:

- Skin/hair response over 8–12 weeks
 - Safety/tolerability: ask about irritation, pruritus, scaling; adjust vehicle/strength or frequency as needed
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Citations:

1. Dou Y, Lee A, Zhu L, Morton J, Ladiges W. The potential of GHK as an anti-aging peptide. *Aging Pathobiol Ther.* 2020;2(1):58-61. doi:10.31491/apt.2020.03.014
 2. 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. doi: 10.1155/2015/648108. Epub 2015 Jul 7. PMID: 26236730; PMCID: PMC4508379.
 3. Tawanwongsri W, Eden C. Melatonin for hair regrowth: Preclinical insights, current evidence, and future perspectives. *Electron J Gen Med.* 2025;22(4):em669. doi:10.29333/ejgm/16520
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