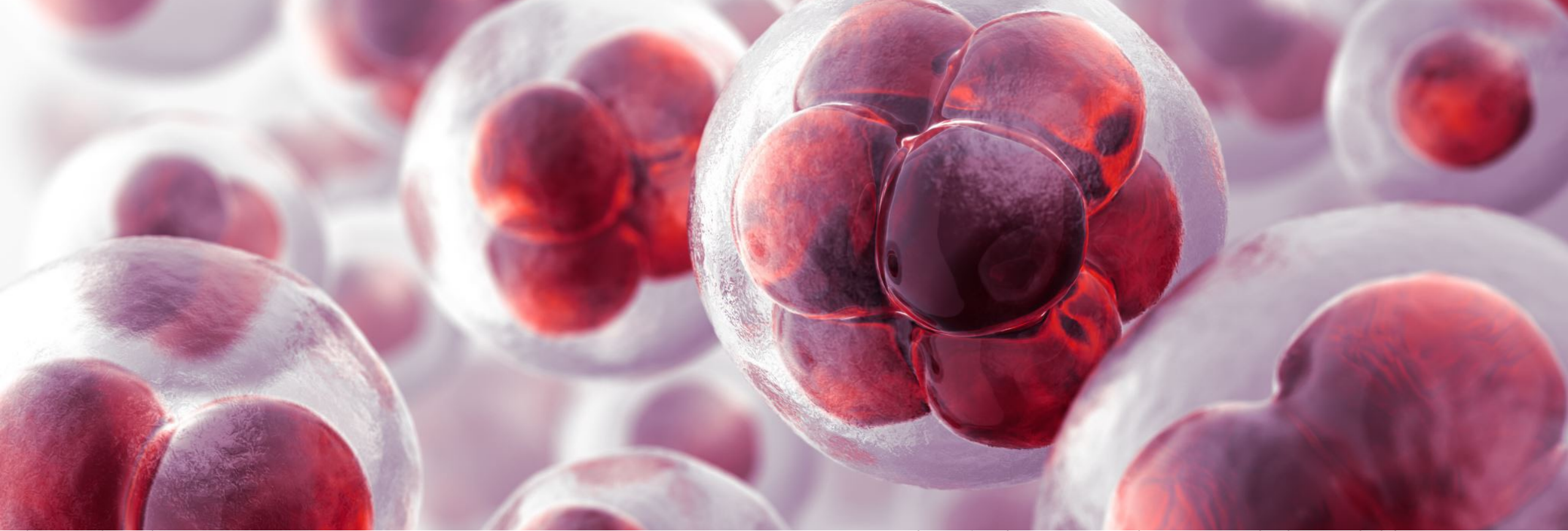




Peptides and Ozone Therapy for Optimizing Patient Outcomes

Lexi Yoo, APRN, FNP-BC, CPNP

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About Me

Double Boarded Family Practice and Pediatrics

SSRP Peptide Certification

A4M (Age Management Medicine Group) Peptide Certification

AMMG Peptide Certification

Functional Medicine Training: IFM (Institute for Functional Medicine)

Biote Mentor/Proctor in Biote Hormone Replacement Therapy Method

American Academy of Anti-aging – Aesthetic Fellow

Galderma Aesthetics Injector Network Trainer

Member of American Academy of Facial Esthetics

National Speaker and Trainer



Objectives

- **Grasp Peptide Therapy in Regeneration and Aesthetics:** Understand peptide therapy's role in tissue repair, regeneration, aesthetics, and distinguish between various peptide types.
- **Review BPC-157, GHK-Cu, and Thymosin Beta-4.** Evaluate how these peptides aid tissue healing, collagen synthesis, and tissue rejuvenation.
- **Explore Peptides and Ozone in Aesthetics:** Learn how peptides like BPC-157, GHK-Cu, and Thymosin Beta-4 tackle aging and hair loss for improved skin, wound acceleration, stretch marks and acne scarring.
- **Examine Peptides and Ozone in Aesthetics:** Study ozone's role in skin health, collagen stimulation, and its potential in managing autoimmune conditions.
- **Apply Peptides and Ozone Clinically:** Develop strategies for integrating peptide therapy and ozone treatment in regenerative medicine and aesthetics, covering dosing, safety, and synergies.

Functions of Peptides

Acting as
hormones

Fighting against
effects of aging

Regeneration

Regulating
appetite,
digestion and
metabolism

Reducing
inflammation

Acting as
antioxidants to
scavenge free
radicals

Delivering
messages from
tissue to blood

Providing
structure to
muscle and
bone

Signaling
Molecules

Antimicrobial

Critical in many
biological
functions

Benefits of Ozone

Works great in combination with majority of therapies

Quick with minimal side effects

Decreases inflammation

Antiviral, Antifungal, Antibacterial

Peptides for Regeneration

BPC-157

**Thymosin
Beta-4**

GHK-Cu

BPC-157 Discovery

BPC-157 is a 15 amino acid peptide

BPC-157 is an acronym for 'Body Protection Compound'

In 1904, Dr Ivan Pavlov initially discovered using gastric juices for healing

Won Nobel Peace Prize

In 1993, BPC-157 was discovered in gastric juices

BPC-157

Found to have significant anti-inflammatory actions

Promotes tissue healing through signaling pathways

Used to treat dyspepsia, gastritis, heartburn, diarrhea, constipation, poor appetite and anemia

MSK injuries: joint, tendon, ligament tor bone

Topical: used to health burns, injuries and scars

BPC-157 Healing Properties

Repair

- Ligament & Tendons

Repair

- Muscle/Nerve

Repair

- Bone Fractures

Repair

- Teeth

Repair

- Cornea

Repair

- Brain in TBI

Reduce

- Neuroinflammation

BPC-157

Mechanism of Action

Increase nitric oxide

Stimulate expression of early growth response 1 gene – responsible for cytokine and growth factor generation and early extracellular matrix (collagen) formation

BPC-157 NASAL SPRAY /SYNAPSIN (100MG/ML)
(for neurocognitive function)

BPC-157 Dosing & Side Effects

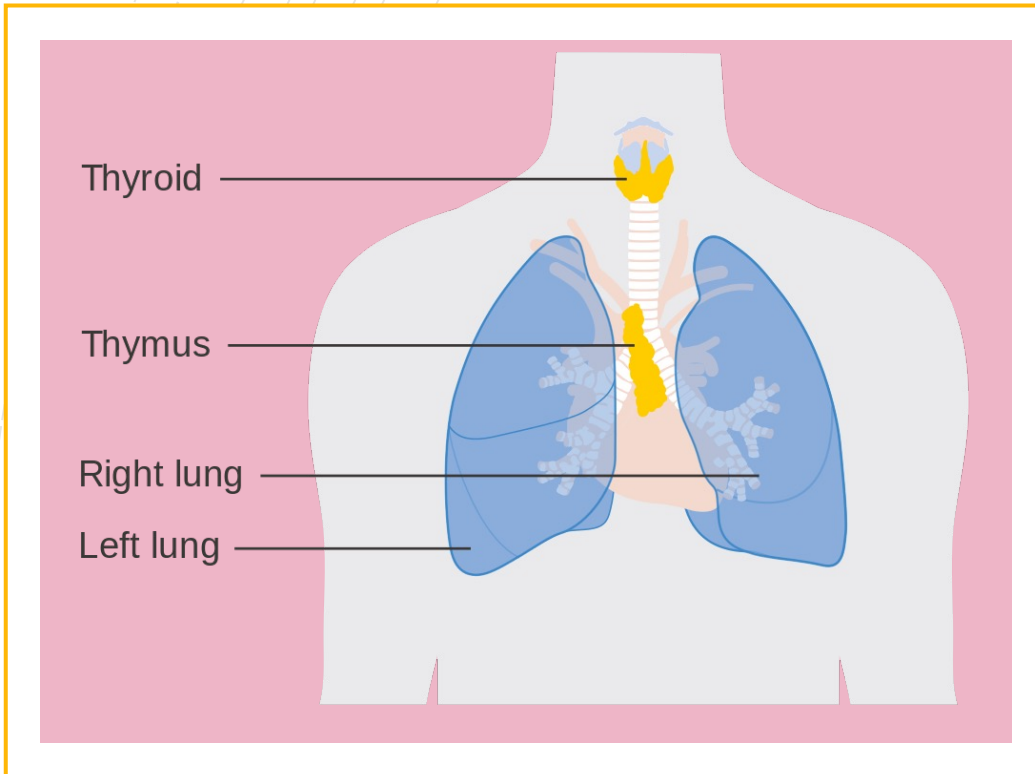
Tissue Repair Dosing

- 2000mcg/mL
 - 0.25mL (500mcg) SQ QD near affected area
 - 0.10mL (200mcg) SQ BID near affected area

INJECTION Side Effects

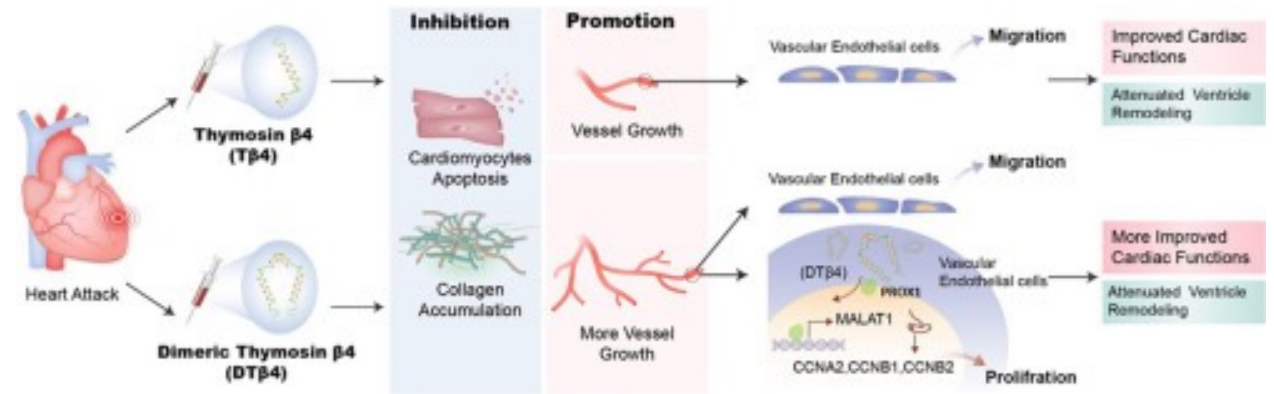
- Redness and swelling, but not common

Thymosin Beta-4



- 43 amino acid sequence encoded by gene TMSBX4
- Produced in the Thymus gland
- Present in all human cells
- Naturally found in higher concentrations in tissue damaged areas
- Innate peptide that is released in our body in response to injury

Thymosin Beta-4



- The Thymosins, including TA1 and TB4, are a family of biologically active peptides with hormone-like properties
- Significant role in:
 - Repair
 - Immunity

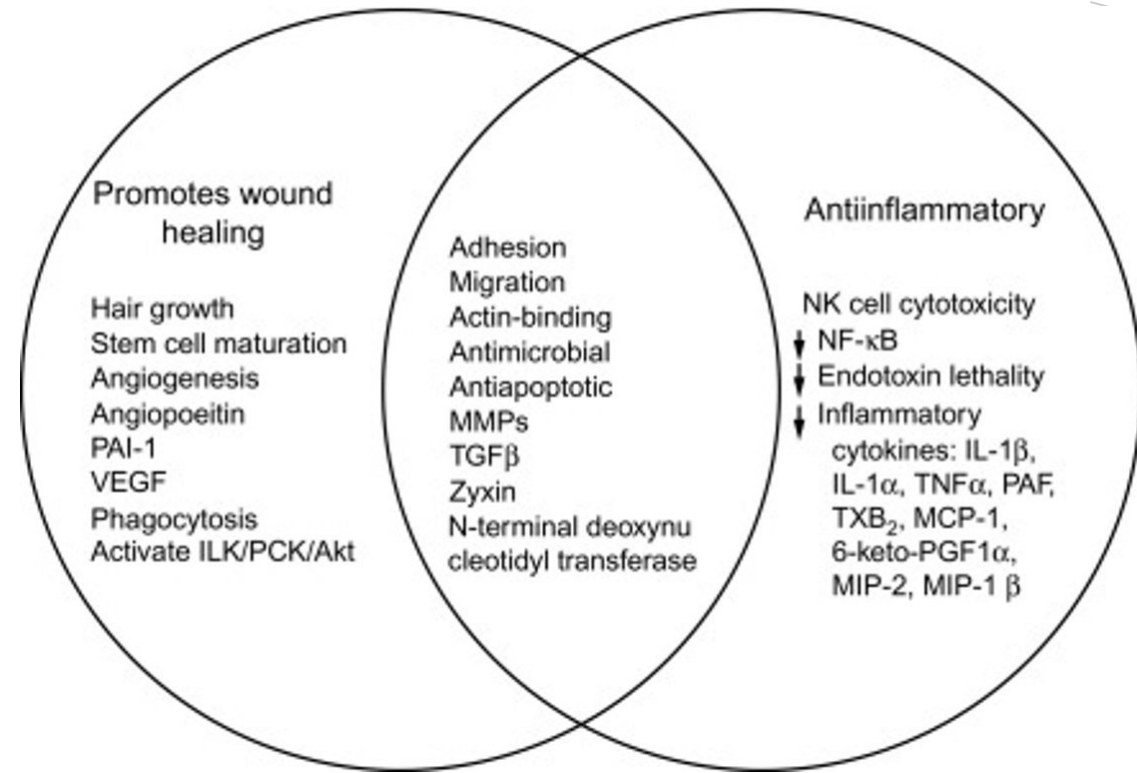
Thymosin Beta-4: Clinical Effects

- Promotes rapid wound healing with little to no scarring
- Enhances collagen deposition
- Works at cellular level supporting tissue stem cells to heal and regenerate injured tissue

**WORKS IN MUSCLES
TO PROTECT
AGAINST
SARCOPENIA AS
WELL AS POST MI**

**PROMOTES
ANGIOGENESIS AND
DIFFERENTIATION
OF ENDOTHELIAL
CELLS**

Thymosin Beta-4: Therapeutic Uses



Chronic inflammation

Soft tissue injury

Wound healing

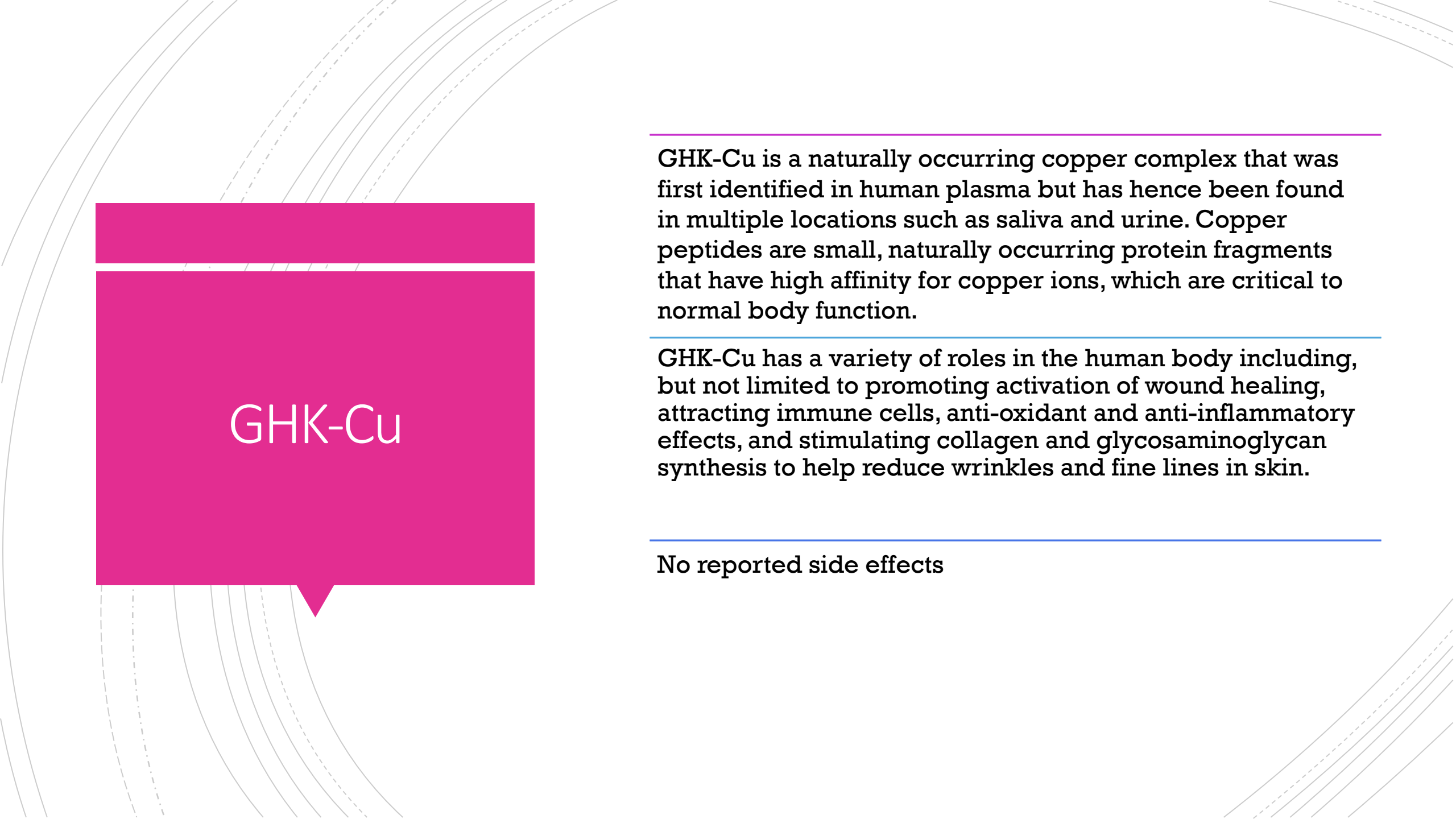
Sarcopenia

Enhance collagen deposition

Reduce acute and chronic pain

Promoting hair growth

Protected restore neurons post traumatic brain injury.



GHK-Cu

GHK-Cu is a naturally occurring copper complex that was first identified in human plasma but has hence been found in multiple locations such as saliva and urine. Copper peptides are small, naturally occurring protein fragments that have high affinity for copper ions, which are critical to normal body function.

GHK-Cu has a variety of roles in the human body including, but not limited to promoting activation of wound healing, attracting immune cells, anti-oxidant and anti-inflammatory effects, and stimulating collagen and glycosaminoglycan synthesis to help reduce wrinkles and fine lines in skin.

No reported side effects

How Does GHK-Cu Work?



GHK-Cu acts directly on fibroblasts by increasing production of mRNA and protein for collagen, elastin, proteoglycans, glycosaminoglycans, and decorin; all of which are critical components in tissue repair and maintenance.



Further, it acts to stimulate the production of metalloproteases and protease inhibitors which function to remove damaged tissue proteins.



Together these functions increase the function of the cellular machinery and scaffolding to initiate repair and healthier tissue.

GHK-CU Benefits



Improves healing of many types of wounds and reduce infections



- Act as an anti-inflammatory to reduce pain
- Help prevent and correct hair loss
- Improve skin collagen by 70%
- Reduce fine lines and wrinkles by 35%



- Help heal nerves and reduce certain types of nerve pain



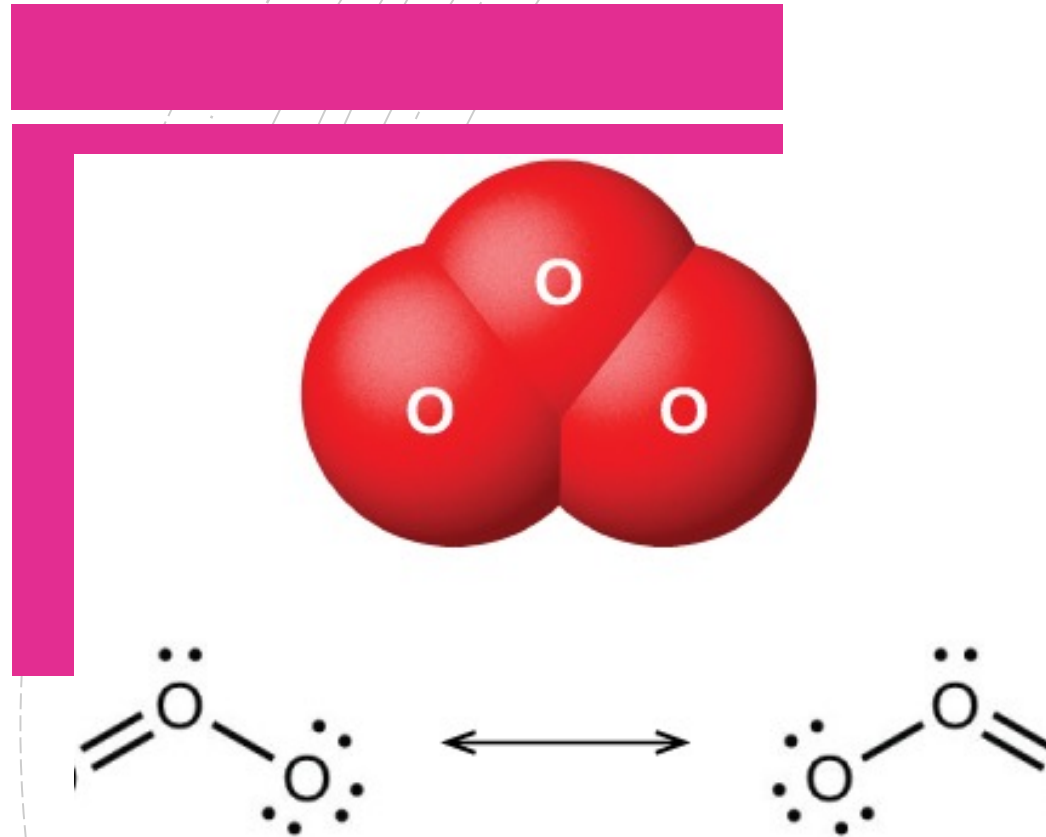
- Protect the lungs from liver fibrosis - Used as an anti-cancer therapy.

GHK-CU INJECTION Dosing

GHK-CU INJECTION:
1-2 MG daily for 6-
week intervals

Can be utilized 3-4 x
a year

What is Ozone ?



- Ozone is a form of oxygen
- Molecular O₃ vs oxygen we breathe is O₂
- 3 oxygen atoms
 - Very unstable
 - Created by the passage of oxygen O₂ through a high voltage potential resulting in the attachment and formation of a third oxygen atom
- Created naturally when lightening strikes the air

Ozone Mechanism of Action

Antibacterial-disrupts integrity of bacterial cell

Antiviral-interrupts reproductive cycle

Antifungal-inhibits cell growth

Vasodilation

Stimulates ATP production (increases RBC glycolysis)

Increases amount of O₂ released to tissues

Creates lipo-peroxides that work locally and systemically

The background of the slide features several thin, curved lines in a light gray color, some solid and some dashed, creating a modern, abstract design. A large magenta speech bubble is positioned on the left side, containing the main title.

How do we use them in Aesthetics

- Clearing out infections
- Scar treatments
- Wound healing
- Stretch marks
- Hair Restoration
- Acne scars
- Improving skin texture, tone, and collagen

Ozone in Wounds

- Ozone can accelerate the healing process of wounds.
Enhances tissue regeneration and recovery.
Reduction of Microbial Infection
- Ozone has antimicrobial properties help prevent infections.
Effective against a wide range of microbes.
Debridement Effect
- Assists in removing dead tissue from wounds
Facilitates a cleaner wound environment for healing,
improving the modulation of Inflammatory Phase
- Ozone helps regulate the inflammatory response.
Supports a balanced healing process. Helps in stimulation of
Angiogenesis
- Promotes the growth of new blood vessels.
Enhances blood supply to the wound area for faster healing.
Biological and Enzymatic Reactions

Scars

- Scars are a result from the natural process of tissue repair after an injury, where collagen fibers replace damaged skin

Before

After



Treatment

Ozone injections
Peptide: Thymosin Beta 4, BPC157,
Ghk-Cu

Before

After



Treatment

Ozone injections
Peptide: Thymosin Beta 4, BPC157,
Ghk-Cu

Scar treatment:

DOSING:

5MG GHKC-CU (0.5ML)

1500MCG TB4 (0.5ML)

1000MCG BPC 157 (0.5ml)

20 Gamma of Ozone

Before

After



Treatment

#2

Ozone injections

**Peptide: Thymosin Beta 4, BPC157,
Ghk-Cu**

Before

After



Treatment

#2

Ozone injections

**Peptide: Thymosin Beta 4, BPC157,
Ghk-Cu**

Scar treatment:

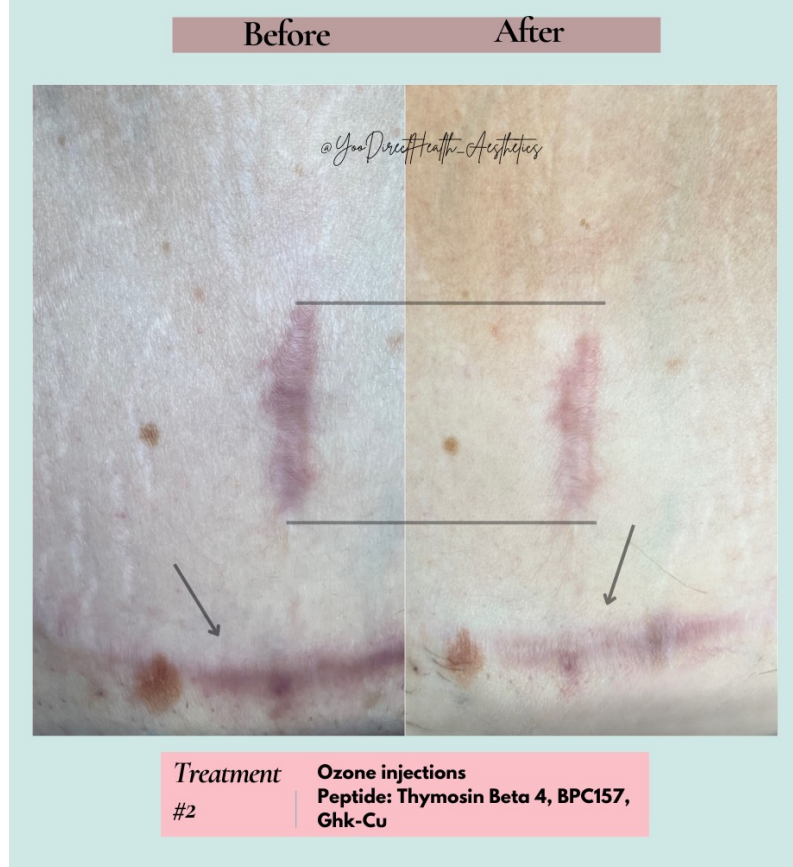
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5MG GHKC-CU (0.5ML)

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20 Gamma of Ozone



Scar treatment:

DOSING:
 5MG GHKC-CU (0.5ML)
 1500MCG TB4 (0.5ML)
 1000MCG BPC 157 (0.5ml)
 20 Gamma of Ozone

Ozone and Peptides

Clinical Case study:

Patient is a 40-year-old female who presents to the office with ulcerations and skin peeling to the upper and lower lips. She was seen by multiple specialties to include dermatology, and otolaryngology. Lab findings were inconclusive for multiple difference to include- HSV, impetigo, granulomatous cheilitis. She was placed on multiple rounds of antibiotics, anti-virals and antifungals, as well as topicals to include a steroid cream by allopathic medicine. Patient also had steroid injections directly into the lips with out relief.

I worked up the patient for underlying autoimmune conditions with minimal positive results, while we were waiting to refer to rheumatology!

Blood panel plus INFLAMMATORY MARKERS were drawn to track progress.

Results:

12/8/22- HS-CRP: 7.70

01/30/22- HS-CRP: 0.9.

IV STANDARD Ozone

BEFORE



AFTER



@YooDirectHealth_Aesthetics

Ozone and Peptides

Amlexanox: dosing protocol 40mg po tid

MOA: Amlexanox is an anti-allergic agent that has been shown to inhibit histamine release from mast cells.

The mechanism of this inhibition involves the acceleration of cyclic adenosine monophosphate (cAMP) generation and the inhibition of phosphodiesterase in mast cells.

Increased cAMP content within mast cells inhibits histamine release, a key mediator of allergic responses.

6 STANDARD OZONE UBI Treatments

@YooDirectHealth_Aesthetics

DOSING PROTOCOL:

TREATMENT 1- 4,200MCG OF OZONE

TREATMENT 2- 8,400MCG OF OZONE

TREATMENT 3- 12,600MCG OF OZONE

TREATMENT 4- 12,600MCG OF OZONE

TREATMENT 5- 12,600MCG OF OZONE

TREATMENT 6- 12,600MCG OF OZONE

6 STANDARD OZONE UBI Treatments

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BEFORE

		01/30/2023	12/08/2022
☐ C-REACTIVE PROTEIN (CRP), HIGH SENSITIVITY	<3.01mg/L	0.90 01/30/2023	7.70 12/08/2022
☐ ERYTHROCYTE SEDIMENTATION RATE (ESR), AUTOMATED	<26mm/hr	3 01/30/2023	3 12/08/2022

AFTER

HIGH SENSITIVE
CRP- REDUCE BY 6.8 MG/L
AFTER 6 TREATMENTS OF IV
OZONE IN JUST 6 WEEKS

Peptide Options

Hair Loss



Causes of Hair Loss

Hereditary hair loss. Both men and women develop this type of hair loss, which is the most common cause of hair loss worldwide

Age decline

Alopecia areata

Childbirth, illness, or other stressors

Hair care (traction)- braids, extensions

Hairstyle pulls on your scalp

Hormonal imbalance

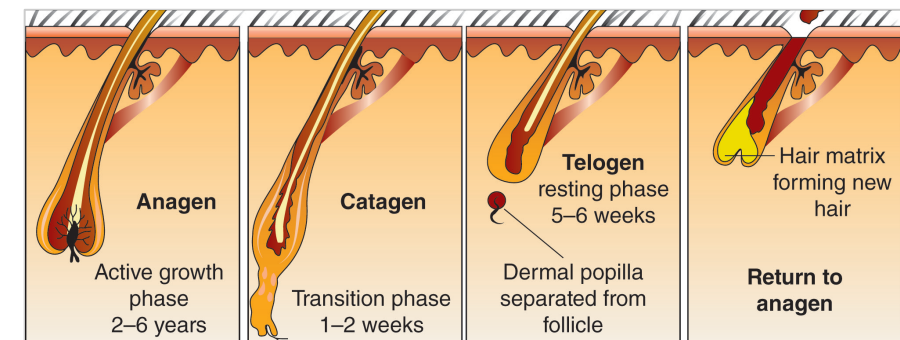
Thyroid dysfunction

Scalp infection



GHK-CU FOR Hair loss

- Restores replicative vitality to fibroblasts after radiation therapy
- Skin regeneration- Effects in cosmetic products
- Hair Growth
- Reduce fine lines and wrinkles
- Reduce photo damage and hyperpigmentation
- Reduce inflammation and free radical damage
- Increase hair growth and thickness, enlarge hair follicle size
- Superior to minoxidil
- No rebound loss



Int J Mol Sci. 2018 Jul; 19(7): 1987.
Published online 2018 Jul 7. doi: [10.3390/ijms19071987](https://doi.org/10.3390/ijms19071987)

PMCID: PMC6073405
PMID: [29986520](https://pubmed.ncbi.nlm.nih.gov/29986520/)

Regenerative and Protective Actions of the GHK-Cu Peptide in the Light of the New Gene Data

Loren Pickart and Anna Margolina*

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Pickart, L., & Margolina, A. (2018). Regenerative and Protective Actions of the GHK-Cu Peptide in the Light of the New Gene Data. *International journal of molecular sciences*, 19(7), 1987. <https://doi.org/10.3390/ijms19071987>

Hair Restoration Peptide Dosing

DOSING:

- 5MG GHKC-CU
- 1500MCG TB4
- 1000MCG BPC 157
- In combo with PRF or Autologous Growth Factors

At home:

- PTD-DM +VP acid spray qhs
- Ghk-Cu + Zinc Thymulin

Acne Scars

BPC-157

TB4

GHK-CU

OZONE

PROCAINE





Questions

- Podcast for more info: The Better Yoo Project: Optimizing Health, Hormones and Aesthetics