

Biotinyl-GHK, citrus and olive tree leaves

Function:

Fights follicle ageing and protects against hair loss.

Definition:

Combination of a vitamin fortified matrikine™ (biotinyl-GHK) with apigenin (a flavonoid from citrus) and oleanolic acid from olive tree leaves.

Properties:

PROCAPIL™ targets the main causes of alopecia: poor scalp micro-circulation, follicle ageing and follicle atrophy caused by dihydrotestosterone.

Characteristics:

Biotinyl-GHK stimulates cell metabolism, apigenin improves micro-circulation and oleanolic acid inhibits 5 α -reductase.

INCI name:

Butylene Glycol – Water (Aqua)
– PPG-26-Buteth-26 –
PEG-40 Hydrogenated Castor Oil
– Apigenin – Oleanolic Acid
– Biotinoyl Tripeptide-1

Applications:

Hair care products: shampoos, conditioners, leave-on, hair lotions, masks...

Formulation:

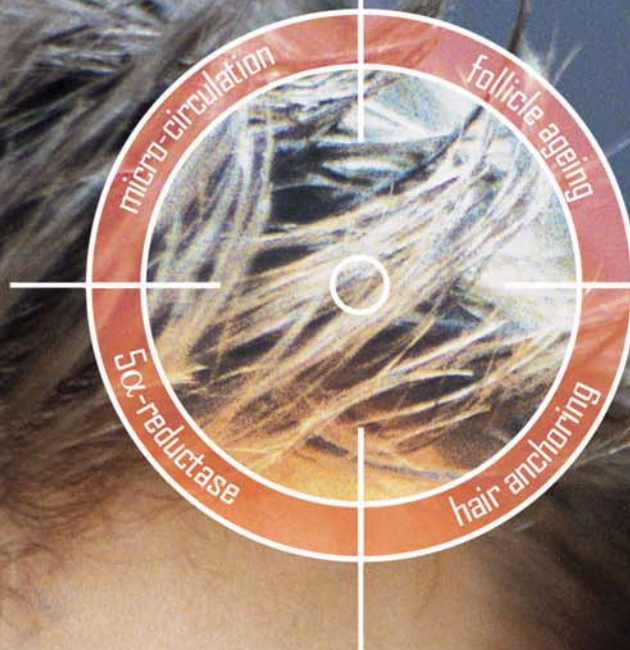
Water soluble.

Incorporate at 45°C in emulsions or at room temperature in gels.

Recommended use level:

1% to 2%

Don't let your hair down



Fortifies
Rejuvenates
Fights against hair loss



Stimulation of cell metabolism

- **Mitosis rate**

Evaluation of root sheath keratinocytes after a 14-day culture of hair follicles. Biotinyl-GHK (2 ppm) stimulates Ki-67 expression, indicating enhanced cell proliferation.

- **Gene expression**

PROCAPIL™ promotes the expression of numerous genes involved in tissue repair mechanisms (DNA-array on 3D SkinEthic® epidermis).

- **Hair anchoring**

Hair follicles are incubated for 14 days with biotinyl-GHK (2 ppm).

Morphological observation of the dermis/root sheath junction.

The persisting dermis/root sheath junction is thick and recovers its normal sinusoidal shape.

Laminin 5 and collagen IV are revealed by immunofluorescence.

PROCAPIL™ provides a protecting and repairing effect on the structure components of the hair follicle, slowing down the ageing process.

- **Stimulation of hair growth**

Hair follicles are incubated for 14 days with biotinyl-GHK or minoxidil (2 ppm).

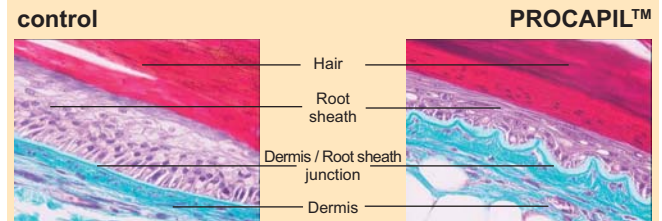
Biotinyl-GHK is as efficient as minoxidil at the same concentration (2 ppm).

In vitro

Examples of activated genes by PROCAPIL™

Gene	Activity	Activation
Laminin binding protein	Adhesion	+146%
Acetyl CoA transferase	Cell metabolism	+137%
Cytokeratins 10	Differentiation	+154%

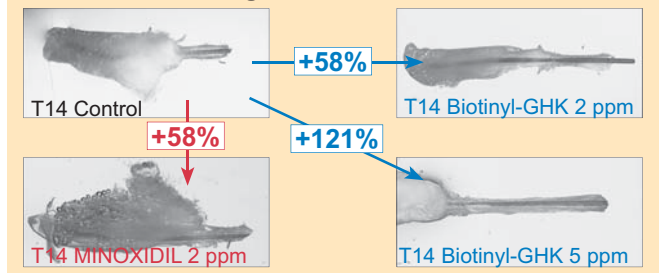
Morphological observation



Presence of adhesion molecules

Adhesion molecules	T14 Control	T14 PROCAPIL™
Laminin 5	+	+++
Collagen IV	+	+++

Hair growth stimulation



Clinical study

Panel of 35 males with alopecia (Tmean=28%) applied a hair lotion with 3% PROCAPIL™ (18 volunteers) or a placebo (17 volunteers) twice daily for 4 months. The proportion of hair observed in anagen phase (A) and telogen phase (T) was determined and the ratio A/T established. Hair samples were taken and analysed.

- **Videotrichogramme**

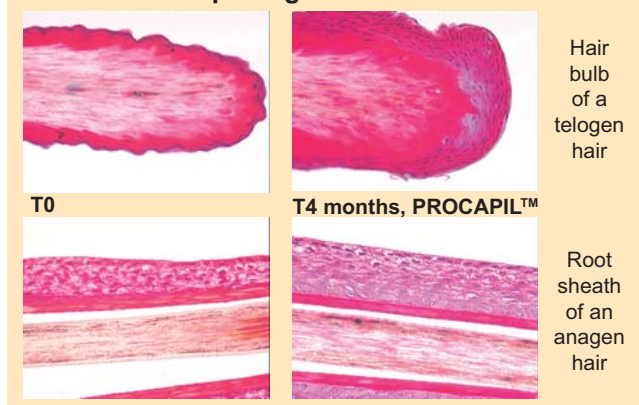
A/T (Mean value)	PROCAPIL™	PLACEBO
T0	2.84	2.61
T4months	3.13	2.54

The A/T ratio increases significantly by up to 46%, compared to T0 and the placebo. With PROCAPIL™, **67% of the volunteers had their anagen hair number increased.**

- **Hair follicle morphological study**

After treatment, hair bulb cells were found to be highly structured and differentiated. The root sheath was thicker and more able to provide optimum anchoring.

Morphological observation



Hair anti-ageing can be promoted by stimulation of follicle cell metabolism, leading to a slow down in hair loss.

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