



Biotinyl-GHK, citrus and loveley hemsleya

Function:

Fights follicle ageing process to prevent hair loss.

Definition:

Combination of a vitaminated matrikine (biotinyl-GHK) with apigenin (a flavonoid from citrus) and oleanolic acid from *loveley hemsleya* root.

Properties:

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

Characteristics:

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

INCI name:

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

Applications:

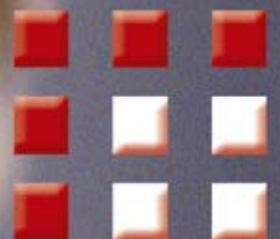
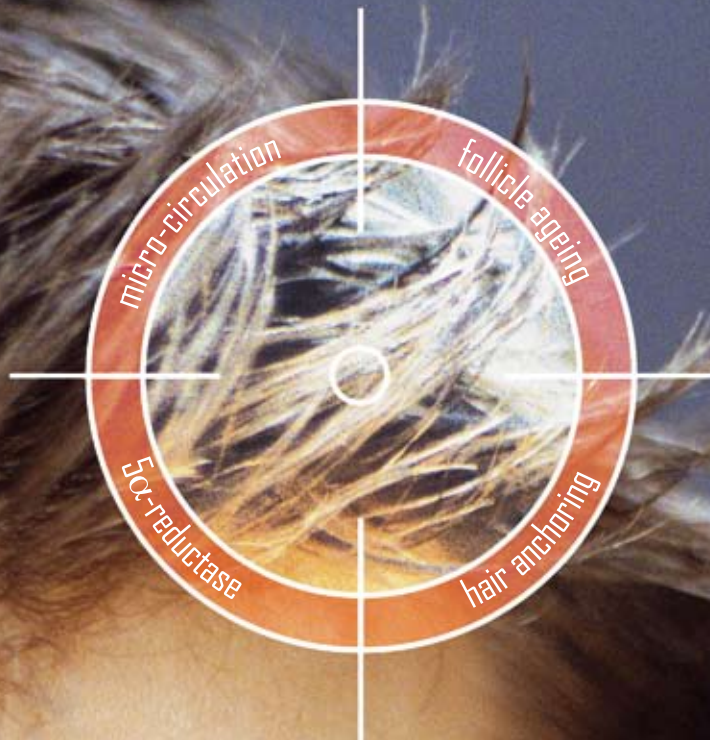
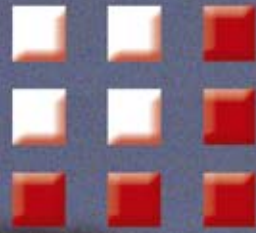
Hair strengthening and anti-hair loss treatments: lotions, conditioners, leave-on products...

Formulation:

Water soluble

Recommended use level:

3%



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).

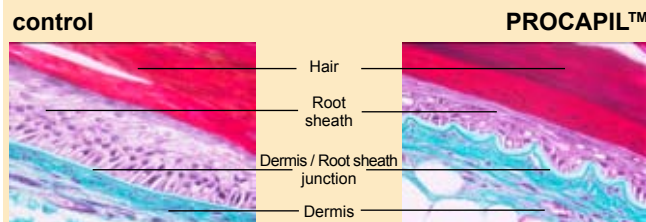
Biotinyl-GHK is as efficient as minoxidil at the same concentration (2 ppm).

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%

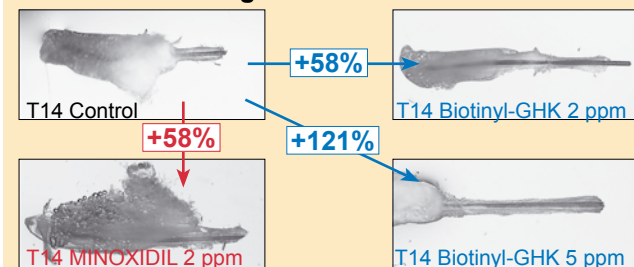
Morphological observation



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

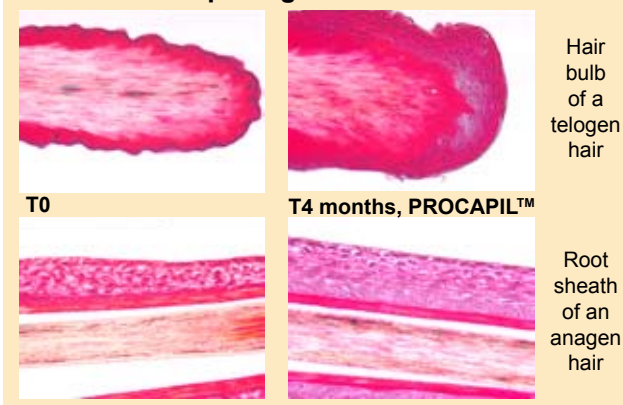
A/T (Mean value)	PROCAPIL™	PLACEBO
T0	2.84	2.61
T4months	3.13	2.54

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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