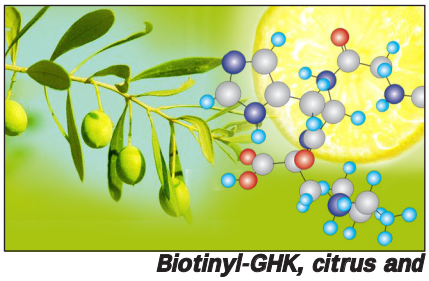
HAIR

Patent n° WO 00/58347

PROCAPIL™



Biotinyl-GHK, citrus and olive tree leaves

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 olive tree leaves.

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

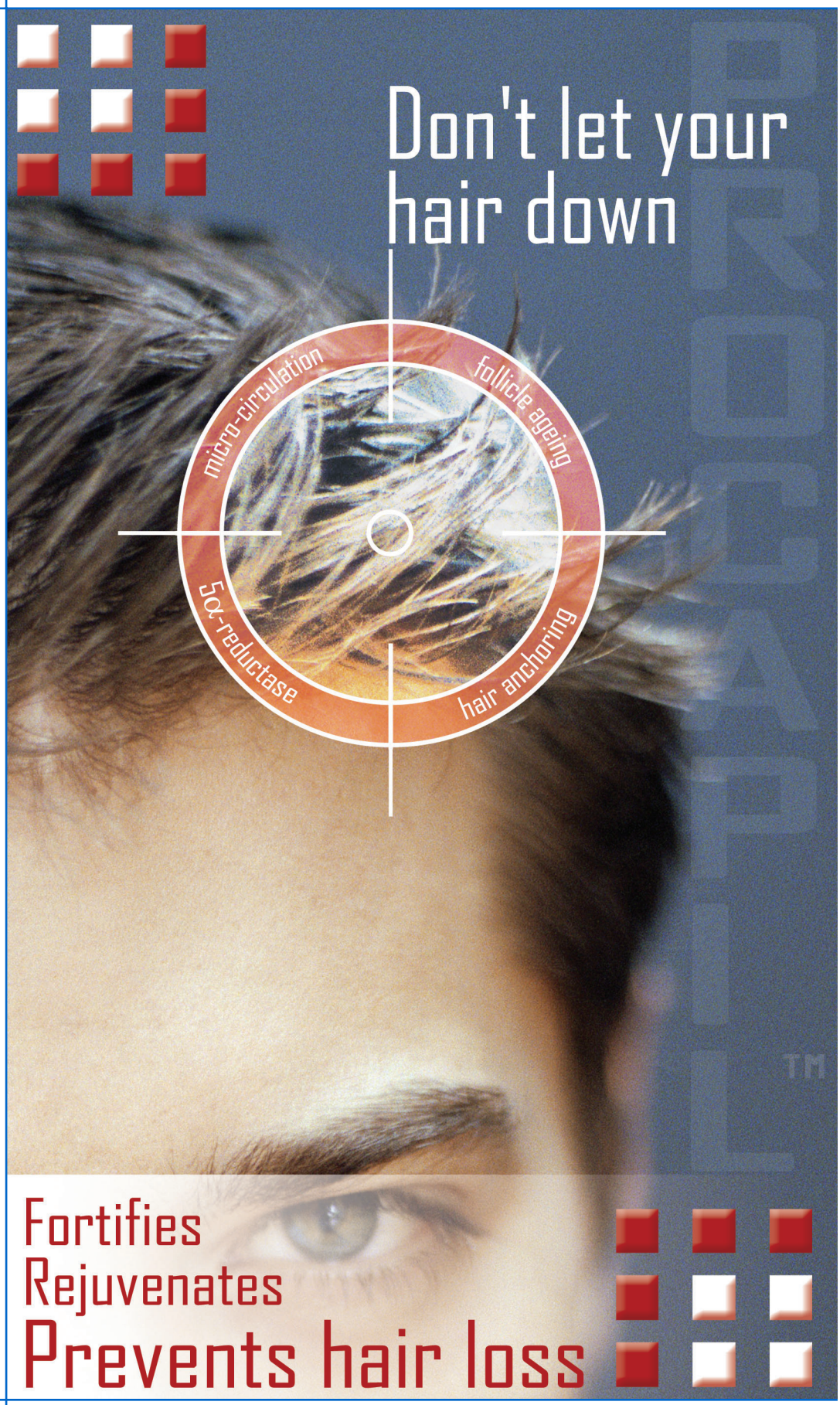
Characteristics:
Oleanolic acid inhibits 5α-reductase, apigenin improves micro-circulation and biotinyl-GHK stimulates cell metabolism.

INCI name:
Butylene Glycol - Water (Aqua) - PPG-26-Buteth-26 - PEG-40 Hydrogenated Castor Oil - Apigenin - Oleanolic Acid - Biotinyl Tripeptide-1

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

Formulation:
Water soluble

Recommended use level:
3%



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CLAIM SUBSTANTIATION

April 2004

Stimulation of cell metabolism

- **Mitosis rate**

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

- **Gene expression**

  PROCAPIL™ activates 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 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 for the different structures of the hair follicle, slowing down the ageing process.

- **Stimulation of hair growth**

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

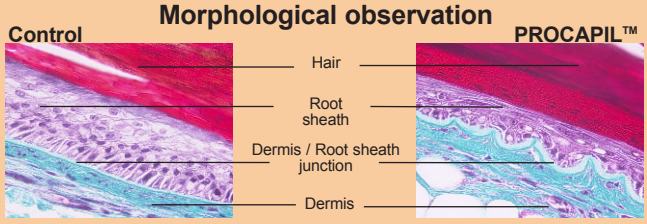
  Using the same concentration, biotinyl-GHK is as efficient as minoxidil.

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%**

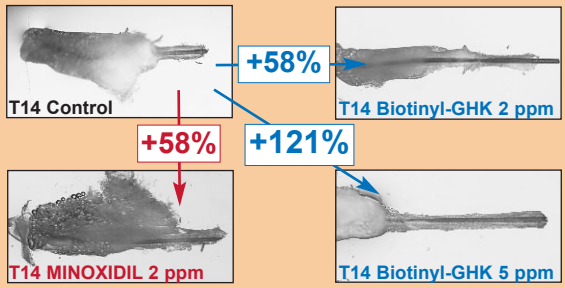
Morphological observation



Presence of adhesion molecules

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

Hair growth stimulation



Clinical study

35 male volunteers with alopecia (T_{mean}=28%) applied a hair lotion with 3% PROCAPIL™ (18 volunteers) or a placebo (17 volunteers) for 4 months. The proportion of hair in anagen phase (A) and telogen phase (T) has been evaluated and the ratio A/T measured. Hair samples are taken and analysed.

- **Videotrichogramme**

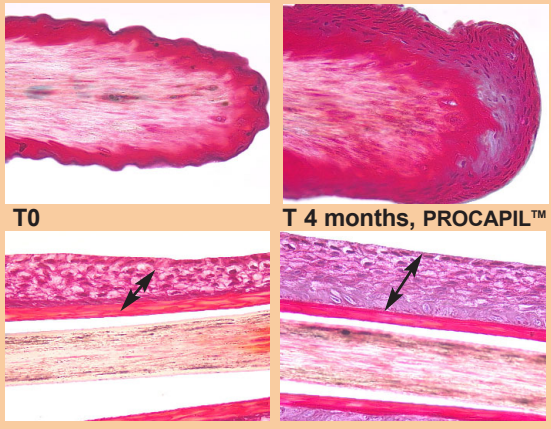
A/T (Mean value)	PROCAPIL™	PLACEBO
T0	2.84	2.61
T4months	**3.13**	2.54

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

- **Hair follicle morphological study**

  After treatment, hair bulb cells are highly structured and differenciated. The root sheath is thicker and ensures optimum anchoring.

Morphological observations



Hair anti-ageing, promoted by stimulation of the follicle cell metabolism, leads to a slowdown in hair loss.

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