Lipoid Kosmetik

Sunflower PI Herbasome®

Liposomal Anti-Aging Concentrate

Description

The phospholipid PI (phosphatidylinositol) and its phosphorylated derivatives (phosphoinositides) play an important role in the biochemistry of cells as a key building block of cell membranes and as a second messenger system [1]. Many of these signaling pathways are directly linked to the process of skin aging such as the cellular defense mechanism to oxidative stress [2] and the aging of fibroblasts [3].

Based on the key role of PI in biochemical processes of the cell, Lipoid Kosmetik has developed a new anti-aging concentrate of liposomal PI from sunflower lecithin. By a gene expression analysis from NHDFs fibroblasts it could successfully be shown that the active ingredient Sunflower PI in Sunflower PI Herbasome synergistically influences the expression of key enzymes involved in the intrinsic (chronological) and extrinsic (photoaging) process of skin aging.

In detail, Sunflower PI Herbasome shows:

- Strong up-regulation (903%) of HAS2 expression (hyaluronic acid synthase), combined with a supportive down-regulation of the hyaluronidases HYAL1 and HYAL2. Both effects support a high level of hyaluronic acid in the skin, boosting skin hydration and indicating protection from chronological skin aging.

- Strong down-regulation of MMP1 expression (-49%), one of the key enzymes involved in UV-induced photo-aging and collagen breakdown.

Benefits

- Stimulates skin rejuvenation on a cellular level
- Protection of the dermis from age-related signs
- 100% natural
- Non-GMO sunflower lecithin
- Preservative-free, liquid
- China-INCI compliant

Gene expression analysis from NHDFs fibroblasts

- Real time qRT-PCR (reverse transcription polymerase chain reaction) was used to analyze the effect of Sunflower PI, the active substance in Sunflower PI Herbasome, on the expression of specific mRNAs target (MMP1, HAS1, HAS2, HAS3, HYAL1, HYAL2).
- Normal human dermal fibroblasts (NHDFs) were treated with an aqueous dispersion of the active lecithin fraction (0.04% in NaCl; corresponds to 0.2% Sunflower PI Herbasome) and NaCl control (0.0036%).
- Total RNAs were extracted after 24 h contact time.

Effect on hyaluronic acid synthesis and degradation

Skin aging is closely associated with the loss of skin moisture [4]. The key molecule involved in binding and retaining water in the skin is the glycosaminoglycan hyaluronic acid (HA, Fig. 1).

HA is synthesized by hyaluronic acid synthases (HAS), membrane bound enzymes that synthesize HA on the inner surface of the plasma membrane. There are three mammalian enzymes HAS1, HAS2 and HAS3, which synthesize HA chains of various length.

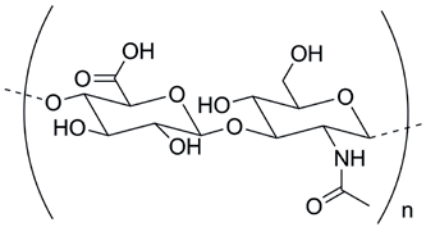

Fig. 1 Chemical structure of hyaluronic acid.

In the skin, HA has a half-life of less than one day as it is quickly degraded into fragments by hyaluronidases (HYAL). HYAL1 and HYAL2 constitute the major enzymes for HA degradation in somatic tissue [5].

Sunflower PI greatly stimulates HAS2 expression (Fig. 2), with a possible increase in in situ hyaluronic acid synthesis as an innovative strategy to boost skin hydration and firmness. This effect is synergistically supported by a decrease of the expression of HA-degrading hyaluronidases HAYL1 and HYAL2 (Fig. 3).

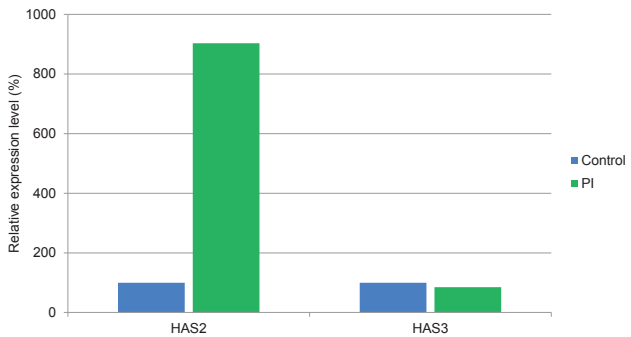

Fig. 2 Strong up-regulation of HAS2 expression (hyaluronic acid synthase)

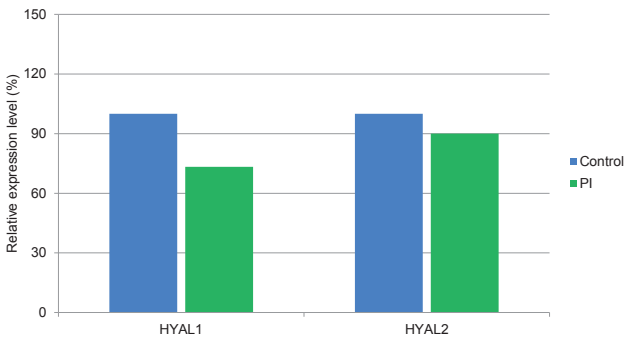

Fig. 3 Supportive down-regulation of hyaluronidases HYAL1 and HYAL2

in vitro Activity

Down-regulation of MMP1

An important role in UV-induced photo-aging is played by metalloproteinases (MMPs), a family of matrix-degrading enzymes that lead to the breakdown of collagen and other extracellular matrix proteins [6]. MMP1, also known as fibroblast collagenase, is the most highly expressed interstitial collagenase degrading fibrillar collagens [7].

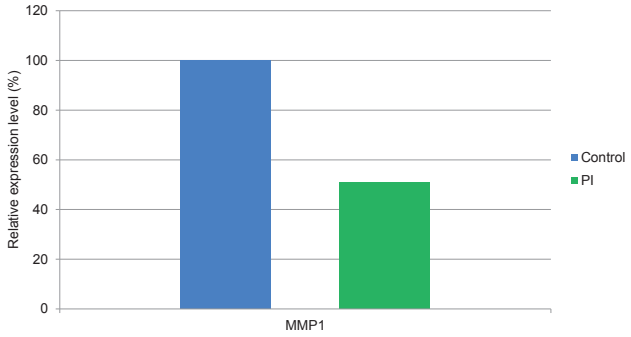

Fig. 4 Strong down-regulation of MMP1 expression

The active ingredient in Sunflower PI Herbasome was found to strongly down-regulate MMP1 expression by -49% (Fig. 4).

Frame Formulation

Phase	Ingredients	INCI	% W/W
A	SLM 2038	Aqua (Water), Caprylic/Capric Triglyceride, Hydrogenated Phosphatidylcholine, Pentylene Glycol, Glycerin, Butyrospermum Parkii (Shea) Butter, Squalane	25.00
B	Xanthan Gum	Xanthan Gum	0.10
	Glycerol	Glycerin	6.00
	Pentylene Glycol	Pentylene Glycol	3.75
	Water	Aqua (Water)	41.80
C	MCT	Caprylic/Capric Triglyceride	20.00
	Vitamin E-Acetate	Tocopheryl Acetate	1.00
	Carbomer	Carbomer	0.20
D	NaOH 20%		0.15
E	Sunflower PI Herbasome	Glycerin, Lecithin, Aqua (Water), Tocopherol, Sodium Chloride	2.00

Manufacturing Process

1. Heat phase A to 40 °C under stirring.
2. Mix Xanthan Gum with Glycerol and Pentylene Glycol. Add water and stir at 40 °C.
3. Add to phase A while stirring and keep temperature at 40 °C.
4. Combine ingredients of phase C at 40 °C and add to batch.
5. Homogenize batch intensively with an Ultra-Turrax at 40 °C. Neutralize batch with D whilst stirring. Stir to cool down and add E. Evacuate. Wait one day for final viscosity.

Applications and recommended use level

Sunflower PI Herbasome is designed for the use in skin care products, especially those to prevent and reduce signs of aging. It can easily be incorporated at the end of the process or directly be added to the water phase.

Recommended use level: 1-2%

INCI

US: Glycerin, Lecithin, Water, Tocopherol, Sodium Chloride
EU: Glycerin, Lecithin, Aqua, Tocopherol, Sodium Chloride

(Please refer to the proprietary composition declaration for up-to-date INCI listing.)

Safety and Regulatory

Compliant with REACH regulation (EC) No 1907/2006 and its amendments.

Literature

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4. Papakonstantinou, Eleni, Michael Roth, and George Karakiulakis. "Hyaluronic acid: A key molecule in skin aging." Dermato-endocrinology 4.3 (2012): 253-258.
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