

# Lipobrite™ HCA-4

## Skin Brightening Solution against signs of Photo-aging



### Lipobrite™ HCA-4

INCI : PEG-4 (and) Hydroxycinnamic Acid

CAS #: 112-60-7, 7400-08-0

EC #: 203-989-9, 231-000-0

**Skin brightening system consisting of a solution of pure Hydroxycinnamic Acid (HCA) designed to ensure its bioavailability to the skin.**

HCA is a potent anti-oxidant that is normally found in aloe and it is shown to exhibit protective effect on cells and biological tissues. It is stable to light and heat, and will not change color or odor when formulated in topically applied products. In a variety of in vitro, ex vivo and in vivo studies, Lipobrite™ HCA was shown to have the following properties:

- Tyrosinase inhibitor 5 times better than kojic acid in-vitro mushroom tyrosinase assay
- Exhibits significant reduction of human tyrosinase activity in pigmented human reconstructed epidermis
- Naturally-occurring compound with potent protection against free radicals
- Exhibits minimal metabolism in the skin
- Clinical improvements of skin tone, and appearance of age spots, facial redness, dark circles and freckles
- HCA can prevent appearance of UV-induced erythema and subsequent pigmentation in human skin<sup>[1]</sup>

### Reduces Appearance of Age Spots & Hyperpigmentation

### Antioxidant

### Improves Texture & Tone

### Naturally Occurring

### Recommended applications



Skin Care



Body Care



[1] Y.K. Seo, et. al., "Effects of p-coumaric acid on erythema and pigmentation of human skin exposed to ultraviolet radiation" Clin. and Exp. Derm., 36, 260-266 (2010)

Vantage

# Stability in formulation

The Lipobrite™ HCA4 system – a highly stable ingredient with no impact on color of formulation, unlike most skin brightening actives.

## No discoloration of ingredient

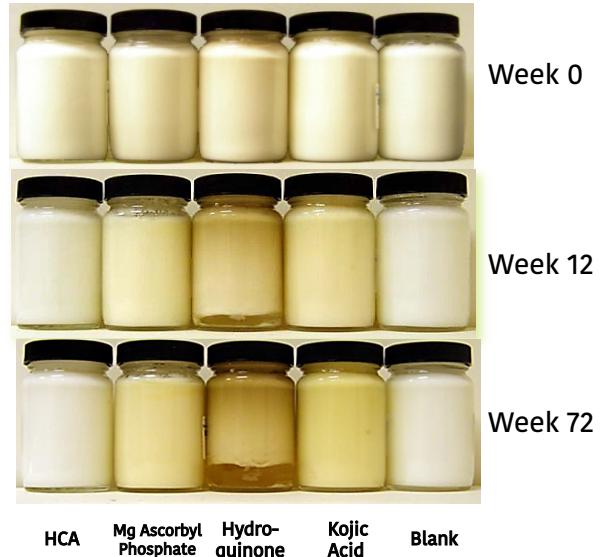
Unlike most skin brightening ingredients that are known to undergo discoloration, Lipobrite™ HCA4 exhibits a colorless to light yellow appearance that does not change with time.

## Light and heat stability

No degradation of HCA was observed in Lipobrite™ HCA4 by HPLC when samples were stored over 2 years

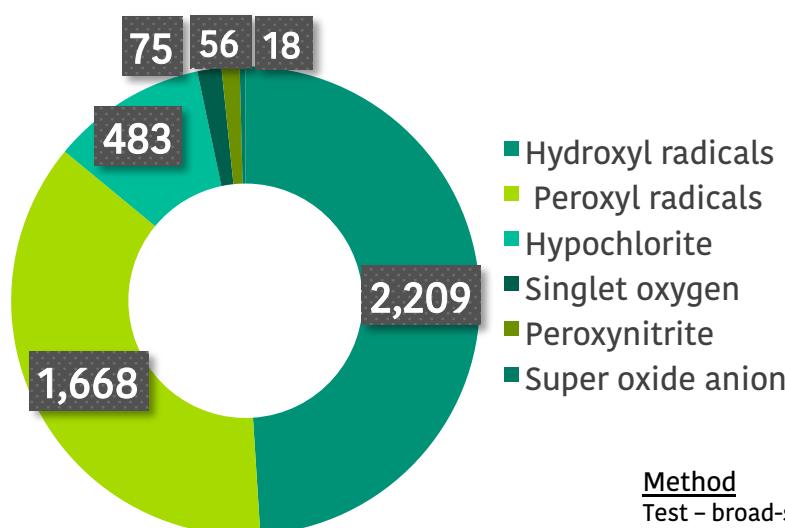
## No discoloration of formulations

Lipobrite™ HCA4 does not change the color of the formulations as was observed with other commonly used skin brightening ingredients



# Hydroxycinnamic acid – an effective anti-oxidant

HCA is an excellent anti-oxidant as seen by the high ORAC score.



### Method

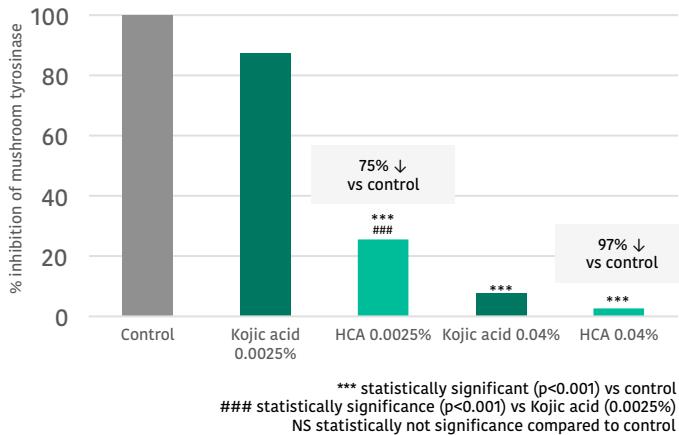
Test – broad-spectrum anti-oxidant analysis by comprehensive ORAC 6.0 assay

Measurement - antioxidant capacity against six primary reactive oxygen species peroxyl, hydroxyl, peroxynitrite, superoxide anion, singlet oxygen, and hypochlorite

Results in micromole Trolox Equivalency per gram (or milliliter) of a test material.

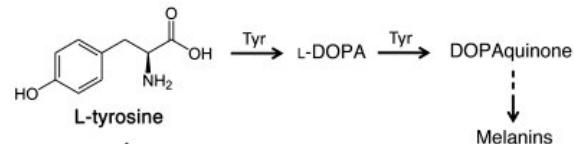
# Inhibition of Mushroom Tyrosinase

HCA inhibits mushroom tyrosinase by 97% and was more effective than Kojic acid



## Principle

Tyrosinase - key enzyme in the synthesis of melanin from Tyrosine



## Method

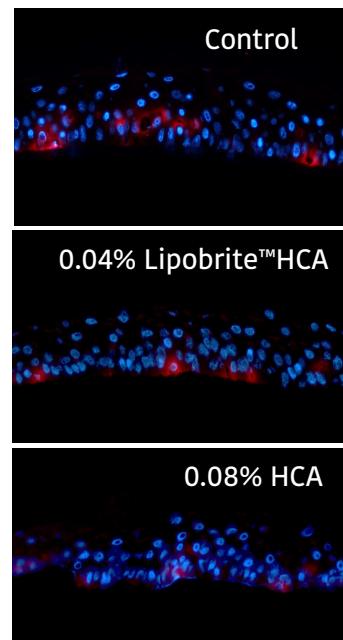
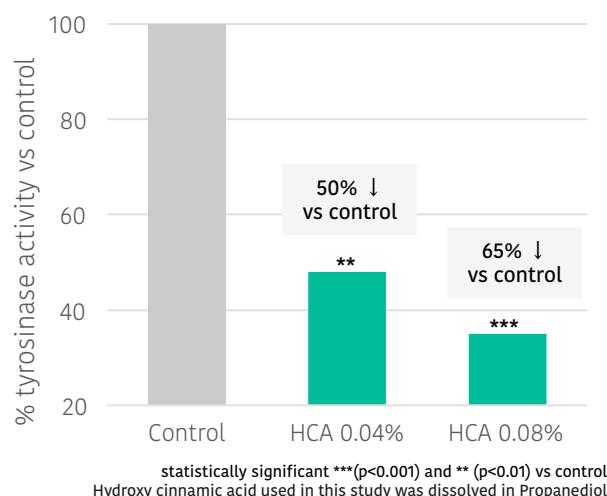
- Mushroom tyrosinase (Sigma, EC 1.14.18.1, activity 3960 units/mg) solution and the test compound or benchmark were mixed in a spectrophotometer cell using Phosphate buffer
- Test compound HCA (0.04% or 0.0025%) equivalent to Lipobrite™ HCA4 at 0.3% or 0.02% respectively
- Benchmark – Kojic acid (0.04% or 0.0025%)
- Equipment - UV-visible spectrophotometer
- Absorbance read continuously for 30 minutes.

# Inhibition of Human Tyrosinase

HCA inhibits Human tyrosinase in reconstructed human skin model by 65%

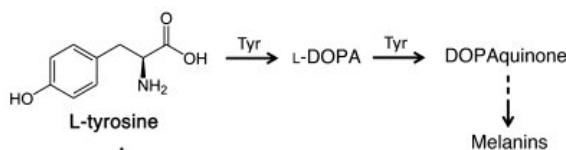
## Method

- Reconstructed human epidermis (RHE) were topically treated ( $n=3$ ) with 5 mg/cm<sup>2</sup> medium containing Hydroxycinnamic acid - 0.04 and 0.08% final concentration (equivalent to Lipobrite™ HCA4 at 0.3% or 0.6% respectively)
- Incubation period: 7 days with test compounds or no treatment (control).
- Method for image capture: Fluorescence intensity was measured by epifluorescence microscopy and values were normalized to the epidermal surface.
- RHE treated with HCA at all concentrations did not show any loss of viability



## Principle

Tyrosinase - key enzyme in the synthesis of melanin from Tyrosine



Fluorescence staining : Blue - DAPI Stain for cell nuclei. Red = Cy3 conjugated solution for tyrosinase activity.

# Lipobrite™ HCA-4

## Skin Brightening Solution against signs of Photo-aging

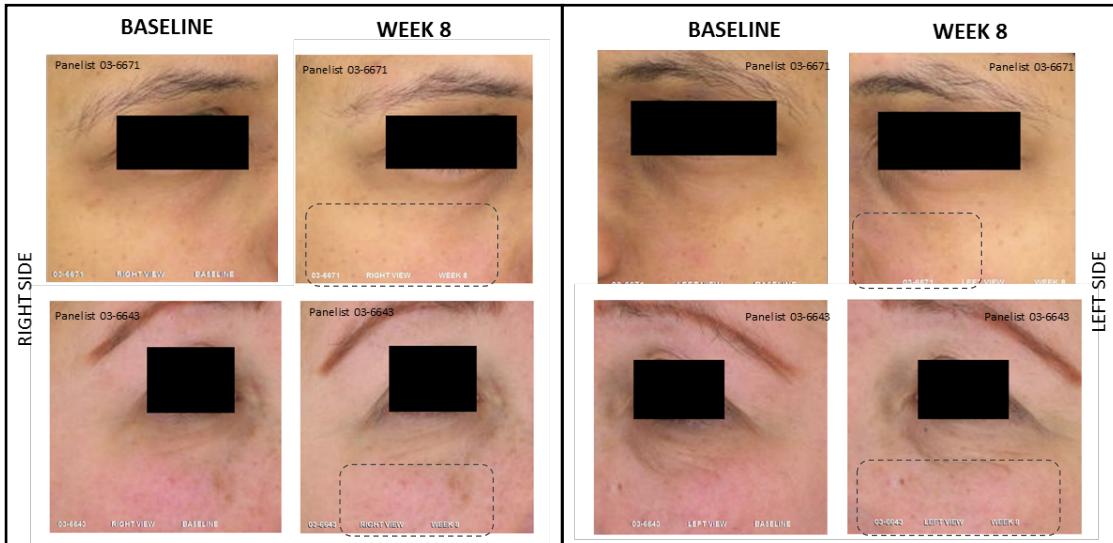
Appearance	Nearly colorless to light amber liquid
Odor	Mild
Solubility	Insoluble in water and dispersible in the aqueous phase
Recommended Use Level	2-6%
Storage & Handling	Store in cool dark place
Hydroxycinnamic Acid	15%

## Assessment of skin tone benefits

Image analysis indicates a clear improvement in skin brightening, redness and wrinkles

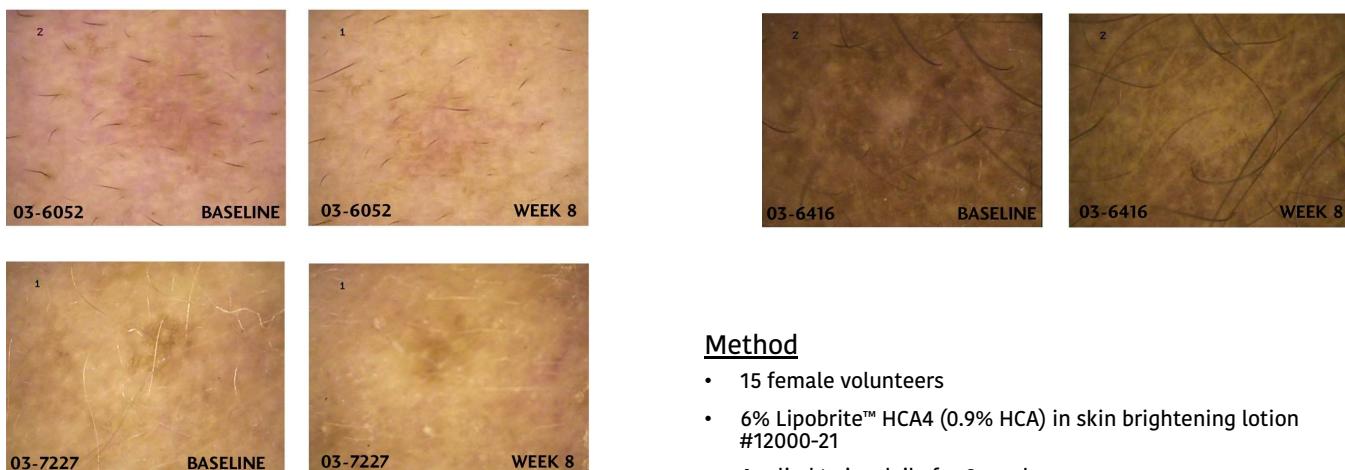
### Method

- 15 female volunteers
- 6% Lipobrite™ HCA4 (0.9% HCA) in skin brightening lotion #12000-21
- Applied twice daily for 8 weeks
- Assessment at week 0 and week 8
- Questionnaire based consumer perception study
- Visia® imaging for skin brightness, redness, and wrinkle
- Magnified Skin Imaging by Charm View Video microscopy to analyze skin texture and color



## Charm view video microscopy

Microscopy indicates an improvement of skin texture and radiance with reduction of age spots



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