

Derma-CLOCK™

-Purpose for Anti-aging agent by improving circadian rhythm

Applicable products of Derma-CLOCK™

Skin care / Body care

Cosmetics : Toner, Essence, Lotion, Cream, Gel, Pack, etc.

What is Derma-CLOCK™ ?

Derma-CLOCK™ protects skin from the damage induced by UV light. Derma-CLOCK™ activates skin protection, repair activity by normalizing disturbed biological rhythm that called to circadian rhythm and improves wrinkles for anti-aging.

About "Derma-CLOCK™"

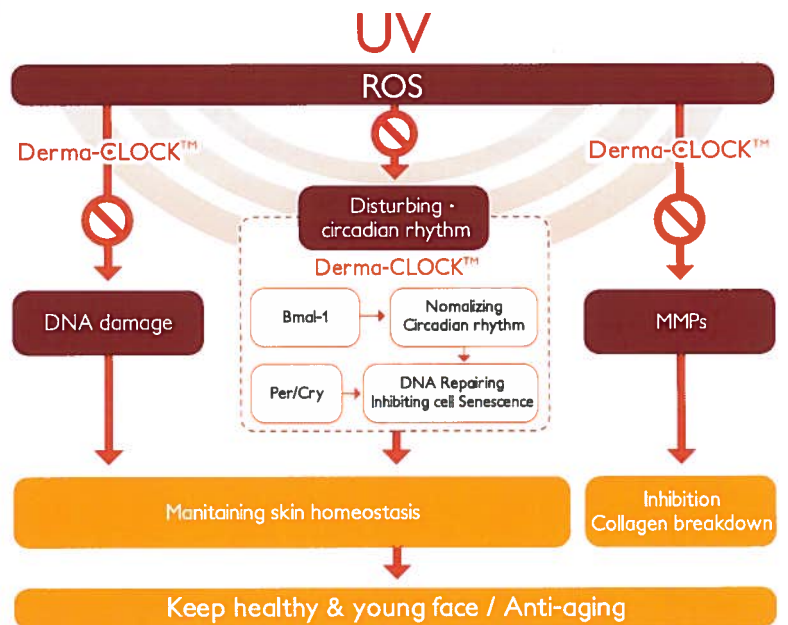


Common name	Trichosanthes kirilowii
Main component	Triterpenoid saponin, Polyphenol

- Trichosanthes kirilowii blooms during the night time while common flower blooms during day time.
- Trichosanthes kirilowii can be found in all over Asia and help normalizing disturbed skin rhythm.

Proposed mechanism for Derma-CLOCK™

- Derma-CLOCK™ protects skin against DNA damage induced by UV light
- In RADIANT R&D center, checked microRNA(miR-142-3p) that targeting circadian clock gene to study circadian rhythm.
- Derma-CLOCK™ normalizes disturbed circadian rhythm. Activating repair activity and inhibiting cell senescence.
- Derma-CLOCK™ improves wrinkles in skin by inhibiting MMPs.



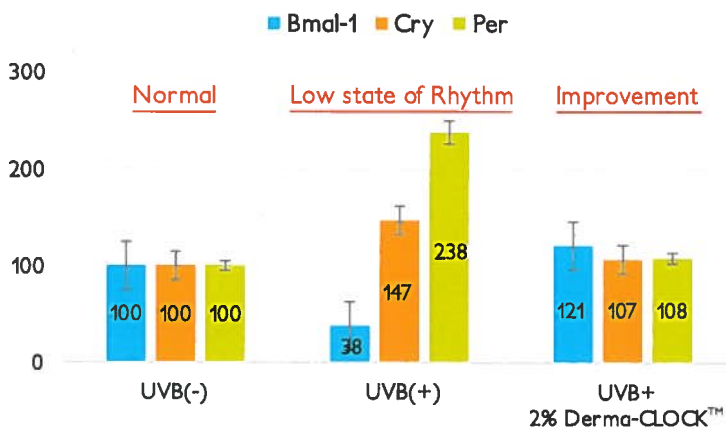
SPECIFICATION

INCI Name
Appearance
Total Polyphenol
Total Saponin
Packing unit
Shelf life
Recommend dosage

Water / Butylene Glycol / Trichosanthes Kirilowii Root Extract
Pale Yellow ~ Light Yellow Liquid
≥ 0.1%
≥ 0.01%
5kg / 10kg / 20kg
2 year
0.5% ~ 2%

Main Biological Effects for Cosmetics

● Normalizing disturbed circadian rhythm

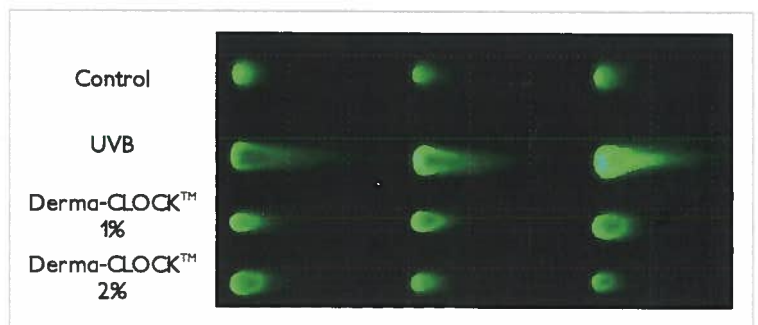


- When treated UVB, Bmal-1 level decreased otherwise Cry/per increased meaning low state of circadian rhythm.
- Derma-CLOCK™ improves circadian rhythm to high state.
- Derma-CLOCK™ protects from disturbing of circadian clock rhythm by increasing Bmal-1 and decreasing Cry and Per.

● DNA protection effect

[For Day care]

- Before exposed to UVB, treated 1%, 2% Derma-CLOCK™ in Keratinocyte.
- As a result, Derma-CLOCK™ showed good DNA protection effect with short tails.

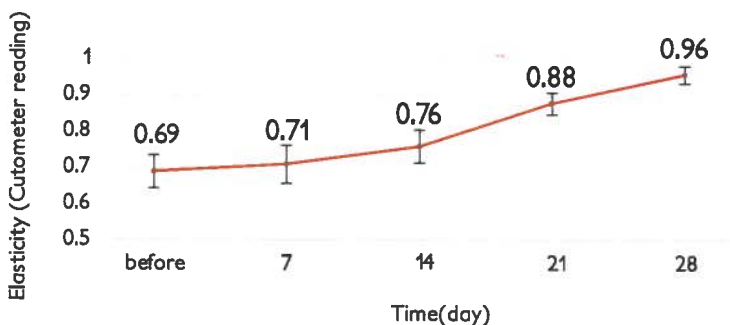


● Anti-wrinkle effect

Sample	MMP-2 expression	MMP-13 expression
Control	4	42
Derma-CLOCK™ 1%	3	35
Derma-CLOCK™ 2%	2.9	30

[MMPs inhibition assay]

- Derma-CLOCK™ has anti-wrinkle effect by inhibiting MMP-2, 13 expression.
- 1, 2% Derma-CLOCK™ showed good inhibition of MMPs expression as does dependently.



[Clinical test]

- Subject : age from 20 to 55 of 20 women
- Application : apply 2 time a day on the face for 4 weeks
- Result : 2% of Derma-CLOCK™ showed good skin elasticity effect.