TXVector™

Patent Pending

smart delivery for a naturally even skin tone

Actera

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next generation technology for a naturally even skin tone

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INCI
Cetyl Tranexamate Mesylate

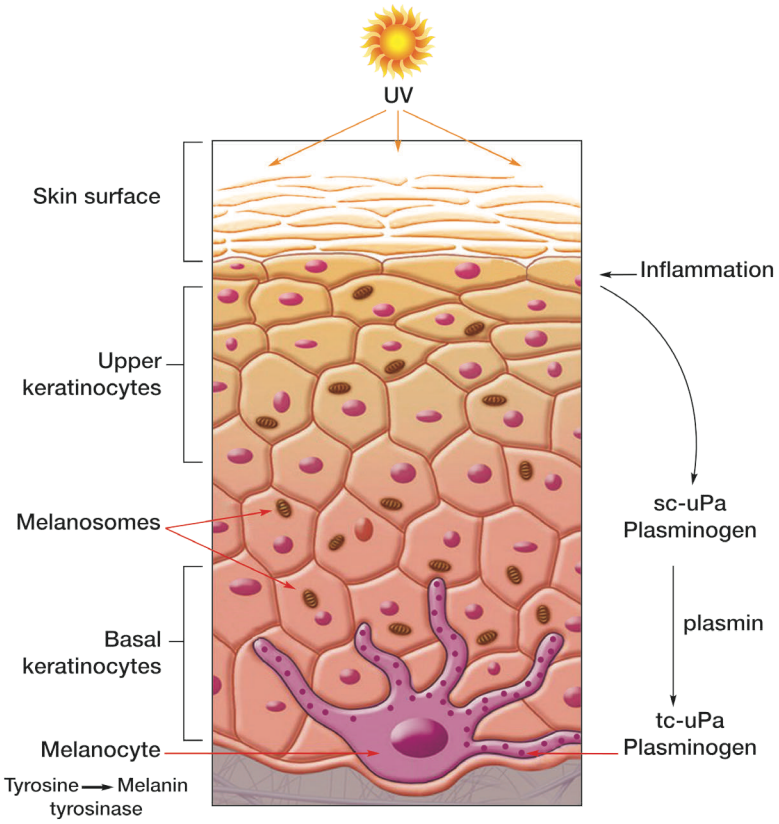
Physical Description
White Powder

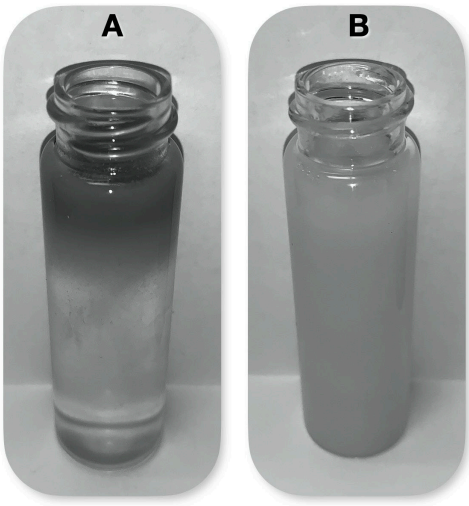
Applications
- Products for the face, hand, and body aimed at fading dark spots and hyperpigmentation
- Spot and blemish treatments
- Recommended forms: serums, lotions, sprays, gel-creams, and creams

Key Benefits
- Visibly even skin tone for a luminous complexion
- Delivers tranexamic acid into deeper layers of the skin
- Inhibits the activity of plasmin and subsequent inflammation cascade
- Prevents the UV-induced activation of melanocytes
- Multifunctional ingredient for better cost-efficiency: emulsifier and bioactive
- Dermatologically proven safe for skin

Key Results

- Reduces redness in 2 weeks and fades dark spots in 4 weeks
- 100% of women agreed their general skin condition improved in 2 weeks
- 100% of women noticed a more uniform complexion after 8 weeks
- 94% of women noticed a reduction of dark spots and signs of aging on their skin after 8 weeks





A - Cetyl Tranexamate Hydrochloride dispersed in water (2%)
B - TeraCeutic TXVector dispersed in water (2%)

Bioactive Rationale

Tranexamic Acid (TXA) is a third-generation bioactive that prevents and soothes both redness and dark spots.

External skin disruptors (UV light, shaving, stripping solvents, detergents, etc.) cause the keratinocytes in the epidermis to produce signal mediators (e.g., plasminogen). These mediators initiate a cascade of events in the skin including inflammation, atypical plasmin activity, proliferation of keratinocytes, desquamation, melanocyte differentiation, increased tyrosinase activity, and transfer of melanosomes to upper layers. The result is unevenly pigmented, dull skin.

TXA inhibits plasmin activity, decelerating the above processes while promoting a more uniform skin tone and faster skin barrier recovery.

However, the permeability of TXA through the skin is insufficient due to its hydrophilic nature and strong hydrogen-bonding capacity.

Esters of TXA offer a higher level of skin-targeting, and epidermal esterases can break down TXA esters to the active TXA form.

TXA esters are known skin permeation enhancers and may boost the efficacy of other active ingredients.

TXVector is a smart delivery form of TXA that is notably easier to formulate compared to other TXA esters. It also works as the primary emulsifier (o/w).

TXVector can be dissolved and dispersed in water, and remains stable over time without separation or aggregation.

One part of TXVector delivers ≈0.33 part of TXA.

Safe for Skin

A Human Repeat Insult Patch Test (HRIPT) study with 54 healthy male and female adult volunteers investigated the irritation and sensitization potential of TXVector Lightening Serum 01-82 containing 2% TXVector. None of the subjects presented adverse events or reactions to the test article. The study concluded that the serum containing TXVector is clinically proven to be safe for skin. This study was performed by Princeton Consumer Research in the UK, and it is available upon request.

Effective on the Skin

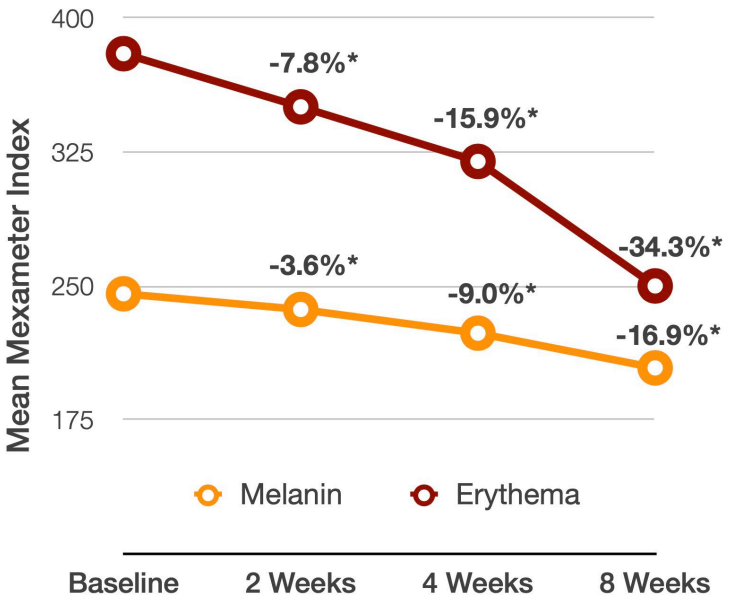
An 8-weeks clinical study on 35 women with self-assessed uneven skin tone, age spots, and redness evaluated the efficacy of TXVector Lightening Serum 01-82 containing 2% TXVector. Volunteers applied the serum at home, twice daily, followed by sunscreen SPF 50 during the day. Volunteers did not use other similar bioactives throughout the study. Product performance was assessed by Mexameter®, photography, and self-perception questionnaires. This study was performed by Princeton Consumer Research in the UK, and it is available upon request.

Instrumental Evaluation

Melanin and erythema indexes were measured using a Mexameter® MX18. This probe measures light absorption and reflection in an area of 19.6 mm2 on the skin surface. Volunteers were assessed in one facial spot for melanin and in another facial spot for erythema (redness). The same spots were measured at each time point.

Melanin is measured by two specific wavelengths (red: 660 nm and infrared: 880 nm) chosen to correspond to different absorption rates by the pigments.

For erythema, two specific wavelengths are used (green: 568 nm and red: 660 nm) corresponding to the spectral absorption peak of hemoglobin and to avoid other color influences (e.g., bilirubin).



*Statistically significant difference when compared to the baseline (P<0.05)

Photography Follow-Up

Digital photographs illustrate the efficacy of TXVector. The serum visibly reduced redness and faded dark spots, resulting in a naturally even skin tone.

Self-Perception Assessment

After using TXVector Lightening Serum 01-82, women noticed:

In two (2) weeks

100% of women agreed and strongly agreed that their general skin condition had improved

In eight (8) weeks

- 100% of women noticed a more uniform complexion
- 100% of women agreed and strongly agreed that the serum improved redness and reduced skin discoloration
- 97% of women agreed and strongly agreed that their skin looked less dull
- 94% of women noticed a reduction in dark spots and signs of aging on their skin

TXVector Formulation Guidelines

Suggested Use Level
1 to 5% (w/w). Clinically tested at 2% (w/w).

Suggested pH Range
3.5 to 5.0

Procedure
- Disperse thickeners or gelling agents in the water first (if any)
- Combine TXVector with the water phase, heat to 85C, mix to dissolve
- Add the oil phase and mix to emulsify
- Carry on according to standard practice

TXVector is cationic: therefore, expect typical incompatibilities with anionic ingredients.

TXVector can also be used as the primary oil-in-water emulsifier.

Secondary emulsifiers (e.g. glyceryl stearate, cetyl alcohol) and gelling agents may improve stability.

TXVector should be dissolved and dispersed in water when heated and mixed at 85°C.

Compatible Emulsifiers & Thickeners
TXVector is cationic and is best formulated with non-ionic and cationic materials. A non-exhaustive list of potential co-emulsifiers and gelling agents is as follows:

Agar
Agarose
Behentrimonium Chloride
Behentrimonium Methosulfate
Caesalpinia Spinosa Gum
Cetyl Alcohol
Cetearyl Alcohol
Hydroxyethylcellulose
Chitosan
Distearyldimonium Chloride
Ethylcellulose
Hydroxyethylcellulose
Hydroxypropyl Guar
Hydroxypropyl Methylcellulose
Glucomannan
Glyceryl Stearate
Guar Gum
Guar Hydroxypropyltrimonium Chloride
Konjac Powder
Locust Bean Gum
Maltodextrin
Polyether-1
Polyglyceryl Esters
Polyquaternium-37
Sclerotium Gum
Sorbitan Esters
Starches
Stearyl Alcohol
Sucrose Esters
Tamarind Gum

The Brightener

This clinically tested serum visibly reduces redness in 2 weeks and lightens dark spots in 4 weeks

Phase	Ingredients (Trade Name)	%wt/wt
A	Water	Q.S.
	TXVector Cetyl Tranexamate Mesylate	2.0
B	Tamarind Gum	1.0
	Glycerin	2.0
	Propanediol	2.0
	Glyoshield Caprylyl Glyceryl Ether (and) Glycerin	0.5
C	Glyceryl Stearate	1.0
	Cetearyl Alcohol	2.0
	Caprylic/Capric Triglyceride	5.0
	Total	100.0

Procedure:

1. Combine phase A, heat to 85°C and mix with propeller until solids have melted and solution is translucent. Ensure that phase A has reached 85°C even if the TXVector is already fully dispersed.

2. Combine phase B ingredients, uniformly dispersing the gum into the glycols, then add to heated phase A and mix.

3. Heat phase C ingredients to 80°C, and add to heated phase A/B, mixing to emulsify.

4. Discontinue heat and continue mixing to room temperature.

Physical Properties:

Semi-Translucent emulsion
pH: 4.35

Stability:

Passed 3 months at RT & 40°C and 3 cycles F/T

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