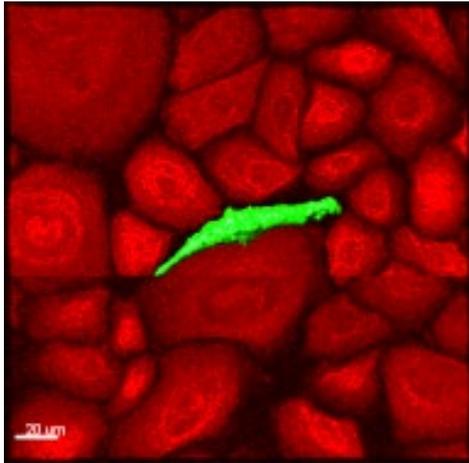


BV-OSC (LIGHTENING)



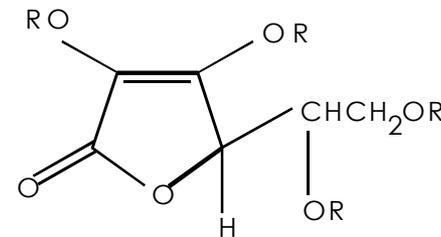
- A Quasi Drug Whitening Benchmark
- Superior Skin Penetration Compared to Other Whiteners
- Reduces Age Spots
- Great Stability in Formulas

CONCEPT

Whitening is the number one category in skin care in Asia. In Japan a whitening formula must contain a quasi-drug active (QD). The QD list is decided by the governmental administration in Japan. In Korea there is also an official list of Functional Actives.

To develop an active ingredient for whitening it is important to have it on those lists. The active also has to be very easy to use, stable, and with good delivery potential to penetrate into the skin. Ideally the whitening active could be used at or close to the skin's natural pH.

An ingredient with all the above would be a benchmark. This is BV-OSC, an oil-soluble ester of ascorbic acid.



BV-OSC at 3% (QD in Japan)

30 people – 3 weeks



Placebo

BV-OSC

<u>INGREDIENT</u>	<u>A</u>	<u>B</u>
PHASE A		
Ceteth-20	1.00	1.00
Sorbeth-30 Tetraoleate	0.50	0.50
Glyceryl Stearate	1.00	1.00
Cetanol	5.00	5.00
Squalane	10.00	10.00
Isocetyl Myristate	6.00	6.00
Triethylhexanoin	3.00	3.00
Joboba Oil	1.00	1.00
Dimethicone	0.20	0.20
Tocopherol	0.10	0.10
Preservative	0.10	0.10
BV-OSC	-----	3.00
PHASE B		
Water	61.90	58.90
Xanthan Gum (2% aq.)	5.00	5.00
Butylene Glycol	5.00	5.00
Preservative	0.20	0.20

BV-OSC was proven to have a strong whitening effect for UV induced pigmentation. The results showed that the formulation containing BV-OSC (3.00%) significantly reduced UV induced pigmentation compared to the placebo.

BV-OSC AT 10% ON AGE SPOTS

10 people – 16 weeks



Before



After

BV-OSC was tested in vivo to effectively remove age spots. The test was performed on 10 people for a sixteen week period at a concentration of 10%.

BV-OSC AT 10% AND 30% ON AGE SPOTS

20 people, 12 weeks

The purpose of this clinical study was to evaluate the clinical effect of high concentrations of BV-OSC in improving skin brightness of senile lentigo (aging spot) on female skin. * All volunteers recruited through the preliminary selection visited the research center for physical examination, medical history and visual evaluation of the test area by dermatologists.

Measurements:

1. L* value: Chromameter CR-400 (Minolta, Japan)

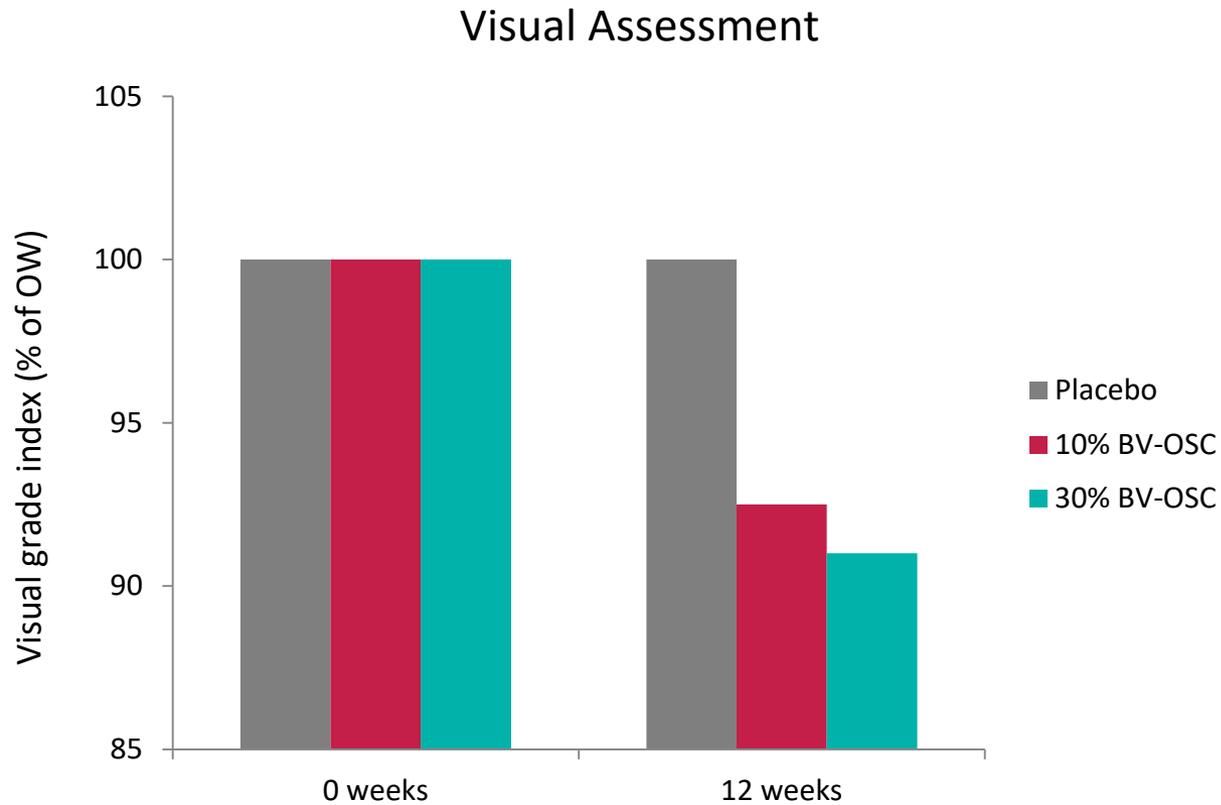


2. The selected tests are as of UV mode image and were evaluated by two experts using the grading scale below (0-7) at baseline, after 4 weeks, 8 weeks and 12 weeks.

- 0 None
- 1 None / mild hyper pigmented
- 2 Mild hyper pigmented
- 3 Mild / moderate hyper pigmented
- 4 Moderate hyper pigmented
- 5 Moderate / severe hyper pigmented
- 6 Severe hyper pigmented
- 7 Very severe hyper pigmented

Three formulas were used (Placebo, 10% BV-OSC and 30% BV-OSC). 20 female volunteers were selected for each formula.

SKIN PIGMENTATION WITH BV-OSC AT 10% AND 30%: VISUAL ASSESSMENT

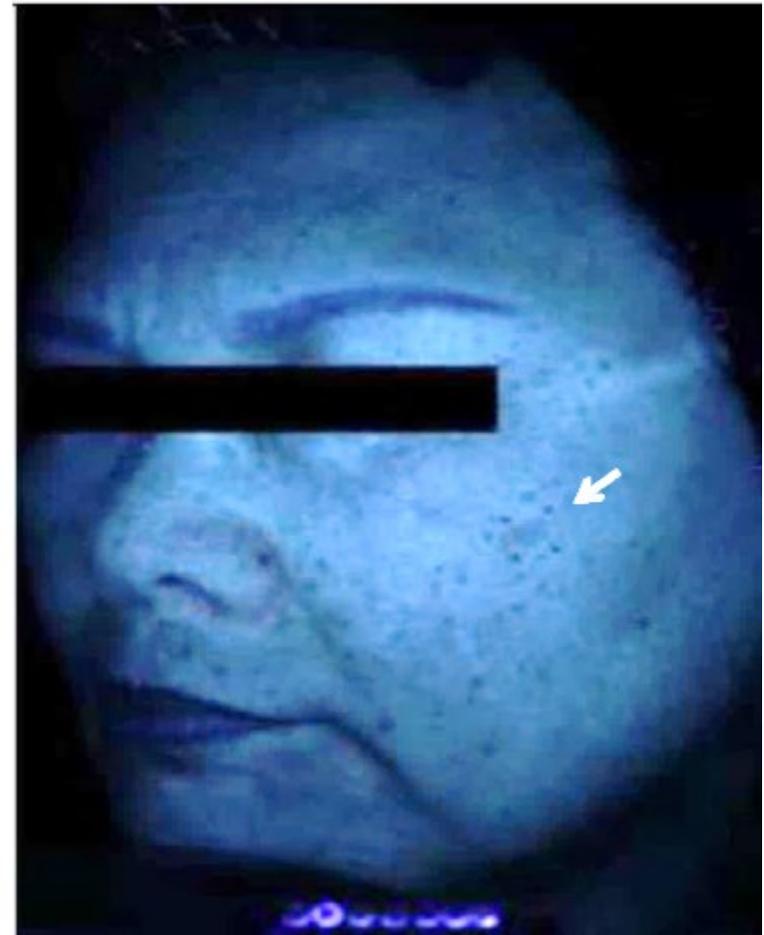


BV-OSC significantly improved skin pigmentation at 10% and more at 30% (visual assessment).

BV-OSC AT 30%



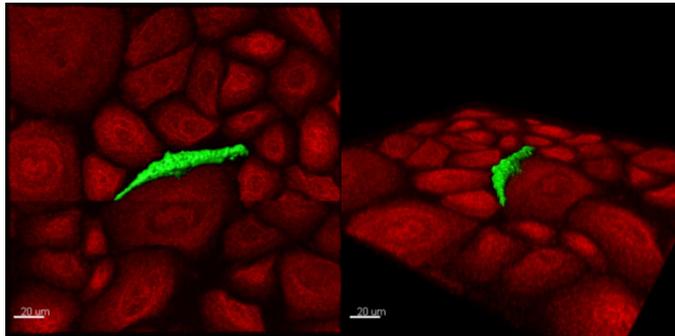
Baseline (0 week)



After 12 weeks

Pictures are an example of a significant reduction in the size of age spots.

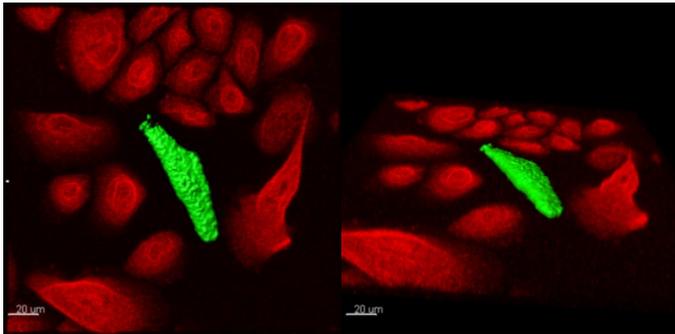
BV-OSC REDUCES DENDRICITY @ 0.006%



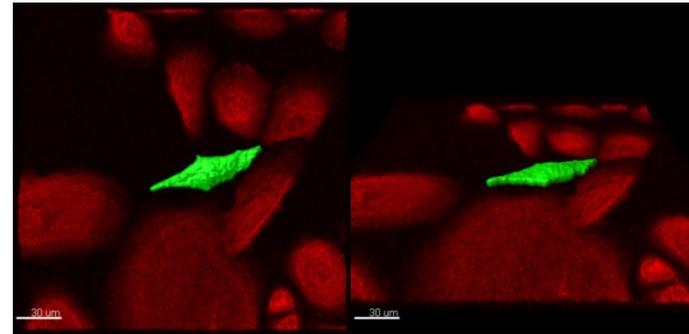
Untreated Co-culture
No dendricity



Co-culture + Endothelin (15nM)
—————> Dendricity



Co-culture+ Endothelin + BV-OSC
(0.006%) - No dendricity



Co-culture + BV-OSC (0.006%)
No dendricity

The pictures show the effect of BV-OSC to reduce dendricity at low concentration.

Protocol

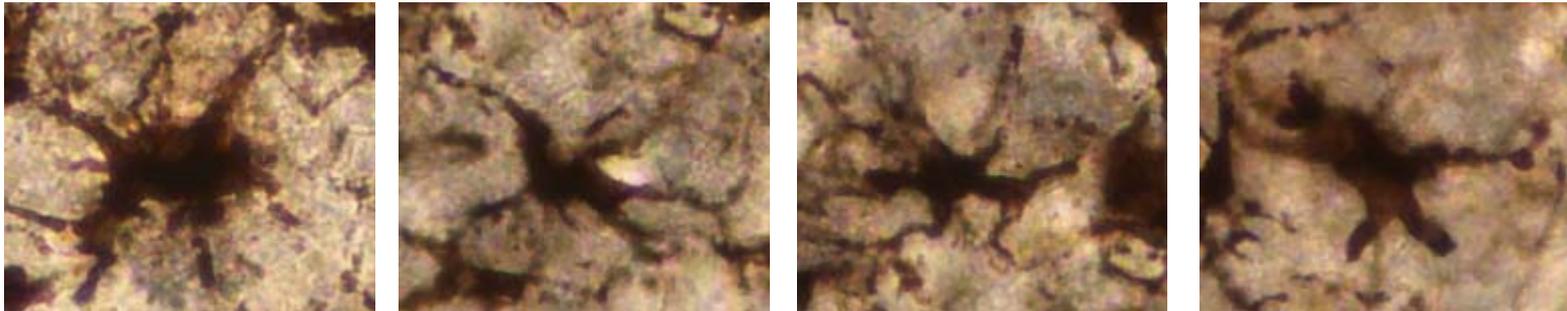
Culture system: co-culture of NHEK (Normal Human Epidermal Keratinocytes) and NHEM (Normal Human Epidermal Melanocytes, with a ratio of 1 melanocyte for every 5 keratinocytes).

BV-OSC REDUCES DENDRICITY @ 2% in 3D SKIN MODEL IN ONE WEEK

The 3D skin model containing melanocytes (MEL) was cultured EPI-100LLMM. Test samples were applied from top of the skin model and melanocyte morphology was evaluated after 1 week. Melanocytes were stained with 0.1 % L-3,4-Dihydrophenylalanin (L-DOPA) and their shape was observed via microscope.

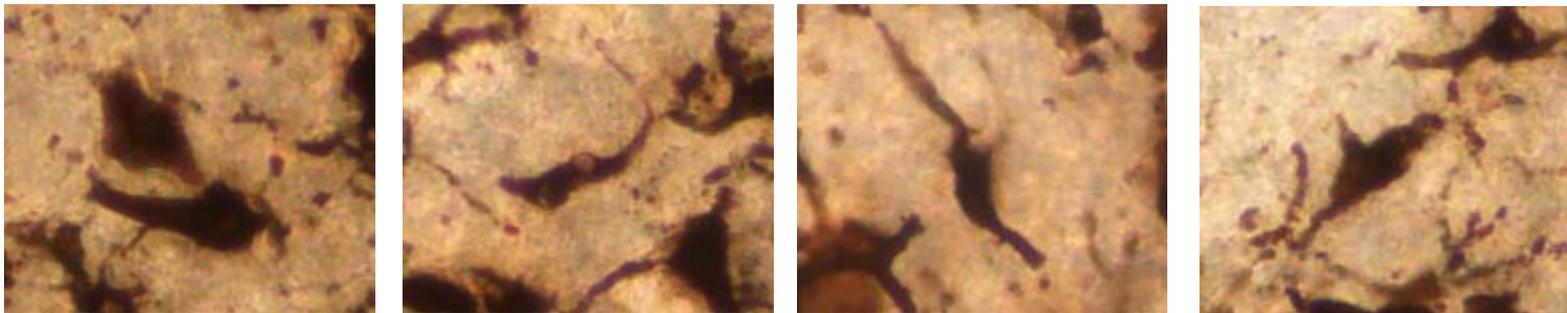
Shape of melanocyte in 3D skin model

Placebo:
Ethylhexyl
Palmitate
(100%).



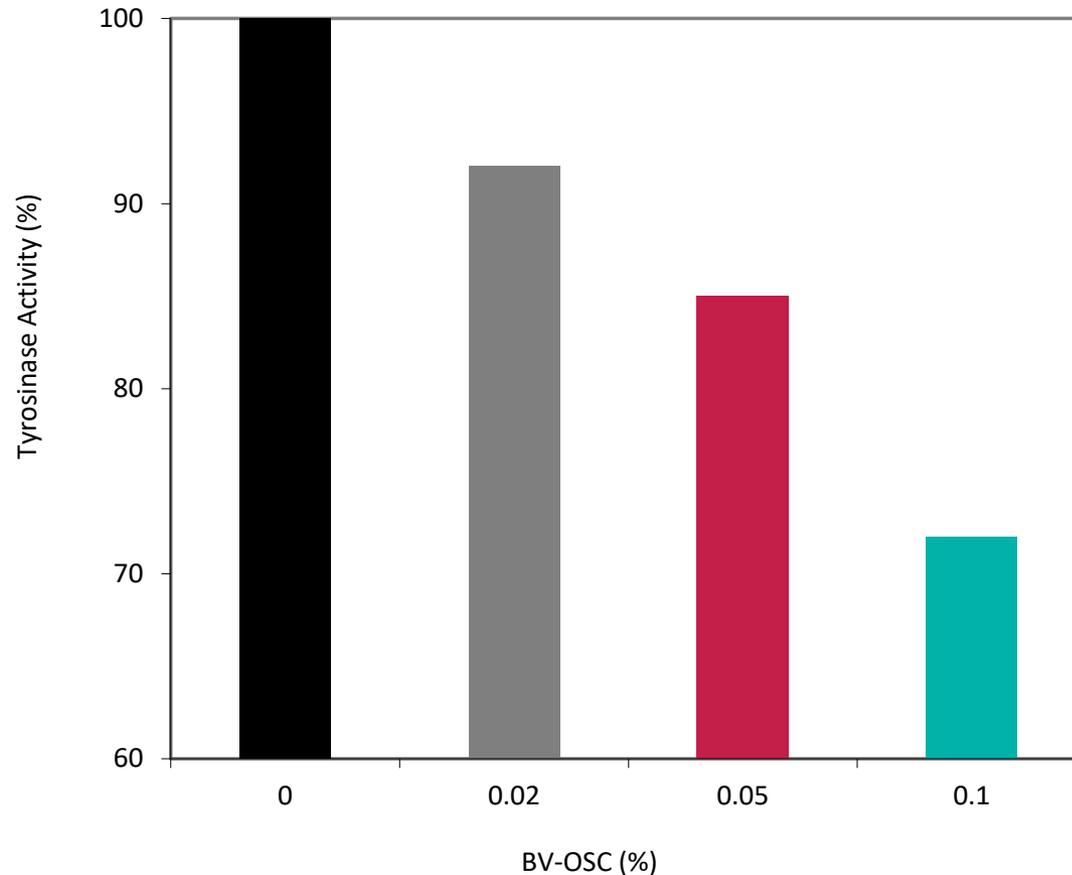
Control (0% BV-OSC)

Test samples:
BV-OSC 2%
In Ethylhexyl
Palmitate.



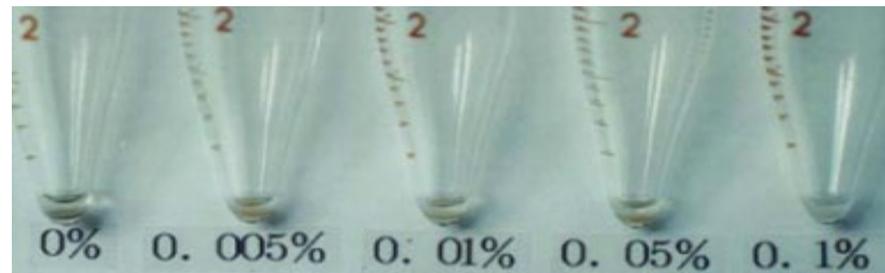
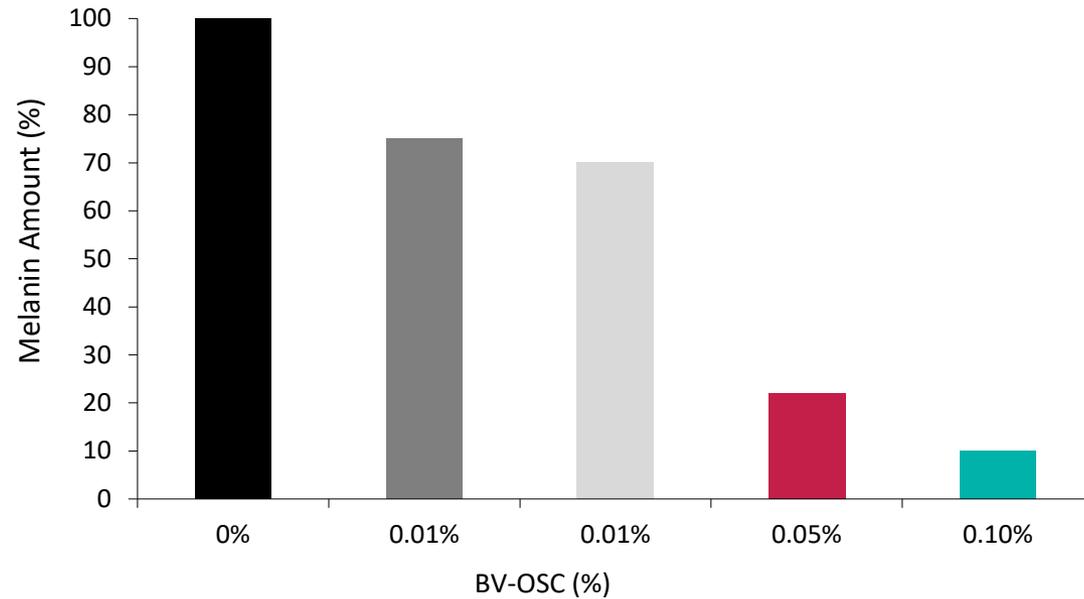
2 % BV-OSC

BV-OSC AND TYROSINASE INHIBITION



BV-OSC was added to melanoma cells (B16-4A5) at various concentrations. After a 72 hour cultivation, the cells were dissolved and extracted. L-Dopa (a precursor of melanin) was then added to the extract. After 60 minutes at 37°C, the amount of dopachrome formed by the activity of tyrosinase was evaluated by measuring its absorbance at 540 nm. The graph above shows that a concentration of 0.02% BV-OSC and above inhibited the activity of tyrosinase.

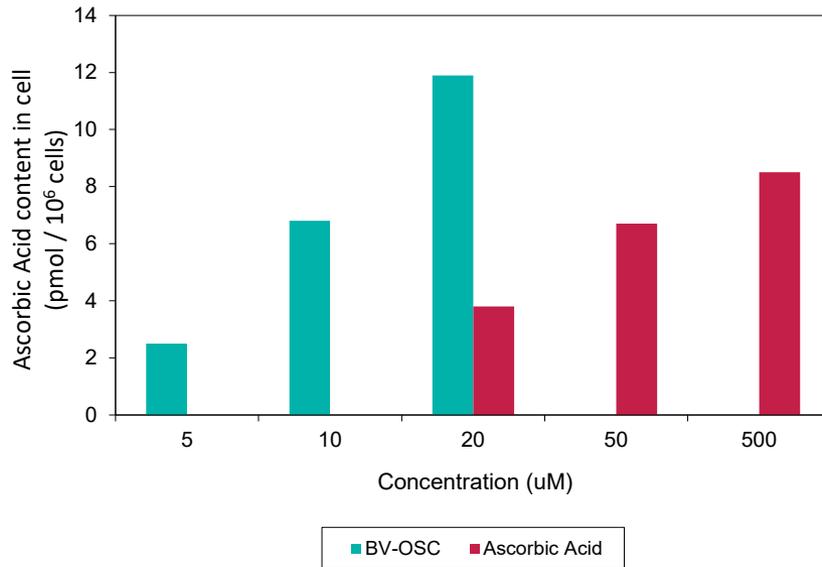
BV-OSC: INHIBITION OF MELANOGENESIS



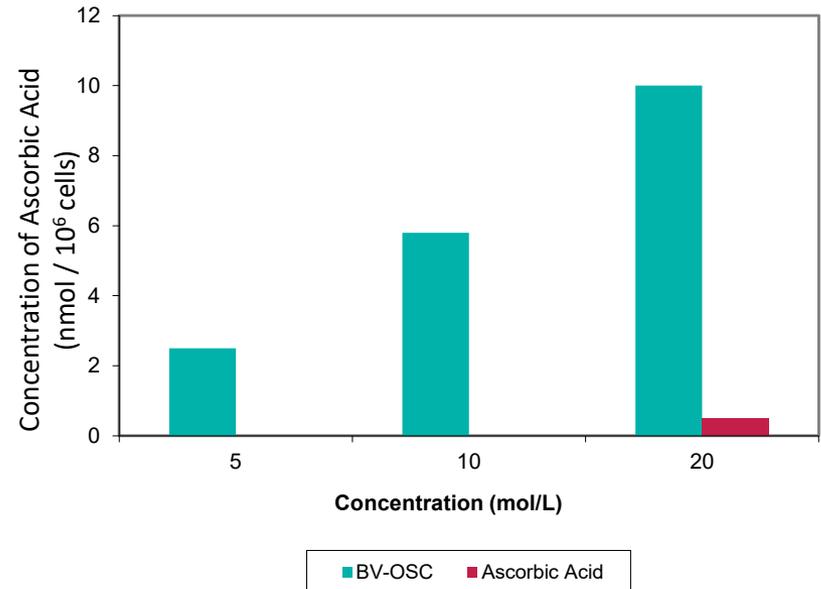
Various concentrations of BV-OSC were added to cultured human melanoma cells (HM-3-KO). After 4 days of cultivation, the amount of melanin produced was measured by observation of the color tone of each cell pellet. As shown, BV-OSC effectively inhibited melanogenesis in human melanoma cells in a dose dependent manner.

BV-OSC: ABSORPTION EVALUATION

Keratinocyte Absorption

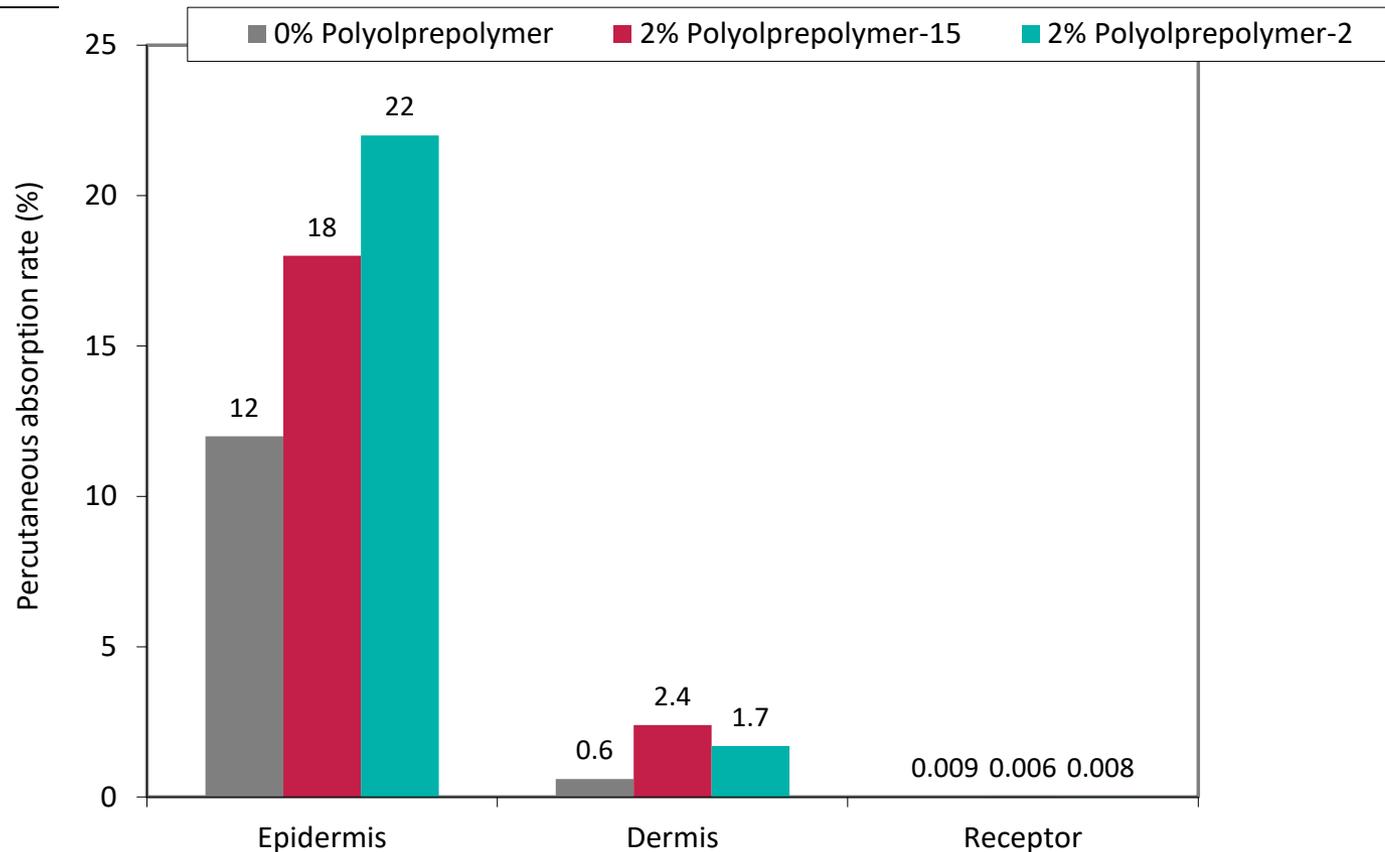


Fibroblast Absorption



The absorption of BV-OSC into human dermal fibroblasts and keratinocytes was measured as a concentration of ascorbic acid 2 hours after adding BV-OSC. As shown, the intake of ascorbic acid was much greater after the addition of BV-OSC as compared to L-ascorbic acid by itself (more than 50 times greater). It is likely that BV-OSC is broken down into Ascorbic Acid in the cells.

IMPROVING BV-OSC PENETRATION



A study was conducted using human skin comparing the percutaneous absorption of topically applied BV-OSC (5 μM) from cream formulations containing 2% Polyolprepolymer-2 and 2% Polyolprepolymer-15 after a 24 hour exposure. The results showed an increased presence of BV-OSC in the epidermis and dermis compared to the cream without Polyolprepolymers.

CONCLUSION

BV-OSC:

- at 0.006%, Reduces dendricity in vitro and 2% on skin models
- at 0.1%, reduces melanin synthesis by 80%
- at 2% and above, reduces UV-induced pigmentation
- Reduces age spots at 10% and more at 30%
- Tested in vivo to penetrate better than Ascorbyl Glucoside
- Superior stability in formulas compared to other Vitamin C derivatives

BV-OSC (LIGHTENING)

INCI Name: Tetrahexadecyl Ascorbate

Preservative: None

Suggested Use Level: 0.10-100.00%

Formulation Guidelines: BV-OSC is a colorless to pale yellow liquid with a faint characteristic odor. BV-OSC is oil soluble and should be added to the oil phase at a temperature below 80°C. The recommended pH range is below 5.5. Please avoid excessive heat. It is recommended to add tocopherol (antioxidant) to the oil phase and EDTA (chelating agent) to the water phase. Additional formulation guidelines are available upon request.

Quasi-Drug (QD): Approved as QD in Japan at 3.00%, Approved as QD in Korea at 2.00%

Global Compliance and Product Features:

For additional information please contact technical@barnetproducts.com.

COUNTRY	COMPLIANCE
AUSTRALIA	Contact Us
CANADA	Listed rICL
CHINA	Listed IECIC, IECSC
EU	<1 MT Exempt

