# BP–Triluronic® Acid Series

## Multilevel skin support

### BP–Triluronic® Acid Solution

INCI : Water (and) Sodium Hyaluronate
CAS #: 7732-18-5, 9067-32-7
EC #: 231-791-2, N/A

### BP–Triluronic® Acid Powder

INCI : Sodium Hyaluronate
CAS #: 9067-32-7
EC #: N/A

### BP–Triluronic® Acid A

INCI : Ricinus Communis (Castor) Seed Oil (and) Sodium Hyaluronate (and) Helianthus Annuus (Sunflower) Seed Wax
CAS #: 8001-79-4, 9067-32-7, 1286686-34-7
EC #: 232-293-8, N/A, N/A

**Anti-aging**

**Hydrating**

**Soothing**

**Supports barrier function**

**Recommended applications**


## BP—Triluronic® Acid is a combination of three different molecular weight fractions of natural hyaluronic acid produced through fermentation—available in liquid, powder and anhydrous varieties.

BP–Triluronic® Acid synergistically deploys its specific benefits to the epidermis, making the layers more available and receptive to the beneficial effects of all skin care actives, while improving the appearance of skin to look younger, healthier and more supple.

BP–Triluronic® Acid is comprised of three different molecular weight (MW) fractions of hyaluronic acid (HA):

- ✓ **High MW HA** (~1500 kDa to ~2000 kDa); supports skin barrier repair, firms, lifts, soothes, moisturizes, hydrates.
- ✓ **Mid MW HA** (~300 kDa to ~500 kDa.); penetrates deeper into the stratum corneum, stimulates corneocyte differentiation, protects skin's Natural Moisturizing Factor (NMF), restores moisture, soothes irritation, and rejuvenates sensitive/dry/damaged skin.
- ✓ **Low MW HA** (~12 kDa to ~15 kDa); penetrates deeper into epidermis, induces production of native HA, and aids in proliferation of the keratinocytes.

China IECIC 2015 | VEGAN | ISO16128 - NOI 99%

Vantage

# What is hyaluronic acid?

HA is one of the most widely recognized polysaccharides with renowned water-binding properties that help skin retain necessary moisture. Although this clear, lubricating substance is naturally produced by the human body– with largest quantities found in skin, connective tissue and eyes– over a third of it is lost daily. HA is most abundant in young healthy skin — it is most plentiful in infancy and adolescence and decreases as we age. Typically, by mid-life span, native production of HA is halved and continues in a sharp decline as we age.

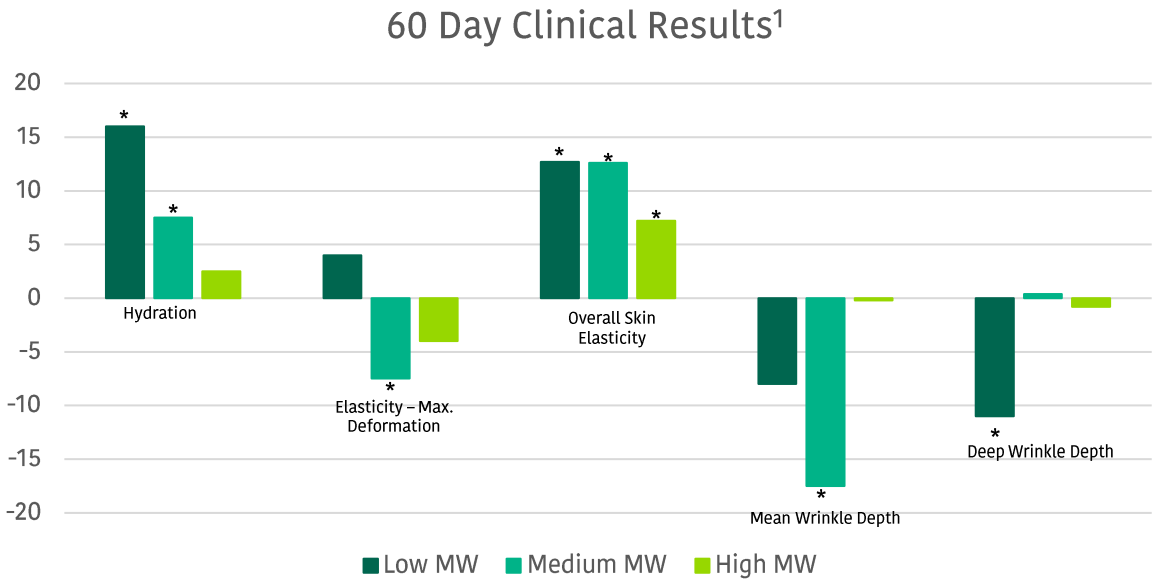
Aging, environmental stressors, and fluctuations in hormone levels are among the many possible causes that contribute to the loss of HA.

Backed by many studies over the years, topical HA has been found to effectively increase hydration levels of skin– yielding to reductions in inflammation, wrinkles, redness and dermatitis.

Aside from its ability to pull moisture to skin, topical HA also has the ability to signal skin cells– however, this property is highly dependent on the molecular weight of the HA.

# Study 1: Evaluation of varying MW HA on skin

It is well established in the scientific literature that HA of different MW have different effects on the skin. Pavicic, et. al.1 performed a clinical study on 76 subjects comparing formulations containing the following HA varieties @ 0.1% to evaluate their effects on skin hydration, elasticity, and wrinkle depth.




*p< 0.05

- ✓ Low MW HA (50-130 kDa) is most effective for skin hydration.
- ✓ Medium MW HA (300-800 kDa) showcased to be most effective for skin elasticity, with some activity from Low and High MW HA
- ✓ High MW HA (2000 kDa) showed to be most effective on average wrinkles, while Low MW HA performed best on deep wrinkles

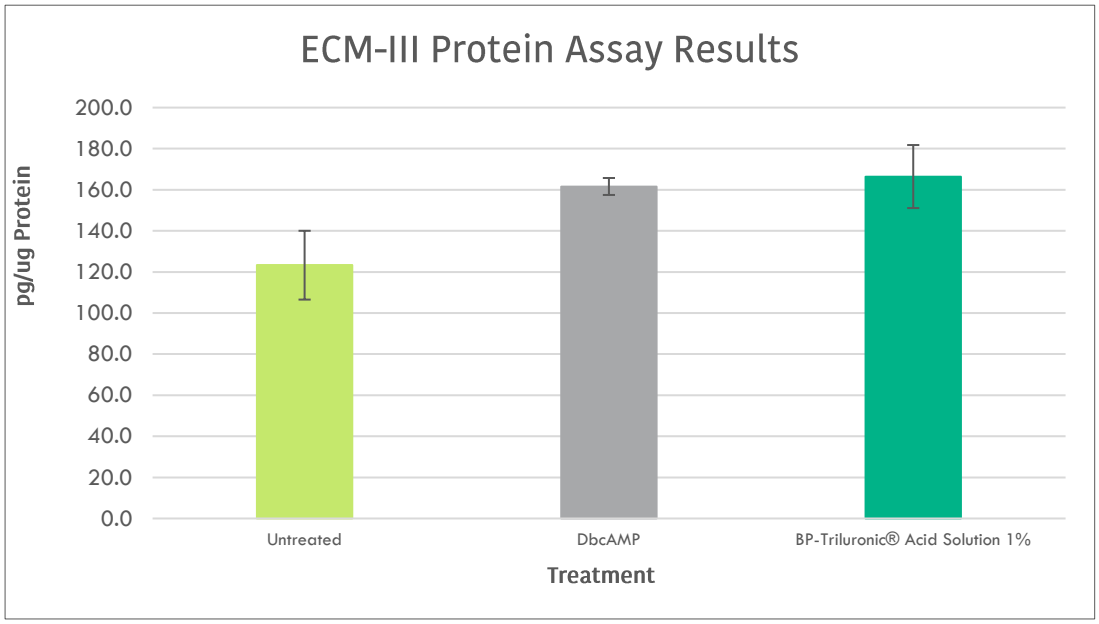
# Study 2: Impact on skin barrier function

Adult Human Epidermal Keratinocytes were used to study the effects of BP–Triluronic® Acid Solutionon the production of a key protein called ECM-III (Extracellular Matrix-III ), a key Hyaluronate Receptor protein found in skin cells.

A positive control, Dibutyryl Cyclic Adenosine Monophosphate (DbcAMP)– a cell permeable form of cAMP– was used in the study as a positive control due to its known ability to increase hyaluronic acid synthesis in fibroblasts and keratinocytes..

**What is ECM-III (Extracellular Matrix-III)?**

Also known as the Hyaluronate Receptor protein, ECM-III is a protein that binds to HA in the viable epidermis of the skin and plays a fundamental role in the growth of skin and the formation of the skin barrier. It is an important cell adhesion molecule.




- ✓ BP–Triluronic® Acid Solution at 1.0% has been shown to effectively stimulate production of the key Hyaluronate Receptor protein, ECM-III, in skin cells– therefore proving its efficacy in supporting the formation and overall health of the skin barrier.
- ✓ BP–Triluronic® Acid Solution offers multifaceted, multifunctional benefits to the skin through its diverse range of molecular weight fractions.

Refer to our published study in the Journal of Cosmetic Dermatology and PubMed!

# Study 3: TEWL performance

Sundaram, et. al.2 , have published a paper comparing Low and High MW HA using human skin explants by applying aqueous gels containing 0.075% HA daily and measuring transepidermal water loss (TEWL) after 2 days. The results showed:

- ✓ TEWL increased by 55.5% for the explants treated with Low MW HA.
- ✓ TEWL was lowered by 15.6% for the explants treated with High MW HA– verifying that High MW HA is most effective in lowering TEWL of the skin.

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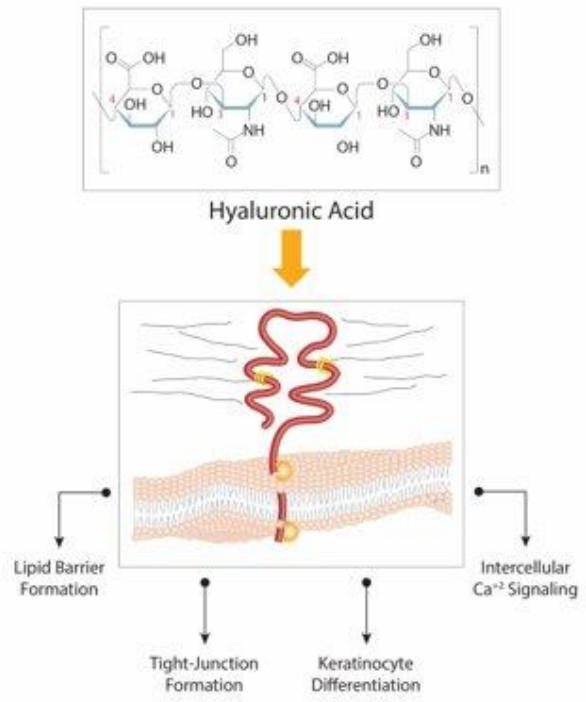
| | BP–Triluronic® Acid Solution | BP–Triluronic® Acid Powder | BP–Triluronic® Acid A |
|---|---|---|---|
| Appearance @ 25°C | Clear Liquid | White Powder | Ivory White to Light Yellow Soft Solid |
| pH @ 25°C | 6.0 – 8.0 | 6.0 – 8.0 | N/A |
| Loss On Drying % | 98.0 Min | <10.0 | N/A |
| Recommended Use Level | 1 – 3% | 0.01 – 0.03% | 0.5 – 2.0% |

# How BP–Triluronic® Acid benefits skin

BP–Triluronic® Acid is produced through fermentation and then by carefully cleaving high molecular weight hyaluronic acid into smaller fractions at three different molecular weights specifically tailored to optimize performance of finished products. The balanced ratio of high to low fractions is designed for skin moisturization and enhanced skin penetration, while the mid fractions work to achieve ideal NMF. BP–Triluronic® Acid benefits skin in various ways:

- ✓ Combats dry skin by boosting hydration and moisture levels
- ✓ Helps lower transepidermal water loss (TEWL) of skin
- ✓ Soothes sensitive skin
- ✓ Supports skin barrier function and the skin lipid barrier
- ✓ Helps accelerate generation of new keratinocytes (primary cells found in the epidermis)
- ✓ Stimulates the expression of the key Hyaluronate Receptor protein (ECM-III) in epidermal keratinocytes
- ✓ Speeds up wound-healing and supports scar management
- ✓ Helps minimize the look of fine lines and wrinkles




# Formulation guidelines

BP– Triluronic® Acid Solution should be added to the aqueous phase of the formulation. It can also be added to an O/W formulation after the emulsification step.

BP– Triluronic® Acid Powder should be added to the heated aqueous phase of the formulation and mixed until completely dissolved before adding any other ingredients.

BP– Triluronic® Acid A can be incorporated either into the oil phase or at the end to the completed formulation. Run it through a roller mill 4-5 times to obtain an optimized and uniform dispersion. Keep the space between the rollers on minimum. If the procedure requires homogenization, add recommended concentration of BP– Triluronic® Acid A at the beginning of the process with continuous mixing until the batch is completed.