

## A Look at Non-Animal Stabilized Hyaluronic Acid (NASHA<sup>®</sup>)

2 decades

50

million procedures

NASHA is a proven technology and is the foundational material for Palette Life Sciences' products Barrigel<sup>®</sup>, Deflux<sup>®</sup> and Solesta<sup>®</sup>.

### A Well-Known Technology

NASHA is well-known in aesthetic markets as Restylane<sup>®</sup>, a dermal filler that is proven to be safe and effective.<sup>1,2</sup> NASHA has been used for more than 20 years in over 50 million medical procedures for men, women and children worldwide.<sup>3</sup>

### → Hyaluronic Acid Overview

#### What is HA?

Hyaluronic acid (HA) is a uniform, unbranched linear polysaccharide with the same chemical structure in all species and tissues.

The body **naturally** produces HA and has many uses in medical applications.

As a naturally-produced molecule in the body, HA remains both **biocompatible** and **biodegradable**.

#### How HA Acts in the Body

- Allows the skin to maintain **elasticity**, **hydration** and **pliability**
- **Protects** and **creates cushion** around cells, similar to bubble wrap
- Acts as a strong **humectant** used to keep water in the skin
- **Lubricates** eyes and joints for smoother movement

## → NASHA Overview<sup>1</sup>

### Understanding the NASHA Acronym

- **NA:** Non-Animal. This refers to where the HA is derived from. NASHA is created through bacterial fermentation which in turn produces HA. Bacterial fermentation is a major technological advancement, allowing isolation and production of pure replication of HA that is safer, less inflammatory and more reproducible than deriving HA from living tissues.
- **S:** Stabilized. Stabilized indicates that the HA molecule is not traditionally crosslinked like a ladder, but rather minimally linked (less than 1%) with small bridges that keep the natural entanglements to maintain the ultimate tolerance of native HA.
- **HA:** Hyaluronic Acid.

### Creating NASHA

- The HA in NASHA is biosynthesized from a non-animal source (cultured bacteria) manufactured by biotechnological methods in order to obtain a product of high purity and preserve the integrity of HA.
- In NASHA products, the HA molecules are stabilized to a minor degree (less than 1%). The stabilization is accomplished using BDDE, a compound that does not cause any significant biological reaction.<sup>4</sup>
- The stabilization is essential to improve the storage conditions, shelf life and residence time following injection from a few days to many months.

### NASHA Benefits

- Developed from a proprietary process of natural entanglements, NASHA is closer to natural HA than other HA products and potentially less inflammatory
- Similar to the natural HA found in the body
- Minimal foreign body reaction, reducing the chance of inflammation
- Biocompatible
- Designed for lifting tissue and holding space

### NASHA has been extensively tested both in vitro and vivo, and the tests have demonstrated that NASHA:

1. Is neither cytotoxic (damaging to cells) or genotoxic (damaging to DNA)
2. Does not give rise to any acute, subacute or chronic effects
3. Has minimal to no inflammatory reaction

**REFERENCES:** 1. Q-Med. Nasha- the Monograph. Uppsala, Sweden. 2001. 2. Cerwinka WH, Scherz HC, Kirsch AJ. Endoscopic treatment of vesicoureteral reflux with dextranomer/hyaluronic acid in children. *Advances in Urology*. 2008; 1-7. 3. Galderma. Restylane. Available at <https://www.galdermaaesthetics.com/science-behind-restylane>. Accessed January 1, 2022. 4. De Boule, Koenraad MD; Glogau, Richard MD; Kono, Taro MD, PhD; Nathan, Myooran MBBS, MRCS, MFPM; Tezel, Ahmet PhD; Roca-Martinez, Jean-Xavier PhD; Paliwal, Sumit PhD; Stroumpoulis, Dimitrios PhD A Review of the Metabolism of 1,4-Butanediol Diglycidyl Ether-Crosslinked Hyaluronic Acid Dermal Fillers, *Dermatologic Surgery*: December 2013 - Volume 39 - Issue 12 - p 1758-1766 doi: 10.1111/dsu.12301

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