

Hyaluronic acid is a carbohydrate. More specifically, it is a polysaccharide. Polysaccharides are long polymers of sugars that can be used for storing sugar, such as starch and glycogen or as structural support for cells and tissues, such as cellulose in plants and chitin in animal cells. Hyaluronic acid is in a subset of the polysaccharides called glucominoglycans or GAG.

As Hyaluronic acid is present in every tissue of the body, hyaluronic acid's importance cannot be underestimated. Retention of water is one of the most important biological functions of hyaluronic acid, second only to providing nutrients and removing waste from cells that do not have a direct blood supply.

Open this pamphlet for more information and examples of HA presence in our bodies.

GLYCO HA ANTI-AGING REVITALIZING SKIN FORMULA

**Glyco HA
Hyaluronic Acid**
— what is it?

GlycoBioSciences Inc. (GBS) is a research and development company which has brought together a group of award winning Scientists who each have more than 20 years experience in developing products, both cosmetic and medical, to treat a variety of skin conditions.

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*The ultimate standard
of excellence in
anti-aging skin therapy*

A GlycoBioSciences Inc. product

Glyco HA Hyaluronic Acid — *what is it?*



CARTILAGE

Hyaluronic acid is a key component of cartilage. Cartilage is a specialized form of connective tissue. It lends strength and flexibility to the body.

SYNOVIAL JOINT FLUID

Our joints, like the elbows and knees, are surrounded by a membrane called the synovial membrane, which forms a capsule around the end of the bones. This membrane secretes a liquid called synovial fluid, which is rich in hyaluronic acid. Synovial fluid has many functions, as a lubricant, a shock absorber and a nutrient carrier. The fluid protects the joints and bones. Cartilage is immersed in the synovial fluid and is a fibrous connective tissue. Cartilage contains no blood vessels and synovial fluid is the only way in which nutrients can be carried into the cartilage and waste can be removed.

EXTRACELLULAR MATRIX

Hyaluronic acid is found in extracellular matrix (ECM). The ECM is composed of fibrous elements produced by the cells and excreted to the extracellular space with the tissues. All nutrients and metabolic waste are transported through the ECM. Hyaluronic acid is a major constituent of the ECM and serves as an essential structural element of the ECM. Hyaluronic acid locks moisture into the ECM and also, HA supports the structural integrity of the extracellular matrix.

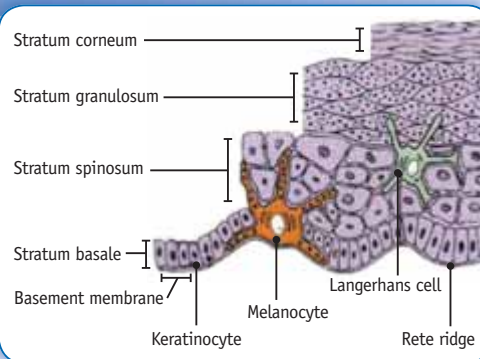
THE SKIN

In the skin, the extracellular matrix is composed of hyaluronic acid and other sulfated GAGs, combined with collagen and elastin. Large amounts of water are held in the ECM of skin. When elastin is not bathed in water, it becomes dry and brittle, thus the look of dry and brittle, wrinkled skin.

There are many factors known to influence hyaluronic acid levels. Genes are likely to be a factor, but there are many environmental factors that are known to have an impact, including zinc and magnesium availability. Not surprisingly, magnesium and zinc deficiencies are known to be associated with many of the same symptoms associated with hyaluronic acid abnormalities, such as poor wound healing.

Hyaluronic acid (HA) was first used commercially in 1942 when Andre Balazs applied for a patent to use it as a substitute for egg white in bakery products. He went on to become the leading expert on HA during the next 50 years.

Hyaluronic acid plays an important role in tissue



hydration, lubrication and cellular function and is able to hold more water than any other natural substance. In the last two decades, the therapeutic and esthetic uses of hyaluronic acid have been extended to a number of areas, including wound healing, treatment of joint pain, use in fertility clinic and tissue augmentation. In the past few years, biotechnology has been used to develop hyaluronic acid derivatives with tailor-made molecular sizes, which will further increase the potential application of this remarkable molecule.

Hyaluronic acid is being used commercially or experimentally to correct a large portion of the problems found in connective tissue disorders, such as fractures, eye disorders, poor wound healing and prematurely wrinkled skin.

HA PRODUCTION

HA has been traditionally extracted from rooster combs. It is difficult, however, to isolate high molecular weight HA economically from this source. It is presently impractical to control the molecular weight of the biopolymer while it is synthesized in animal tissue. Subsequent extraction and purification processes result in an inherent molecular weight reduction.

Industry has turned instead to bacterial formation fermentation process with the hope of obtaining commercially viable biopolymer. The amount of HA that can be produced by this route is theoretically unlimited. The recent trend has been to use Lancefield's group A and C streptococci which naturally produce a mucoid capsule of HA.

Streptococci are facultative anaerobes which produce lactic acid as a by-product of glucose catabolism.

Glyco HA Gel, Revitalizing Skin Formula is an aqueous, moderately viscous Gel, which contains a special and proprietary fraction of Hyaluronate Sodium as its principal ingredient.

Using novel and proprietary technology, ***GlycoBioSciences*** researchers have created ***Glyco HA Gel Revitalizing Skin Formula*** for the following indications:

- Glyco Anti-Aging Gel restores the mechanical strength of the facial and neck skin (Firming) for individuals in their 30's and beyond who are exhibiting signs of skin aging.
- Glyco Anti-Aging Gel reduces signs of aging which may include, but not be limited to, fine lines, discoloration or an aged wrinkled appearance.
- Glyco Anti-Aging Gel provides a refreshing, revitalizing and healthy feeling for the skin without undesirable stickiness, flaking or irritation.
- Deep moisturizing in dry skin tone and texture following exposure to sun or other harsh environmental conditions resulting from every day activities.
- Restoration of normal skin tone and texture following exposure to sun or other harsh environmental conditions resulting from every day activities.

