

Anti-Oxidants Q&A

What is an anti-oxidant?

Anti-oxidants are substances that inhibit the oxidation of other materials. Oxidation can be destructive resulting in the breakdown of substances. For example, the interaction of oxygen and iron yields rust, banana peels ripen and darken by interaction with oxygen through oxidation, and oxidation of LDL cholesterol leads to clogging of arteries with plaque. Oxidation results when substances interact with reactive oxygen species (ROS); free radicals help to create ROS in the body.

Why are anti-oxidants important in the skin?

As important as oxygen is to our life functioning, an overage of oxygen and the process of oxidation is damaging to skin and its cellular makeup. One common way for oxidation to occur in skin is through interaction with free radicals. Free radicals interact with oxygen species creating the highly reactive ROS. These ROS and free radicals are highly energized molecules that want to dispel excess energy (like when you build up extra electrical energy and discharge it with a shock when you touch another person or object). The ROS and free radicals transfer their excess energy to cellular components in the skin, and damage them in the process. Over time, mutations in DNA result, leading to dysfunctional skin, including abnormal production of melanin and age spots, decreased cell turnover and rough, dry skin, keratoses and skin cancers. This same type of destruction takes place in the deeper layers of the skin resulting in poorly constructed collagen and elastic fibers – the result: wrinkles and sagging skin.

What is the necessary anti-oxidant delivery system needed for the skin to maximize benefits?

Topical antioxidants need to be absorbed into the layers of the skin to work. They need to be in their working form, or converted in the skin to the working form if necessary. For example, one form of vitamin C is absorbed and functions immediately as an antioxidant, whereas some forms require a conversion to the active form.

How do you know an anti-oxidant is working for your skin?

A lot of the benefits of antioxidants in skin are simply *assumed* based on the general acceptance that antioxidants are important and beneficial. However, there is one antioxidant model that directly relates antioxidant effects to skin by showing how antioxidants can inhibit activating a gene in the skin that promotes skin aging. This model has shown that ***gluconolactone (a PHA)*** can inhibit free radicals (from sunlight) from turning on this gene! It's an important finding because it shows how the right antioxidants protect the skin against a sun-induced aging response.

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How do you choose the right anti-oxidant for your skin?

The best antioxidants are those with proven benefits in skin. Many known antioxidants have been tested in *in vitro* (test tube) models, and have not been tested on skin. **Gluconolactone** has been shown to reduce free radical damage in a skin model, protecting it against aging. In addition, the best antioxidants are stable long enough to function; gluconolactone is a stable molecule that is not easily degraded by air and light.

Gluconolactone also functions to chelate or trap metals. Metals are known oxidation-promoting compounds. In fact, iron is thought to be an important participant in the process of generating free radicals following UV exposure; iron chelation is an up and coming treatment of aging skin. **Lactobionic acid (a Bionic Acid)** is a proven iron chelator, and can provide the benefit of helping to protect skin against sun damage caused by free radicals.

What are possible side-effects of anti-oxidants in the skin?

Some antioxidants are limited in use due to stability and shelf-life. Vitamin C, for example, is very difficult to work with because it is unstable when exposed to air. Some antioxidants are irritating. Idebenone, for example, has reports of irritation, and it has an unpleasant odor.

What sets NeoStrata Company's anti-oxidants apart from others?

The **PHAs** and **Bionic Acids** are uniquely multi-functional antioxidant compounds that formulate easily into skin care products and remain stable. They do not require conversion to an active form in skin, and, importantly, they are very gentle to skin. In addition to their natural gentleness, these compounds are humectants that moisturize the skin, and help improve its barrier function – all important benefits for antioxidants for antiaging!