Antioxidant Nutrients and Skin Protection

Free radical damage is one of the principal mechanisms of aging. Free radicals are highly and indiscriminately reactive chemicals that can damage any structure in living cells. The most common source of free radicals is normal burning of fuel that occurs in every cell every minute of every day. (Generally, the more free radicals a species produces, the shorter its life span.) Skin suffers additional free radical damage from sunlight and pollutants.

Topical antioxidants provide some protection against environmental damage to the skin and may be somewhat effective in slowing down the skin aging. Their effect depends on skin permeability, other ingredients in the cream and many other factors. It appears that increasing oral intake of some antioxidants may additionally protect skin from free radicals. Keep in mind, however, that relatively little solid research has been done specifically on skin benefits of oral or topical antioxidants and much of the supporting evidence is indirect.

A very important chemical property for an oxidant is its solubility in water and fat (or oil). Basically, living organisms have two types of internal media, watery extra- and intracellular space and oily membranes that serve as partitions enclosing individual cells and various intracellular compartments. Water-soluble antioxidants are effective mainly in extra- and intracellular fluid, whereas fat-soluble antioxidants protect biological membranes. Both types of antioxidants are needed to create an effective shield against free radicals for the entire body, and skin in particular.

Solubility of antioxidants

Water soluble	Fat soluble	Water and fat soluble
Vitamin C Cysteine Methionine Selenium Glutathione	Vitamin E Vitamin A Carotenes Lycopene Coenzyme Q10	Lipoic acid Melatonin Some polyphenols Some flavonoids

Below we review some of the antioxidant nutrients and supplements which appear the most likely to produce skin benefits.

Vitamin E

Vitamin E is a principal fat soluble antioxidant vitamin in the body. It protects cellular membranes, lipoproteins and other "oily" structures. Skin is high in unsaturated fatty acids ("oily" molecules especially susceptible to free radical damage), and can benefit from vitamin E protection (both oral and topical).

Flavonoids

Flavonoids are a diverse group of plant pigments with antioxidant properties. These substances are responsible for color in many fruits, vegetables and flowers. In addition to providing color that attracts insects or animals, these pigments protect plants from environmental stress. In addition to being potent antioxidants, some flavonoids have antiallergic, anti-carcinogenic, anti-viral and anti-inflammatory activity. Over 4,000 flavonoids have been characterized and classified, but only a few have been researched. As far as skin benefits are concerned, two classes of flavonoids appear to be especially beneficial: proanthocyanins (found in grapes and pine bark) and polyphenols (found in green tea).

Coenzyme Q10, Lipoic acid, Cysteine, Methionine

Coenzyme Q10, lipoic acid, cysteine and methionine are potent antioxidants. But they also play other roles that are at least as important as their antioxidant activity.