

Extra Protection

THE SCIENCE BEHIND THE USE OF ANTIOXIDANTS IN COSMECEUTICALS AND SUN PROTECTION PRODUCTS.

By Laura Beliz



Antioxidative enzymes and molecules occur naturally in the body, where they defend cells against oxidation. But as we age, these enzymes become less active leading to an increased risk of cellular damage. It's no surprise, therefore, that topical antioxidants have become key ingredients in antiaging skincare products, where they protect the skin from damaging UV exposure and environmental pollution. But the benefits of antioxidants stretch beyond preventing the signs of aging. More recent evidence shows that topical antioxidants can help reduce the redness of sunburn and even ease the inflammation of rosacea.

"Oxidation happens when oxygen atoms combine with other atoms, and sometimes the oxides that are produced in these reactions are toxic—they can interfere with the activity of cells," explains John Kulesza, president of skincare company Young Pharmaceuticals. "Antioxidants, in general, are compounds that prevent oxidation reactions."

Antioxidants And Aging

In her latest textbook *Cosmeceuticals and Cosmetic Ingredients* (McGraw Hill 2014), dermatologist Leslie Baumann, MD, identifies a number of antioxidative enzymes and molecules that are naturally produced by our bodies, including superoxide dismutase, catalase and ascorbic acid (vitamin C). The problem is that these defense mechanisms become less active as the body ages. "This leads to an imbalance and increased number of unchecked free radicals, which engender damage to DNA, cytoskeletal elements, cellular proteins, and cellular membranes," she writes.

While minimizing free radicals is thought to prevent wrinkles (rather than treat those already present), Dr. Baumann notes that topical antioxidants have other antiaging benefits as well. "In addition to the effects associated with their antioxidative activity, many antioxidants exhibit anti-inflammatory properties or depigmenting activities," she writes. "They protect cell membranes, proteins, DNA and mitochondria."

In particular, antioxidants protect the skin cells against damaging UV exposure and environmental pollution. "They are the hero ingredients when it comes to defending the skin from environmental damage," says Sarah Longton Pajaro, executive director of accounts and education for LIFTLAB Skin Regeneration. "UV radiation causes the formation of free radicals, which break down collagen and rearrange elastin. This leads to deterioration in skin's structure and strength. When antioxidants are present, they are able to catch and neutralize these scavengers to prevent damage."

More Effective Sun Protection

In recent years, antioxidants have become common ingredients in sun protection products. "Sunlight, especially ultraviolet light, has a lot of energy that is able to knock electrons off of atoms, creating reactive oxygen species—which can be damaging and lead to inflammation," says Kulesza. "There are classic studies that show if you apply an antioxidant, like vitamin C, to the skin immediately after sun exposure, you can reduce the amount of redness that occurs."

He adds that there is a window of time within which an antioxidant may be applied in order to have the desired effect—if you wait too long after sun exposure to apply the topical antioxidant, it won't work.

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