



## THE BENEFITS OF **MICRONUTRIENTS** FOR HEALTHY SKIN & COLLAGEN



The skin is not only the largest organ in the body, it is also a mirror of the health of the body's internal organs. In addition to protection of inner tissue structures, the skin helps in regulation of body temperature and elimination of metabolic waste products. Many diseases of the digestive, cardiovascular, and nervous systems, and hormonal imbalances and inflammatory conditions are reflected on the skin. With approximately 20 square feet of surface area, the skin is primarily taken care of for cosmetic appeal. Thousands of skin care products cater to beauty and health conscious consumers who hope to avoid acne, discoloration and signs of aging, as well as skin cancer. It is estimated that the global skin care products industry revenue will be \$102.3 billion by 2018.

Known risk factors for unhealthy skin are excessive exposure to ultraviolet rays, environmental pollution, dehydration, and diet deficient in nutrients, consumption of sugary drinks and alcohol, and smoking. In addition, metabolic syndrome, which includes obesity, diabetes, and high blood pressure, and hormonal imbalances, can contribute to skin issues and signs of early aging.

The skin is made up of three main layers. The Epidermis is the outermost layer and contains the proteins keratin (which strengthens the skin), and melanin (which protects the skin from harsh sun rays). The Dermis is the second layer containing blood vessels, nerves, and collagen fibers, which are essential for the skin's firmness and elasticity. The Hypodermis is third layer containing fat cells, which help maintain body temperature.

The main component of the skin is collagen, a fibrous protein. There are several subtypes of collagen found in different parts of our body. As one ages, less collagen is formed and its degradation increases resulting in sagging skin and wrinkles. Age-related decline of the sex hormones and decreased growth hormone production also adversely impact the texture and health of the skin. Declining levels of estrogen promote dry and wrinkly skin and reduce the thickness of the skin. A drop in growth

hormone production is reflected by dull skin due to decreased production of new skin cells and accumulation of dead cells on the skin layers. This accumulation also increases melanin pigmentation because melanin coalesces into small pockets forming brown patches or "sunsspots" on the skin. The ground substance (also known as the extra cellular matrix) in skin is built by layers of glycosaminoglycans (or hyaluronic acid). Decreased production of hyaluronic acid lowers the ability of the skin to repair itself, and impacts its organization affecting the skin structure.

These factors and a dietary deficiency of micronutrients such as vitamin C, proline, lysine, vitamin E, selenium, zinc, and others, accelerate the process of skin aging. For instance, wrinkles occur due to reduction in muscle mass and skin thickness, and the destruction of the collagen and elastin supporting the skin structure. Vitamin C in combination with lysine and proline are essential for producing healthy collagen fibers. Free radicals generated from oxidative damage activate matrix metalloproteinases (MMP) enzymes, which break down collagen and elastin thereby, promoting wrinkles and other signs of premature aging. Vitamin C, together with vitamin E, is highly effective in reducing free radical damage. Other important micronutrients for healthy skin are green tea, carotenoids, lycopene, curcumin, and coenzyme Q-10.

Although topical solutions are available for wrinkles, acne, and dry or oily skin, it is critical to support our body's largest organ from the inside through diet and synergistic combinations of micronutrients. In this aspect, adequate collagen production is not only important for healthy skin, but also for strong and healthy coronary arteries, bones and cartilage, and for improving the function of all organs in the body. This can only be achieved by healthy diet and lifestyle choices along with appropriate micronutrient supplementation.

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The ground-breaking nature of this research poses a threat to the multi-billion dollar pharmaceutical "business with disease". It is no surprise that over the years the drug lobby has attacked Dr. Rath and his research team in an attempt to silence this message. To no avail. During this battle, Dr. Rath has become an internationally renowned advocate for natural health. Says he: "Never in the history of medicine have researchers been so ferociously attacked for their discoveries. It reminds us that health is not given to us voluntarily, but we need to fight for it."

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