

Addressing the Real Needs of the Skin for True Skin Health

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Abstract

Despite the significant advances in cosmetic science in the past 20 years, little attention has been paid to the health of the cells that comprise the skin. Since the health of these cells is perhaps the most important factor in maintaining a beautiful complexion, cosmetic scientists should put greater emphasis on how to maintain the healthiest skin cells possible. The scientific artisan practicing in the area of cosmetics today is acutely aware that the skin is subjected to the ravages of environmental exposures because it is the outermost organ of the body. Those exposures include ultraviolet light and pollutants that have the potential to overwhelm the skin's natural defense system and thereby create significant damage to skin cells. This damage seldom is limited to the outermost layers of the skin. However, today's approach to protecting the skin from that damage only includes the use of topically applied creams and lotions. Approaches involving claims for cosmetic products related to the transdermal delivery of materials in order to provide protectant activities would virtually insure that governmental regulatory bodies would deem such products to be drugs instead of cosmetics. However, methods do exist that will help ensure the maximum health of skin cells throughout the entire depth of the skin, particularly in regard to the antioxidant protection of skin cells. Those methods are addressed in this article.

Introduction

Nothing is more attractive than healthy skin. This is never more evident than when looking at and touching the skin of a baby. The absence of blemishes, the glow of the skin, its softness, suppleness and firmness to the touch of a baby's skin are qualities we associate with skin health. However, as people age, environmental assaults, especially exposure to sunlight, wreak havoc in the cells of the skin. These assaults damage cell membranes, proteins, and may even cause changes to the genetic material of skin cells. Although skin cells have protective mechanisms to guard against such damage, over-exposure to these environmental assaults can overwhelm the skin's inherent mechanisms and create damage within cells that must be repaired.¹⁻⁶ Failure to repair such damage can

lead to either apoptosis (programmed cellular death) or cellular mutations. Such mutations are believed to be precursors to skin cancers.^{7,8} The cumulative damage to the skin over the years results in the visible changes in the skin that is commonly referred to as premature ageing or photoageing.⁹ These environmental assaults can also suppress the skin's immune function, causing skin cells to become more susceptible to further environmental assaults as well as potentially limiting the ability of skin's natural protective mechanisms to mount a defense against the growth of mutated cells. This can also lead to skin cancer formation.¹⁰⁻¹²

Skin Damage Induced by Environmental Exposure

The chief culprit in these types of phenomena occurring in the skin is sunlight, especially the ultraviolet wavelengths of solar radiation.^{7, 8, 13} It is well documented that the shorter wavelengths of solar ultraviolet light, termed the UVB, have the potential to cause sunburn with its associated inflammation and swelling. These wavelengths also induce a thickening of the skin as a result of enhanced cellular proliferation, sunburn cell formation as a result of apoptosis, and suppression of the skin's immune system.¹⁴⁻¹⁶ However, these wavelengths do not penetrate very deeply into the skin. UVB is not believed to penetrate significantly beyond the dermal-epidermal junction.¹⁷ This means that the damage caused by these solar wavelengths is primarily restricted to the outermost portion of the skin.

The longer solar ultraviolet wavelengths of sunlight have the ability to penetrate significantly deeper into the skin.¹⁷ These wavelengths, commonly referred to as the UVA, are associated with damage to the elastic properties of the skin because they induce a cross-linking of collagen.^{14, 15, 18} This effect is primarily responsible for the formation of wrinkles and sagging of skin. It must also be kept in mind that these wavelengths can also cause damage in the more superficial layers of the skin since they penetrate these layers in order to reach the dermis where they cause collagen damage.¹⁸⁻²¹

Cells of the human body require oxygen to convert the foods that we eat to the energy required to maintain normal cellular

