

Neova® Maximum Body Repair Combats Photodamage with DNA Repair and Copper Peptide Technologies

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Abstract

Neova® Maximum Body Repair treatment now combines a blend of Copper Peptide Complex® technology with the DNA protection provided by the addition of Endosomes. The DNA repair enzyme encapsulated in the Endosome liposomes target damaged DNA within cells in the upper layer of skin, for repair of the photodamage that results from UV irradiation. Copper peptide technology is present to enhance the skins natural repair mechanisms to lessen the biological effects of aging skin.

Introduction

Wrinkles are not very desirable features for most people despite the fact that they are the inevitable results of aging and environmental stress and damage. Wrinkles, of course, are caused in part by the natural slowdown of repair of the underlying extracellular matrix (ECM) of the skin. The resulting accumulation of fine lines, wrinkles, sagging skin can add to an increased appearance of age.

Maximum Body Repair now combines Copper Peptide Complex technology with the DNA protection provided by Endosomes in a paraben free, full body treatment formula.

DNA damage is a critical aftermath of UV irradiation due to sunlight exposure and contributes to many of the visible aspects of photoaging. Exposure to UVB causes the formation of thiamine dimmers. DNA damage can also come about during the normal process of cellular metabolism and respiration.

DNA Repair

DNA repair refers to a collection of processes used by a cell to identify and correct damage to the DNA from either normal cellular processes or UV radiation. The DNA repair process is constantly active as the cells respond to damage in the DNA structure. The rate of DNA repair is dependent on many factors such as the type of cell, the age of the cell, and the cellular environment. If a cell accumulates a large amount of DNA damage with insufficient repair, it may become dormant (senescence), initiate programmed cell death (apoptosis), or start unregulated cell proliferation (cancer).

Copper Peptide Complex®

Copper is essential to vital cellular and enzyme processes required for human health, and is the third most abundant trace metal in the body, after iron and zinc. Since the 1830s, copper has been known to be an essential nutrient. It was found that copper plays a key role in several of the body's essential enzyme systems needed for tissue repair and other biological responses. These copper-based enzyme systems allow tissue to repair itself, blood vessels to form, wounds to close and inflammation to decrease. Copper is now known to be critical to the normal repair and healing process in all tissue, including connective tissues that comprise human skin, internal organs and bones.

The Copper Peptide Complex in Maximum Body Repair is a tripeptide (glycyl-L-histidyl-L-lysine) complexed with copper. The tripeptide was originally isolated from the albumin fraction of human serum¹. It was subsequently shown that the peptide existed as the copper complex and enhanced the uptake of copper by cells²⁻⁴. The glycyl-L-histidyl-L-lysine peptide sequence is found in several proteins associated with the extracellular matrix including the large extracellular matrix protein termed SPARC and may be liberated by endogenous proteolysis or cleavage of these proteins during the repair and regeneration processes⁵⁻⁸. These small peptides liberated from the extracellular matrix were termed matrikines.

Skin health, dermal wound healing, and general soft tissue repair requires many of the same biological processes such as reconstitution of an extracellular matrix and increased blood flow (angiogenesis). Copper is utilized by essentially every cell and organ; resulting in the formation of

important copper-dependent enzymes—including cytochrome C oxidase (energy production), superoxide dismutase (antioxidation) and lysyl oxidase (cross-linking of elastin and collagen in skin)^{9,10}.

In numerous studies, copper peptides have been shown to promote new blood vessel growth, enhance the expression of growth factors, activate matrix metalloproteases, and stimulate the formation of new collagen, elastin, and glycosaminoglycan components of tissue to accelerate the repair process¹¹⁻¹⁷.

More importantly, Copper Peptide Complex, formulated in a wide variety of cosmetic preparations, has shown to both stimulate collagen production and to reduce the visible signs of aging, improve skin laxity, clarity, and appearance, reduce the appearance of fine lines and wrinkles, and to increase skin density and thickness both on the face and eye area¹⁸⁻²¹.

Activities of Copper and Copper Peptide Scientific Studies	
Collagen	Enhance
Glycosaminoglycans	Enhance
Elastin	Enhance
Angiogenesis	Enhance
Growth Factors	Enhance
Matrix Metalloproteases	Enhance
Performance Evaluations	
Collagen	Enhance
Skin Laxity	Improve
Skin Clarity	Improve
Skin Appearance	Improve
Fine Lines & Wrinkles	Reduce Appearance
Skin Density	Increase
Skin Thickness	Increase

Endosomes

Endosomes contain an enzyme extract prepared from *Micrococcus luteus*, which was discovered after a complete search for an organism very resistant to UV radiation. The resistance of *Micrococcus luteus* is largely due to the presence of the enzyme UV endonuclease, which recognizes UV induced DNA damage and initiates its repair. Delivery of these enzymes is well known to enhance removal of sun damage and increase cell survival, and to protect the immune system²².

Endosomes have been shown to enhance DNA repair in human cells. The enzyme activity encapsulated in the liposomes stimulates the recognition and elimination of damage to skin that has been most closely linked to the long term effects of sun exposure, Figure 1.

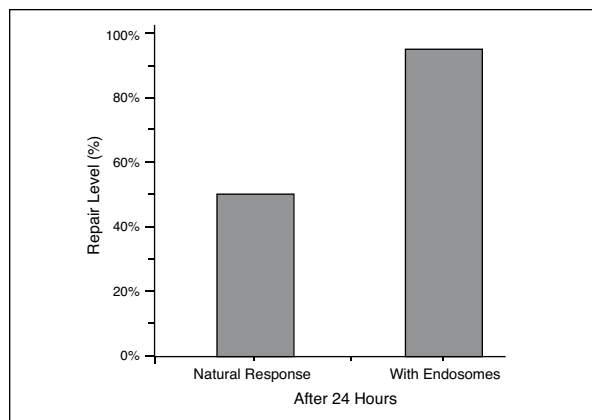


Figure 1. Effect of Endosomes on DNA Repair In Human Cells

In vitro studies using reconstituted human epidermis show that Endosomes decrease the immune response to UVB irradiation. This is an important function is decreasing the response to UV exposure, Figure 2.

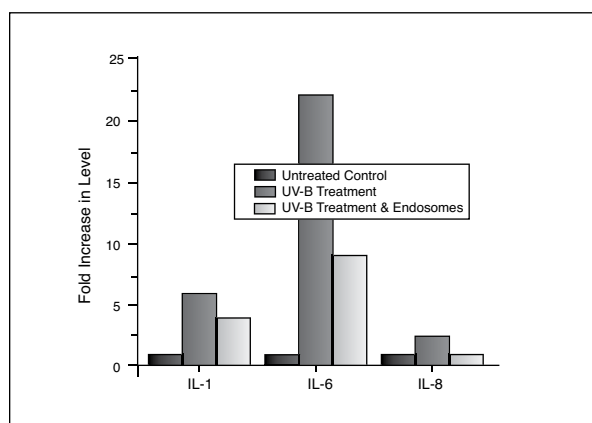


Figure 2. Effect of Endosomes on Immune Reaction Markers In Human Cells

Summary

Maximum Body Repair is formulated to combat the effects of photoaging on the skin. DNA repair enzymes encapsulated in liposomes target damaged DNA within cells in the upper layer of skin, for repair from the photodamage that results from UV irradiation. Copper Peptide technology is present to enhance the skins natural repair mechanisms to lessen the biological effects of aging skin.

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