

Recombinant Human Hair Keratin for Improving Hair Health

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DESCRIPTION

Conventional chemical hair care product used for treatment of broken hair and hair straightening. Excessive use of chemical hair treatments will turn out irreversible injury to hair texture and may cause hair loss. Scleroprotein (or) fibrous protein are structural macromolecule a significant building block of hair covering ninetyth of total hair mass and provides mechanical strength. Scleroprotein treatment has been a growing trend to revive the natural characteristics and juvenility of hair. Scleroprotein is employed in a very wide selection of hair care formulations, perform several functions, as well as learning, permanent hair straightening and smoothness of the broken hair.

Scleroprotein based hair care products are available within the market for different hair treatments. Industrially, scleroprotein extracted from varied natural sources like feathers, wools, horns and hooves either in intact or hydrolyzed for industrial production of hair care products. However, for hair cosmetic application feathers is taken into account a most popular scleroprotein extraction supply due to its abundance and economical value. Toughness of the scleroprotein sources extremely sturdy chemical strategies square measure accustomed extract the scleroprotein. These strategies embrace either sturdy alkali or acid treatments at high temperatures. Alkali treatment incorporates a forceful impact on structural integrity and organic compound composition of the extracted scleroprotein. The scleroprotein from feathers has similarity with human hair scleroprotein, whereas intact scleroprotein from hairs, wools or horns obtained through chemicals sturdy strategies have defects in its structural integrity and organic compound composition that all makes it less favorable to hair binding.

The scleroprotein isolated through chemical strategies typically exists within the kind of peptides instead of intact macromolecule. Varied studies have shown that the intact scleroprotein isolated have showed improved mechanical strength of the broken hair as compared to the scleroprotein product.

Solubility of the scleroprotein could be a major concern in isolation and its inclusion in a product. Conventionally, the scleroprotein hydrolyzed into peptides through accelerator chemical reaction or alkaline treatment. However, the peptides once applied on hair might not offer economical stability. Therefore, maltreatment of the intact scleroprotein in its native kind would be ideal to recover broken profile of the hair macromolecule supply mechanical strength to the hair. Many studies have rumored that application of intact scleroprotein isolated from scleroprotein sources in hair cosmetics. However, the flaw in maltreatment the intact scleroprotein and its extracts strategies that either use aldehyde or alternative dangerous chemicals which require intensive processing for his or her removal, creating the merchandise costlier or place the human health on risk. These chemicals have potential effects on human health.

Several hair care product containing scleroprotein was prohibited in U.S by American state bureau due to excessive aldehyde levels within the product. Several keratin-based products contain aldehyde. Its chemical nature within the product makers would possibly list various names (methylene glycol, group chemical compound, formalin, methanal, paraform, formic organic compound, oxymethylene, oxomethane, or CAS range 50-00-0) for aldehyde and claim that the merchandise is aldehyde unengaged to deceive the customers.

Keratin extracted by reducing or aerophilous agent like thiols and peroxides severally, that decreases the steadiness of scleroprotein fibers and solublize the macromolecule. These chemical agents cause hepatotoxicity to human health, troublesome to handle and can't be recycled. Scleroproteins also are extracted through physiochemical strategies by heating scleroprotein source (horns, hooves, hairs and feather etc.) with organic solvents like Dimethylformamide (DMF) and Dimethyl Sulfoxide (DMSO). The proteins are then precipitated with dissolvent followed by distillation to get rid of the solvent. Both chemical and physical extraction strategies of scleroprotein need intensive energy to get rid of this dangerous chemicals from the scleroprotein resolution.

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Keratin peptides extracted through chemical strategies from scleroprotein sources utilized in hair care formulations. Although these peptides simply penetrate through the cuticle of the damaged hair and bind the macromolecule building blocks with non-specificity they'll not fill the gaps created by the loss of intact macromolecule. The nonspecific nature of the amide might not enable all the peptides in resolution to bind with broken hair, thus increasing the number within the formulation throughout hair treatment.

The non-specific nature of scleroprotein peptides are high in cost and health risks related to the scleroprotein. It is isolated through physiochemical strategies various methods for scleroprotein production. Recombinant production of the

human hair scleroprotein would be a perfect methodology for hair care formulations. It doesn't involve any dangerous chemicals and proteins. This enables the scleroprotein to fill the gaps created by the intact macromolecule throughout hair injury. The particular nature of the macromolecule increases the probabilities of applied macromolecule binding with hair and thus decreasing the desired amount in formulation. The recombinant production of human scleroprotein is non-dangerous and extremely economical for hair care formulations due to its specificity and native state. It is an alternative supply for human hair scleroprotein i.e. acidic scleroprotein K34-39 and basic scleroprotein K81-86 in *E. coli* and analyze their mix impact once applied on broken hair. The combination of such recombinant scleroprotein will add additional improvement to hair health.