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(71) Applicant:

Beiersdorf AG, 20253 Hamburg, DE

(72) Inventors:

Schönrock, Uwe, Dr., 22844 Norderstedt, DE; Pollet, Dieter, Dr., 22523 Hamburg, DE; Schreiner, Volker, Dr., 22523 Hamburg, DE; Märker, Uwe, 22085 Hamburg, DE; Kruse, Inge, 20146 Hamburg, DE

(56) Documents to be taken into consideration in assessing patentability:

DE 34 47 618 C2
DE 43 23 615 A1
DE 33 19 282 A1
DE 26 17 919 A1
DE-OS 24 01 450
= US 40 88 756
FR 26 51 434 A1
FR 26 49 610 A1
FR 26 47 342 A1
FR 26 34 374 A1
US 39 37 809
EP 04 84 199 B1
EP 02 56 472 A3
EP 02 56 472 A2
Derwent Abstract, 84-227814/37 to J5 9134-707-A;
JP Patents Abstracts of Japan: 63-152309 A.,C-541,Nov. 8,1988,Vol.12,No.421;
6- 80564 A.,C-1217,June 27,1994,Vol.18,No.337;

(54) Use of an effective content of adenosine in cosmetic or dermatological preparations

(57) Use of adenosine for enhancing cell proliferation in human skin.

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The following details have been taken from the documents submitted by the Applicant

DESCRIPTION

The present invention relates to the use of adenosine in cosmetic and dermatological preparations.

In a separate embodiment, the present invention relates to cosmetic and dermatological preparations for the prevention and therapy of cosmetic or dermatological skin changes such as, for example, skin aging.

The skin ages because of endogenous, genetically determined influences. Exogenous factors, such as UV-light and chemical irritants, can have cumulative effects and accelerate the natural aging processes. This produces a number of degenerative processes whose results include the following structural changes and insult in the dermis and epidermis (dermatoheliosis), depending on the magnitude of the influencing factors:

a) Involution of the microvascular system.

b) Loosening and formation of wrinkles in part due to the reduction and cross-linking of collagen and accumulation of glucosaminoglycans (basic substance).

c) Flattening of the reticular plugs. In conjunction with this is the surface reduction between dermis and epidermis, through which substances for the nourishment and cleansing of the epidermis are exchanged.

d) Limited regenerative turnover in the epidermis in conjunction with abnormal formation of the horny layer (hornification) that leads to drying out of the skin.

e) Abnormal regulation of cell division (proliferation) and cell maturation (differentiation) in the epidermis resulting in atypical cells and polarity loss.

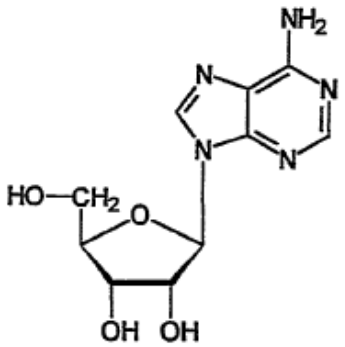
f) Local hyper-, hypo-, and abnormal pigmentations (age spots).

Accordingly, the present invention relates to products for the care and prevention of aged skin and for the therapy of the damage resulting from skin aging, in particular those phenomena listed in a) to f).

It was surprising and unforeseeable by the specialist that for enhancement of cell proliferation in human skin, preferably in cosmetic or dermatological preparations, remedies the drawbacks of the prior art.

In one particular embodiment, the present invention accordingly relates to the use of adenosine for the care and prevention of aged skin and for the therapy of the damage resulting from skin aging, in particular those phenomena listed in a) to f).

Adenosine is characterized by the structural formula:



DE-OS 24 01 450 discloses pharmaceutical compositions for the relief of proliferative skin diseases containing an effective adenosine content. Furthermore, several prior art documents are known that deal with the cosmetic or dermatological use of adenosine phosphates (cyclic adenosine-3'5'-monophosphate = cAMP, adenosine monophosphate = AMP, adenosine diphosphate = ADP, adenosine triphosphate = ATP), for example US patent specification 4,702,913, in which the use of ATP and cAMP as substances enhancing skin moisture is discussed. The prior art does not, however, provide an indication of the use according to this invention.

According to the use as described in the invention, cosmetic or dermatological formulations can be composed as usual and used for the treatment, care and cleansing of the skin and/or hair, and as a make-up product in

decorative cosmetics. They contain preferably 0.001% by weight to 10% by weight, but particularly 0.01% by weight to 6% by weight, of the active substance combinations according to the invention relative to the total weight of the product.

For use according to the invention, the cosmetic and dermatological preparations are — applied in sufficient quantity to the skin and/or hair in the manner conventional for cosmetics.

Cosmetic and dermatological preparations can be in various forms for use according to the invention. For example, they can be a solution, a non-aqueous preparation, a water-in-oil (W/O) or oil-in-water (O/W) emulsion or microemulsion, a multiple emulsion such as a water-in-oil-in-water (W/O/W) emulsion, a gel, a solid stick, a salve or even an aerosol. Adenosine can also be advantageously administered in encapsulated form according to the invention, for example in collagen matrices and other conventional encapsulation materials, for example as cellulose encapsulations, in gelatins, wax matrices or encapsulated in liposomes. In particular, wax matrices as disclosed in DE-OS 43 08 282 have been shown to be advantageous.

The addition of adenosine to aqueous systems or tenside preparations for cleansing the skin and the hair is also possible and advantageous according to the present invention.

In keeping with the use according to the invention, cosmetic and dermatological preparations can contain cosmetic adjuvants as conventionally used in such preparations, for example preservatives, bactericides, fragrances, anti-foaming agents, dyes, pigments having a coloring effect, thickeners, surfactants, emulsifiers, softening, wetting and/or moisture-retaining substances, fats, oils, waxes or other

conventional components of a cosmetic or dermatological formulation like alcohols, polyols, polymers, foam stabilizers, electrolytes, organic solvents or silicone derivates.

In particular, adenosine can also be combined with antioxidants.

According to the invention, all antioxidants suitable or usable in cosmetic and/or dermatological applications can be used advantageously as antioxidants.

It is advantageous to select the antioxidants from the group comprised of amino acids (for example; glycine, histidine, tyrosine, tryptophan) and their derivatives, imidazoles (for example, urocanic acid) and their derivatives, peptides such as D,L-carnosine, D-carnosine, L-carnosine and their derivatives (for example, anserine); carotenoids, carotenes (for example, α-carotene, β-carotene, lycopine) and their derivatives; chlorogenic acid and its derivatives, liponic acid and its derivatives (for example, dihydroliponic acid), aurothioglucose, propylthiouracil and other thiols (for example, thioredoxin, glutathion, cysteine, cystine, cystamine and their glycosyl-, N-acetyl-, methyl-, ethyl-, propyl-, amyl-, butyl- and lauryl-, palmitoyl-, oleyl-, γ-linoleyl-, cholesteryl- and glyceryl esters) and their salts, dilaurylthiodipropionate, distearylthiodipropionate, thiodipropionic acid and their derivatives (esters, ethers, peptides, lipids, nucleotides, nucleosides and salts) and sulfoximine compounds (for example, buthionine sulfoximine, homocysteine sulfoximine, buthionine sulfone, penta-, hexa-, heptathionine sulfoximine) in very low, tolerable doses (for example, pmol to μmol/kg); in addition, (metal) chelators (for example, α-hydroxy fatty acids, palmitic acid, phytinic acid, lactoferrin), α-hydroxy acids (for example,

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