

【CLAIMS】

~~—【Claim 1】—~~

~~A composition for diagnosing damage of skin cells or skin barrier by microdust comprising an agent for measuring the expression level of mRNA of one or more gene selected from a group consisting of S100A7 (NM_002963) gene, S100A8 (NM_002964) gene, S100A9 (NM_002965) gene, CYP1A1 (NM_000499) gene, CYP1B1 (NM_000104) gene, PI3 (NM_002638) gene, IL36G (NM_019618) gene, IL1B (NM_000576) gene, CCL27 (NM_006664) gene, IL8 (NM_000584) gene, PTGS2 (NM_000963) gene, NOX5 (NM_001184779) gene, XDH (NM_000379) gene, CXCL14 (NM_004887) gene, SOD3 (NM_003102) gene, KRT1 (NM_006121) gene, H19 (NR_002196) gene, CASP14 (NM_012114) gene, KRT10 (NM_000421) gene, CASP8 (NM_001080125) gene, KRT15 (NM_002275) gene and KRT13 (NM_002274) gene or protein thereof.~~

~~—【Claim 2】—~~

~~The composition according to claim 1, wherein the agent for measuring the expression level of the mRNA or protein thereof is a polynucleotide complementary to the mRNA of the gene or a fragment thereof, or a probe or a primer capable of amplifying the gene.~~

~~—【Claim 3】—~~

~~The composition according to claim 1, wherein the agent for measuring the expression level of the mRNA or protein thereof is an antibody specifically recognizing the protein.~~

~~—【Claim 4】—~~

~~A kit for diagnosing damage of skin cells or skin barrier by microdust comprising the composition according to any of claims 1 to 3.~~

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~~—【Claim 5】—~~

~~A method for diagnosing damage of skin cells or skin barrier by microdust comprising:~~

~~a) measuring the expression level of the mRNA of one or more gene selected from a group consisting of S100A7 (NM_002963) gene, S100A8 (NM_002964) gene, S100A9 (NM_002965) gene, CYP1A1 (NM_000499) gene, CYP1B1 (NM_000104) gene, PI3 (NM_002638) gene, IL36G (NM_019618) gene, IL1B (NM_000576) gene, CCL27 (NM_006664) gene, IL8 (NM_000584) gene, PTGS2 (NM_000963) gene, NOX5 (NM_001184779) gene, XDH (NM_000379) gene, CXCL14 (NM_004887) gene, SOD3 (NM_003102) gene, KRT1 (NM_006121) gene, H19 (NR_002196) gene, CASP14 (NM_012114) gene, KRT10 (NM_000421) gene, CASP8 (NM_001080125) gene, KRT15 (NM_002275) gene and KRT13 (NM_002274) gene or protein encoded thereby, from a skin cell sample of a subject; and~~

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~~b) comparing the expression level with the expression level of the mRNA of the gene or protein encoded thereby, in a skin cell sample not damaged by microdust.~~

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~~—【Claim 6】—~~

~~The method for diagnosing damage of skin cells or skin barrier by microdust according to claim 5 further comprising determining that skin cells or skin barrier is damaged by microdust~~

~~1) when the expression level of the mRNA of one or more gene selected from a group consisting of CXCL14 (NM_004887) gene, SOD3 (NM_003102) gene, KRT1 (NM_006121) gene, H19 (NR_002196) gene, CASP14 (NM_012114) gene, KRT10 (NM_000421) gene, CASP8 (NM_001080125) gene, KRT15 (NM_002275) gene, KRT13 (NM_002274) gene and filaggrin gene or protein encoded thereby, measured from the skin cells of a subject is lower than that of a skin cell sample not damaged by microdust, or~~

~~2) when the expression level of the mRNA of one or more gene selected from a group consisting of S100A7 (NM_002963) gene, S100A8 (NM_002964) gene, S100A9 (NM_002965) gene, CYP1A1 (NM_000499) gene, CYP1B1 (NM_000104) gene, PI3 (NM_002638) gene, IL36G (NM_019618) gene, IL1B (NM_000576) gene, CCL27 (NM_006664) gene, IL8 (NM_000584) gene, PTGS2 (NM_000963) gene, NOX5 (NM_001184779) gene and XDH (NM_000379) gene or protein encoded thereby measured from the skin cells of a subject is higher than that of a skin cell sample not damaged by microdust.~~

~~—【Claim 7】—~~

~~The method according to claim 5, wherein the expression level of the mRNA of the gene or protein is measured by one or more method selected from a group consisting of microarray, PCR, NGS (next generation sequencing), western blot,~~

~~northern blot, ELISA, radioimmunoassay, radioimmunodiffusion, histological immunostaining and immunoprecipitation assay.~~

~~—【Claim 8】—~~

5 ~~A method for screening a substance improving skin damage by microdust comprising:~~

~~treating skin cells with microdust;~~

~~treating the microdust-treated skin cells with a test substance; and~~

10 ~~checking the expression level of the mRNA of one or more gene selected from a group consisting of S100A7 (NM_002963) gene, S100A8 (NM_002964) gene, S100A9 (NM_002965) gene, CYP1A1 (NM_000499) gene, CYP1B1 (NM_000104) gene, PI3 (NM_002638) gene, IL36G (NM_019618) gene, IL1B (NM_000576) gene, CCL27 (NM_006664) gene, IL8 (NM_000584) gene, PTGS2 (NM_000963) gene, NOX5 (NM_001184779) gene, XDH (NM_000379) gene, CXCL14 (NM_004887) gene, SOD3 (NM_003102) gene, KRT1 (NM_006121) gene, H19 (NR_002196) gene, CASP14 (NM_012114) gene, KRT10 (NM_000421) gene, CASP8 (NM_001080125) gene, KRT15 (NM_002275) gene and KRT13 (NM_002274) gene or protein encoded by the genes in the skin cells treated with the test substance, before and after the treatment with the test substance.~~

20 ~~—【Claim 9】—~~

~~The method for screening a substance improving skin damage by microdust according to claim 8, further comprising determining the test substance as a substance improving skin damage by microdust~~

1) when the expression level of the mRNA of one or more gene selected from a group consisting of CXCL14 (NM_004887) gene, SOD3 (NM_003102) gene, KRT1 (NM_006121) gene, H19 (NR_002196) gene, CASP14 (NM_012114) gene, KRT10 (NM_000421) gene, CASP8 (NM_001080125) gene, KRT15 (NM_002275) gene, KRT13 (NM_002274) gene and filaggrin gene or protein encoded by the genes is increased after the treatment with the test substance as compared to before the treatment with the test substance, or

2) when the expression level of the mRNA of one or more gene selected from a group consisting of S100A7 (NM_002963) gene, S100A8 (NM_002964) gene, S100A9 (NM_002965) gene, CYP1A1 (NM_000499) gene, CYP1B1 (NM_000104) gene, PI3 (NM_002638) gene, IL36G (NM_019618) gene, IL1B (NM_000576) gene, CCL27 (NM_006664) gene, IL8 (NM_000584) gene, PTGS2 (NM_000963) gene, NOX5 (NM_001184779) gene and XDH (NM_000379) gene or protein encoded by the genes is decreased after the treatment with the test substance as compared to before the treatment with the test substance.

~~—【Claim 10】—~~

~~The method for screening a substance improving skin damage by microdust according to claim 8, wherein the skin cell is a keratinocyte.~~

~~—【Claim 11】—~~

~~A composition for moisturizing skin comprising galangin, an isomer thereof, a pharmaceutically acceptable salt thereof, a prodrug thereof, a hydrate thereof or a solvate thereof as an effective ingredient.~~

~~【Claim 12】~~

~~A composition for enhancing skin barrier function comprising galangin, an isomer thereof, a pharmaceutically acceptable salt thereof, a prodrug thereof, a hydrate thereof or a solvate thereof as an effective ingredient.~~

~~【Claim 13】~~

~~A composition for inducing differentiation of keratinocytes comprising galangin, an isomer thereof, a pharmaceutically acceptable salt thereof, a prodrug thereof, a hydrate thereof or a solvate thereof as an effective ingredient.~~

【Claim 141】

A cosmetic composition for improving skin damage by microdust comprising galangin, an isomer thereof, a pharmaceutically acceptable salt thereof, a prodrug thereof, a hydrate thereof or a solvate thereof as an effective ingredient.

【Claim 2】

A health food composition for improving skin damage by microdust comprising galangin, an isomer thereof, a pharmaceutically acceptable salt thereof, a prodrug thereof, a hydrate thereof or a solvate thereof as an effective ingredient.

【Claim 153】

The composition according to ~~any of claims 11-1 to or 142~~, wherein the composition comprises 0.000001-30 wt% of galangin, an isomer thereof, a

pharmaceutically acceptable salt thereof, a prodrug thereof, a hydrate thereof or a solvate thereof based on the total weight of the composition.

【Claim ~~164~~】

5 The composition according to ~~any of claims 11-1 to or 142~~, wherein the concentration of the galangin, the isomer thereof, the pharmaceutically acceptable salt thereof, the prodrug thereof, the hydrate thereof or the solvate thereof is 0.1-5 μ M based on the total volume of the composition.

10 【Claim ~~175~~】

 The composition according to ~~any of claims 11-1 to or 142~~, wherein the composition promotes the expression of one or more selected from a group consisting of CXCL14 (NM_004887) gene, SOD3 (NM_003102) gene, KRT1 (NM_006121) gene, H19 (NR_002196) gene, CASP14 (NM_012114) gene, KRT10
15 (NM_000421) gene, CASP8 (NM_001080125) gene, KRT15 (NM_002275) gene, KRT13 (NM_002274) gene and filaggrin gene.

 【Claim ~~186~~】

 The composition according to ~~any of claims 11-1 to or 142~~, wherein the
20 composition decreases the expression of one or more selected from a group consisting of S100A7 (NM_002963) gene, S100A8 (NM_002964) gene, S100A9 (NM_002965) gene, CYP1A1 (NM_000499) gene, CYP1B1 (NM_000104) gene, PI3 (NM_002638) gene, IL36G (NM_019618) gene, IL1B (NM_000576) gene, CCL27

(NM_006664) gene, IL8 (NM_000584) gene, PTGS2 (NM_000963) gene, NOX5 (NM_001184779) gene and XDH (NM_000379) gene.

【Claim 197】

5 The composition according to ~~any of claims 11-1 to or 142~~, wherein the composition promotes the synthesis of filaggrin protein or keratin protein.

~~【Claim 20】~~

10 ~~The composition according to any of claims 11 to 14, wherein the composition is a cosmetic composition, a pharmaceutical composition or a health food composition.~~