

Claims

1. A composition comprising one or more enzymes capable of catalysing the hydrolysis of keratinocyte effector molecules such as protein keratins that support the function and integrity of the human skin and its appendages such as the hair follicle that are supported by keratinocytes to maintain the biological barrier, its function and struture, where the composition is:
- a. a pharmaceutical composition, comprising at least one pharmaceutically acceptable ingredient in addition to the one or more enzymes;
- or
- b. a cosmetic composition, comprising at least one cosmetically acceptable ingredient in addition to the one or more enzymes
2. The composition of claim 1, wherein the one or more enzymes capable of catalysing the hydrolysis of keratinocyte effector molecules such as protein keratins that support the integrity of the human skin and its appendages such as the hair follicle that are supported by keratinocytes to keep the biological barrier, function and struture, are selected among glutamyl endopeptidases.
3. The composition of claim 2, wherein the glutamyl endopeptidases are selected among glutamyl endopeptidases having at least 60% sequence identity, e.g. at least 70% sequence identity; e.g. at least 80% sequence identity; e.g. at least 90% sequence identity; e.g. at least 95% sequence identity; e.g. at least 96% sequence identity; e.g. at least 97% sequence identity; e.g. at least 98% sequence identity; e.g. at least 99% sequence identity; to the polypeptide having the sequence of SEQ ID NO: 1
4. The composition of claim 2, wherein the glutamyl endopeptidases are selected among glutamyl endopeptidases having at least 60% sequence identity, e.g. at least 70% sequence identity; e.g. at least 80% sequence identity; e.g. at least 90% sequence identity; e.g. at least 95% sequence identity; e.g. at least 96% sequence identity; e.g. at least 97% sequence identity; e.g. at least 98% sequence identity; e.g. at least 99% sequence identity; to the polypeptide having the sequence of SEQ ID NO: 13.

5. The composition of claim 3, wherein the glutamyl endopeptidases are selected among the glutamyl endopeptidase having an amino acid sequence comprising or consisting of SEQ ID NO: 1, or a variant thereof comprising one or more substitutions in comparison with SEQ ID NO: 1, e.g. 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 substitutions.
6. The composition of claim 4, wherein the glutamyl endopeptidases are selected among the glutamyl endopeptidase having an amino acid sequence comprising or consisting of SEQ ID NO: 13, or a variant thereof comprising one or more substitutions in comparison with SEQ ID NO: 13, e.g. 1, 2, 3, 4, 5, 6, 7, 8, 9, or 10 substitutions.
7. The composition according to any of claims 2-6, wherein the glutamyl endopeptidases are present in amounts in the range of 1 µg to 10 mg enzyme protein per g of the composition.
8. The composition according to any of the preceding claims, wherein the composition promotes delivery of enzyme to the site of action to facilitate its function and purpose formulated as a gel, cream such as semisolid emulsions of a hydrophilic and a hydrophobic phase, semisolid and/or liquid including nano- and microemulsions and more than two phases, cloth, sponge, paste, pellet, shampoo, soap, jelly, lotion, foam, ointment, film, spray, solution, liquid, oil, ointment, suspension of subnano- to micrometer sized particles in a liquid or solid suspension, medical patch, medical patch with microneedles, medical patch with dissolving microneedles, derma roller with microneedles, iontophoresis, compressed air pressure, solid skin implant, semi-solid skin implant, liquid skin implant, skin tattoo, roll-on, swab, syrup, tape, wafer or injectable liquid, injectable solution, injectable emulsion, or injectable suspension.
9. A medical device comprising a pharmaceutical composition according to any of the claims 1-8.
10. The medical composition of claim 9, wherein the medical device is a patch or injectable liquid comprising the composition.

11. The use of a composition according to any of the claims 1-8, or a medical device according to claim 9 or 10 for treating follicular dermatoses and hair follicle-linked conditions.
- 5 12. The use according to claim 11, wherein the composition is a pharmaceutical composition and the hair follicle-linked condition and follicular dermatoses is selected among: Hirsutism, Hypertrichosis or Pseudofolliculitis barbae; or follicular dermatoses that are induced by follicular hyperkeratosis or follicular occlusion that leads to development of Acne vulgaris, Keratosis pilaris, Dowling-Degos
- 10 disease, Hailey-Hailey disease, Mammillary fistula or follicular occlusion tetrad syndromes including Acne conglobata, Pilonidal sinus disease, Dissecting cellulitis of the scalp and Hidradenitis suppurativa; or inflammatory hair follicle-linked conditions including Follicular psoriasis, Pityriasis Rubra Pilaris, Discoid Lupus, Lichen Planopilaris, Hypertrophic Lichen Planopilaris, Lichen Planus Follicularis
- 15 Tumidus, Lichen Schlerosus, Lichen Spinulosus, Wong-type dermatomyositis, infectious hair follicle-linked conditions including Post-Kala Azar dermal Leishmaniasis, Type I Reactions in borderline tubercloid leprosy, Pityriasis Folliculorum; and other hair follicle-linked diseases including Nevus Comedonicus, Folliculotropic Mycosis Fungoides and Phrynoderma.
- 20 13. Use of a composition according to any of the claims 1-8, or a medical device according to claim 9 or 10 for treating follicular dermatoses and hair follicle-linked conditions.
- 25 14. The use according to claim 11 or 12, wherein the composition is used to prevent the development of follicular dermatoses and hair follicle-linked conditions in a susceptible individual.
15. The use according to claim 11 wherein the composition is a cosmetical composition and it is used for removal of undesired hair.
- 30 16. The use according to claim 11, wherein the composition is a cosmetical composition and it is used for skin peeling.
- 35 17. The use according to claim 11 or 12, wherein the composition is used to promote the skin and hair follicle delivery of the one or more proteins such as enzymes including themselves.

18. The use according to claim 11 or 12, wherein the composition is used to enhance follicular and skin delivery of other pharmaceuticals or cosmetics ingredients.
- 5 19. Composition according to any one of claims 1-8 for use as a medicament or pharmaceutical for treatment of human hair follicle-linked conditions and follicular dermatoses.
- 10 20. A composition according to claim 1-8 for use in the treatment of Hirsutism, Hypertrichosis or Pseudofolliculitis barbae; or follicular dermatoses that are induced by follicular hyperkeratosis or follicular occlusion that leads to development of Acne vulgaris, Keratosis pilaris, Dowling-Degos disease, Hailey-Hailey disease, Mammary fistula or follicular occlusion tetrad syndromes including
- 15 Acne conglobata, Pilonidal sinus disease, Dissecting cellulitis of the scalp and Hidradenitis suppurativa; or inflammatory hair follicle-linked conditions including Follicular psoriasis, Pityriasis Rubra Pilaris, Discoid Lupus, Lichen Planopilaris, Hypertrophic Lichen Planopilaris, Lichen Planus Follicularis Tumidus, Lichen Schlerosus, Lichen Spinulosus, Wong-type dermatomyositis, infectious hair follicle-linked conditions including Post-Kala Azar dermal Leishmaniasis, Type I
- 20 Reactions in borderline tubercloid leprosy, Pityriasis Folliculorum; and other hair follicle-linked diseases including Nevus Comedonicus, Folliculotropic Mycosis Fungoides and Phrynoderma.
- 25 21. Composition according to any one of claims 1-6 for cosmetic use in relation to human hair follicle-linked conditions and follicular dermatoses.