CLAIMS

1. A pharmaceutical composition comprising a nanoparticle composition, a botulinum toxin, and at least one excipient,

wherein the nanoparticle composition comprises a population of particles, wherein the majority of particles have diameters between 10 and 300 nanometers,

wherein the nanoparticle composition comprises at least one aqueous dispersion medium, at least one oil, and at least one surfactant,

wherein the oil is a medium chain triglyceride,

wherein the surfactant is a polysorbate,

wherein the ratio of oil to surfactant is between about 0.5:1 to about 1:1; and,

wherein the at least one excipient is mineral oil, isopropyl myristate, white petrolatum, emulsifying wax, propyl paraben, methylparaben, or any combination thereof,

wherein the pharmaceutical composition has a degree of transdermal penetration higher than when said at least one excipient is absent.

2. The pharmaceutical composition of claim 1, wherein the medium chain triglyceride is an acid containing 6-12 carbons atoms or is Labracfac Lipophile WL 1349 oil.

3. The pharmaceutical composition of claim 1, wherein the polysorbate is polysorbate 80.

4. The pharmaceutical composition of any one of claims 1-3, wherein the pharmaceutical composition does not contain parabens.

5. The pharmaceutical composition of claim 1, wherein the botulinum toxin is selected from the group comprising type A, type Ab, type Af, type B, type Bf, type Cl, type C2, type D, type E, type F, type G, and any combinations thereof, optionally the botulinum toxin is type A botulinum toxin.

6. The pharmaceutical composition of any one of claims 1-5, wherein the pharmaceutical composition is formulated for topical administration, parenteral administration or oral administration.

7. The pharmaceutical composition of claim 6, wherein the pharmaceutical composition formulated for topical administration can

(i) penetrate skin without altering or changing the skin;

(ii) penetrate skin without the use of skin permeation enhancers or abrasives;

(iii) penetrate the top layer of skin without the use of skin permeation enhancers or abrasives; or combination thereof,

optionally wherein the top layer of the skin

(a) is the surface of the stratum corneum;

(b) includes dermal pores;

(c) includes dermal glands; or any combination thereof.

8. The pharmaceutical composition of claim 6, wherein the pharmaceutical composition is formulated as a liquid dosage form or formulated as a sterile injectable formulation.

9. The pharmaceutical composition of claim 6, wherein the pharmaceutical composition remains stable following prolonged storage, wherein the prolonged storage is at least 1 week, at least 2 weeks, at least 1 month, at least 2 months, at least 3 months, at least 6 months, at least 9 months, or at least 12 months, optionally wherein the prolonged storage is carried out at 2 °C to 8 °C.

10. A kit comprising the pharmaceutical composition of any one of claims 1-5.

11. Use of the pharmaceutical composition of any one of claims 1-5 in the manufacture of an medicament for treatment of a condition or disorder selected from the group consisting of acne, hyperhidrosis, unwanted sweating, excess sebum-producing disorders, rosacea, psoriasis, dermal infections, actinic keratosis, eczematous dermatitis, burns, Raynaud's phenomenon, lupus erythematosus, hyperpigmentation disorders, skin cancer, and headache, and/or combinations thereof.

12. The use of claim 11, wherein the pharmaceutical composition is to be administered via a route of delivery selected from the group consisting of oral, intravenous, intramuscular, intraarterial, intramedullary, intrathecal, subcutaneous, intraventricular, transdermal, interdermal, intradermal, rectal, vaginal, intraperitoneal, intragastric, topical, mucosal, intranasal, buccal, enteral, vitreal, sublingual, and combinations thereof.

13. The use of claim 11, wherein the pharmaceutical composition is to be administered via a route of delivery selected from the group consisting of intratracheal instillation, bronchial instillation, inhalation, and combinations thereof.

14. Use of the pharmaceutical composition of any one of claims 1-5, for treating a cosmetic condition selected from the group consisting of hair loss, facial wrinkles, wrinkles involving the forehead, glabellar, rhytids and/or periorbital regions, unsightly facial expressions, neck lines, hyperfunctional facial lines, hyperkinetic facial lines, and platysma bands.

15. The use of claim 11, wherein the pharmaceutical composition is to be administered via a sterile injectable formulation for parenteral administration; wherein the pharmaceutical composition is disposed within a device comprising one or a plurality of needles.

16. The use of claim 15, wherein the device comprises a plurality of needles.

17. The use of claim 16, wherein the needles have a length sufficient to project through the stratum corneum of the skin.

18. The use of claim 15, wherein the device limits effective penetration length of the one or plurality of needles into the skin.

19. The use of claim 18, wherein the effective penetration length is selected so that the one or plurality of needles does not rupture a blood vessel.

20. The use of claim 16, wherein the device is or comprises a syringe.

maintained although amount or concentration increases (*e.g.*, up to X% of study level) or decreases (*e.g.*, down to Y% of starting level).

[00067] *Substantially*: As used herein, the term "substantially" refers to the qualitative condition of exhibiting total or near-total extent or degree of a characteristic or property of interest. One of ordinary skill in the biological arts will understand that biological and chemical phenomena rarely, if ever, go to completion and/or proceed to completeness or achieve or avoid an absolute result. The term "substantially" is therefore used herein to capture the potential lack of completeness inherent in many biological and chemical phenomena.

[00068] *Substantially free of*: A nanoparticle composition is said to be "substantially free of" particles whose diameter is outside of a stated range when no more than about 50% of the particles in that composition have diameters outside of the range. In some embodiments, no more than 25% of the particles are outside of the range. In some embodiments, no more than 20%, 19%, 18%, 17%, 16%, 15%, 14%, 13%, 12%, 10%, 9%, 8%, 7%, 6%, 5%, 4%, 3%, 2%, 1%, 0.5% or less of the particles have diameters outside of the stated range.

[00069] *Suffering from*: An individual who is "suffering from" a disease, disorder, or condition (*e.g.*, any disease, disorder, or condition, including, but not limited to, any disease, disorder, or condition described herein) has been diagnosed with or exhibits symptoms of the disease, disorder, or condition. In some embodiments, exemplary diseases, disorders, or conditions include, but are not limited to, a condition associated with sweat glands or sebaceous glands, such as acne; hyperhidrosis; unwanted sweating; bromhidrosis; body odor; chromhidrosis; hair loss; psoriasis; actinic keratosis; dermal infection; eczematous dermatitis (*e.g.*, atopic dermatitis, *etc.*); excess sebum-producing disorder; burns; Raynaud's phenomenon; lupus erythematosus; hyperpigmentation disorder; hypopigmentation disorder; skin cancer; *etc.*

[00070] *Susceptible to*: An individual who is "susceptible to" a disease, disorder, or condition (*e.g.*, any disease, disorder, or condition, including, but not limited to, any disease, disorder, or condition described herein) is at risk for developing the disease, disorder, or condition. In some embodiments, an individual who is susceptible to a disease, disorder, or condition does not display any symptoms of the disease, disorder, or condition. In some embodiments, an individual who is susceptible to a disease, disorder, or condition has not been diagnosed with the disease, disorder, and/or condition. In some embodiments, an individual who is susceptible to a disease, disorder, or condition is an individual who has

and/or prevention of diseases, disorders or conditions associated with the epidermal and/or dermal level of the skin.

[000320] In some embodiments, the present invention provides methods and compositions for the treatment and/or prevention of one or more of acne, unwanted sweating, body odor, hyperhidrosis, bromhidrosis, chromhidrosis, rosacea, hair loss, psoriasis, actinic keratosis, eczematous dermatitis (*e.g.*, atopic dermatitis, *etc.*), excess sebum-producing disorders (*e.g.*, seborrhea, seborrheic dermatitis, *etc.*), burns, Raynaud's phenomenon, lupus erythematosus, hyperpigmentation disorders (*e.g.*, melasma, *etc.*), hypopigmentation disorders (*e.g.*, vitiligo, *etc.*), skin cancer (*e.g.*, squamous cell skin carcinoma, basal cell skin carcinoma, *etc.*), dermal infection (*e.g.*, bacterial infection, viral infection, fungal infection, *etc.*), facial wrinkles, (*e.g.*, wrinkles involving the forehead, glabellar, rhytids and/or periorbital regions), headache, unsightly facial expressions (*e.g.*, due to overactivity of underlying facial musculature), neck lines, hyperfunctional facial lines, hyperkinetic facial lines, platysma bands, neuromuscular disorders and conditions involving muscular spasm and/or contracture (including various forms of facial palsy, cerebral palsy, blepharospasm, facial contracture), dystonia, prostate hyperplasia, headache, strabismus, hemifacial spasm, tremor, spasticity such as that resulting from multiple sclerosis, retroorbital muscle, various ophthalmologic conditions, and/or combinations thereof.

[000321] In some embodiments, the present invention involves administration of at least one provided composition according to a dosing regimen sufficient to achieve a reduction in the degree and/or prevalence of a relevant dermatologic condition of at least about 20%; in some embodiments according to a dosing regimen sufficient to achieve a of at least about 25%; in some embodiments according to a dosing regimen sufficient to achieve a reduction of at least about 30%; in some embodiments according to a dosing regimen sufficient to achieve a reduction of at least about 31%, about 32%, about 33%, about 34%, about 35%, about 36%, about 37%, about 38%, about 39%, about 40%, about 41%, about 42%, about 43%, about 44%, about 45%, about 46%, about 47%, about 48%, about 49%, about 50%, about 51%, about 52%, about 53%, about 54%, about 55%, about 56%, about 57%, about 58%, about 59%, about 60%, about 61%, about 62%, about 63%, about 64%, about 65%, about 66%, about 67%, about 68%, about 69%, about 70%, about 71%, about 72%, about 73%, about 74%, about 75%, about 76%, about 77%, about 78%, about 79%, about 80%, about 81%, about 82%, about 83%, about 84%, about 85%, about 86%, about 87%, about 88%, about 89%, about 90%, or more.

Lupus Erythematosus

[000438] In some embodiments, provided compositions are useful for treating and/or preventing lupus erythematosus, an autoimmune condition that may involve the skin as well as disease of multiple organ systems, including the brain and nervous system, kidneys, liver, and/or blood vessels. A lupus rash often involves the malar region of the face and is described as a "butterfly rash". Some patients exhibit thick, red, scaly patches of skin referred to as discoid lupus. Hair loss can also be a manifestation of the disease. Mouth, nasal and vaginal ulcers are also possible.

[000439] Current therapies for the treatment and/or prevention of one or more symptoms and/or causes of lupus erythematosus include botulinum toxin, nonsteroidal anti-inflammatory medications (*e.g.*, ibuprofen, *etc.*), aspirin, antimalarial drugs (*e.g.*, chloroquine, hydroxychloroquine, *etc.*), corticosteroids (*e.g.*, hydroxycortisone, *etc.*), immunosupressive medications (*e.g.*, azathioprine, cyclophosphamide, cyclosporine, mycophenolate mofetil, methotrexate, therapeutic antibodies, *etc.*), and/or combinations thereof.

[000440] In some embodiments, provided compositions for treatment and/or prevention of lupus erythematosus are formulated into a cream, liniment, lotion, gel, sunscreen, *etc.*

[000441] In some embodiments, provided compositions for treatment and/or prevention of lupus erythematosus are administered locally to an affected site (*e.g.*, on axillae, hands, feet, scalp, face, neck, back, arms, chest, *etc.*).

Hyperpigmentation Disorders

[000442] In some embodiments, provided compositions are useful for treating and/or preventing one or more hyperpigmentation disorders (*e.g.*, melasma, *etc.*), that result in focal or generalized abnormal darkening of the skin. Hyperpigmentation is often due to skin damage due to sun exposure, medications, and/or inflammation (including inflammation due to acne vulgaris). Melasma is a condition of dark, irregular patches of skin found most usually on the upper cheek, nose, lips, upper lip, and/or forehead. Melasma is often associated with pregnancy.

[000443] Current therapies utilized for the treatment and/or prevention of one or more symptoms and/or causes of hyperpigmentation disorders include botulinum toxin, phenols (*e.g.*, hydroxyquinone, mequinol, *etc.*), retinoids (*e.g.*, tretinoin, isotretinoin, *etc.*), alpha-