CLAIMS

What is claimed is:

1. Use of a~~A~~ ~~pharmaceutical~~ composition in the manufacture of a medicament for treating a skin condition of a subject in need thereof~~comprising a probiotic,~~ wherein the medicament is to be administered topically to the subject, wherein the composition comprises a ~~which~~ probiotic ~~comprises (i) human-isolated or synthetic~~of the genus *Alcaligenes*, wherein the probiotic comprises a polynucleotide having a nucleic acid sequence at least 95% identical to the 16s rRNA gene sequence of SEQ ID NO: 1 ~~*faecalis, Bacillus altitudinis, Bacillus pumilus, Bacillus subtilis, Janthinobacterium lividum*, in an amount effective to treat a disease, disorder, or condition associated with a pathogenic microorganism and (ii) at least one first excipient, wherein the at least one first excipient is a cryoprotectant~~.

2. The use ~~pharmaceutical composition~~ of claim 1, ~~formulated for topical application to a mammal to for treating at least one symptom arising from an infection with a pathogenic microorganism~~wherein the composition further comprises a first excipient comprising a cryoprotectant.

3. The use ~~pharmaceutical composition~~ of ~~any one of the preceding claims~~claim 2, wherein the composition further compris~~es~~~~ing~~ a second excipient.

4. The use ~~pharmaceutical composition~~ of any one of the preceding claims, wherein the composition is frozen or lyophilized.

5. The use ~~pharmaceutical composition~~ of any one of ~~the preceding claims~~claims 2-4, wherein the cryoprotectant results in a greater percent recovery of the probiotic after freezing or lyophilization as compared to a composition comprising the same probiotic without the cryoprotectant.

6. The use ~~pharmaceutical composition~~ of any one of ~~the preceding claims~~claims 2-5, wherein the cryoprotectant results in greater efficacy, stability, and/or viability of the ~~pharmaceutical~~ composition against a pathogenic organism as compared to a ~~pharmaceutical~~ composition comprising the same probiotic without the cryoprotectant.

7. The use ~~pharmaceutical composition~~ of claim 6, wherein the percent recovery in the composition with a cryoprotectant is between one to three logs greater after 20 days, as compared to the composition without the cryoprotectant.

8. The use ~~pharmaceutical composition~~ of any one of ~~the preceding claims~~claims 2-7, wherein the cryoprotectant comprises a disaccharide.

9. The use ~~pharmaceutical composition~~ of claim 8, wherein the disaccharide comprises trehalose.

10. The use ~~pharmaceutical composition~~ of claim 9, wherein the trehalose comprises D-trehalose at 2-20%.

~~11. The pharmaceutical composition of any one of the preceding claims, wherein the probiotic comprising comprises one or more of human-isolated or synthetic Alcaligenes faecalis, Bacillus altitudinis, Bacillus pumilus, Bacillus subtilis, or Janthinobacterium~~

~~lividum comprises or consists of a nucleic acid sequence at least 95% identical to that set forth in SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO: 3, SEQ ID NO: 4, or SEQ ID NO: 5.~~

11~~2~~. The use ~~pharmaceutical composition~~ of ~~claim 11~~any of the preceding claims, wherein the nucleic acid sequence is at least 99% identical to the 16s rRNA gene sequence of SEQ ID NO: 1~~wherein the percent identity is at least 99%~~.

~~13. The pharmaceutical composition of any one of the preceding claims, further comprising at least one additional isolated or synthetic microbe.~~

12~~4~~. The use ~~pharmaceutical composition~~ of ~~claim 13~~any one of the preceding claims, wherein the composition further comprises at least one additional isolated or synthetic microbe, wherein the additional isolated or synthetic microbe comprises a human-isolated or synthetic probiotic selected from *Alcaligenes faecalis, Bacillus altitudinis, Bacillus pumilus, Bacillus subtilis,* or *Janthinobacterium lividum.*

13~~5~~. The use ~~pharmaceutical composition~~ of ~~claim 13~~any one of the preceding claims, wherein the composition further comprises at least one additional isolated or synthetic microbe, wherein the additional isolated or synthetic microbe comprises one or more members of a genera selected from *Lactobacillus, Lactococcus, Cutibacterium,* or *Propionibacterium.*

14~~6~~. The use ~~pharmaceutical composition of~~ any one of the preceding claims, wherein the composition further comprises~~ing~~ a first additional isolated microbe and a second additional isolated microbe, wherein the first and second additional isolated microbes are independently selected from bacteria, virus, yeast, fungus, or any combination thereof.

~~17. The pharmaceutical composition of any one of the preceding claims, further comprising a plurality of additional isolated microbes, which microbes are selected from bacteria, virus, yeast, fungus, or any combination thereof.~~

~~18. The pharmaceutical composition of claim 17, wherein the isolated microbes are human-isolated or synthetic microbes.~~

15~~9~~. The use ~~pharmaceutical composition~~ of any one of the preceding claims, wherein the ~~disease, disorder, or~~skin condition is associated with Malassezia, a dermatophyte, gram positive bacteria and *Staphylococcus*, *Candida*, or *Trichophyton*.

~~20. The pharmaceutical composition of any one of the preceding claims, wherein the disease, disorder, or condition is selected from Malassezia dandruff, atopic eczema, dermatitis, pityriasis versicolor, tinea versicolor, seborrheic dermatitis, folliculitis or any combination thereof.~~

~~21. The pharmaceutical composition of any one of claims 1-18, wherein the disease, disorder, or condition is associated with a dermatophyte.~~

~~22. The pharmaceutical composition of any one of claims 1-18 or 21, wherein the disease, disorder, or condition is selected from tinea barbae, tinea capitis, tinea corporis, tinea curis, tinea pedis, tinea versicolor, onychomycosis or any combination thereof.~~

~~23. The pharmaceutical compositions of any one of claims 1-18, wherein the disease, disorder, or condition is associated with gram positive bacteria and Staphylococcus.~~

~~24. The pharmaceutical composition of any one of claims 1-18 or 23, wherein the disease, disorder, or condition is selected from atopic dermatitis, impetigo, skin infections, soft tissue infections, or any combination thereof.~~

~~25. The pharmaceutical composition of claims 1-18, wherein the disease, disorder, or condition is associated with Candida.~~

~~26. The pharmaceutical composition of any one of claims 1-18 or 25, wherein the disease, disorder, or condition is selected from oral thrush, urinary tract infection, genital infection, mucocutaneous candidiasis or any combinations thereof.~~

~~27. The pharmaceutical composition of claims 1-18, wherein the disease, disorder, or condition is associated with Trichophyton.~~

~~28. The pharmaceutical composition of claims 1-18 or 27, wherein the disease, disorder, or condition is associated with tinea barbae, tinea capitis, tinea corporis, tinea curis, tinea pedis, tinea versicolor, onychomycosis or any combination thereof.~~

16~~29~~. The use ~~pharmaceutical composition~~ of any one of the preceding claims, wherein the composition further comprises~~sing~~ an anti-fungal compound or anti-bacterial compound.

17~~30~~. The use ~~pharmaceutical composition~~ of claim 16~~29~~, wherein the anti-fungal or anti-bacterial compound is present in the composition in a therapeutic or sub-therapeutic amount.

~~31. The pharmaceutical composition of claim 29, wherein the anti-fungal compound is present in the composition in a sub-therapeutic amount.~~

~~32. The pharmaceutical composition of any one of the preceding claims, further comprising an anti-bacterial compound.~~

~~33. The pharmaceutical composition of claim 32, wherein the anti-bacterial compound is present in thecomposition in a therapeutic amount.~~

~~34. The pharmaceutical composition of claim 32, wherein the anti-bacterial compound is present in the composition in a sub-therapeutic amount.~~

~~35. The pharmaceutical composition of any one of the preceding claims, further comprising a prebiotic.~~

~~36. The pharmaceutical composition of any one of the preceding claims, further comprising at least one postbiotic.~~

~~37. The pharmaceutical composition of any one of the preceding claims, comprising a topically acceptable carrier.~~

18~~38~~. The use ~~pharmaceutical composition~~ of ~~claim 37~~any of the preceding claims, wherein the composition further comprises a ~~wherein the~~topically acceptable carrier ~~further comprises~~comprising a prebiotic, metabolite, postbiotic, cell lysate, probiotic or any combination thereof.

39. The pharmaceutical composition of any one of the preceding claims, wherein the diseases, disorder, or condition comprises a skin disease.

40. The pharmaceutical composition of any one of the preceding claims, wherein the disease, disorder, or condition is present in a mammal.

41. The pharmaceutical composition of claim 40, wherein the mammal is a human.

42. The pharmaceutical composition of claim 41, wherein the pharmaceutical composition is administered to a human in need thereof, in an amount effective to treat the human skin disease, disorder, or condition.

43. The pharmaceutical composition of claim 41 or 42, wherein the pharmaceutical composition is administered in an amount effective to treat growth of a topical pathogenic microorganism present on or in the skin of the human.

44. The pharmaceutical composition of claim 43, wherein the topical pathogenic microorganism comprises or consists of Malassezia.

45. The pharmaceutical composition of claim 44, wherein the Malassezia comprises or consists of Malassezia furfur.

46. The pharmaceutical composition of claim 44, wherein the Malassezia comprises or consists of Malassezia restricta.

47. The pharmaceutical composition of claim 44, wherein the Malassezia comprises or consists of Malassezia globosa.

48. The pharmaceutical composition of claim 43, wherein the topical pathogenic microorganism comprises or consists of a dermatophyte.

49. The pharmaceutical composition of claim 48, wherein the dermatophyte comprises or consists of Trichophyton.

50. The pharmaceutical composition of claim 49, wherein the Trichophyton comprises or consists of Trichophyton mentagrophytes .

51. The pharmaceutical composition of claim 49, wherein the Trichophyton comprises or consists of Trichophyton rubrum.

52. The pharmaceutical composition of claim 43, wherein the topical pathogenic microorganism comprises or consists of a gram-positive bacteria.

53. The pharmaceutical composition of claim 52, wherein the bacteria is Staphylococcus aureus.

54. The pharmaceutical composition of any one of the preceding claims, wherein the composition is dried to powder format by lyophilization.

55. The pharmaceutical composition of claim 54, wherein the probiotic is at least 10% viable upon rehydration.

~~56. The pharmaceutical composition of any one of the preceding claims, wherein the probiotic is at least 90% viable at refrigerated conditions for at least about 164 days.~~

~~57. The pharmaceutical composition of any one of the preceding claims, wherein the pharmaceutical composition is formulated for topical administration to a human or nonhuman subject.~~

1958. The use ~~pharmaceutical composition~~ of any one of claims 1-1857, wherein the ~~pharmaceutical composition~~medicament is formulated as a cream, gel, foam, ointment, powder, ~~or~~ lotion, liquid, tincture, spray, mister, or inhaler.

~~59. The pharmaceutical composition of claim 57, wherein the pharmaceutical composition is formulated as a liquid, tincture, spray, mister, or inhaler.~~

2060. The use ~~pharmaceutical composition~~ of any one of claims 1-1857, wherein the ~~pharmaceutical composition~~ medicament is formulated for topical administration to human skin or human mucosa.

~~61. The pharmaceutical composition of claim 57, wherein the pharmaceutical composition is formulated for topical administration to human mucosa.~~

~~62. A synthetic composition comprising human-isolated or synthetic Alcaligenes faecalis, Bacillus altitudinis, Bacillus pumilus, Bacillus subtilis, or Janthinobacterium lividum comprising a nucleic acid sequence 95 % identical to SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO: 3, SEQ ID NO: 4 or SEQ ID NO: 5, wherein the composition is formulated for topical application.~~

~~63. The synthetic composition of claim 62, wherein the Alcaligenes faecalis, Bacillus altitudinis, Bacillus pumilus, Bacillus subtilis, or Janthinobacterium lividum nucleic acid sequence identity is 99% identical to that of SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO: 3, SEQ ID NO: 4, or SEQ ID NO: 5.~~

~~64. The synthetic composition of claim 62 or 63, formulated for application to a material that will be in contact with human skin, nails, hair, or mucosa.~~

~~65. The synthetic composition of claim 62 or 63, formulated forapplication to human skin, nails, hair, or mucosa.~~

~~66. The synthetic composition of any one of claims 62-65, formulated in an aqueous formulation.~~

~~67. The synthetic composition of any one of claims 62-66, formulated for topical application to a surface that is contacted by a human.~~

~~68. The synthetic composition of any one of claims 62-67, formulated for use as a cosmetic composition.~~

~~69. The synthetic composition of claim 68, formulated as a toothpaste, mouthwash, shampoo, soap, dental floss, eye drops, or nasal spray composition.~~

~~70. The synthetic composition of claim 68, formulated as a sunscreen, moisturizer, antiaging, probiotic, or health promoting composition.~~

71. A pharmaceutical composition comprising Alcaligenes faecalis, Bacillus altitudinis, Bacillus pumilus, Bacillus subtilis, or Janthinobacterium lividum comprises a nucleic acid sequence at least 98% identical to SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO: 3, SEQ ID NO: 4 or SEQ ID NO: 5 at the 16s rRNA gene sequence in an amount effective to treat, inhibit or prevent a disease, disorder, or condition associated with a pathogenic microorganism.

72. A pharmaceutical composition comprising Alcaligenes or Bacillus comprising a nucleic acid sequence comprising SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO: 3, or SEQ ID NO: 4 in an amount effective to treat, inhibit or prevent a disease, disorder, or condition associated with a pathogenic microorganism.

73. A method of treating or preventing a pathogenic microorganism, the method comprising administering an effective amount of human-isolated or synthetic Alcaligenes faecalis, Bacillus altitudinis, Bacillus pumilus, Bacillus subtilis, or Janthinobacterium lividum to a subject in need thereof.

74. A method of treating a skin condition in a subject in need thereof, comprising administering topically to the subject a therapeutically effective amount of a pharmaceutical composition that comprises a probiotic of the genus Alcaligenes, Bacillus, or Janthinobacterium, wherein the probiotic comprises a polynucleotide having a nucleic acid sequence at least 95% identical to the 16s rRNA gene sequence of SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO: 3, SEQ ID NO: 4, or SEQ ID NO: 5.

75. A method of improving efficacy of a probiotic comprising Alcaligenes comprising a probiotic having a methyltransferase at least 95% identical to that of SEQ ID NO: 6.

76. An isolated Alcaligenes, Bacillus, or Janthinobacterium probiotic comprising a 16s rRNA nucleic acid molecule having a sequence at least 95% identical to SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO: 3, SEQ ID NO:4, or SEQ ID NO: 5.

77. The isolated Alcaligenes probiotic of claim 76, comprising a methyltransferase having at least 95% identity to SEQ ID NO: 6.

78. A pharmaceutical composition comprising at least one Alcaligenes, Bacillus, or Janthinobacterium probiotic of claim 76 or 77.

79. A synthetic composition comprising at least one Alcaligenes, Bacillus, or Janthinobacterium probiotic of claim 76 or 77.

80. A cosmetic composition comprising at least one Alcaligenes, Bacillus, or Janthinobacterium probiotic of claim 76 or 77.

81. An isolated Alcaligenes, Bacillus, or Janthinobacterium probiotic comprising a 16s rRNA nucleic acid sequence at least 98% identical to SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO: 3, SEQ ID NO: 4, or SEQ ID NO: 5.

82. A combination composition comprising at least two probiotics selected from any of the Alcaligenes, Bacillus or Janthinobacterium of claim 76.

83. A pharmaceutical composition, comprising at least one species of human-isolated or synthetic Alcaligenes faecalis, Bacillus altitudinis, Bacillus pumilus, Bacillus subtilis, or

~~Janthinobacterium lividum present in an amount effective to treat or prevent a disease, disorder, or condition associated with a pathogenic microorganism in a subject in need thereof, wherein the pharmaceutical composition is in a topical dosage form.~~

~~84. A pharmaceutical composition, comprising a metabolite from at least one species of human-isolated or synthetic, Alcaligenes faecalis, Bacillus altitudinis, Bacillus pumilus, or Bacillus subtilis. wherein the metabolite is present in an amount sufficient for treatment, inhibition or prevention of a disease, disorder or condition associated with a pathogenic microorganism in a subject in need thereof, wherein the pharmaceutical composition is in a topical dosage form.~~

~~85. A pharmaceutical composition, comprising a cell lysate of at least one species of human-isolated or synthetic Alcaligenes faecalis, Bacillus altitudinis, Bacillus pumilus, Bacillus subtilis, or Janthinobacterium lividum present in an amount effective to treat or prevent a disease, disorder, or condition associated with a pathogenic microorganism in a subject in need thereof, wherein the pharmaceutical composition is in a topical dosage form.~~

~~86. A pharmaceutical composition, comprising a postbiotic of at least one species of human-isolated or synthetic Alcaligenes faecalis, Bacillus altitudinis, Bacillus pumilus, Bacillus subtilis, or Janthinobacterium lividum present in an amount effective to treat, inhibit or prevent a disease, disorder, or condition associated with a pathogenic microorganism in a subject in need thereof, wherein the pharmaceutical composition is in a topical dosage form.~~

~~87. A method for treating a skin disorder in a subject in need thereof, wherein the method comprises topically administering a formulation comprising an effective amount of probiotic bacteria, a metabolite of probiotic bacteria, postbiotic of probiotic bacteria, and/or cell lysate of probiotic bacteria; wherein the probiotic bacteria are human- isolated or synthetic Alcaligenes faecalis, Bacillus altitudinis, Bacillus pumilus, Bacillus subtilis, or Janthinobacterium lividum,' and the disorder is associated with the presence of a topical pathogenic microorganism.~~

~~88. The method according to claim 87, wherein the formulation is formulated for administration to skin, nails, or hair.~~

~~89. The method according to claim 87, wherein the formulation is formulated for administration to mucosa.~~

~~90. The method according to claim 89, wherein the mucosa is selected from the group consisting of mucosa of a vagina, penis, urethra, bladder, anus, mouth, nose, throat, bronchi, lungs, eye, and ear and nasal cavity.~~

~~91. A pharmaceutical composition comprising a metabolite produced from at least one human-isolated or synthetic Alcaligenes faecalis, Bacillus altitudinis, Bacillus pumilus, Bacillus subtilis, or Janthinobacterium lividum in an amount effective to treat, inhibit or prevent a disease, disorder, or condition associated with a pathogenic microorganism.~~

~~92. The pharmaceutical composition of claim 91, wherein the Janthinobacterium lividum Alcaligenes faecalis, Bacillus altitudinis, Bacillus pumilus, Bacillus subtilis or Janthinobacterium lividum, comprises a 16S rRNA genesequence that is at least 95%~~

identical to SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO:3, SEQ ID NO: 4 or SEQ ID NO: 5.

93. A pharmaceutical composition comprising a cell lysate from at least one human-isolated or synthetic Alcaligenes faecalis, Bacillus altitudinis, Bacillus pumilus, Bacillus subtilis, or Janthinobacterium lividum in an amount effective to treat or prevent a disease, disorder, or condition associated with a pathogenic microorganism.

94. The pharmaceutical composition of claim 93, wherein the Alcaligenes faecalis, Bacillus altitudinis, Bacillus pumilus, Bacillus subtilis, or Janthinobacterium lividum comprises a 16S rRNA genesequence that is at least 95% identical to SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO:3, SEQ ID NO: 4, or SEQ ID NO: 5.

95. A pharmaceutical composition comprising a postbiotic from at least one human-isolated or synthetic Alcaligenes faecalis, Bacillus altitudinis, Bacillus pumilus, Bacillus subtilis, or Janthinobacterium lividum in an amount effective to treat, inhibit or prevent a disease, disorder, or condition associated with a pathogenic microorganism.

96. The pharmaceutical composition of claim 95, wherein the Alcaligenes faecalis, Bacillus altitudinis, Bacillus pumilus, Bacillus subtilis, or Janthinobacterium lividum comprises a 16S rRNA gene sequence that is at least 95% identical to SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO:3, SEQ ID NO: 4, or SEQ ID NO: 5.

97. A synthetic composition comprising an effective amount of at least one human-isolated Alcaligenes faecalis, Bacillus altitudinis, Bacillus pumilus, Bacillus subtilis, or Janthinobacterium lividum metabolite, formulated for topical application.

98. The synthetic composition of claim 97, wherein the Alcaligenes faecalis, Bacillus altitudinis, Bacillus pumilus, Bacillus subtilis, or Janthinobacterium lividum comprises a 16S rRNA gene sequence that is at least 95% identical to SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO:3, SEQ ID NO: 4, or SEQ ID NO: 5.

99. The synthetic composition of claim 98, wherein the synthetic composition is a cosmetic composition.

100. The synthetic composition of claims 99, formulated as a toothpaste, mouthwash, shampoo, soap, moisturizer, or dental floss.

101. The synthetic composition of claim 99, wherein the cosmetic composition comprises a sunscreen, moisturizer, anti-aging, probiotic or health-promoting composition.

102. A synthetic composition comprising an effective amount of Janthinobacterium lividum, Alcaligenes faecalis, Bacillus altitudinis, Bacillus pumilus, or Bacillus subtilis cell lysate, formulated for topical application.

103. The synthetic composition of claim 102, wherein the Janthinobacterium lividum Alcaligenes faecalis, Bacillus altitudinis, Bacillus pumilus, Bacillus subtilis, or Janthinobacterium lividum comprises a 16S rRNA gene sequence that is at least 95% identical to SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO:3, SEQ ID NO: 4, or SEQ ID NO: 5.

~~104. The synthetic composition of claim 103, wherein the synthetic composition is a cosmetic composition.~~

~~105. The synthetic composition of claim 104, formulated as a toothpaste, mouthwash, shampoo, soap, moisturizer, or dental floss.~~

~~106. The synthetic composition of claim 104, formulated as a sunscreen, moisturizer, anti-aging, probiotic or health-promoting composition.~~

~~107. A synthetic composition comprising an effective amount of human-isolated or synthetic Alcaligenes faecalis, Bacillus altitudinis, Bacillus pumilus, Bacillus subtilis or Janthinobacterium lividum, postbiotic, formulated for topical application.~~

~~108. The synthetic composition of claim 107, wherein the Alcaligenes faecalis, Bacillus altitudinis, Bacillus pumilus, Bacillus subtilis or Janthinobacterium lividum comprises a 16S rRNA gene sequence that is at least 95% identical to SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO: 3, SEQ ID NO: 4, OR SEQ ID NO: 5.~~

~~109. The synthetic composition of claim 108, wherein the synthetic composition is a cosmetic composition.~~

~~110. The synthetic composition of claim 109, formulated as a toothpaste, mouthwash, shampoo, soap, moisturizer, lip balm, or dental floss.~~

~~111. The synthetic composition of claim 109, formulated as a sunscreen, moisturizer, anti-aging, probiotic or health-promoting composition.~~

~~112. A method of treating a subject in need thereof comprising administering to the subject a composition comprising a probiotic selected from Alcaligenes faecalis, Bacillus altitudinis, Bacillus pumilus, Bacillus subtilis or Janthinobacterium lividum or derivative thereof and at least one cryoprotectant, which cryoprotectant increases a level of at least one metabolite of the probiotic, wherein the increased level of the at least one metabolite is associated with treatment of a diseases, disorder, or condition associated with a pathogenic microorganism.~~

~~113. A method of treating a subject in need thereof comprising administering to the subject a composition comprising a probiotic selected from Alcaligenes faecalis, Bacillus altitudinis, Bacillus pumilus, Bacillus subtilis or Janthinobacterium lividum or derivative thereof and at least one cryoprotectant, which cryoprotectant decreases a level of least one metabolite of the probiotic, wherein the at least one decreased level of the at least one metabolite is associated with treatment of a diseases, disorder, or condition associated with a pathogenic microorganism.~~

~~114. A lyophilized probiotic composition comprising at least one probiotic selected from Alcaligenes faecalis, Bacillus altitudinis, Bacillus pumilus, Bacillus subtilis or Janthinobacterium lividum or derivative thereof and at least one cryoprotectant.~~

~~115. The lyophilized probiotic composition of claim 114, wherein the cryoprotectant comprises a disaccharide.~~

~~116. The lyophilized probiotic composition of claim 115, wherein the cryoprotectant results in a composition with improved efficacy, stability, and/or viability as compared to a composition not comprising the cryoprotectant.~~

~~117. The lyophilized formulation of any one of claims 114-116, further comprising at least one prebiotic.~~

~~118. A probiotic composition comprising at least one of Alcaligenes faecalis, Bacillus altitudinis, Bacillus pumilus, Bacillus subtilis or Janthinobacterium lividum and at least one cryoprotectant for use as a medicament.~~

~~119. The probiotic composition of claim 118 for use in the treatment of a disease, disorder, or condition associated with at least one pathogenic microorganism.~~

~~120. A probiotic composition comprising at least one of Alcaligenes faecalis, Bacillus altitudinis, Bacillus pumilus, Bacillus subtilis or Janthinobacterium lividum for use in the treatment of an infection associated with a pathogenic microorganism.~~

~~121. The probiotic composition of claim 120, wherein the infection is a skin infection.~~

~~122. The probiotic microorganism of claim 120 or 121, wherein the pathogenic microorganism comprises or consists of Malassezia.~~

~~123. The probiotic microorganism of claim 122, wherein the pathogenic microorganism is associated with dandruff, atopic eczema, dermatitis, pityriasis versicolor, tinea versicolor, seborrheic dermatitis, folliculitis or any combinations thereof.~~

~~124. The probiotic composition of claim 120, wherein the pathogenic microorganism comprises or consists of dermatophytes.~~

~~125. The probiotic composition of claim 124, wherein the pathogenic microorganism is associated with tinea barbae, tinea capitis, tinea corporis, tinea curis, tinea pedis, tinea versicolor, onychomycosis or any combinations thereof.~~

~~126. The probiotic composition of claim 119 for use in treatment of tinea pedis or tinea versicolor.~~

~~127. A composition comprising at least one metabolite of Alcaligenes faecalis, Bacillus altitudinis, Bacillus pumilus, Bacillus subtilis or Janthinobacterium lividum.~~

~~128. The composition of claim 127, for use in the treatment of an infection associated with a pathogenic microorganism.~~

~~129. A kit comprising (i) at least one vial comprising a composition, which composition comprises at least one stabilized human-isolated or synthetic Alcaligenes faecalis, Bacillus altitudinis, Bacillus pumilus, Bacillus subtilis, or Janthinobacterium lividum and at least one first excipient, wherein the at least one first excipient is a cryoprotectant; and (ii) instructions.~~

~~130. The kit of claim 129, further comprising at least one vial of formulation buffer for reconstitution.~~

~~131. The kit of 130, further comprising instructions for mixing and application, and, optionally, one or more implements of mixing and/or application.~~

~~132. The kit of any one of claims 129-131, wherein the composition is in a powdered format.~~

~~133. The kit of any one of claims 129-131, wherein the composition is in a liquid format.~~