WHAT IS CLAIMED IS:

1. A method of dual-action immediate and persistent microbial reduction, said method comprising:

applying a topical formulation to a surface contaminated with a plurality of microbes;

wherein said topical formulation comprises a terpene, tocopheral acetate, polyaminopropyl biguanide and at least one quaternary ammonium salt selected from the group consisting of benzethonium chloride and benzalkonium chloride,

wherein the formulation kills at least 99% of said plurality of microbes within 20 seconds of contact with the microbes,

wherein the formulation is configured to kill at least 90% of said plurality of microbes at least 4 hours post-application of said formulation, and

wherein said plurality of microbes comprises two or more of the following: gram-positive bacteria, gram-negative bacteria, fungi, yeast, and viruses.

2. The method of Claim 1, wherein said topical formulation is free of triclosan.

3. The method of Claim 1, wherein said topical formulation is free of alcohol.

4. The method of Claim 1, wherein said topical formulation is free of both triclosan and alcohol.

5. The method of Claim 3, wherein said microbes comprise gram-positive and gram-negative bacteria.

6. The method of Claim 1, wherein the topical formulation is a non-gel sanitizer,

wherein the terpene is present in an amount ranging from about 0.1% to about 2% by weight of the formulation,

wherein the tocopheryl acetate is present in an amount ranging from about 0.01% to about 1.0% by weight of the formulation,

wherein the polyaminopropyl biguanide is present in an in an amount ranging from about 0.05% to about 3% by weight of the formulation,

wherein the at least one quaternary ammonium salt is present in an amount ranging from about 0.1% to about 1.5% by weight of the formulation,

wherein the formulation further comprises glycerine in an amount ranging from about 1.5% to about 3.5% by weight of the formulation,

wherein the formulation further comprises dimethicone in an amount ranging from about 0.5% to about 2.0% by weight of the formulation,

wherein the formulation further comprises panthenol in an amount ranging from about 0.1% to about 2% by weight of the formulation, and

wherein the formulation further comprises hydroxyethyl ethylcellulose in an amount ranging from about 0.4% to about 1.0% by weight of the formulation.

7. The method of Claim 1, wherein the topical formulation is a sanitizing lotion,

wherein the terpene is present in an amount ranging from about 0.1% to about 2% by weight of the formulation,

wherein the tocopheryl acetate is present in an amount ranging from about 0.01% to about 1.0% by weight of the formulation,

wherein the polyaminopropyl biguanide is present in an in an amount ranging from about 0.05% to about 3% by weight of the formulation,

wherein the at least one quaternary ammonium salt is present in an amount ranging from about 0.1% to about 1.5% by weight of the formulation,

wherein the formulation further comprises glycerine in an amount ranging from about 1.5% to about 3.5% by weight of the formulation,

wherein the formulation further comprises dimethicone in an amount ranging from about 0.5% to about 2.0% by weight of the formulation,

wherein the formulation further comprises panthenol in an amount ranging from about 0.1% to about 2%by weight of the formulation, and

wherein the formulation further comprises hydroxyethyl ethylcellulose in an amount ranging from about 0.4% to about 1.0% by weight of the formulation,

wherein the formulation further comprises one or more zinc salts in an amount ranging from about 0.1% to about 2% by weight of the formulation, and

wherein the formulation further comprises a chlorhexidine digluconate in an amount ranging from about 0.1% to about 1.0% by weight of the formulation.

8. The method of Claim 1, wherein the terpene is present in the topical formulation in an amount ranging from about 0.25% to about 0.60% by weight of the formulation.

9. The method of Claim 1, wherein the tocopheral acetate is present in the topical formulation in an amount ranging from about 0.05% to about 0.5% by weight of the formulation.

10. The method of Claim 1, wherein the polyaminopropyl biguanide is present in an amount ranging from about 0.05% to about 0.20% by weight of the formulation.

11. The method of Claim 1, wherein the at least one quaternary ammonium salt is present in an amount ranging from about 0.01% to about 0.40% by weight of the formulation.

12. The method of Claim 11, wherein the quaternary ammonium salt comprises benzethonium chloride.

13. The method of Claim 1, wherein the terpene comprises a sesquiterpene.

14. The method of Claim 13, wherein the sesquiterpene comprises farnesol.

15. The method of Claim 1, wherein the application of the topical formulation comprises dispensing between about 0.1 and 0.8 mL of the formulation onto the surface.

16. The method of Claim 1, wherein the efficacy of the formulation at 4 hours post-application of said formulation is achieved in the absence of reapplication of the formulation to the surface.

17. The method of Claim 1, wherein the surface is human skin.

18. The method of Claim 17, wherein said application does not induce skin irritation.

19. The method of Claim 1, wherein the surface is animal skin.

20. The method of Claim 19, wherein said application does not induce skin irritation.

21. The method of Claim 1, wherein the surface an inorganic surface.

22. A method according to any one of Claims 1 to 21, wherein the topical formulation further comprises alcohol in an amount ranging from about 8% to about 20% by weight of the formulation.

23. A method according to any one of Claims 1 to 6 or 8 to 21, wherein the topical formulation further comprises chlorhexidine gluconate in an amount ranging from about 0.10% to about 0.40 % by weight of the formulation.

24. A method according to any one of Claims 1 to 5 or 8 to 21, wherein the topical formulation further comprises hydroxyethyl ethylcellulose in an amount ranging from about 0.05% to about 0.20% by weight of the formulation.

25. A method according to any one of Claims 1 to 6 or 8 to 21, wherein the topical formulation further comprises one or more zinc salts in an amount ranging from about 0.05% to about 0.60% by weight of the formulation.

26. The method of Claim 25, wherein the one or more zinc salts comprises zinc lactate.

27. The method of Claim 25, wherein the one or more zinc salts comprises zinc gluconate.

28. A method according to any one of Claims 1 to 5 or 8 to 21, wherein the topical formulation further comprises panthenol in an amount ranging from about 0.25 % to about 0.60 % by weight of the formulation.

29. A method according to any one of Claims 1 to 21, wherein the topical formulation further comprises one or more additional emollient compounds.

30. A method according to any one of Claims 1 to 21, wherein the topical formulation further comprises one or more of Vitamins A, B, K, and C.

31. A method according to any one of Claims 1 to 21, wherein the topical formulation further comprises an essential oil.

32. The method of Claim 31, wherein said essential oil comprises eucalyptus oil.

33. The method of Claim 32, wherein said eucalyptus oil is present in an amount ranging from about 0.05 % to about 0.5 % by weight of the formulation.

34. A method of dual-action immediate and persistent microbial reduction, said method comprising:

applying a topical formulation to a surface contaminated with both gram-positive and gram-negative bacteria;

wherein said topical formulation comprises a terpene, polyaminopropyl biguanide and at least one quaternary ammonium salt selected from the group consisting of benzethonium chloride and benzalkonium chloride,

wherein the formulation kills at least 99% of said plurality of microbes within 20 seconds of contact with the microbes,

wherein the formulation is configured to kill at least 90% of both gram-positive and gram-negative bacteria at least 4 hours post-application of said formulation.

35. A method of dual-action immediate and persistent microbial reduction, said method comprising:

applying a topical formulation to a surface contaminated with a plurality of microbes;

wherein said topical formulation comprises a terpene, polyaminopropyl biguanide and at least one quaternary ammonium salt selected from the group consisting of benzethonium chloride and benzalkonium chloride,

wherein the formulation kills at least 99% of said plurality of microbes within 20 seconds of contact with the microbes,

wherein the formulation is configured to kill at least 90% of said plurality of microbes at least 4 hours post-application of said formulation, and

wherein said plurality of microbes comprises two or more of the following: gram-positive bacteria, gram-negative bacteria, fungi, and viruses.

36. The method of Claim 34 or 35, wherein the topical formulation is a soap,

wherein the terpene is present in an amount ranging from about 0.1% to about 1.0% by weight of the formulation,

wherein the polyaminopropyl biguanide is present in an in an amount ranging from about 0.01% to about 0.5% by weight of the formulation,

wherein the at least one quaternary ammonium salt is present in an amount ranging from about 0.05% to about 2.0% by weight of the formulation,

wherein the formulation further comprises a zinc salt in an amount ranging from about 0.1% to about 2.0% by weight of the formulation, and

wherein the formulation further comprises ethyl alcohol in an amount ranging from about 5.0% to about 20.0% by weight of the formulation.

37. The method of Claim 34 or 35, wherein the topical formulation further comprises alcohol in an amount ranging from about 60% to about 90% by weight of the formulation.

38. A method according to any one of Claims 34 to 37, wherein surface is human or animal skin or an inorganic surface.

39. The method of Claim 38, wherein said surface is human or animal skin, and wherein said application does not induce skin irritation.

40. A method according to any one of Claims 34 to 39, wherein said topical formulation dries within about 5 to about 30 seconds.

41. A method according to any one of Claims 34 to 40, wherein said bacteria comprise transient bacteria.

42. A method according to any one of Claims 34 to 41, wherein the terpene is present in the topical formulation in an amount ranging from about 0.25% to about 0.60 % by weight of the formulation.

43. A method according to any one of Claims 34 to 42, wherein the polyaminopropyl biguanide is present in an amount ranging from about 0.05% to about 0.20% by weight of the formulation.

44. A method according to any one of Claims 34 to 43, wherein the at least one quaternary ammonium salt is present in an amount ranging from about 0.10% to about 0.40% by weight of the formulation.

45. The method of Claim 44, wherein the quaternary ammonium salt comprises benzethonium chloride.

46. A method according to any one of Claims 34 to 45, wherein the topical formulation further comprises hydroxyethyl ethylcellulose in an amount ranging from about 0.05% to about 0.20% by weight of the formulation.

47. A method according to any one of Claims 34 to 46, wherein the terpene comprises a sesquiterpene.

48. The method of Claim 47, wherein the sesquiterpene comprises farnesol.

49. A method according to any one of Claims 34 to 48, wherein the topical formulation further comprises panthenol in an amount ranging from about 0.25 % to about 0.60 % by weight of the formulation.

50. A method according to any one of Claims 34 to 49, wherein the topical formulation further comprises one or more additional emollient compounds.

51. A method according to any one of Claims 34 to 50, wherein the topical formulation further comprises one or more of Vitamins A, B, E, K, and C.

52. A method according to any one of Claims 34 to 51, wherein the application of the topical formulation comprises dispensing between about 0.1 and 0.8 mL of the formulation onto the surface.

53. A method according to any one of Claims 34 to 52, wherein the efficacy of the formulation at 4 hours post-application of said formulation is achieved in the absence of reapplication of the formulation to the surface.

54. A method of immediate microbial reduction, said method comprising:

applying a topical formulation to a surface contaminated with both gram-positive and gram-negative bacteria;

wherein said topical formulation comprises a terpene, tocopheral acetate, polyaminopropyl biguanide and at least one quaternary ammonium salt selected from the group consisting of benzethonium chloride and benzalkonium chloride,

wherein the formulation kills at least 90% of both gram-positive and gram-negative bacteria within 20 seconds of contact with the microbes.

55. A method of immediate microbial reduction, said method comprising:

applying a topical formulation to a surface contaminated with a plurality of microbes;

wherein said topical formulation comprises a terpene, tocopheral acetate, polyaminopropyl biguanide and at least one quaternary ammonium salt selected from the group consisting of benzethonium chloride and benzalkonium chloride,

wherein the formulation kills at least 90% of said plurality of microbes within 20 seconds of contact with the microbes, and

wherein said plurality of microbes comprises two or more of the following: gram-positive bacteria, gram-negative bacteria, fungi, and viruses.

56. A method according to any one of the preceding claims, wherein said formulation is configured in a form selected from the group consisting of a sanitizer, scrub, gel, lotion, crème, foaming soap, and block soap.

57. A method according to any one of the preceding claims, wherein said formulation is suitable for incorporation into an additional formulation selected from the group consisting of body wash, shampoo, conditioner, and cosmetic base.

58. A method according to any one of the preceding claims, wherein the reduction of microorganisms is measured using a pig-skin test.

59. A dual-action antimicrobial formulation for both immediate and persistent reduction of gram-positive and gram-negative bacteria, said formulation comprising:

a quaternary ammonium salt in an amount ranging from about 0.10% to about 0.40% by weight of the formulation, wherein the quaternary ammonium salt comprises benzethonium chloride, benzalkonium chloride, or combinations thereof;

a terpene or derivative thereof in an amount ranging from about 0.25% to about 0.60 % by weight of the formulation;

tocopheral acetate in an amount ranging from about 0.05% to about 0.5% by weight of the formulation,

polyaminopropyl biguanide in an amount ranging from about 0.05% to about 0.20% by weight of the formulation,

wherein the formulation kills at least 99% of both gram-positive and gram-negative bacteria within 20 seconds of contact with the microbes, and

wherein the formulation is configured to kill at least 90% of both gram-positive and gram-negative bacteria at least 4 hours post-application of said formulation.

60. A dual-action antimicrobial formulation for both immediate and persistent reduction of broad spectrum microbes, said formulation comprising:

a quaternary ammonium salt in an amount ranging from about 0.10% to about 0.40% by weight of the formulation, wherein the quaternary ammonium salt comprises benzethonium chloride, benzalkonium chloride, or combinations thereof;

a terpene or derivative thereof in an amount ranging from about 0.25% to about 0.60% by weight of the formulation;

tocopheral acetate in an amount ranging from about 0.05% to about 0.5% by weight of the formulation,

polyaminopropyl biguanide in an amount ranging from about 0.05% to about 0.20% by weight of the formulation,

wherein the formulation kills at least 99% of a plurality of microbes within 20 seconds of contact with the microbes,

wherein the formulation is configured to kill at least 90% of said plurality of microbes at least 4 hours post-application of said formulation, and

wherein said plurality of microbes comprises two or more of the following: gram-positive bacteria, gram-negative bacteria, fungi, and viruses.

61. A formulation according to Claim 59 or 60, wherein said formulation is suitable for application to a surface is infected gram-positive and gram-negative bacteria and/or a plurality of microbes

62. The formulation of Claim 61, wherein the infected surface is human skin or an inorganic surface.

63. A formulation according to Claim 59 or 60, wherein the terpene is present in the topical formulation in an amount ranging from about 0.25% to about 0.60 % by weight of the formulation.

64. A formulation according to Claim 59 or 60, wherein the tocopheral acetate is present in the topical formulation in an amount ranging from about 0.05% to about 0.5% by weight of the formulation.

65. A formulation according to Claim 59 or 60, wherein the polyaminopropyl biguanide is present in an amount ranging from about 0.05% to about 0.20% by weight of the formulation.

66. A formulation according to Claim 59 or 60, wherein the quaternary ammonium salt comprises benzethonium chloride.

67. A formulation according to Claim 59 or 60, wherein the topical formulation further comprises alcohol in an amount ranging from about 8% to about 20% by weight of the formulation.

68. A formulation according to Claim 59 or 60, wherein the topical formulation further comprises chlorhexidine gluconate in an amount ranging from about 0.10% to about 0.40 % by weight of the formulation.

69. A formulation according to Claim 59 or 60, wherein the topical formulation further comprises hydroxyethyl ethylcellulose in an amount ranging from about 0.05% to about 0.20% by weight of the formulation.

70. A formulation according to Claim 59 or 60, wherein the topical formulation further comprises one or more zinc salts in an amount ranging from about 0.05% to about 0.60% by weight of the formulation.

71. The formulation of Claim 70, wherein the one or more zinc salts comprises zinc lactate.

72. The formulation of Claim 70, wherein the one or more zinc salts comprises zinc gluconate.

73. A formulation according to Claim 59 or 60, wherein the topical formulation further comprises panthenol in an amount ranging from about 0.25 % to about 0.60 % by weight of the formulation.

74. A formulation according to any one of Claims 59 to 73, wherein the terpene or derivative thereof comprises a sesquiterpene.

75. A formulation according to any one of Claims 59 to 73, wherein the terpene or derivative thereof comprises farnesol.

76. A formulation according to any one of Claims 59 to 75, wherein the topical formulation further comprises one or more additional emollient compounds.

77. A formulation according to any one of Claims 59 to 76, wherein the topical formulation further comprises one or more of Vitamins A, B, K, and C.

78. A formulation according to any one of Claims 59 to 77, wherein the topical formulation further comprises an essential oil.

79. The formulation of Claim 78, wherein said essential oil comprises eucalyptus oil.

80. The formulation of Claim 79, wherein said eucalyptus oil is present in an amount ranging from about 0.05 % to about 0.5 % by weight of the formulation.

81. A formulation according to any one of Claims 59 to 80, wherein the dual action antimicrobial effects are achieved by dispensing between about 0.1 and 0.8 mL of the formulation onto a surface infected with gram-positive and gram-negative bacteria and/or a plurality of microbes.

82. A formulation according to any one of Claims 59 to 80, wherein the immediate and the persistent antimicrobial effects are achieved using a single dose of the formulation.

83. An antimicrobial formulation for the reduction of microbes, comprising:

alcohol in an amount ranging from about 8% to about 20% by weight of the formulation;

chlorhexidine gluconate in an amount ranging from about 0.10% to about 0.40% by weight of the formulation;

a quaternary ammonium salt in an amount ranging from about 0.10% to about 0.40% by weight of the formulation,

wherein the quaternary ammonium salt comprises benzethonium chloride, benzalkonium chloride, or combinations thereof;

hydroxyethyl ethylcellulose in an amount ranging from about 0.05% to about 0.20% by weight of the formulation;

a zinc salt in an amount ranging from about 0.05% to about 0.60% by weight of the formulation;

a terpene or derivative thereof in an amount ranging from about 0.25% to about 0.60% by weight of the formulation;

a polymeric biguanide in an amount ranging from about 0.05% to about 0.20% by weight of the formulation,

wherein the polymeric biguanide comprises polyaminopropyl biguanide;

panthenol in an amount ranging from about 0.25% to about 0.60% by weight of the formulation;

tocopheral acetate in an amount ranging from about 0.05% to about 0.5% by weight of the formulation,

wherein the formulation kills at least 99% of the microbes within 20 seconds of contact with the microbes,

wherein the microbial killing effect of the formulation persists at greater than 90% for at least 4 hours, and

wherein the microbes comprise one or more of viruses, gram positive bacteria, gram negative bacteria, drug resistant bacteria, molds, yeasts, fungi, and combinations thereof.

84. The formulation of Claim 83, wherein the zinc salt is zinc lactate.

85. The formulation of Claim 83, wherein the zinc salt is zinc gluconate.

86. A formulation according to any one of Claims 83 to 85, wherein the terpene or derivative thereof comprises a sesquiterpene.

87. A formulation according to any one of Claims 83 to 85, wherein the terpene or derivative thereof comprises farnesol.

88. A formulation according to any one of Claims 83 to 85, wherein the quaternary ammonium salt comprises benzethonium chloride.

89. A formulation according to any one of Claims 83 to 88, further comprising one or more additional emollient compounds.

90. A formulation according to any one of Claims 83 to 89, further comprising one or more of Vitamins A, B, K, and C.

91. A formulation according to any one of Claims 83 to 90, further comprising an essential oil.

92. The formulation of Claim 91, wherein said essential oil comprises eucalyptus oil.

93. The formulation of Claim 92, wherein said eucalyptus oil is present in an amount ranging from about 0.05% to about 0.5% by weight of the formulation.

94. A formulation according to any one of Claims 83 to 93, wherein the alcohol is present in an amount ranging from about 8% to about 15% by weight of the formulation.

95. A formulation according to any one of Claims 83 to 94, wherein the chlorhexidine gluconate is present in an amount ranging from about 0.10% to about 0.30% by weight of the formulation.

96. A formulation according to any one of Claims 83 to 95, wherein the quaternary ammonium salt is present in an amount ranging from about 0.10% to about 0.30% by weight of the formulation.

97. A formulation according to any one of Claims 83 to 96, wherein the hydroxyethyl ethylcellulose is present in an amount ranging from about 0.05% to about 0.15% by weight of the formulation.

98. A formulation according to any one of Claims 83 to 97, wherein the zinc salt is present in an amount ranging from about 0.05% to about 0.25% by weight of the formulation.

99. A formulation according to any one of Claims 83 to 98, wherein the terpenoid or derivative thereof is present in an amount ranging from about 0.30% to about 0.60% by weight of the formulation.

100. A formulation according to any one of Claims 83 to 99, wherein the panthenol is present in an amount ranging from about 0.30% to about 0.60% by weight of the formulation.

101. A formulation according to any one of Claims 83 to 100, wherein the formulation is suitable for topical use.

102. A formulation according to any one of Claims 83 to 101, wherein the formulation is suitable for treatment of a surface.

103. A formulation according to any one of Claims 83 to 102, wherein short term and persistent killing effects are achieved using a single dose of the formulation in a volume ranging from about 0.2 to 0.8 mL.

104. A method for the short-term and persistent broad-spectrum reduction of microorganisms on a surface, comprising:

contacting said surface with an antimicrobial lotion comprising:

a) alcohol in an amount ranging from about 8% to about 20% by weight of the formulation or chlorhexidine gluconate in an amount ranging from about 0.10% to about 0.40 % by weight of the formulation;

b) a quaternary ammonium salt in an amount ranging from about 0.10% to about 0.40 % by weight of the formulation, wherein the quaternary ammonium salt comprises benzethonium chloride, benzalkonium chloride, or combinations thereof;

c) hydroxyethyl ethylcellulose in an amount ranging from about 0.05% to about 0.20% by weight of the formulation;

d) a zinc salt in an amount ranging from about 0.05% to about 0.60% by weight of the formulation;

e) a terpenoid or derivative thereof in an amount ranging from about 0.25 % to about 0.60 % by weight of the formulation;

f) a polymeric biguanide in an amount ranging from about 0.05 % to about 0.20 % by weight of the formulation,

wherein the polymeric biguanide comprises polyaminopropyl biguanide; and

g) panthenol in an amount ranging from about 0.25 % to about 0.60 % by weight of the formulation,

h) tocopheral acetate in an amount ranging from about 0.05% to about 0.5% by weight of the formulation,

wherein the microorganisms comprise one or more of viruses, gram positive bacteria, gram negative bacteria, drug resistant bacteria, molds, yeasts, fungi,

wherein said contacting results in killing of at least 99% of the microorganisms within 20 seconds, and

wherein said contacting results in a persistent killing effect of greater than 90% of the microorganism for at least 4 hours.

105. The method of Claim 104, wherein the surface is the dermal surface of a subject.

106. The method of Claim 105, wherein the subject is a human.

107. A method according to any one of Claims 104 to 106, wherein the contacting comprises dispensing between about 0.1 and 0.8 mL of the lotion onto the surface.

108. A method according to any one of Claims 104 to 107, wherein the zinc salt is zinc lactate.

109. A method according to any one of Claims 104 to 108, wherein the zinc salt is zinc gluconate.

110. A method according to any one of Claims 104 to 109, wherein the terpene or derivative thereof comprises a sesquiterpene.

111. The method of Claim 110, wherein the terpene or derivative thereof comprises farnesol.

112. A method according to any one of Claims 104 to 111, wherein the quaternary ammonium salt comprises benzethonium chloride.

113. A method according to any one of Claims 104 to 112, wherein the formulation further comprises one or more additional emollient compounds.

114. A method according to any one of Claims 104 to 113, wherein the formulation further comprises one or more of Vitamins A, B, K, and C.

115. A method according to any one of Claims 104 to 114, wherein the formulation further comprises an essential oil.

116. The method of Claim 115, wherein said essential oil comprises eucalyptus oil.

117. The method of Claim 116, wherein said eucalyptus oil is present in an amount ranging from about 0.05 % to about 0.5 % by weight of the formulation.

118. A method for the short-term and persistent reduction of microorganism load on a surface, comprising:

contacting said surface with an antimicrobial formulation comprising:

a) alcohol in an amount ranging from about 8% to about 20% by weight of the formulation or chlorhexidine gluconate in an amount ranging from about 0.10 % to about 0.40 % by weight of the formulation;

b) a quaternary ammonium salt in an amount ranging from about 0.10 % to about 0.40 % by weight of the formulation, wherein the quaternary ammonium salt comprises benzethonium chloride, benzalkonium chloride, or combinations thereof;

c) hydroxyethyl ethylcellulose in an amount ranging from about 0.05 % to about 0.20 % by weight of the formulation;

d) a zinc salt in an amount ranging from about 0.05 % to about 0.60 % by weight of the formulation;

e) a terpenoid or derivative thereof in an amount ranging from about 0.25 % to about 0.60 % by weight of the formulation, and

e) panthenol in an amount ranging from about 0.25 % to about 0.60 % by weight of the formulation,

wherein said contacting results in killing of at least 99% of the microorganisms within 20 seconds,

wherein said contacting results in a persistent killing effect of greater than 90% of the microorganism for at least 4 hours, and

wherein the microorganism comprise one or more of viruses, gram positive bacteria, gram negative bacteria, drug resistant bacteria, molds, yeasts, fungi, and combinations thereof.

119. The method of Claim 118, wherein the surface is the dermal surface of a subject.

120. An antimicrobial formulation for the reduction of microbes, comprising:

alcohol in an amount ranging from about 8% to about 20% by weight of the formulation;

chlorhexidine gluconate in an amount ranging from about 0.10 % to about 0.40 % by weight of the formulation;

a quaternary ammonium salt in an amount ranging from about 0.10 % to about 0.40 % by weight of the formulation,

wherein the quaternary ammonium salt comprises benzethonium chloride, benzalkonium chloride, or combinations thereof;

hydroxyethyl ethylcellulose in an amount ranging from about 0.05 % to about 0.20 % by weight of the formulation;

a zinc salt in an amount ranging from about 0.05 % to about 0.60 % by weight of the formulation;

a terpenoid or derivative thereof in an amount ranging from about 0.25 % to about 0.60 % by weight of the formulation, and

panthenol in an amount ranging from about 0.25 % to about 0.60 % by weight of the formulation,

wherein the formulation kills at least 99% of the microbes within 20 seconds of contact with the microbes,

wherein the microbial killing effect of the formulation persists at greater than 90% for at least 4 hours, and

wherein the microbes comprise one or more of viruses, gram positive bacteria, gram negative bacteria, drug resistant bacteria, molds, yeasts, fungi, and combinations thereof.

121. A method for the short-term and persistent reduction of infectious microorganisms on a surface, comprising:

contacting said surface with an antimicrobial lotion comprising:

a) alcohol in an amount ranging from about 8% to about 20% by weight of the formulation or chlorhexidine gluconate in an amount ranging from about 0.10 % to about 0.40 % by weight of the formulation;

b) a quaternary ammonium salt in an amount ranging from about 0.10 % to about 0.40 % by weight of the formulation, wherein the quaternary ammonium salt comprises benzethonium chloride, benzalkonium chloride, or combinations thereof;

c) hydroxyethyl ethylcellulose in an amount ranging from about 0.05 % to about 0.20 % by weight of the formulation;

d) a zinc salt in an amount ranging from about 0.05 % to about 0.60 % by weight of the formulation;

e) a terpenoid or derivative thereof in an amount ranging from about 0.25 % to about 0.60 % by weight of the formulation;

f) a polymeric biguanide in an amount ranging from about 0.05 % to about 0.20 % by weight of the formulation,

wherein the polymeric biguanide comprises polyaminopropyl biguanide; and

g) panthenol in an amount ranging from about 0.25 % to about 0.60 % by weight of the formulation,

wherein said contacting results in killing of at least 99% of the microorganisms within 20 seconds,

wherein said contacting results in a persistent killing effect of greater than 90% of the microorganism for at least 4 hours, and

wherein the microorganism comprise one or more of viruses, gram positive bacteria, gram negative bacteria, drug resistant bacteria, molds, yeasts, fungi, and combinations thereof.

WHAT IS CLAIMED IS:

1. A dual-action antimicrobial formulation for both immediate and persistent reduction of broad spectrum microbes, said formulation comprising:

a quaternary ammonium salt in an amount ranging from about 0.10% to about 0.40% by weight of the formulation;

a terpene or derivative thereof in an amount ranging from about 0.25% to about 0.60% by weight of the formulation;

panthenol in an amount ranging from about 0.25% to about 0.60% by weight of the formulation;

chlorhexidine gluconate in an amount ranging from about 0.10% to about 0.40 % by weight of the formulation;

polyaminopropyl biguanide in an amount ranging from about 0.01% to about 3.0% by weight of the formulation;

wherein the formulation kills at least 99% of a plurality of microbes within 20 seconds of contact with the microbes,

wherein the formulation is configured to kill at least 90% of said plurality of microbes at least 4 hours post-application of said formulation, and

wherein said plurality of microbes comprises one or more of the following: fungi, mold, yeast, bacteria, and viruses.

2. The formulation of Claim 1, wherein the plurality of microbes comprises bacteria, wherein the bacteria comprises gram-positive and gram-negative bacteria and wherein the formulation kills at least 99% of both gram-positive and gram-negative bacteria within 20 seconds of contact with the microbes, and wherein the formulation is configured to kill at least 90% of said gram-positive and gram-negative bacteria at least 4 hours post-application of said formulation.

3. A formulation according to Claim 1 or 2, wherein the plurality of microbes comprises bacteria and wherein said formulation is suitable for application to a surface that is infected with gram-positive and gram-negative bacteria and/or a plurality of microbes.

4. The formulation of Claim 1, wherein said formulation is suitable for application to a surface that is infected with bacteria and/or viruses.

5. A formulation according to Claim 3 or 4, wherein the infected surface is human or animal skin or an inorganic surface.

6. A formulation according to any one of Claims 1 to 5, wherein the formulation further comprises tocopheral acetate, wherein the tocopherol acetate is present in the formulation in an amount ranging from about 0.05% to about 0.5% by weight of the formulation.

7. A formulation according to any one of Claims 1 to 6, wherein the polyaminopropyl biguanide is present in an amount of about 1.5% by weight of the formulation.

8. A formulation according to any one of Claims 1 to 7, wherein the quaternary ammonium salt is selected from the group consisting of benzethonium chloride, benzalkonium chloride, and combinations thereof.

9. A formulation according to any one of Claims 1 to 8, wherein the quaternary ammonium salt comprises benzethonium chloride.

10. A formulation according to any one of Claims 1 to 9, wherein the formulation further comprises one or more zinc salts in an amount ranging from about 0.05% to about 0.60% by weight of the formulation.

11. The formulation of Claim 10, wherein the one or more zinc salts comprises zinc lactate.

12. The formulation of Claim 10, wherein the one or more zinc salts comprises zinc gluconate.

13. A formulation according to any one of Claims 1 to 12, wherein the terpene comprises farnesol.

14. A formulation according to any one of Claims 1 to 13, wherein the formulation is a sanitizing lotion,

wherein the formulation further comprises glycerine in an amount ranging from about 1.5% to about 3.5% by weight of the formulation,

wherein the formulation further comprises dimethicone in an amount ranging from about 0.5% to about 2.0% by weight of the formulation, and

wherein the formulation further comprises one or more additional emollient compounds.

15. A formulation according to any one of Claims 1 to 14, wherein said formulation is free of triclosan.

16. A formulation according to any one of Claims 1 to 15, wherein the formulation further comprises alcohol in an amount ranging from about 8% to about 20% by weight of the formulation.

17. A formulation according to any one of Claims 1 to 15, wherein said formulation is free of alcohol.

18. A formulation according to any one of Claims 1 to 15, wherein said formulation is free of both triclosan and alcohol.

19. A method for the immediate and persistent reduction of broad spectrum microbes comprising applying a formulation according to any one of the preceding claims to a surface contaminated with a plurality of microbes.

20. The method of Claim 19, wherein the application of the formulation comprises dispensing between about 0.1 and 0.8 mL of the formulation onto the surface, wherein the surface comprises one or more hands of a user of the formulation.

21. A method according to Claim 19 or 20, wherein an efficacy of the formulation at 4 hours post-application of said formulation is achieved in the absence of reapplication of the formulation to the surface.

22. A method according to any one of Claims 19 to 21, wherein the surface is human skin and said application does not induce skin irritation.

23. A method according to any one of Claims 19 to 22, wherein the immediate and the persistent antimicrobial effects are achieved using a single administration of the formulation.

24. A dual-action antimicrobial formulation for both immediate and persistent reduction of broad spectrum microbes, said formulation comprising:

a quaternary ammonium salt in an amount ranging from about 0.001% to about 2.0% by weight of the formulation, wherein the quaternary ammonium salt is selected from the group consisting of benzethonium chloride, benzalkonium chloride, and combinations thereof;

a terpene or derivative thereof in an amount ranging from about 0.1% to about 2% by weight of the formulation;

polyaminopropyl biguanide in an amount ranging from about 0.01% to about 3.0% by weight of the formulation;

alcohol; and/or

water;

wherein the formulation kills at least 99% of a plurality of microbes within 20 seconds of contact with the microbes,

wherein the formulation is configured to kill at least 90% of said plurality of microbes at least 4 hours post-application of said formulation, and

wherein said plurality of microbes comprises one or more of the following: fungi, mold, yeast, bacteria, and viruses.

25. The formulation of Claim 24, wherein the formulation further comprises panthenol in an amount ranging from about 0.25% to about 0.60% by weight of the formulation, tocopheral acetate in an amount ranging from about 0.05% to about 0.5% by weight of the formulation, and chlorhexidine gluconate in an amount ranging from about 0.10% to about 0.40 % by weight of the formulation.

26. The formulation of Claim 24, wherein the formulation comprises alcohol and wherein the alcohol is present in an amount of about 8% to about 20% by weight of the formulation.

27. The formulation of Claim 24, wherein the formulation is alcohol free.

28. The formulation of Claim 24, wherein the formulation comprises alcohol and wherein said alcohol is present in an amount ranging from about 60% to about 75% by weight of the formulation,

wherein the water comprises deionized water, which is present in an amount ranging from about 20% to about 30% by weight of the formulation,

wherein the terpene is present in an amount ranging from about 0.25% to about 0.60% by weight of the formulation,

wherein the quaternary ammonium salt is present in an amount ranging from about 0.05% to about 0.2% by weight of the formulation, wherein the formulation further comprises:

a viscosity builder/thickener comprising a cellulose in an amount ranging from about 0.4% to about 1.0% by weight of the formulation, and

an emollient compound in an amount ranging from about 0.1% to about 0.3% by weight of the formulation.

29. The formulation of Claim 28, wherein the quaternary ammonium salt comprises benzethonium chloride, wherein the terpene comprises farnesol, wherein the viscosity builder/thickener comprising a cellulose comprises hydroxyethyl ethylcellulose, and wherein the emollient is dimethicone.

30. The formulation of Claim 24, wherein the water comprises deionized water, which is present in an amount ranging from about 20.0% to about 30.0% by weight of the formulation,

wherein the formulation comprises alcohol, which is present in an amount ranging from about 60% to about 75% by weight of the formulation,

wherein the quaternary ammonium salt is present in an amount ranging from about 0.05% to about 1.0% by weight of the formulation, and

wherein the formulation further comprises:

D,L-panthenol in an amount ranging from about 0.5% to about 2.0% by weight of the formulation, and

an emollient in an amount ranging from about 0.05% to about 0.5% by weight of the formulation.

31. The formulation of Claim 30, wherein the quaternary ammonium salt comprises benzethonium chloride, which is present in amount ranging from about 0.10% to about 0.40% by weight of the formulation, wherein the emollient comprises dimethicone, and wherein the terpene comprises farnesol.

32. The formulation of Claim 24, wherein the water comprises deionized water, which is present in an amount ranging from about 50.0% to about 65.0% by weight of the formulation,

wherein the quaternary ammonium salt is present in an amount ranging from about 0.05% to about 2.0% by weight of the formulation, wherein the formulation comprises alcohol,

wherein the terpene is present in an amount ranging from about 0.1% to about 1.0% by weight of the formulation, and

wherein the polyaminopropyl biguanide is present in an amount ranging from about 0.01% to about 0.5% by weight of the formulation.

33. The formulation of Claim 32, wherein the quaternary ammonium salt comprises benzethonium chloride, which is present in amount ranging from about 0.10% to about 0.40% by weight of the formulation, wherein the alcohol comprises alcohol 200 proof alcohol, which is present in an amount ranging from about 5.0% to about 20.0% by weight of the formulation, and wherein the terpene comprises farnesol.

34. A formulation according to any one of Claims 24 to 33, wherein the plurality of microbes comprises bacteria, wherein the bacteria comprises gram-positive and gram-negative bacteria and wherein the formulation kills at least 99% of both gram-positive and gram-negative bacteria within 20 seconds of contact with the microbes, and wherein the formulation is configured to kill at least 90% of said gram-positive and gram-negative bacteria at least 4 hours post-application of said formulation.

35. A formulation according to any one of Claims 24 to 33, wherein the plurality of microbes comprises bacteria and/or viruses.