WHAT IS CLAIMED IS:

1. A screening method for identifying candidate therapeutics for treating or preventing age-related macular degeneration (AMD), comprising:

a) Culturing a microorganism in a suitable culture medium in the presence of a test compound;

b) Measuring the growth of the microorganism in the culture medium in the presence of the test compound; and

c) Identifying a candidate therapeutics that inhibits the growth of the microorganism compared to a control,

wherein the microorganism comprises a species that is enriched in the intraocular spacein a subject having age-related macular degeneration (AMD) compared to a healthy subject;

wherein the microorganism comprises one or more species selected from *Staphylococcus epidermidis,Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Staphylococcus haemolyticus*, *Pseudomonas putida*, *Stenotrophomonas maltophilia*, *Bacillus cereus*, *Bacillus megaterium*, *Lactobacillus reuteri*, *Gardnerella vaginalis*, *Enterococcus faecium*, *Cytophaga hutchinsonii*, *Bacillus licheniformis*, and *Xanthomonas oryzae*.

2. The screening method of claim 1, wherein the intraocular space is aqueous humor in anterior chamber, a suspensory ligament, ciliary body, ciliary body and muscle, vitreous humor in posterior chamber, retina, choroid, optic nerve, lens, or iris.

3. The screening method of claim 1, wherein the microorganism comprises *Bacillus megaterium* and/or *Pseudomonas putida*.

4. The screening method of claim 1, wherein the microorganism comprises a mixture of microbial species substantially similar to those observed from an aqueous humor, vitreous humor, and/or soft drusen of a subject having age-related macular degeneration.

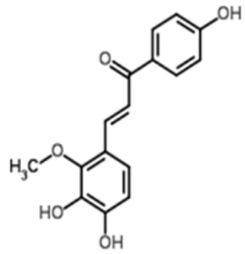
5. The screening method of claim 1, wherein the microorganism is derived, in part or in whole, from an aqueous humor and/or vitreous humor of a subject having age-related macular degeneration.

6. The screening method of any one of claims 1-5, wherein a plurality of test compounds are screened, and wherein the plurality of test compounds comprise at least one test compound that is not a known broad spectrum antibiotic or a known antibiotic having efficacy against one or more species of the microorganism.

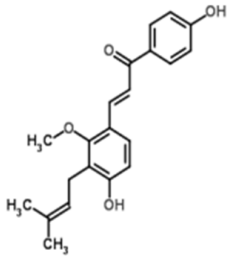
7. The screening method of claim 6, wherein the test compound is not ampicillin, vancomycin, neomycin, metronidazole, or tetracycline.

8. The screening method of any one of claims 1-5, wherein the test compound is selected from Formula I (e.g., Formula I-1, Formula I-2, Formula I-3, Formula I-4, Formula I-5), Formula II (e.g., Formula II-1, Formula II-2, Formula II-3, Formula II-4, Formula II-5, Formula II-6, Formula II-7, Formula II-8, Formula II-9, Formula II-10), Formula III (e.g., Formula III-1, Formula III-2, Formula III-3), Formula IV-1 or IV-2 (e.g., Formula IV-3, Formula IV-4, Formula IV-5, Formula IV-6), a glycoside (e.g., Formula V), wherein the aglycone of the glycoside is a phenolic compound, a flavonoid, a coumarin, a benzoic acid, or a sterol,or a pharmaceutically acceptable salt or ester thereof, or a pharmaceutical composition comprising the compound or pharmaceutically acceptable salt or ester thereof, wherein the Formula I, II, III, IV-1, IV-2, V, and subformulae thereof are defined herein.

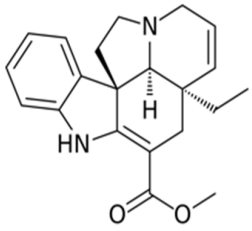
9. The screening method of any one of claims 1-5, wherein the test compound is selected from compounds 1-8 or a pharmaceutically acceptable salt or ester thereof, or a pharmaceutical composition comprising the compound or pharmaceutically acceptable salt or ester thereof, wherein compounds 1-8 have the following chemical structure:



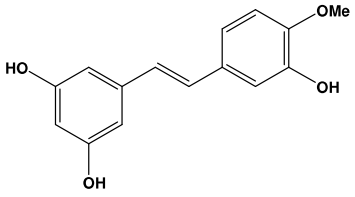
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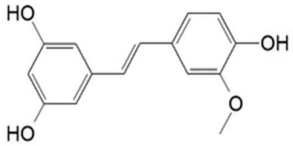
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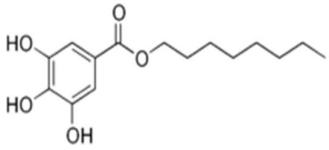
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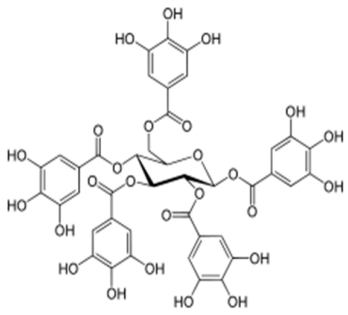
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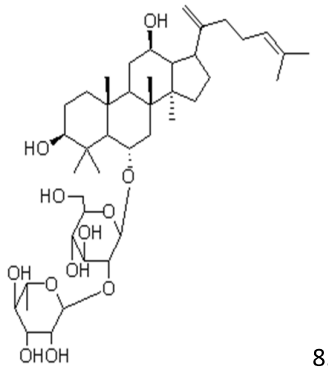
5,



6,



7, and



8.

10. The screening method of any one of claims 1-5, wherein the test compound is an extract, wherein the extract is an extract from one or more TCMs selected from Licorice*(e.g., Glycyrrhiza uralensis)*, White Peony Root *(e.g., Cynanchum otophyllum)*, Forsythia *(e.g., Forsythia suspense)*, Fructus Aurantii *(e.g., Citrus aurantium L.)*, Rehmannia glutinosa *(e.g., Rehmannia glutinosa Libosch)*, Tangerine Peel *(e.g., Citrus reticulata Blanco)*, and Notoginseng *(e.g., Panax notoginseng*).

11. The screening method of any one of claims 8-10, wherein the compound or pharmaceutically acceptable salt or ester thereof, or the pharmaceutical composition is administered to the subject in an amount effective in killing or inhibiting the growth of the microorganism in the eye (e.g., intraocular space), blood, and/or GI tract, such as intestine of the subject.

12. The screening method of any one of claims 8-11, wherein the pharmaceutical composition is administered orally, topically, intravitreously, intramuscularly, subcutaneously, or intravenously.

13. The screening method of any one of claims 1-12, wherein the identifying comprises identifying a candidate therapeutics that prevents visible growth of the microorganism at or below the maximum tested concentration.

14. The screening method of any one of claims 1-12, wherein the identifying comprises identifying a candidate therapeutics that prevents visible colony formation of the microorganism at or below the maximum tested concentration.

15. A screening method for identifying candidate therapeutics for treating or preventing age-related macular degeneration (AMD), comprising:

a) Determining or having determined one or more microbial species as enriched in the intraocular space in a subject having age-related macular degeneration (AMD) compared to a healthy subject;

b) Culturing a microorganism comprising at least one of the enriched microbial species in a suitable culture medium in the presence of a test compound;

c) Measuring the growth of the microorganism in the culture medium in the presence of the test compound; and

d) Identifying a candidate therapeutics that inhibits the growth of the microorganism compared to a control;

wherein the microorganism comprises one or more species selected from *Staphylococcus epidermidis,Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Staphylococcus haemolyticus*, *Pseudomonas putida*, *Stenotrophomonas maltophilia*, *Bacillus cereus*, *Bacillus megaterium*, *Lactobacillus reuteri*, *Gardnerella vaginalis*, *Enterococcus faecium*, *Cytophaga hutchinsonii*, *Bacillus licheniformis*, and *Xanthomonas oryzae*.

16. The screening method of claim 15, wherein the microorganism comprises a mixture of microbial species substantially similar to those observed from an aqueous humor, vitreous humor and/or soft drusen of a subject having age-related macular degeneration.

17. The screening method of any one of claims 1-16, wherein the subject is a human subject.

18. A method of preparing an animal model for AMD, the method comprising introducing a microorganism and/or inactivated protein therefrom to an intraocular space of an eye of an animal, wherein the microorganism comprises a species that is enriched in the intraocular space in a subject having age-related macular degeneration (AMD) compared to a healthy subject; wherein the microorganism comprises one or more species selected from *Staphylococcus epidermidis,Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Staphylococcus haemolyticus*, *Pseudomonas putida*, *Stenotrophomonas maltophilia*, *Bacillus cereus*, *Bacillus megaterium*, *Lactobacillus reuteri*, *Gardnerella vaginalis*, *Enterococcus faecium*, *Cytophaga hutchinsonii*, *Bacillus licheniformis*, and *Xanthomonas oryzae*.

19. The method of claim 18, wherein the microorganism comprises *Bacillus megateriumand*/or *Pseudomonas putida*.

20. The method of claim 18, wherein the microorganism comprises a mixture of microbial species substantially similar to those observed from an aqueous humor, vitreous humor, and/or soft drusen of a subject having age-related macular degeneration.

21. The method of claim 18, wherein the microorganism is derived, in part or in whole, from an aqueous humor and/or vitreous humor of a subject having age-related macular degeneration.

22. The method of any one of claims 18-21, wherein the animal is a non-human primate (e.g., monkey).

23. The method of any one of claims 18-21, wherein the animal is not macaque.

24. The method of any one of claims 18-23, wherein the microorganism and/or inactivated protein therefrom is to be injected into the subretinal space of the animal.

25. The method of any one of claims 18-24, wherein the microorganism and/or inactivated protein therefrom is to be injected to induce a drusenoid lesion, e.g., on retinal tissues, of the animal.

26. The method of any one of claims 18-25, wherein the microorganism and/or inactivated protein therefrom is to be injected to induce drusen-like nodules, e.g., under the retinal pigment epithelium layer in the eye of the animal.

27. The method of any one of claims 18-26, wherein the microorganism and/or inactivated protein therefrom is to be injected to induce pyroptosis, e.g., of the retinal pigment epithelium cells in the eye of the animal.

28. The method of any one of claims 18-27, wherein the microorganism and/or inactivated protein therefrom is to be injected to induce activation of the complement system and/or inflammation in the eye of the animal, e.g., with elevated expression of C5A, CFH, CASPASE1, and NLRP3 proteins.

29. The method of any one of claims 18-28, wherein the microorganism and/or inactivated protein therefrom is to be injected to induce secretion of active IL-1β and/or IL-18, e.g., by retinal pigment epithelium cells in the eye of the animal.

30. An animal model produced by the method of any one of claims 18-29.

31. Use of a test compound in the manufacture of a medicament for treating or preventing age-related macular degeneration (AMD), wherein the test compound is to be administered to the animal model of Claim 30; wherein the severity of the one or more symptoms of the eye disease post administration is to be determined; and a candidate therapeutics is to be identified that relieves at least one of the symptoms compared to a control.

32. The use of claim 31, wherein the test compound is to be administered orally, topically, intravitreously, intramuscularly, subcutaneously, or intravenously.

33. The use of claim 31 or 32, wherein the identification of the candidate therapeutics is done such that, when compared to a control, a) reduces a drusenoid lesion, e.g., on retinal tissues, of the animal; b) reduces drusen-like nodules, e.g., under the retinal pigment epithelium layer in

the eye of the animal; c) reduces pyroptosis of the retinal pigment epithelium cells in the eye of the animal; d) reduces activation of the complement system and/or inflammation in the eye of the animal, e.g., reduces expression of C5A, CFH, CASPASE1, and NLRP3 proteins; e) reduces secretion of active IL-1β and/or IL-18 by retinal pigment epithelium cells in the eye of the animal; or f) any combination of a)-e).

34. The use of any one of claims 31-33, wherein the identification of the candidate therapeutics is done such that, when compared to a control, kills or inhibits growth of the microorganism in the eye (e.g., intraocular space or cavity), blood, and/or GI tract, such as intestine of the animal model.

35. The use of any one of claims 31-34, wherein the test compound is to be prescreened as being effective in inhibiting the growth of the microorganism.

36. Use of an effective amount of an antibiotic in the manufacture of a medicament for the treatment of a drusen symptom (e.g., soft drusen) in a subject in need thereof, wherein the subject suffers from AMD (e.g., dry AMD or wet AMD), and the subject is infected in the intraocular space with one or more species selected from *Staphylococcus epidermidis, Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Staphylococcus haemolyticus*, *Pseudomonas putida*, *Stenotrophomonas maltophilia*, *Bacillus cereus*, *Bacillus megaterium*, *Lactobacillus reuteri*, *Gardnerella vaginalis*, *Enterococcus faecium*, *Cytophaga hutchinsonii*, *Bacillus licheniformis*, and *Xanthomonas oryzae*.

37. Use of an effective amount of an antibiotic in the manufacture of a medicament for reducing a drusenoid lesion, drusen-like nodules, pyroptosis of the retinal pigment epithelium cells in the eye; activation of the complement system and/or inflammation in the eye, and/or secretion of active IL-1β and/or IL-18 by retinal pigment epithelium cells in the eye, in a subject in need thereof, wherein the subject suffers from AMD (e.g., dry AMD or wet AMD), and the subject is infected in the intraocular space with one or more species selected from *Staphylococcus epidermidis, Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Staphylococcus haemolyticus*, *Pseudomonas putida*, *Stenotrophomonas maltophilia*, *Bacillus cereus*, *Bacillus megaterium*, *Lactobacillus reuteri*, *Gardnerella vaginalis*, *Enterococcus faecium*, *Cytophaga hutchinsonii*, *Bacillus licheniformis*, and *Xanthomonas oryzae*.

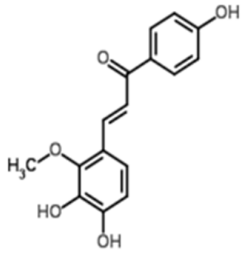
38. The use of claim 36 or 37, whereinthe subject has soft drusen deposited between retinal pigment epithelium (RPE) and the Bruch's membrane; and/or retinal pigmentary changes in the macular.

39. Use of a compound or combination of compounds in the manufacture of a medicament for treating or preventing age-related macular degeneration (AMD), wherein one or more organisms under conditions that mimic human intraocular space or in cooked meat medium to produce one or more cultures are being cultured, wherein the one or more organisms comprises a species that is enriched in the intraocular space in a subject having age-related macular degeneration (AMD) compared to a healthy subject; wherein the one or more organisms are selected from the group consisting of *Staphylococcus epidermidis,Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Staphylococcus haemolyticus*, *Pseudomonas putida*, *Stenotrophomonas maltophilia*, *Bacillus cereus*, *Bacillus megaterium*, *Lactobacillus reuteri*, *Gardnerella vaginalis*, *Enterococcus faecium*, *Cytophaga hutchinsonii*, *Bacillus licheniformis*, *Xanthomonas oryzae*, and combinations thereof; wherein the compound or combination of compounds is to be added to the one or more cultures; and wherein the compound or combination of compounds is to be screened whether the same reduces growth or reduces population of the one or more cultures.

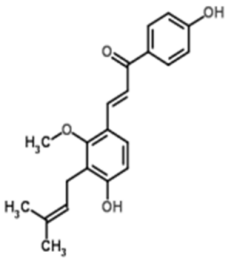
40. The use of claim 39, wherein the compound or combination of compounds is to be identified after the same is determined whether the compound or combination of compounds reduces growth or reduces population of the one or more cultures in vitro.

41. The use of claim 39, wherein the test compound is to be selected from Formula I (e.g., Formula I-1, Formula I-2, Formula I-3, Formula I-4, Formula I-5), Formula II (e.g., Formula II-1, Formula II-2, Formula II-3, Formula II-4, Formula II-5, Formula II-6, Formula II-7, Formula II-8, Formula II-9, Formula II-10), Formula III (e.g., Formula III-1, Formula III-2, Formula III-3), Formula IV-1 or IV-2 (e.g., Formula IV-3, Formula IV-4, Formula IV-5, Formula IV-6), a glycoside (e.g., Formula V), wherein the aglycone of the glycoside is a phenolic compound, a flavonoid, a coumarin, a benzoic acid, or a sterol,or a pharmaceutically acceptable salt or ester thereof, or a pharmaceutical composition comprising the compound or pharmaceutically acceptable salt or ester thereof, wherein the Formula I, II, III, IV-1, IV-2, V, and subformulae thereof are defined herein.

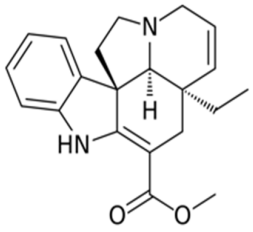
42. The use of claim 39, wherein the test compound is to be selected from compounds 1-8 or a pharmaceutically acceptable salt or ester thereof, or a pharmaceutical composition comprising the compound or pharmaceutically acceptable salt or ester thereof, wherein compounds 1-8 have the following chemical structure:



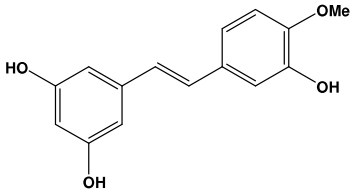
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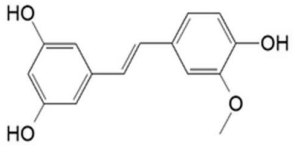
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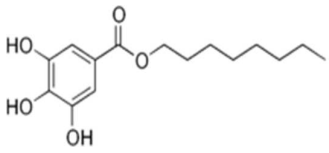
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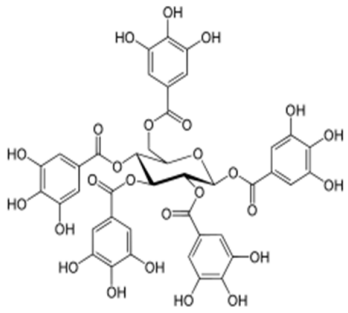
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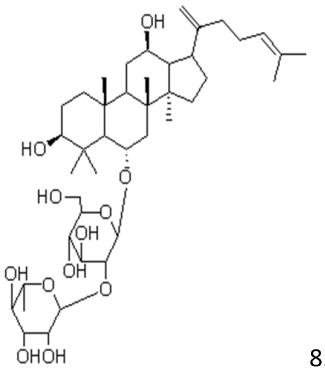
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7, and



8.

43. The use of claim 39, wherein the test compound is an extract, wherein the extract is an extract from one or more TCMs selected from Licorice*(e.g., Glycyrrhiza uralensis)*, White Peony Root *(e.g., Cynanchum otophyllum)*, Forsythia *(e.g., Forsythia suspense)*, Fructus Aurantii *(e.g., Citrus aurantium L.)*, Rehmannia glutinosa *(e.g., Rehmannia glutinosa Libosch)*, Tangerine Peel *(e.g., Citrus reticulata Blanco)*, and Notoginseng *(e.g., Panax notoginseng*).

44. The use of any one of claims 41-43, wherein the compound or pharmaceutically acceptable salt or ester thereof, or the pharmaceutical composition is to be administered to the subject in an amount effective in killing or inhibiting the growth of the microorganism in the eye (e.g., intraocular space), blood, and/or GI tract, such as intestine of the subject.

45. The use of any one of claims 41-44, wherein the pharmaceutical composition is to be administered orally, topically, intravitreously, intramuscularly, subcutaneously, or intravenously.

46. A method for producing a mammalian model of age-related macular degeneration (AMD), comprising:

introducing one or more microorganisms and/or one or more inactivated proteins of the one or more microorganisms into an eye of a mammal, thereby generating the mammalian model,

wherein the one or more microorganisms are selected from the group consisting of *Staphylococcus epidermidis,Pseudomonas aeruginosa*, *Staphylococcus aureus*, *Staphylococcus haemolyticus*, *Pseudomonas putida*, *Stenotrophomonas maltophilia*, *Bacillus cereus*, *Bacillus megaterium*, *Lactobacillus reuteri*, *Gardnerella vaginalis*, *Enterococcus faecium*, *Cytophaga hutchinsonii*, *Bacillus licheniformis*, *Xanthomonas oryzae*, and combinations thereof.

47. The method of claim 46, further comprising monitoring development and progression of one or more markers of AMD.

48. The method of claim 46 or 47, further comprising allowing sufficient time to pass after introducing the one or more microorganisms and/or one or more inactivated proteins of the one or more microorganisms, for the mammal to develop drusenoid lesions.

49. The method of any one of claims 46-48, wherein monitoring development and progression of one or more markers of the ocular disease comprises monitoring ocular inflammatory response in the mammal.

50. The method of any one of claims 47-48, wherein monitoring development and progression of one or more markers of the ocular disease comprises monitoring the formation or progression of drusenoid lesions.

51. The method of any one of claims 46-50, wherein introducing the one or more microorganisms and/or one or more inactivated proteins of the one or more microorganisms comprises intraocularly injecting the one or more microorganisms and/or one or more inactivated proteins of the one or more microorganisms.

52. The method of any one of claims 46-51, wherein the mammal is a non-human primate.

53. The method of claim 52, wherein the mammal is a macaque.

54. Use of a compound or combination of compounds in the manufacture of a medicament for treating or preventing age-related macular degeneration (AMD), wherein the medicament is to be administered to the mammalian model of any one of claims 46-53; and wherein the medicament is effective in reducing or preventing one or more symptoms of AMD.

55. The use of claim 54, wherein the compound or combination of compounds is to be administered after the formation of drusenoid lesions in the mammalian model.

56. The use of any one of claims 54-55, wherein the compound or combination of compounds is to be injected into an eye of the mammalian model.

57. The use of claim 56, wherein the compound or combination of compounds is to be injected by intraocular injection.

58. The use of any one of claims 54-57, wherein the one or more symptoms are selected from the group consisting of formation of drusenoid lesions, microbial growth or load, inflammatory molecule or marker production, and combinations thereof.