[0004] Direct injection into the eye, using conventional needles and syringes has been reported to be effective, but requires professional training and raises concerns about safety (Maurice, *J. Ocul. Pharmacol. Ther.* 17:393-401 (2001)). It also would be desirable to be able to minimize the number and/or frequency of eye injection treatments needed to deliver therapeutically effective amounts of drug to the ocular tissue sites that need it.

[0005] The suprachoroidal space (SCS) of the eye has been studied, and its cannulation described as a possible route for drug delivery. *See, e.g.*, Olsen, et al., *American J. Ophthalmology* 142(5): 777-87 (Nov. 2006).; PCT Patent Application Publication No. WO 2007/100745.

[0006] It therefore would be desirable to provide better, safer, more effective techniques for the direct delivery of therapeutic agents to posterior segment eye tissues, for example, to treat a posterior ocular disorder. It further would be desirable to provide better, safer, more effective techniques for the direct delivery of therapeutic agents to the SCS for the treatment of choroidal maladies, for example, choroidal maladies associated with vascular abnormalities. The present invention addresses these and other needs.

SUMMARY OF THE INVENTION

[0007] ~~In one aspect, the present invention relates~~Disclosed are ~~to~~ non-surgical ophthalmic therapies in human patients in need of such treatment, and more particularly to the infusion of a drug formulation into the suprachoroidal space of the eye for targeted, local drug delivery, for the treatment of posterior ocular disorders, choroidal maladies and other diseases associated with vascular abnormalities.

[0007a] In one aspect, there is provided a drug formulation for use in treating a posterior ocular disorder in a human subject in need thereof, wherein the drug formulation is formulated for non-surgical administration to the suprachoroidal space (SCS) of the eye of the human subject in need of treatment of the posterior ocular disorder, wherein upon administration, the drug formulation flows away from the insertion site and is substantially localized to the posterior segment of the eye.

[0007b] In yet another aspect, there is provided a pharmaceutical composition comprising triamcinolone particles having a D_{50} of less than 3 μm.

[0008] In one ~~aspect of the invention~~example, a method is provided for treating a posterior ocular disorder in a human subject in need of treatment. In one ~~embodiment~~example, the method comprises non-surgically administering an effective amount of a drug formulation to the suprachoroidal space (SCS) of the eye of the subject in need of treatment of the posterior ocular disorder or choroidal malady. In a further ~~embodiment~~example, upon administration, the drug formulation flows away from the insertion site and is substantially localized to the posterior segment of the eye. In one ~~embodiment~~example, the posterior ocular disorder is an ocular inflammatory condition such as

uveitis, scleritis, glaucoma, ocular sarcoidosis, optic neuritis, macular edema, diabetic retinopathy, macular degeneration, a corneal ulcer, an autoimmune disorder, ophthalmic manifestations of AIDS, optic nerve degeneration, geographic atrophy, choroidal disease or retinitis. The condition in one embodiment is acute. In another ~~embodiment~~example, the condition is chronic.

[0008a] In another aspect, there is provided a drug formulation for use in treating a choroidal malady in a human patient, formulated for non-surgical administration to the suprachoroidal spaces (SCS) of the eye of the patient and wherein the drug formulation comprises an effective amount of an anti-inflammatory drug, a vascular endothelial growth factor (VEGF) modulator, a platelet derived growth factor (PDGF) modulator, an angiogenesis inhibitor, an immunosuppressive agent, a vascular permeability inhibitor, or a combination thereof.

[0008b] In yet another aspect, there is provided a drug formulation for use in treating a choroidal neovascularization in a human patient not properly responsive to prior therapy for the choroidal neovascularization, formulated for non-surgical administration to the suprachoroidal spaces (SCS) of the eye of the patient and wherein the drug formulation comprises an effective amount of an anti-inflammatory drug, a vascular endothelial growth factor (VEGF) modulator, a platelet derived growth factor (PDGF) modulator, an angiogenesis inhibitor, an immunosuppressive agent, a vascular permeability inhibitor or a combination thereof.

[0008c] In yet another aspect, there is provided a drug formulation for use in treating a human patient for a choroidal malady, not properly responsive to prior therapy for the choroidal malady, formulated for non-surgical administration to the suprachoroidal space (SCS) of the eye of the patient and wherein the drug formulation comprises an effective amount of an anti-inflammatory drug, a vascular endothelial growth factor (VEGF) modulator, a platelet derived growth factor (PDGF) modulator, an angiogenesis inhibitor, an immunosuppressive agent, a vascular permeability inhibitor, or a combination thereof.

[0009] In another embodiment, the a method is provided for the treatment of a choroidal malady, e.g., ocular neovascularization, polypoidal choroidal vasculopathy, choroidal sclerosis, central sirrus choroidopathy, a multi-focal choroidopathy or a choroidal dystrophy (e.g., central gyrate choroidal dystrophy, serpiginous choroidal dystrophy, total central choroidal atrophy). In one

~~embodiment~~example, the method comprises non-surgically administering a drug formulation comprising an effective amount of an anti-inflammatory drug, a vascular endothelial growth factor (VEGF) modulator, a platelet derived growth factor (PDGF) modulator, an angiogenesis inhibitor, an immunosuppressive agent, a vascular permeability inhibitor, or a combination thereof, to the SCS of the patient in need of treatment. In a further ~~embodiment~~example, the effective amount of the drug administered to the SCS provides higher efficacy or a greater therapeutic effect of the drug, compared to the identical drug dose administered intravitreally, intracamerally, topically, parenterally or orally. In even a further ~~embodiment~~example, the patient undergoing treatment via SCS drug therapy was not previously responsive to a different type of therapy for the same condition.

[0009a] In yet another aspect, there is provided use of an effective amount of an interfering RNA molecule targeting a gene selected from the group consisting of HTRA1, CFH, elastin, and ARMS2, such that the expression of the targeted gene is downregulated upon administration of the interfering RNA in the manufacture of a medicament for treating or preventing polypoidal choroidal vasculopathy (PCV) in a patient.

[0009b] In yet another aspect, there is provided use of a choroidal malady diagnostic agent to the SCS in the manufacture of a diagnostic agent diagnosing a patient with a choroidal malady.

[0009c] In yet another aspect, there is provided a drug formulation for decreasing subretinal exudation and bleeding in a subject in need thereof, formulated for non-surgical administration to the suprachoroidal space (SCS) of the eye of the subject, and comprises an effective amount of an anti-inflammatory drug, a vascular endothelial growth factor (VEGF) modulator, a platelet derived growth factor (PDGF) modulator, an angiogenesis inhibitor, an immunosuppressive agent, a vascular permeability inhibitor or a combination thereof, wherein administration of the drug formulation to the SCS reduces the subretinal exudation and bleeding experienced by the patient as compared to the identical dosage of the drug administered intravitreally to the patient.

[0010] In yet another ~~embodiment~~example, a method for decreasing subretinal exudation and bleeding in a subject is provided. In a further ~~embodiment~~example, the method comprises non-surgically administering a drug formulation comprising an effective amount of an effective amount of an anti-inflammatory drug, a vascular endothelial growth factor (VEGF) modulator, a

platelet derived growth factor (PDGF) modulator, an angiogenesis inhibitor, an immunosuppressive agent, a vascular permeability inhibitor, or a combination thereof, to the SCS of the patient in need of treatment, wherein administration of the drug formulation reduces subretinal exudation and bleeding experienced by the patient, as compared to the identical dosage of the drug administered intravitreally to the patient.

[0010a] In another aspect, there is provideda drug formulation for reducing edema in a subject in need thereof, formulated for non-surgical administration to the suprachoroidal space (SCS), wherein the drug formulation comprises an effective amount an anti-inflammatory drug, a vascular endothelial growth factor (VEGF) modulator, a platelet derived growth factor (PDGF) modulator, an angiogenesis inhibitor, an immunosuppressive agent, a vascular permeability inhibitor, or a combination thereof, wherein administration of the drug formulation to the SCS reduces the edema experienced by the patient as compared to the identical dosage of the drug administered intravitreally to the patient.

[0011] In one ~~embodiment~~example, a method for treating a posterior ocular disorder or a choroidal malady in a human patient is provided. In a further ~~embodiment~~example, the method comprises non-

surgically administering an effective amount of a drug formulation to the suprachoroidal space (SCS) of the eye of the subject in need of treatment of the posterior ocular disorder or choroidal malady. In a further ~~embodiment~~example, the intraocular elimination half life ($t_{1/2}$) of the drug administered to the SCS is greater than the intraocular $t_{1/2}$ of the drug, when administered intravitreally, intracamerally, topically, parenterally or orally. In another ~~embodiment~~example, the mean intraocular maximum concentration (C_{max}) of the drug, when administered to the SCS via the methods described herein, is greater than the intraocular C_{max} of the drug, when administered intravitreally, intracamerally, topically, parenterally or orally. In another ~~embodiment~~example, the mean intraocular area under the curve (AUC_{0-t}) of the drug, when administered to the SCS via the methods described herein, is greater than the intraocular AUC_{0-t} of the drug, when administered intravitreally, intracamerally, topically, parenterally or orally. In yet another ~~embodiment~~example, the intraocular time to peak concentration (t_{max}) of the drug, when administered to the SCS via the methods described herein, is greater than the intraocular t_{max} of the drug, when the same drug dose is administered intravitreally, intracamerally, topically, parenterally or orally. In a further ~~embodiment~~example, the drug formulation comprises an effective amount of an anti-inflammatory drug (e.g., a steroid or NSAID), a VEGF modulator (e.g., VEGF antagonist), a platelet derived growth factor (PDGF) modulator, an angiogenesis inhibitor, an immunosuppressive agent, a vascular permeability inhibitor, or a combination thereof.

[0012] In one ~~embodiment~~example, the method for treating a posterior ocular disorder or choroidal malady in a human subject comprises delivering a drug formulation via a hollow microneedle to the SCS of the eye of the human subject in need of treatment. In a further ~~embodiment~~example, delivering the drug formulation comprises inserting a hollow microneedle into the eye of the human subject at an insertion site, the microneedle having a tip end with an opening; and infusing over a period of time a drug formulation through the inserted microneedle and into the SCS space away from the insertion site. The drug formulation administered to the SCS, in one embodiment, flows away from the insertion site and is substantially localized to the posterior segment of the eye, thereby increasing the therapeutic efficacy of the dose of the drug compared to the therapeutic efficacy of the same drug dose administered by another means (e.g. intravitreally, intracamerally, topically, parenterally, and/or orally). In another ~~embodiment~~example, the dose of the drug sufficient to elicit a therapeutic response when administered to the SCS is less

than the dosage of the drug sufficient to elicit a therapeutic response when administered intravitreally, topically, parenterally or orally. In another ~~embodiment~~example, the drug formulation is delivered to the SCS by a hollow microneedle inserted into the sclera at the equator of the eye or between the equator and the limbus of the eye. In a further embodiment, the hollow microneedle is inserted in the insertion site at a 90 degree angle (perpendicular).

[0012a] In one aspect, there is provided a drug formulation for reducing ocular inflammation in a subject in need thereof formulated for non-surgical administration to the suprachoroidal space (SCS) of the eye, wherein the drug formulation comprises an effective amount of an anti-inflammatory drug, a vascular endothelial growth factor (VEGF) modulator, a platelet derived growth factor (PDGF) modulator, an angiogenesis inhibitor, an immunosuppressive agent, a vascular permeability inhibitor, or a combination thereof, wherein administration of the drug formulation to the SCS reduces the ocular inflammation compared to the identical dosage of the drug administered intravitreally to the patient.

[0013] The drug formulation delivered by the methods described herein, in one ~~embodiment~~example, comprises an effective amount of an anti-inflammatory drug, for example a steroid or a non-steroidal anti-inflammatory drug (NSAID). In another ~~embodiment~~example, the drug delivered to the SCS via the methods described herein is a steroid, immunosuppressive, antimetabolite, T-cell inhibitor, alkylating agent, biologic, TNFα antagonist, interleukin antagonist, neuroprotectant, vascular endothelial growth factor (VEGF) antagonist, platelet derived growth factor (PDGF) antagonist, or a combination thereof. In another ~~embodiment~~example, the drug affects inflammation, neuroprotection, complement inhibition, drusen formation, scar formation, reduction in choriocapillaris or choroidal neocasvularization. In another ~~embodiment~~example, the drug formulation comprises microparticles and/or nanoparticles of the drug. In one ~~embodiment~~example, the drug formulation comprises microparticles having a D_{50} of 1 μm or less and/or a D_{99} of 10 μm or less.

[0014] ~~As provided above, one aspect of the invention includes~~ Also disclosed is a method for treating a posterior ocular disorder in a human subject in need thereof comprising non-surgically administering a drug formulation to the SCS of the eye of the human subject, wherein upon administration, the drug formulation flows away from the insertion site and is substantially

localized to the posterior segment. In one ~~embodiment~~ example of the method, the intraocular pressure of the eye remains substantially constant during administration of the drug formulation to the SCS. In another ~~embodiment~~example, administration of the drug formulation to the SCS of the eye results in a decreased number of side effects, or a reduced severity of one or more side effects, compared to administration of the same drug dose intravitreally, intracamerally, topically, orally or parenterally.

[0015] ~~In one aspect of the invention, the present invention relates to~~Also disclosed is a method for treating a choroidal malady in a human patient in need of treatment. In one ~~embodiment~~example, the method comprises non-surgically administering a drug formulation comprising an effective amount of an

anti-inflammatory drug, a vascular endothelial growth factor (VEGF) modulator, a platelet derived growth factor (PDGF) modulator, an angiogenesis inhibitor, an immunosuppressive agent or a vascular permeability inhibitor, to the suprachoroidal space (SCS) of the eye of the patient. In a further ~~embodiment~~example, the human patient, prior to administration of the drug formulation, was previously treated for the choroidal malady and was not properly responsive to the treatment.

[0015a] In another aspect, there is provided a drug formulation for use in treating an ocular neovascularization in a human not properly responsive to prior therapy for the ocular neovascularization formulated for non-surgical administration to the suprachoroidal spaces (SCS) of the eye of the patient and wherein the drug formulation comprises an effective amount of an anti-inflammatory drug, a vascular endothelial growth factor (VEGF) modulator, a platelet derived growth factor (PDGF) modulator, an angiogenesis inhibitor, an immunosuppressive agent, a vascular permeability inhibitor, or a combination thereof.

[0016] ~~In another aspect of the invention, the present invention relates to~~ Also disclosed is a method for treating ocular neovascularization in a human patient in need of treatment. In one ~~embodiment~~example, the method comprises non-surgically administering a drug formulation comprising an effective amount of an anti-inflammatory drug, a vascular endothelial growth factor (VEGF) modulator (e.g., a VEGF antagonist), a platelet derived growth factor (PDGF) modulator (e.g., a PDGF antagonist), an angiogenesis inhibitor, an immunosuppressive agent or a vascular permeability inhibitor, to the suprachoroidal space (SCS) of the eye of the patient. In a further ~~embodiment~~example, the ocular neovascularization is a choroidal neovascularization. In one ~~embodiment~~example, the human patient being treated for the ocular neovascularization, prior to administration of the drug formulation, was previously treated for the ocular neovascularization and was not properly responsive to the treatment.

[0017] The drug formulation delivered by the methods described herein, in one ~~embodiment~~example, comprises an effective amount of an anti-inflammatory drug, for example a steroidal compound or a non-steroidal anti-inflammatory drug (NSAID). In another ~~embodiment~~example, the drug delivered to the SCS via the methods described herein is a vascular permeability inhibitor, an angiogenesis inhibitor or a VEGF modulator, *e.g.*, a VEGF

antagonist. In one ~~embodiment~~example, the VEGF antagonist is a VEGF receptor antagonist or a soluble VEGF receptor. In one ~~embodiment~~example, the drug formulation comprises drug microparticles having a D_{50} of 1 μm or less and/or a D_{99} of 10 μm or less. In a further ~~embodiment~~example, the drug formulation comprises triamcinolone.

[0018] ~~In one embodiment of the invention,~~Also disclosed is a method for treating a choroidal malady or a posterior ocular disorder in a human subject in need thereof is provided comprising non-surgically administering a drug formulation to the SCS of the eye of the human subject, wherien, the intraocular pressure of the eye remains substantially constant during administration of the

drug formulation to the SCS. In another ~~embodiment~~example, administration of the drug formulation to the SCS of the eye of the patient in need of treatment of the posterior ocular disorder or choroidal malady results in a decreased number of side effects, or a reduced severity of one or more side effects, compared to administration of the same drug dose intravitreally, intracamerally, topically, orally or parenterally. In one ~~embodiment~~example, the side effect reduced by the methods described herein is subretinal exudation and/or bleeding.

[0018a] In yet another aspect, there is provided the use of a triamcinolone composition in the manufacture of a medicament for treating an ocular disorder in the eye of a patient, wherein said medicament is to be:

(a) inserted using a hollow microneedle into the eye at an insertion site, the microneedle having a tip end with an opening;

(b) applied a selected pressure to the triamcinolone composition, which comprises triamcinolone microparticles, to induce infusion of the triamcinolone composition through the inserted microneedle;

(c) determined whether the triamcinolone composition has flowed into the suprachoroidal space of the eye and away from the insertion site;

(d) if the determination in step (c) is that the triamcinolone composition has flowed into the suprachoroidal space away from the insertion site, then infusing a selected volume of the triamcinolone composition and thereupon removing the pressure, or if the determination in step (c) is that substantially none of the triamcinolone composition has flowed into the suprachoroidal space away from the insertion site, then repositioning the inserted microneedle and repeating steps (b)-(d) until a selected volume of the triamcinolone composition has been infused.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019] FIGS. 1A, 1B, 1C, and **1D** are cross-sectional illustrations of the tissue structures of a human eye. The eye as a whole (A), a close-up of the cornea (**1B**), and a close-up of the sclera and associated tissue in an eye without fluid in the suprachoroidal space (**1C**) or with fluid in the suprachoroidal space (**1D**).

[0020] FIG. 2 is a cross-sectional view of a microneedle device comprising a hollow microneedle disposed in an elongated body according to one embodiment.

[0021] FIG. 3 is a cross-sectional view of the elongated body of the microneedle devices shown in **FIG. 2**.

[0022] FIG. 4 is an illustration of a microneedle device according to one embodiment.

[0023] FIG. 5 is an illustration of a microneedle device according to one embodiment.

[0024] FIGS. 6A and **6B** illustrate an embodiment of a process for using a hollow microneedle to deliver drug into the suprachoroidal space of an eye, where the process includes inserting the hollow microneedle into the sclera and infusion of a fluid drug formulation into the suprachoroidal space.

[0025] FIG. 7A shows a comparison of a hollow microneedle according to one embodiment as compared to the tip of a conventional 30 gauge hypodermic needle. **FIG. 7B** shows a schematic illustration of a custom acrylic mold shaped to fit a whole eye.

[0026] FIGS. 8A and **8B** are brightfield microscopic images of saggital cross sections of a pig eye before and after infusion of sulforhadamine, respectively.

CLAIMS

1. A method of treating a posterior ocular disorder in a human subject in need thereof, the method comprising,

non-surgically administering an effective amount of a drug formulation to the suprachoroidal space (SCS) of the eye of the human subject in need of treatment of the posterior ocular disorder,

wherein upon administration, the drug formulation flows away from the insertion site and is substantially localized to the posterior segment of the eye.

2. The method of claim 1, wherein the administering step comprises inserting a hollow microneedle into the sclera at an insertion site, the microneedle having a tip end with an opening and infusing the drug formulation into the SCS through the inserted microneedle.

3. The method of claim 2, wherein the insertion site is at about the equator of the eye, or between the equator and the limbus of the eye.

4. The method of claim 2 or 3, wherein the microneedle has a length of from about 500 μm and about 1500 μm.

5. The method of any one of claims 2-4, wherein the microneedle has a diameter of from about 200 μm to about 600 μm.

6. The method of any one of claims 2-5, wherein the microneedle has a bevel angle of about 5 degrees to about 30 degrees.

7. The method of any one of claims 2-6, wherein the bevel height is from about 100 μm to about 500 μm.

8. The method of any one of claims 2-7, wherein the microneedle is inserted into the sclera without penetrating through the sclera.

9. The method of any one of claims 2-8, wherein the microneedle is inserted into the sclera without penetrating through the choroid.

10. The method of any one of claims 2-9, wherein the microneedle comprises a beveled tip.

11. The method of claim 10, wherein the beveled tip has an angle from about 10 degrees to about 20 degrees.

12. The method of claim 10 or 11, wherein the beveled tip has an aspect ratio of from about 1:1.5 to about 1:10.

13. The method of any one of claims 10-12, wherein the beveled tip has a height of from about 500 μm to about 1 mm.

14. The method of any one of claims 2-13, wherein the microneedle has a length of from about 500 μm to about 1500 μm.

15. The method of claim 14, wherein the microneedle has a length of from about 500 μm to about 1000 μm.

16. The method of any one of claims 2-15, wherein the microneedle comprises a cylindrical shaft having an outer diameter of from about 200 microns to about 600 microns.

17. The method of any one of claims 1-16, wherein the effective amount of the drug formulation is present in a volume of from about 10 μL to about 200 μL.

18. The method of any one of claims 1-17, wherein the effective amount of the drug formulation is present in a volume of from about 30 μL to about 100 μL.

19. The method of any one of claims 1-18, wherein the drug formulation comprises a suspension of microparticles.

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20. The method of anyone of claims 1-19, wherein the drug formulation comprises a suspension of nanoparticles.

21. The method of claim 19, wherein the microparticles have a D_{50} of 2 μm or less.

22. The method of claim 20, wherein the nanoparticles have a D_{50} of 1000 nm or less.

23. The method of claim 20, wherein the nanoparticles have a D_{50} of 500 nm or less.

24. The method of claim 20, wherein the nanoparticles have a D_{50} of 250 nm or less.

25. The method of claim 19 or 20, wherein the microparticles or nanoparticles have a D_{99} of 10 μm or less.

26. The method of claim 19 or 20, wherein the microparticles or nanoparticles have a D_{99} of 5 μm or less.

27. The method of any one of claims 2-26, wherein the microneedle is inserted into the surface of the sclera at an angle of from about 70 degrees to about 110 degrees.

28. The method of any one of claims 2-27, wherein the microneedle is inserted into the surface of the sclera at an angle of about 90 degrees.

29. The method of any one of claims 1-28, wherein the drug formulation comprises an anti-inflammatory drug.

30. The method of claim 29, wherein the anti-inflammatory drug is selected from mycophenolate, infliximab, nepafenac, azathioprine, cyclosphosphamide, dexamethasone, difluprednate, fluocinolone, fluorometholone, leteprednol, prednisolone acetate, prednisolone sodium phosphate, rimexolone, triamcinolone, bromfenac, diclofenac, fluibiprofen, ketorolac, adalimumab, etanercept, certolizumab, gotimumab, daclizumab, rituximab, abatacept, basiliximab, belimumab, anakinra, efalizuma, alefacept, and natalizumab.

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31. The method of claim 29 or 30, wherein the anti-inflammatory drug is mycophenolate.

32. The method of claim 29 or 30, wherein the anti-inflammatory drug is infliximab.

33. The method of claim 29 or 30, wherein the anti-inflammatory drug is nepafenac.

34. The method of claim 29 or 30, wherein the anti-inflammatory drug is azathioprine.

35. The method of claim 29 or 30, wherein the anti-inflammatory drug is cyclosphosphamide.

36. The method of claim 29 or 30, wherein the drug is dexamethsone.

37. The method of claim 29 or 30, wherein the anti-inflammatory drug is difluprednate.

38. The method of claim 29 or 30, wherein the anti-inflammatory drug is fluocinolone.

39. The method of claim 29 or 30, wherein the anti-inflammatory drug is leteprednol.

40. The method of claim 29 or 30, wherein the drug is triamcinolone.

41. The method of claim 40, wherein the triamcinolone is triamcinolone acetonide.

42. The method of claim 29 or 30, wherein the anti-inflammatory drug is bromfenac.

43. The method of claim 29 or 30, wherein the anti-inflammatory drug is diclofenac.

44. The method of claim 29 or 30, wherein the anti-inflammatory drug is fluibiprofen.

45. The method of claim 29 or 30, wherein the anti-inflammatory drug is ketorolac.

46. The method of claim 29 or 30, wherein the anti-inflammatory drug is adalimumab.

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47. The method of claim 29 or 30, wherein the anti-inflammatory drug is etanercept.

48. The method of claim 29 or 30, wherein the anti-inflammatory drug is certolizumab.

49. The method of claim 29 or 30, wherein the anti-inflammatory drug is gotimumab.

50. The method of claim 29 or 30, wherein the anti-inflammatory drug is daclizumab.

51. The method of claim 29 or 30, wherein the anti-inflammatory drug is rituximab.

52. The method of claim 29 or 30, wherein the anti-inflammatory drug is abatacept.

53. The method of claim 29 or 30, wherein the anti-inflammatory drug is basiliximab.

54. The method of claim 29 or 30, wherein the anti-inflammatory drug is belimumab.

55. The method of claim 29 or 30, wherein the anti-inflammatory drug is anakinra.

56. The method of claim 29 or 30, wherein the anti-inflammatory drug is efalizuma.

57. The method of claim 29 or 30, wherein the anti-inflammatory drug is alefacept.

58. The method of claim 29 or 30, wherein the anti-inflammatory drug is natalizumab.

59. The method of any one of claims 1-30, wherein the drug formulation comprises a steroid.

60. The method of any one of claims 1-29, wherein the drug formulation comprises a non-steroid anti-inflammatory drug (NSAID).

61. The method of any one of claims 1-28, wherein the drug formulation comprises an angiogenesis inhibitor.

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62. The method of any one of claims 1-28, wherein the drug formulation comprises a vascular endothelial growth factor (VEGF) antagonist.

63. The method of claim 62, wherein the VEGF antagonist is a VEGF-receptor kinase antagonist, an anti-VEGF antibody or fragment thereof, an anti-VEGF receptor antibody, an anti-VEGF aptamer, a small molecule VEGF antagonist, a thiazolidinedione, a quinoline or a designed ankyrin repeat protein (DARPin).

64. The method of any one of claims 1-28, wherein the drug formulation comprises a TNF-α antagonist or a TNF-α receptor antagonist.

65. The method of any one of claims 1-28, wherein the drug formulation comprises a platelet derived growth factor (PDGF) antagonist.

66. The method of claim 65, wherein the PDGF antagonist is a PDGF receptor (PDGFR) antagonist.

67. The method of claim 66, wherein the PDGFR is PDGFR-α.

68. The method of claim 66, wherein the PDGFR is PDGFR-β.

69. The method of claim 62 or 63, wherein the VEGF antagonist is aflibercept, ziv-aflibercept, bevacizumab, ranibizumab, lapatinib, sunitinib, sorafenib, plitidepsin, regorafenib, verteporfin, bucillamine, axitinib, pazopanib, fluocinolone acetonide, nintedanib, AL8326, 2C3 antibody, AT001 antibody, XtendVEGF antibody, HuMax-VEGF antibody, R3 antibody, AT001/r84 antibody, HyBEV, ANG3070, APX003 antibody, APX004 antibody, ponatinib, BDM-E, VGX100 antibody, VGX200, VGX300, COSMIX, DLX903/1008 antibody, ENMD2076, INDUS815C, R84 antibody, KD019, NM3, MGCD265, MG516, MP0260, NT503, anti-DLL4/VEGF bispecific antibody, PAN90806, Palomid 529, BD0801 antibody, XV615, lucitanib, motesanib diphosphate, AAV2-sFLT01, soluble Flt1 receptor, cediranib, AV-951, Volasertib, CEP11981, KH903, lenvatinib, lenvatinib mesylate, terameprocol, PF00337210, PRS050, SP01, carboxyamidotriazole orotate, hydroxychloroquine, linifanib, ALG1001, AGN150998, MP0112, AMG386, ponatinib,

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AVA101, BMS690514, KH902, golvatinib (E7050), dovitinib lactate (TKI258, CHIR258), ORA101, ORA102, Axitinib (Inlyta, AG013736), PTC299, pegaptanib sodium, troponin, EG3306, vatalanib, Bmab100, GSK2136773, Anti-VEGFR Alterase, Avila, CEP7055, CLT009, ESBA903, GW654652, HMPL010, GEM220, HYB676, JNJ17029259, TAK593, Nova21012, Nova21013, CP564959, smart Anti-VEGF antibody, AG028262, AG13958, CVX241, SU14813, PRS055, PG501, PG545, PTI101, TG100948, ICS283, XL647, enzastaurin hydrochloride, BC194, COT601M06.1, COT604M06.2, MabionVEGF, Apatinib or AL3818.

70. The method of claim 64, wherein the VEGF antagonist is sorafenib.

71. The method of claim 62, wherein the VEGF antagonist is axitinib.

72. The method of claim 62, wherein the VEGF antagonist is aflibercept.

73. The method of claim 62, wherein the VEGF antagonist is bevacizumab.

74. The method of claim 62, wherein the VEGF antagonist is ranibizumab.

75. The method of any one of claims 65-68, wherein the PDGF antagonist is an anti-PDGF aptamer, an anti-PDGF antibody or fragment thereof, an anti-PDGFR antibody or fragment thereof, or a small molecule antagonist.

76. The method of claim 65, wherein the PDGF antagonist is the anti-PDGF-β aptamer E10030, sunitinib, axitinib, sorefenib, imatinib, imatinib mesylate, nintedanib, pazopanib HCl, ponatinib , MK-2461, Dovitinib, pazopanib, crenolanib, PP-121, telatinib, imatinib, KRN 633, CP 673451, TSU-68, Ki8751, amuvatinib, tivozanib, masitinib, motesanib diphosphate, dovitinib dilactic acid, linifanib (ABT-869).

77. The method of any one of claims 1-76, wherein the intraocular pressure of the eye of the subject is substantially constant during administration of the drug formulation.

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78. The method of any one of claims 1-77, wherein the intraocular pressure of the eye of the subject varies by no more than about 10% during the administration.

79. The method of any one of claims 1-78, wherein administration of the drug to the SCS of the eye provides a decreased number of side effects, or a reduced severity of one or more side effects, as compared to the identical dosage of the drug administered intravitreally, intracamerally, topically, parenterally or orally.

80. The method of any one of claims 1-79, wherein the dosage of the drug sufficient to elicit a therapeutic response when administered to the SCS is less than the dosage of the drug sufficient to elicit a therapeutic response when administered intravitreally, intracamerally, topically, parenterally or orally.

81. The method of claim 80, wherein the dosage of the drug sufficient to elicit a therapeutic response when administered to the SCS is 75% or less of the dosage of the drug sufficient to elicit a therapeutic response when administered intravitreally, intracamerally, topically, parenterally or orally.

82. The method of claim 80, wherein the dosage of the drug sufficient to elicit a therapeutic response when administered to the SCS is 50% or less of the dosage of the drug sufficient to elicit a therapeutic response when administered intravitreally, intracamerally, topically, parenterally or orally.

83. The method of claim 80, wherein the dosage of the drug sufficient to elicit a therapeutic response when administered to the SCS is 25% or less of the dosage of the drug sufficient to elicit a therapeutic response when administered intravitreally, intracamerally, topically, parenterally or orally.

84. The method of claim 80, wherein the dosage of the drug sufficient to elicit a therapeutic response when administered to the SCS is 10% or less of the dosage of the drug sufficient to elicit a therapeutic response when administered intravitreally, intracamerally, topically, parenterally or orally.

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85. The method of any one of claims 1-84, wherein the retention of the drug in the posterior segment of the eye is greater than the retention of the drug in the posterior segment of the eye when administered intravitreally, intracamerally, topically, parenterally or orally.

86. The method of any one of claims 1-84, wherein the $t_{1/2}$ of the drug is greater than the $t_{1/2}$ of the drug when administered intravitreally, intracamerally, topically, parenterally or orally.

87. The method of any one of claims 1-84, wherein the systemic exposure of the drug is less than the systemic exposure of the drug when the drug is administered intravitreally, intracamerally, topically, parenterally or orally.

88. The method of any one of claims 1-87, wherein the intraocular T_{max} of the drug is less than the intraocular T_{max} of the drug, when the same drug dose is administered intravitreally, intracamerally, topically, parenterally or orally at the same dose.

89. The method of claim 88, wherein the T_{max} of the drug is at least 10% less than the T_{max} of the drug, when the same drug dose is administered intravitreally, intracamerally, topically, parenterally or orally at the same dose.

90. The method of any one of claims 1-89, wherein the intraocular C_{max} of the drug is greater than the intraocular C_{max} of the drug, when the drug dose is administered intravitreally, intracamerally, topically, parenterally or orally.

91. The method of any one of claims 1-90, wherein the intraocular $t_{1/2}$ of the drug is greater than the intraocular $t_{1/2}$ of the drug, when the same drug dose is administered intravitreally, intracamerally, topically, parenterally or orally.

92. The method of any one of claims 1-90, wherein the intraocular AUC_{0-t} of the drug is greater than the intraocular AUC_{0-t} of the drug, when the same drug dose is administered intravitreally, intracamerally, topically, parenterally or orally.

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93. The method of any one of claims 1-92, wherein the ocular disease is uveitis, glaucoma, scleritis, ocular sarcoidosis, optic neuritis, macular edema, diabetic macular edema, age related macular degeneration (AMD), diabetic retinopathy, macular degeneration, choroidal neovascularization, corneal ulcer, ocular autoimmune disorder, or retinitis.

94. The method of claim 93, wherein the ocular disease is uveitis.

95. The method of claim 93, wherein the ocular disease is cytomegalovirus retinitis.

96. The method of claim 93, wherein the ocular disease is AMD.

97. The method of claim 96, wherein the AMD is dry AMD.

98. The method of claim 96, wherein the ocular disease is dry AMD.

99. The method of any one of claims 1-98, further comprising non-surgically administering to the eye of the subject a second drug.

100. The method of claim 99, wherein the second drug is a VEGF antagonist.

101. The method of claim 99, wherein the second drug is a PDGF antagonist.

102. The method of claim 99, wherein the second drug is an anti-inflammatory agent.

103. The method of any one of claims 99-102, wherein the second drug is administered to the suprachoroidal space (SCS) of the eye of the subject.

104. The method of claim 103, wherein administration to the SCS of the eye of the subject comprises:

inserting a hollow microneedle into the sclera at an insertion site, the microneedle having a tip end with an opening, and

infusing the drug formulation into the SCS through the inserted microneedle.

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105. The method of any one of claims 99-102, wherein the second drug is administered intravitreally.

106. The method of any one of claims 99-105, wherein the first and second drug are administered to the subject in one sitting.

107. The method of any one of claims 1-106, wherein the effective amount of the drug administered to the SCS provides a higher therapeutic efficacy of the drug, compared to the identical drug dose administered intravitreally, intracamerally, topically, parenterally or orally.

108. The method of any one of claims 1-107, wherein the drug dose sufficient to elicit a therapeutic response is lower than the drug dose sufficient to elicit the same or substantially the same therapeutic response, when the drug is administered intravitreally, intracamerally, topically, parenterally or orally.

109. A method for treating a choroidal malady in a human patient, the method comprising:

non-surgically administering a drug formulation comprising an effective amount of an anti-inflammatory drug, a vascular endothelial growth factor (VEGF) modulator, a platelet derived growth factor (PDGF) modulator, an angiogenesis inhibitor, an immunosuppressive agent, a vascular permeability inhibitor, or a combination thereof, to the suprachoroidal space (SCS) of the eye of the patient.

110. A method for treating a choroidal neovascularization in a human patient not properly responsive to prior therapy for the choroidal neovascularization, the method comprising:

non-surgically administering a drug formulation comprising an effective amount of a anti-inflammatory drug, a vascular endothelial growth factor (VEGF) modulator, a platelet derived growth factor (PDGF) modulator, an angiogenesis inhibitor, an immunosuppressive agent, a vascular permeability inhibitor or a combination thereof, to the suprachoroidal space (SCS) of the eye of the patient.

111. A method for treating a human patient for a choroidal malady, not properly responsive to prior therapy for the choroidal malady, the method comprising:

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non-surgically administering a drug formulation comprising an effective amount of a anti-inflammatory drug, a vascular endothelial growth factor (VEGF) modulator, a platelet derived growth factor (PDGF) modulator, an angiogenesis inhibitor, an immunosuppressive agent, a vascular permeability inhibitor, or a combination thereof, to the suprachoroidal space (SCS) of the eye of the patient.

112. A method for treating an ocular neovascularization in a human not properly responsive to prior therapy for the ocular neovascularization, the method comprising:

non-surgically administering a drug formulation comprising an effective amount of an anti-inflammatory drug, a vascular endothelial growth factor (VEGF) modulator, a platelet derived growth factor (PDGF) modulator, an angiogenesis inhibitor, an immunosuppressive agent, a vascular permeability inhibitor, or a combination thereof, to the suprachoroidal space (SCS) of the eye of the patient.

113. A method for decreasing subretinal exudation and bleeding in a subject in need thereof, the method comprising:

non-surgically administering an effective amount of a drug formulation to the suprachoroidal space (SCS) of the eye of the subject, wherein the drug formulation comprises an effective amount of an anti-inflammatory drug, a vascular endothelial growth factor (VEGF) modulator, a platelet derived growth factor (PDGF) modulator, an angiogenesis inhibitor, an immunosuppressive agent, a vascular permeability inhibitor or a combination thereof, to the suprachoroidal space (SCS) of the eye of the subject,

wherein administration of the drug formulation to the SCS reduces the subretinal exudation and bleeding experienced by the patient as compared to the identical dosage of the drug administered intravitreally to the patient.

114. A method for reducing edema in a subject in need thereof, the method comprising:

non-surgically administering an effective amount of a drug formulation comprising an effective amount of an anti-inflammatory drug, a vascular endothelial growth factor (VEGF) modulator, a platelet derived growth factor (PDGF) modulator, an angiogenesis inhibitor, an immunosuppressive agent, a vascular permeability inhibitor, or a combination thereof, wherein administration to the SCS reduces the edema experienced by the patient as compared to the identical dosage of the drug administered intravitreally to the patient.

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115. A method for reducing ocular inflammation in a subject in need thereof, the method comprising: non-surgically administering an effective amount of a drug formulation comprising an effective amount of an anti-inflammatory drug, a vascular endothelial growth factor (VEGF) modulator, a platelet derived growth factor (PDGF) modulator, an angiogenesis inhibitor, an immunosuppressive agent, a vascular permeability inhibitor, or a combination thereof, to the suprachoroidal space (SCS) of the eye of the subject, wherein administration of the drug formulation to the SCS reduces the ocular inflammation compared to the identical dosage of the drug administered intravitreally to the patient.

116. The method of anyone of claims 109-115,
wherein upon administration, the drug formulation flows away from the insertion site.

117. The method of anyone of claims 109-115, wherein upon administration, the drug formulation flows away from the insertion and is substantially localized to the posterior segment of the eye.

118. The method of claim 109,
wherein the choroidal malady is polyploidal choroidal vaculopathy.

119. The method of claim 109,
wherein the choroidal malady ocular neovascularization, polypoidal choroidal vasculopathy, choroidal sclerosis, central sirrus choroidopathy, a multi-focal choroidopathy or a choroidal dystrophy.

120. The method of claim 119,
wherein the choroidal malady is a choroidal dystrophy and the choroidal dystrophy is central gyrate choroidal dystrophy, serpiginous choroidal dystrophy or total central choroidal atrophy.

121. The method of any one of claims 110-112,
wherein the prior therapy comprises intravitreal administration of the drug formulation.

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122. The method of any one of claims 109-121,

wherein prior to administration of the drug formulation, a polypoidal lesion is present in the eye of the patient, and

administration of the effective amount of the drug to the SCS of the patient reduces the size of the polypoidal lesion as compared to the identical dosage of the drug administered intravitreally.

123. The method of any one of claims 109-121,

wherein prior to administration of the drug formulation, polypoidal lesions of varying sizes are present in the eye of the patient, and

administration of the effective amount of the drug to the SCS reduces the variability in size of the polypoidal lesions as compared to the identical dosage of the drug administered intravitreally.

124. The method of any one of claims 109-121,

wherein administration of the effective amount of the drug to the SCS reduces the vascular permeability of the eye, compared to the identical dosage of the drug administered intravitreally.

125. The method of claim 122,

wherein the polypoidal lesion is present in the peripapillary area of the eye.

126. The method of claim 123,

wherein the one or more of the polypoidal lesions is present in the peripapillary area of the eye.

127. The method of claim 122,

wherein the polypoidal lesion is present in the central macula of the eye.

128. The method of claim 123,

wherein the one or more of the polypoidal lesions is present in the central macula of the eye.

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129. The method of any one of claims 109-128,

wherein prior to administration of the drug formulation, dilated and branching inner choroidal vessels of varying sizes are present in the eye of the patient, and

administration of the effective amount of the drug to the SCS reduces the variability in size of the inner choroidal vessels, compared to the identical dosage of the drug administered intravitreally

130. The method of any one of claims 109-128,

wherein prior to administration of the drug formulation, atherosclerosis is present in the choroidal vessels of the eye of the patient, and

administration of the effective amount of the drug to the SCS reduces the level of atherosclerosis of the choroidal vessels, compared to the identical dosage of the drug administered intravitreally.

131. The method of any one of claims 109-128,

wherein prior to administration of the drug formulation, a choroidal vessel of the eye of the patient is hyalinized, and

administration of the effective amount of the drug to the SCS reduces the level of hyalinization of the choroidal vessels, compared to the identical dosage of the drug administered intravitreally.

132. The method of any one of claims 109-128,

wherein prior to administration of the drug formulation, the patient experiences a level of subretinal bleeding, and

administration of the effective amount of the drug to the SCS reduces the level of subretinal bleeding, compared to the identical dosage of the drug administered intravitreally.

133. The method of any one of claims 109-128,

wherein the visual acuity of the patient is improved upon administration of the effective amount of the drug to the SCS, as compared to the identical dosage of the drug administered intravitreally.

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134. The method of any one of claims 109-128,

wherein prior to administration of the drug formulation, the eye of the patient experiences recurrent neovascularization or serosanguineous, and

administration of the effective amount of the drug to the SCS reduces the recurrent neovascularization or serosanguineous detachments in the eye, as compared to the identical dosage of the drug administered intravitreally.

135. The method of any one of claims 109-128,

wherein prior to administration of the drug formulation, a subretinal lipid deposition is present in the eye of the patient, and

administration of the effective amount of the drug to the SCS reduces the subretinal lipid deposition compared to the identical dosage of the drug administered intravitreally.

136. The method of any one of claims 109 and 118-120,

wherein the choroidal malady affects both eyes of the subject, and

administration of the drug formulation to the SCS is performed in both eyes.

137. The method of any one of claims 109-136, wherein the patient has concomitant drusen.

138. The method of any one of claims 109-137, wherein the patient is Caucasian.

139. The method of any one of claims 109-137, wherein the subject is of a pigmented race.

140. The method of any one of claims 109-137, wherein the subject is African American.

141. The method of any one of claims 109-137, wherein the subject is Asian.

142. The method of any one of claims 109-141,

wherein the administering step comprises inserting a hollow microneedle into the sclera at an insertion site, the microneedle having a tip end with an opening and

infusing the drug formulation into the SCS through the inserted microneedle.

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143. The method of claim 142,

wherein the insertion site is at about the equator of the eye, or between the equator and the limbus of the eye.

144. The method of claim 142 or 143,

wherein the microneedle has a length of from about 500 μm and about 1500 μm.

145. The method of claim 142 or 143,

wherein the microneedle has a diameter of from about 200 μm to about 600 μm.

146. The method of any one of claims 142-145,

wherein the microneedle comprises a beveled tip.

147. The method of claim 146,

wherein the microneedle has a bevel angle of about 5 degrees to about 30 degrees.

148. The method of claim 146,

wherein the microneedle has a bevel height from about 100 μm to about 500 μm.

149. The method of claim 146,

wherein the beveled tip has an angle from about 10 degrees to about 20 degrees.

150. The method of any one of claims 146-149,

wherein the beveled tip has an aspect ratio of from about 1:1.5 to about 1:10.

151. The method of claim 146,

wherein the beveled tip has a height of from about 500 μm to about 1 mm.

152. The method of any one of claims 146-151,

wherein the microneedle is inserted into the sclera without penetrating through the sclera.

153. The method of any one of claims 146-151

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wherein the microneedle is inserted into the sclera without penetrating through the choroid.

154. The method of any one of claims 146-153,

wherein the microneedle comprises a cylindrical shaft having an outer diameter of from about 200 microns to about 600 microns.

155. The method of any one of claims -109-154,

wherein the drug formulation is has a volume of from about 10 μL to about 200 μL.

156. The method of any one of claims 109-154,

wherein the drug formulation is has a volume of from about 30 μL to about 100 μL

157. The method of any one of claims 109-156,

wherein the microneedle is inserted into the surface of the sclera at an angle of from about 70 degrees to about 110 degrees.

158. The method of any one of claims 109-154,

wherein the microneedle is inserted into the surface of the sclera at an angle of about 90 degrees.

159. The method of any one of claims 109-158,

wherein administration of the drug formulation to the SCS results in a decreased number of side effects experienced by the patient, or a reduced severity of a side effect experienced by the patient, compared to the identical dosage of the drug administered intravitreally.

160. The method of claim 159,

wherein administration of the drug formulation to the SCS results in a decreased number of side effects experienced by the patient, compared to the number of side effects experienced by the patient when the identical dosage of the drug is administered intravitreally.

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161. The method of claim 159,

wherein administration of the drug formulation to the SCS results in a reduced severity of a side effect experienced by the patient, compared to the severity of the side effect experienced by the patient when the identical dosage of the drug is administered intravitreally.

162. The method of any one of claims 109-161,

wherein the dosage of the drug sufficient to elicit a therapeutic response in the patient, when administered to the SCS, is less than the dosage of the drug sufficient to elicit a therapeutic response in the patient, when administered intravitreally.

163. The method of claim 162,

wherein the dosage of the drug sufficient to elicit a therapeutic response when administered to the SCS is 75% or less of the dosage of the drug sufficient to elicit a therapeutic response when administered intravitreally.

164. The method of claim 162,

wherein the dosage of the drug sufficient to elicit a therapeutic response when administered to the SCS is 50% or less of the dosage of the drug sufficient to elicit a therapeutic response when administered intravitreally.

165. The method of claim 162,

wherein the dosage of the drug sufficient to elicit a therapeutic response when administered to the SCS of the patient is 25% or less of the dosage of the drug sufficient to elicit a therapeutic response when administered intravitreally to the patient.

166. The method of claim 162,

wherein the dosage of the drug sufficient to elicit a therapeutic response when administered to the SCS of the patient is 10% or less of the dosage of the drug sufficient to elicit a therapeutic response when administered intravitreally to the patient.

167. The method of claim 117,

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wherein the retention of the drug in the posterior segment of the eye is greater than the retention of the drug in the posterior segment of the eye when administered intravitreally.

168. The method of any one of claims 109-167,

wherein the intraocular $t_{1/2}$ of the drug administered to the SCS is greater than the intraocular $t_{1/2}$ of the drug when administered intravitreally.

169. The method of any one of claims 109-168,

wherein the systemic exposure of the drug administered to the SCS is less than the systemic exposure of the drug when the drug is administered intravitreally.

170. The method of any one of claims 109-169,

further comprising subjecting the patient to at least one additional therapy selected from the group consisting of photodynamic therapy, laser photocoagulation, and transpupillary thermotherapy.

171. The method of any one of claims 109-170,

wherein the patient has an additional macular abnormality, and wherein the patient is treated for the one or more additional macular abnormalities by administering an effective amount of a second drug formulation to the SCS of the eye.

172. The method of claim 171,

wherein the additional macular abnormality is sickle cell retinopathy, central serous chorioretinopathy, typical neovascular (type 1 or 2) age-related macular degeneration, melanocytoma of the optic nerve, circumscribed choroidal hemangioma, the tilted disk syndrome, pathological myopia, or choroidal osteoma.

173. The method of any one of claims -109-172, wherein the drug formulation comprises an effective amount of a VEGF modulator.

174. The method of claim 173,

wherein the VEGF modulator is a VEGF antagonist selected from the group consisting of a VEGF-receptor kinase antagonist, an anti-VEGF antibody or fragment

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thereof, an anti-VEGF receptor antibody, an anti- VEGF aptamer, a small molecule VEGF antagonist, a thiazolidinedione, a quinoline and a designed ankyrin repeat protein (DARPin).

175. The method of claim 173,

wherein the VEGF modulator is a VEGF antagonist selected from the group consisting of a VEGF-receptor kinase antagonist, an anti-VEGF antibody or fragment thereof, an anti-VEGF receptor antibody, an anti- VEGF aptamer, a small molecule VEGF antagonist, a thiazolidinedione, a quinoline and a designed ankyrin repeat protein (DARPin).

176. The method of claim 173,

wherein the VEGF modulator is a VEGF antagonist selected from the group consisting of aflibercept, zivaflibercept, bevacizumab, ranibizumab, vandetanib, cabozantinib, ponatinib, ziv-afibercept, lapatinib, sunitinib, sorafenib, plitidepsin, regorafenib, verteporfin, bucillamine, axitinib, pazopanib, fluocinolone acetonide, nintedanib, AL8326, 2C3 antibody, AT001 antibody, XtendVEGF antibody, HuMax-VEGF antibody, R3 antibody, AT001/r84 antibody, HyBEV, ANG3070, APX003 antibody, APX004 antibody, ponatinib, BDM-E, VGX100 antibody, VGX200, VGX300, COSMIX, DLX903/1008 antibody, ENMD2076, INDUS815C, R84 antibody, KD019, NM3, MGCD265, MG516, MP0260, NT503, anti-DLL4/VEGF bispecific antibody, PAN90806, Palomid 529, BD0801 antibody, XV615, lucitanib, motesanib diphosphate, AAV2-sFLT01, soluble Flt1 receptor, cediranib, AV-951,Volasertib, CEP11981, KH903, lenvatinib, lenvatinib mesylate, terameprocol, PF00337210,PRS050, SP01, carboxyamidotriazole orotate, hydroxychloroquine, linifanib, ALG1001,AGN150998, MP0112, AMG386, AVA101, BMS690514, KH902, golvatinib (E7050), dovitinib lactate (TKI258, CHIR258), ORA101, ORA102, Axitinib (Inlyta, AG013736), PTC299, pegaptanib sodium, troponin, EG3306, vatalanib, Bmab100, GSK2136773, Anti-VEGFR Alterase, Avila, CEP7055, CLT009, ESBA903, GW654652, HMPL010, GEM220, HYB676, JNJ17029259, TAK593, Nova21012, Nova21013, CP564959,smart Anti-VEGF antibody, AG028262, AG13958, CVX241, SU14813, PRS055, PG501,PG545, PTI101, TG100948, ICS283, XL647, enzastaurin hydrochloride, BC194, COT601M06.1, COT604M06.2, MabionVEGF, Apatinib and AL3818.

177. The method of any one of claims -109-172,

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wherein the drug formulation comprises an effective amount of an angiogenesis inhibitor.

178. The method of claim 177, wherein the angiogenesis inhibitor is angiopoietin-1, angiopoietin-2, angiostatin, endostatin, vasostatin, thrombospondin, calreticulin, platelet factor-4, TIMP, CDAI, interferon α, interferon β,vascular endothelial growth factor inhibitor (VEGI) meth-1, meth-2, prolactin, VEGI, SPARC, osteopontin, maspin, canstatin, proliferin-related protein (PRP), restin, TSP-1, TSP-2, interferon gamma 1β, ACUHTR028, αVβ5, aminobenzoate potassium, amyloid P, ANG1122, ANG1170, ANG3062, ANG3281, ANG3298, ANG4011, anti-CTGF RNAi, Aplidin, astragalus membranaceus extract with salvia and schisandra chinensis, atherosclerotic plaque blocker, Azol, AZX100, BB3, connective tissue growth factor antibody, CT140, danazol, Esbriet, EXC001, EXC002, EXC003, EXC004, EXC005, F647, FG3019, Fibrocorin, Follistatin, FT011, a galectin-3 inhibitor, GKT137831, GMCT01, GMCT02, GRMD01, GRMD02, GRN510, Heberon Alfa R, interferon α-2β, ITMN520, JKB119, JKB121, JKB122, KRX168, LPA1 receptor antagonist, MGN4220, MIA2, microRNA 29a oligonucleotide, MMI0100, noscapine, PBI4050, PBI4419, PDGFR inhibitor, PF-06473871, PGN0052, Pirespa, Pirfenex, pirfenidone, plitidepsin, PRM151, Px102, PYN17, PYN22 with PYN17, Relivergen, rhPTX2 fusion protein, RXI109, secretin, STX100, TGF-β Inhibitor, transforming growth factor, β-receptor 2 oligonucleotide,VA999260 or XV615.

179. The method of any one of claims 109-172,

wherein the drug formulation comprises an effective amount of an anti-inflammatory drug.

180. The method of claim 179,

wherein the anti-inflammatory drug is a steroidal compound.

181. The method of claim 180,

wherein the steroidal compound is hydrocortisone, hydrocortisone-17-butyrate, hydrocortisone-17-aceponate, hydrocortisone-17-buteprate, cortisone, tixocortol pivalate, prednisolone, methylprednisolone, prednisone, triamcinolone, triamcinolone acetonide, mometasone, amcinonide, budesonide, desonide, fluocinonide, halcinonide, bethamethasone,

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bethamethasone dipropionate, dexamethasone, fluocortolone, hydrocortisone-17-valerate, halometasone, alclometasone dipropionate, prednicarbate, clobetasone-17-butyrate, clobetasol-17-propionate, fluocortolone caproate, fluocortolone pivalate, fluprednidene acetate or prednicarbate.

182. The method of claim 181,

wherein the steroidal compound is triamcinolone, triamcinolone acetonide or dexamethasone.

183. The method of claim 179,

wherein the anti-inflammatory drug is a non-steroidal anti-inflammatory drug (NSAID).

184. The method of claim 183,

wherein the non-steroidal anti-inflammatory drug (NSAID) is a salicylate.

185. The method of claim 183,

wherein the non-steroidal anti-inflammatory drug (NSAID) is a propionic acid derivative.

186. The method of claim 183,

wherein the non-steroidal anti-inflammatory drug (NSAID) is an acetic acid derivative.

187. The method of claim 183,

wherein the non-steroidal anti-inflammatory drug (NSAID) is an enolic acid derivative.

188. The method of claim 183,

wherein the non-steroidal anti-inflammatory drug (NSAID) is a fenamic acid derivative.

189. The method of claim 183,

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wherein the non-steroidal anti-inflammatory drug (NSAID) is a cyclooxygenase-2 (COX-2) inhibitor.

190. The method of claim 183 or 184,

wherein the non-steroidal anti-inflammatory drug (NSAID) is acetylsalicylic acid, diflunisal or salsalate.

191. The method of claim 183 or 185,

wherein the non-steroidal anti-inflammatory drug (NSAID) is ibuprofen, dexibuprofen, naproxen, fenoprofen, keotoprofen, dexketoprofen, flurbiprofen, oxaprozin or loxaprofen.

192. The method of claim 183 or 186,

wherein the non-steroidal anti-inflammatory drug (NSAID) is indomethacin, tolmetin, sulindac, etodolac, ketorolac, diclofenac or nabumetone.

193. The method of claim 183 or 187,

wherein the non-steroidal anti-inflammatory drug (NSAID) is piroxicam, meloxicam, tenoxicam, droxicam, lornoxicam or isoxicam.

194. The method of claim 183 or 188,

wherein the non-steroidal anti-inflammatory drug (NSAID) is mefanamic acid, meclofenamic acid, flufenamic acid or tolfenamic acid.

195. The method of claim 183 or 189,

wherein the non-steroidal anti-inflammatory drug (NSAID) is celecoxib, refecoxib, valdecoxib, parecoxib, lumiracoxib, etoricoxib or firocoxib.

196. The method of any one of claims 109-172,

wherein the drug formulation comprises an effective amount of a platelet derived growth factor (PDGF) modulator.

197. The method of claim 196,

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wherein the platelet derived growth factor (PDGF) modulator is a PDGF antagonist.

198. The method of claim 197,

wherein the platelet derived growth factor (PDGF) antagonist is a PDGF-receptor antagonist, an anti-PDGF antibody or fragment thereof, an anti- PDGF receptor antibody or fragment thereof, an anti-PDGF aptamer or a small molecule PDGF antagonist.

199. The method of claim 197,

wherein the platelet derived growth factor (PDGF) antagonist is an antagonist of the PDGF receptor-α (PDGFR-α) or PDGF receptor-β (PDGFR-β).

200. The method of claim 197,

wherein the PDGF antagonist is the anti-PDGF-β aptamer E10030, sunitinib, axitinib, sorefenib, imatinib, imatinib mesylate, nintedanib, pazopanib HCl, ponatinib, MK-2461, dovitinib, pazopanib, crenolanib, PP-121, telatinib, imatinib, KRN 633, CP 673451, TSU-68, Ki8751, amuvatinib, tivozanib, masitinib, motesanib diphosphate, dovitinib dilactic acid or linifanib (ABT-869).

201. The method of any one of claims 109-172,

wherein the drug formulation comprises an effective amount of an immunosuppressive agent.

202. The method of claim 201,

wherein the immunosuppressive agent is a glucocorticoid, cytokine inhibitor, cytostatic, alkylating agent, anti-metabolite, folic acid analogue, cytotoxic antibiotic, interferon, opioid, T-cell receptor directed antibody or an IL-2 receptor directed antibody .

203. The method of claim 202,

wherein the anti-metabolite is a purine analog, pyrimidine analogue, folic acid analogue or a protein synthesis inhibitor.

204. The method of claim 201,

wherein the immunosuppressive agent is an interleukin-2 inhibitor.

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205. The method of claim 201,

wherein the immunosuppressive agent is cyclophosphamide, nitrosourea, methotrexate, azathioprine, mercaptopurine, fluorouracil, dactinomycin, anthracycline, mitomycin C, bleomycin, mithramycin, muromonab-CD3, cyclosporine, tacrolimus, sirolimus or mycophenolate.

206. The method of claim 204,

wherein the interleukin-2 inhibitor is basiliximab or daclizumab

207. The method of claim 203 or 205,

wherein the immunosuppressive agent is mycophenolate.

208. The method of any one of claims 109-172,

wherein the drug formulation comprises an effective amount of a vascular permeability inhibitor.

209. The method of claim 208,

wherein the vascular permeability inhibitor is a vascular endothelial growth factor (VEGF) antagonist or an angiotensin converting enzyme (ACE) inhibitor.

210. The method of claim 209,

wherein the vascular permeability inhibitor is an angiotensin converting enzyme (ACE) inhibitor and the ACE inhibitor is captopril.

211. A method for treating or preventing polypoidal choroidal vasculopathy (PCV) in a patient, the method comprising:

administering to the eye of the patient an effective amount of an interfering RNA molecule targeting a gene selected from the group consisting of HTRA1, CFH, elastin, and ARMS2, such that the expression of the targeted gene is downregulated upon administration of the interfering RNA, and

wherein the administering step comprises:

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inserting a hollow microneedle into the sclera at an insertion site, the microneedle having a tip end with an opening, and

infusing the interfering RNA molecule into the SCS through the inserted microneedle.

212. The method of claim 211,

wherein the interfering RNA molecule is an siRNA, miRNA, or shRNA.

213. The method of claim 211 or 212,

wherein the targeted gene is CFH, and wherein the interfering RNA molecule targets a polymorphism selected from the group consisting of rs3753394, rs800292, rs3753394, rs6680396, rs1410996, rs2284664, rs1329428, and rs1065489.

214. The method of any one of claims 109-213,

further comprising administering a photosensitizer to the patient.

215. The method of claim 214, wherein the photosensitizer is verteporfin.

216. A method of diagnosing a patient for a choroidal malady, comprising:

administering a choroidal malady diagnostic agent to the SCS of one or both eyes of the patient,

visualizing the diagnostic agent, and

making a determination based on the visualization whether the patient has the choroidal malady.

217. The method of claim 216,

wherein the diagnostic agent is delivered to the SCS of one or both eyes of the patient via a hollow microneedle comprising a tip and an opening.

218. A method of administering a triamcinolone composition to an eye of a patient, comprising:

(a) inserting a hollow microneedle into the eye at an insertion site, the microneedle having a tip end with an opening;

(b) applying a selected pressure to the triamcinolone composition, which comprises

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triamcinolone microparticles, to induce infusion of the triamcinolone composition through the
inserted microneedle;

(c) determining whether the triamcinolone composition has flowed into the suprachoroidal space of the eye and away from the insertion site;

(d) if the determination in step (c) is that the triamcinolone composition has flowed into the suprachoroidal space away from the insertion site, then infusing a selected volume of the
triamcinolone composition and thereupon removing the pressure, or if the determination in step
(c) is that substantially none of the triamcinolone composition has flowed into the suprachoroidal
space away from the insertion site, then repositioning the inserted microneedle and repeating steps (b)-(d) until a selected volume of the triamcinolone composition has been infused; and

(e) retracting the microneedle from the eye.

219. The method of claim 218,
wherein the triamcinolone is triamcinolone acetonide.

220. The method of claim 219,
wherein the composition comprises nanoparticles.

221. The method of claim 219 or 220,
wherein the composition comprises microparticles.

222. The method of claim 221,
wherein the microparticles have a D_{50} of 2 μm or less.

223. The method of claim 221 or 222,
wherein the microparticles have a D_{99} of less than 10 μm.

224. The method of any one of claims 219-223,
wherein the triamcinolone is present in the composition at about 40 mg/mL.

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225. The method of any one of claims 219-223, wherein the drug formulation further comprises sodium chloride.

226. The method of any one of claims 219-223, wherein the drug formulation further comprises carboxymethylcellulose sodium.

227. The method of any one of claims 219-223,
wherein the drug formulation further comprises polysorbate 80.

228. The method of any one of claims 219-223,
wherein the drug formulation further comprises $CaCl_2$, $MgCl_2$, sodium acetate, sodium citrate, or a combination thereof.

229. A pharmaceutical composition comprising triamcinolone particles having a D_{50} of less than 3 μm.

230. The pharmaceutical composition of claim 229,
wherein the triamcinolone is present in the composition at 40 mg/mL.

231. The pharmaceutical composition of claim 229 or 230,
wherein the D_{90} of the particles is less than or equal to 10 μm.

232. The pharmaceutical composition of claim 231,
wherein the D_{90} of the particles is less than 10 μm.

233. The pharmaceutical composition of any one of claims 229-232, further comprising polysorbate 80.

234. The pharmaceutical composition of any one of claims 229-233, further comprising carboxymethylcellulose sodium.

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235. The pharmaceutical composition of any one of claims 229-234, further comprising one or more of $CaCl_2$, $MgCl_2$, KCl, sodium acetate, sodium citrate.

236. The pharmaceutical composition of any one of claims 229-235, wherein the pH of the composition is from about 6.0 to about 7.5.

237. The pharmaceutical composition of any one of claims 229-236, wherein the D50 of the particles is about 2 μm.

238. The pharmaceutical composition of any one of claims 229-237, wherein the D50 of the particles is less than about 2 μm.

239. The pharmaceutical composition of any one of claims 229-238, wherein the D50 of the particles is less than about 1 μm.

240. The pharmaceutical composition of any one of claims 229-239, wherein the triamcinolone is triamcinolone acetonide.

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CLAIMS

1. A drug formulation for use in treating a posterior ocular disorder in a human subject in need thereof,

Wherein the drug formulation is formulated for non-surgical administration to the suprachoroidal space (SCS) of the eye of the human subject in need of treatment of the posterior ocular disorder,

wherein upon administration, the drug formulation flows away from the insertion site and is substantially localized to the posterior segment of the eye.

2. The drug formulation of claim 1, wherein the non-surgical administration comprises inserting a hollow microneedle into the sclera at an insertion site, the microneedle having a tip end with an opening and infusing the drug formulation into the SCS through the inserted microneedle.

3. The drug formulation of claim 2, wherein the insertion site is at about the equator of the eye, or between the equator and the limbus of the eye.

4. The drug formulation of claim 2 or 3, wherein the microneedle has a length of from about 500 μm and about 1500 μm.

5. The drug formulation of any one of claims 2-4, wherein the microneedle has a diameter of from about 200 μm to about 600 μm.

6. The drug formulation of any one of claims 2-5, wherein the microneedle has a bevel angle of about 5 degrees to about 30 degrees.

7. The drug formulation of any one of claims 2-6, wherein the bevel height is from about 100 μm to about 500 μm.

8. The drug formulation of any one of claims 2-7, wherein the microneedle is inserted into the sclera without penetrating through the sclera.

9. The drug formulation of any one of claims 2-8, wherein the microneedle is inserted into the sclera without penetrating through the choroid.

10. The drug formulation of any one of claims 2-9, wherein the microneedle comprises a beveled tip.

11. The drug formulation of claim 10, wherein the beveled tip has an angle from about 10 degrees to about 20 degrees.

12. The drug formulation of claim 10 or 11, wherein the beveled tip has an aspect ratio of from about 1:1.5 to about 1:10.

13. The drug formulation of any one of claims 10-12, wherein the beveled tip has a height of from about 500 μm to about 1 mm.

14. The drug formulation of any one of claims 2-13, wherein the microneedle has a length of from about 500 μm to about 1500 μm.

15. The drug formulation of claim 14, wherein the microneedle has a length of from about 500 μm to about 1000 μm.

16. The drug formulation of any one of claims 2-15, wherein the microneedle comprises a cylindrical shaft having an outer diameter of from about 200 microns to about 600 microns.

17. The drug formulation of any one of claims 1-16, wherein an effective amount of the drug formulation is present in a volume of from about 10 μL to about 200 μL.

18. The drug formulation of any one of claims 1-17, wherein an effective amount of the drug formulation is present in a volume of from about 30 μL to about 100 μL.

19. The drug formulation of any one of claims 1-18, comprising a suspension of microparticles.

20. The drug formulation of anyone of claims 1-19, comprising a suspension of nanoparticles.

21. The drug formulation of claim 19, wherein the microparticles have a D_{50} of 2 μm or less.

22. The drug formulation of claim 20, wherein the nanoparticles have a D_{50} of 1000 nm or less.

23. The drug formulation of claim 20, wherein the nanoparticles have a D_{50} of 500 nm or less.

24. The drug formulation of claim 20, wherein the nanoparticles have a D_{50} of 250 nm or less.

25. The drug formulation of claim 19 or 20, wherein the microparticles or nanoparticles have a D_{99} of 10 μm or less.

26. The drug formulation of claim 19 or 20, wherein the microparticles or nanoparticles have a D_{99} of 5 μm or less.

27. The drug formulation of any one of claims 2-26, wherein the microneedle is inserted into the surface of the sclera at an angle of from about 70 degrees to about 110 degrees.

28. The drug formulation of any one of claims 2-27, wherein the microneedle is inserted into the surface of the sclera at an angle of about 90 degrees.

29. The drug formulation of any one of claims 1-28, wherein the drug formulation comprises an anti-inflammatory drug.

30. The drug formulation of claim 29, wherein the anti-inflammatory drug is selected from mycophenolate, infliximab, nepafenac, azathioprine, cyclosphosphamide, dexamethasone, difluprednate, fluocinolone, fluorometholone, leteprednol, prednisolone acetate, prednisolone sodium phosphate, rimexolone, triamcinolone, bromfenac, diclofenac,

fluibiprofen, ketorolac, adalimumab, etanercept, certolizumab, gotimumab, daclizumab, rituximab, abatacept, basiliximab, belimumab, anakinra, efalizuma, alefacept, and natalizumab.

31. The drug formulation of claim 29 or 30, wherein the anti-inflammatory drug is mycophenolate.

32. The drug formulation of claim 29 or 30, wherein the anti-inflammatory drug is infliximab.

33. The drug formulation of claim 29 or 30, wherein the anti-inflammatory drug is nepafenac.

34. The drug formulation of claim 29 or 30, wherein the anti-inflammatory drug is azathioprine.

35. The drug formulation of claim 29 or 30, wherein the anti-inflammatory drug is cyclosphosphamide.

36. The drug formulation of claim 29 or 30, wherein the drug is dexamethsone.

37. The drug formulation of claim 29 or 30, wherein the anti-inflammatory drug is difluprednate.

38. The drug formulation of claim 29 or 30, wherein the anti-inflammatory drug is fluocinolone.

39. The drug formulation of claim 29 or 30, wherein the anti-inflammatory drug is leteprednol.

40. The drug formulation of claim 29 or 30, wherein the drug is triamcinolone.

41. The drug formulation of claim 40, wherein the triamcinolone is triamcinolone acetonide.

42. The drug formulation of claim 29 or 30, wherein the anti-inflammatory drug is bromfenac.

43. The drug formulation of claim 29 or 30, wherein the anti-inflammatory drug is diclofenac.

44. The drug formulation of claim 29 or 30, wherein the anti-inflammatory drug is fluibiprofen.

45. The drug formulation of claim 29 or 30, wherein the anti-inflammatory drug is ketorolac.

46. The drug formulation of claim 29 or 30, wherein the anti-inflammatory drug is adalimumab.

47. The drug formulation of claim 29 or 30, wherein the anti-inflammatory drug is etanercept.

48. The drug formulation of claim 29 or 30, wherein the anti-inflammatory drug is certolizumab.

49. The drug formulation of claim 29 or 30, wherein the anti-inflammatory drug is gotimumab.

50. The drug formulation of claim 29 or 30, wherein the anti-inflammatory drug is daclizumab.

51. The drug formulation of claim 29 or 30, wherein the anti-inflammatory drug is rituximab.

52. The drug formulation of claim 29 or 30, wherein the anti-inflammatory drug is abatacept.

53. The drug formulation of claim 29 or 30, wherein the anti-inflammatory drug is basiliximab.

54. The drug formulation of claim 29 or 30, wherein the anti-inflammatory drug is belimumab.

55. The drug formulation of claim 29 or 30, wherein the anti-inflammatory drug is anakinra.

56. The drug formulation of claim 29 or 30, wherein the anti-inflammatory drug is efalizuma.

57. The drug formulation of claim 29 or 30, wherein the anti-inflammatory drug is alefacept.

58. The drug formulation of claim 29 or 30, wherein the anti-inflammatory drug is natalizumab.

59. The drug formulation of any one of claims 1-30, wherein the drug formulation comprises a steroid.

60. The drug formulation of any one of claims 1-29, wherein the drug formulation comprises a non-steroid anti-inflammatory drug (NSAID).

61. The drug formulation of any one of claims 1-28, wherein the drug formulation comprises an angiogenesis inhibitor.

62. The drug formulation of any one of claims 1-28, wherein the drug formulation comprises a vascular endothelial growth factor (VEGF) antagonist.

63. The drug formulation of claim 62, wherein the VEGF antagonist is a VEGF-receptor kinase antagonist, an anti-VEGF antibody or fragment thereof, an anti-VEGF receptor antibody, an anti-VEGF aptamer, a small molecule VEGF antagonist, a thiazolidinedione, a quinoline or a designed ankyrin repeat protein (DARPin).

64. The drug formulation of any one of claims 1-28, wherein the drug formulation comprises a TNF-α antagonist or a TNF-α receptor antagonist.

65. The drug formulation of any one of claims 1-28, wherein the drug formulation comprises a platelet derived growth factor (PDGF) antagonist.

66. The drug formulation of claim 65, wherein the PDGF antagonist is a PDGF receptor (PDGFR) antagonist.

67. The drug formulation of claim 66, wherein the PDGFR is PDGFR-α.

68. The drug formulation of claim 66, wherein the PDGFR is PDGFR-β.

69. The drug formulation of claim 62 or 63, wherein the VEGF antagonist is aflibercept, ziv-aflibercept, bevacizumab, ranibizumab, lapatinib, sunitinib, sorafenib, plitidepsin, regorafenib, verteporfin, bucillamine, axitinib, pazopanib, fluocinolone acetonide, nintedanib, AL8326, 2C3 antibody, AT001 antibody, XtendVEGF antibody, HuMax-VEGF antibody, R3 antibody, AT001/r84 antibody, HyBEV, ANG3070, APX003 antibody, APX004 antibody, ponatinib, BDM-E, VGX100 antibody, VGX200, VGX300, COSMIX, DLX903/1008 antibody, ENMD2076, INDUS815C, R84 antibody, KD019, NM3, MGCD265, MG516, MP0260, NT503, anti-DLL4/VEGF bispecific antibody, PAN90806, Palomid 529, BD0801 antibody, XV615, lucitanib, motesanib diphosphate, AAV2-sFLT01, soluble Flt1 receptor, cediranib, AV-951, Volasertib, CEP11981, KH903, lenvatinib, lenvatinib mesylate, terameprocol, PF00337210, PRS050, SP01, carboxyamidotriazole orotate, hydroxychloroquine, linifanib, ALG1001, AGN150998, MP0112, AMG386, ponatinib, AVA101, BMS690514, KH902, golvatinib (E7050), dovitinib lactate (TKI258, CHIR258), ORA101, ORA102, Axitinib (Inlyta, AG013736), PTC299, pegaptanib sodium, troponin, EG3306, vatalanib, Bmab100, GSK2136773, Anti-VEGFR Alterase, Avila, CEP7055, CLT009, ESBA903, GW654652, HMPL010, GEM220, HYB676, JNJ17029259, TAK593, Nova21012, Nova21013, CP564959, smart Anti-VEGF antibody, AG028262, AG13958, CVX241, SU14813, PRS055, PG501, PG545, PTI101, TG100948, ICS283, XL647, enzastaurin hydrochloride, BC194, COT601M06.1, COT604M06.2, MabionVEGF, Apatinib or AL3818.

70. The drug formulation of claim 64, wherein the VEGF antagonist is sorafenib.

71. The drug formulation of claim 62, wherein the VEGF antagonist is axitinib.

72. The drug formulation of claim 62, wherein the VEGF antagonist is aflibercept.

73. The drug formulation of claim 62, wherein the VEGF antagonist is bevacizumab.

74. The drug formulation of claim 62, wherein the VEGF antagonist is ranibizumab.

75. The drug formulation of any one of claims 65-68, wherein the PDGF antagonist is an anti-PDGF aptamer, an anti-PDGF antibody or fragment thereof, an anti-PDGFR antibody or fragment thereof, or a small molecule antagonist.

76. The drug formulation of claim 65, wherein the PDGF antagonist is the anti-PDGF-β aptamer E10030, sunitinib, axitinib, sorefenib, imatinib, imatinib mesylate, nintedanib, pazopanib HCl, ponatinib , MK-2461, Dovitinib, pazopanib, crenolanib, PP-121, telatinib, imatinib, KRN 633, CP 673451, TSU-68, Ki8751, amuvatinib, tivozanib, masitinib, motesanib diphosphate, dovitinib dilactic acid, linifanib (ABT-869).

77. The drug formulation of any one of claims 1-76, wherein the intraocular pressure of the eye of the subject is substantially constant during administration of the drug formulation.

78. The drug formulation of any one of claims 1-77, wherein the intraocular pressure of the eye of the subject varies by no more than about 10% during the administration.

79. The drug formulation of any one of claims 1-78, wherein administration of the drug to the SCS of the eye provides a decreased number of side effects, or a reduced severity of one or more side effects, as compared to the identical dosage of the drug administered intravitreally, intracamerally, topically, parenterally or orally.

80. The drug formulation of any one of claims 1-79, wherein the dosage of the drug sufficient to elicit a therapeutic response when administered to the SCS is less than the

dosage of the drug sufficient to elicit a therapeutic response when administered intravitreally, intracamerally, topically, parenterally or orally.

81. The drug formulation of claim 80, wherein the dosage of the drug sufficient to elicit a therapeutic response when administered to the SCS is 75% or less of the dosage of the drug sufficient to elicit a therapeutic response when administered intravitreally, intracamerally, topically, parenterally or orally.

82. The drug formulation of claim 80, wherein the dosage of the drug sufficient to elicit a therapeutic response when administered to the SCS is 50% or less of the dosage of the drug sufficient to elicit a therapeutic response when administered intravitreally, intracamerally, topically, parenterally or orally.

83. The drug formulation of claim 80, wherein the dosage of the drug sufficient to elicit a therapeutic response when administered to the SCS is 25% or less of the dosage of the drug sufficient to elicit a therapeutic response when administered intravitreally, intracamerally, topically, parenterally or orally.

84. The drug formulation of claim 80, wherein the dosage of the drug sufficient to elicit a therapeutic response when administered to the SCS is 10% or less of the dosage of the drug sufficient to elicit a therapeutic response when administered intravitreally, intracamerally, topically, parenterally or orally.

85. The drug formulation of any one of claims 1-84, wherein the retention of the drug in the posterior segment of the eye is greater than the retention of the drug in the posterior segment of the eye when administered intravitreally, intracamerally, topically, parenterally or orally.

86. The drug formulation of any one of claims 1-84, wherein the $t_{1/2}$ of the drug is greater than the $t_{1/2}$ of the drug when administered intravitreally, intracamerally, topically, parenterally or orally.

87. The drug formulation of any one of claims 1-84, wherein the systemic exposure of the drug is less than the systemic exposure of the drug when the drug is administered intravitreally, intracamerally, topically, parenterally or orally.

88. The drug formulation of any one of claims 1-87, wherein the intraocular T_{max} of the drug is less than the intraocular T_{max} of the drug, when the same drug dose is administered intravitreally, intracamerally, topically, parenterally or orally at the same dose.

89. The drug formulation of claim 88, wherein the T_{max} of the drug is at least 10% less than the T_{max} of the drug, when the same drug dose is administered intravitreally, intracamerally, topically, parenterally or orally at the same dose.

90. The drug formulation of any one of claims 1-89, wherein the intraocular C_{max} of the drug is greater than the intraocular C_{max} of the drug, when the drug dose is administered intravitreally, intracamerally, topically, parenterally or orally.

91. The drug formulation of any one of claims 1-90, wherein the intraocular $t_{1/2}$ of the drug is greater than the intraocular $t_{1/2}$ of the drug, when the same drug dose is administered intravitreally, intracamerally, topically, parenterally or orally.

92. The drug formulation of any one of claims 1-90, wherein the intraocular AUC_{0-t} of the drug is greater than the intraocular AUC_{0-t} of the drug, when the same drug dose is administered intravitreally, intracamerally, topically, parenterally or orally.

93. The drug formulation of any one of claims 1-92, wherein the ocular disease is uveitis, glaucoma, scleritis, ocular sarcoidosis, optic neuritis, macular edema, diabetic macular edema, age related macular degeneration (AMD), diabetic retinopathy, macular degeneration, choroidal neovascularization, corneal ulcer, ocular autoimmune disorder, or retinitis.

94. The drug formulation of claim 93, wherein the ocular disease is uveitis.

95. The drug formulationof claim 93, wherein the ocular disease is cytomegalovirus retinitis.

96. The drug formulation of claim 93, wherein the ocular disease is AMD.

97. The drug formulation of claim 96, wherein the AMD is dry AMD.

98. The drug formulation of claim 96, wherein the ocular disease is dry AMD.

99. The drug formulation of any one of claims 1-98, further comprising non-surgically administering to the eye of the subject a second drug.

100. The drug formulation of claim 99, wherein the second drug is a VEGF antagonist.

101. The drug formulation of claim 99, wherein the second drug is a PDGF antagonist.

102. The drug formulation of claim 99, wherein the second drug is an anti-inflammatory agent.

103. The drug formulation of any one of claims 99-102, wherein the second drug is formulation for administration to the suprachoroidal space (SCS) of the eye.

104. The drug formulation of claim 103, wherein administration to the SCS of the eye of the subject comprises:

inserting a hollow microneedle into the sclera at an insertion site, the microneedle having a tip end with an opening, and

infusing the drug formulation into the SCS through the inserted microneedle.

105. The drug formulation of any one of claims 99-102, wherein the second drug is formulated for intravitreal administration.

106. The drug formulation of any one of claims 99-105, wherein the first and second drug are administered to the subject in one sitting.

107. The drug formulation of any one of claims 1-106, wherein an effective amount of the drug administered to the SCS provides a higher therapeutic efficacy of the drug, compared to

the identical drug dose administered intravitreally, intracamerally, topically, parenterally or orally.

108. The drug formulation of any one of claims 1-107, wherein the dose sufficient to elicit a therapeutic response is lower than the dose sufficient to elicit the same or substantially the same therapeutic response, when the drug is administered intravitreally, intracamerally, topically, parenterally or orally.

109. A drug formulation for use in treating a choroidal malady in a human patient, formulated for non-surgical administration to the suprachoroidal spaces (SCS) of the eye of the patient and wherein the drug formulation comprises an effective amount of an anti-inflammatory drug, a vascular endothelial growth factor (VEGF) modulator, a platelet derived growth factor (PDGF) modulator, an angiogenesis inhibitor, an immunosuppressive agent, a vascular permeability inhibitor, or a combination thereof.

110. A drug formulation for use in treating a choroidal neovascularization in a human patient not properly responsive to prior therapy for the choroidal neovascularization, formulated for non-surgical administration to the suprachoroidal spaces (SCS) of the eye of the patient and wherein the drug formulation comprises an effective amount of an anti-inflammatory drug, a vascular endothelial growth factor (VEGF) modulator, a platelet derived growth factor (PDGF) modulator, an angiogenesis inhibitor, an immunosuppressive agent, a vascular permeability inhibitor or a combination thereof.

111. A drug formulation for use in treating a human patient for a choroidal malady, not properly responsive to prior therapy for the choroidal malady, formulated for non-surgical administration to the suprachoroidal space (SCS) of the eye of the patient and wherein the drug formulation comprises an effective amount of an anti-inflammatory drug, a vascular endothelial growth factor (VEGF) modulator, a platelet derived growth factor (PDGF) modulator, an angiogenesis inhibitor, an immunosuppressive agent, a vascular permeability inhibitor, or a combination thereof.

112. A drug formulation for use in treating an ocular neovascularization in a human not properly responsive to prior therapy for the ocular neovascularization formulated for non-

surgical administration to the suprachoroidal spaces (SCS) of the eye of the patient and wherein the drug formulation comprises an effective amount of an anti-inflammatory drug, a vascular endothelial growth factor (VEGF) modulator, a platelet derived growth factor (PDGF) modulator, an angiogenesis inhibitor, an immunosuppressive agent, a vascular permeability inhibitor, or a combination thereof.

113. A drug formulation for decreasing subretinal exudation and bleeding in a subject in need thereof, formulated for non-surgical administration to the suprachoroidal space (SCS) of the eye of the subject, and comprises an effective amount of an anti-inflammatory drug, a vascular endothelial growth factor (VEGF) modulator, a platelet derived growth factor (PDGF) modulator, an angiogenesis inhibitor, an immunosuppressive agent, a vascular permeability inhibitor or a combination thereof,

wherein administration of the drug formulation to the SCS reduces the subretinal exudation and bleeding experienced by the patient as compared to the identical dosage of the drug administered intravitreally to the patient.

114. A drug formulation for reducing edema in a subject in need thereof, formulated for non-surgical administration to the suprachoroidal space (SCS), wherein the drug formulation comprises an effective amount an anti-inflammatory drug, a vascular endothelial growth factor (VEGF) modulator, a platelet derived growth factor (PDGF) modulator, an angiogenesis inhibitor, an immunosuppressive agent, a vascular permeability inhibitor, or a combination thereof, wherein administration of the drug formulation to the SCS reduces the edema experienced by the patient as compared to the identical dosage of the drug administered intravitreally to the patient.

115. A drug formulation for reducing ocular inflammation in a subject in need thereof formulated for non-surgical administration to the suprachoroidal space (SCS) of the eye, wherein the drug formulation comprises an effective amount of an anti-inflammatory drug, a vascular endothelial growth factor (VEGF) modulator, a platelet derived growth factor (PDGF) modulator, an angiogenesis inhibitor, an immunosuppressive agent, a vascular permeability inhibitor, or a combination thereof, wherein administration of the drug formulation to the SCS reduces the ocular inflammation compared to the identical dosage of the drug administered intravitreally to the patient.

116. The drug formulation of anyone of claims 109-115,

wherein upon administration, the drug formulation flows away from the insertion site.

117. The drug formulation of anyone of claims 109-115, wherein upon administration, the drug formulation flows away from the insertion and is substantially localized to the posterior segment of the eye.

118. The drug formulation of claim 109,

wherein the choroidal malady is polyploidal choroidal vaculopathy.

119. The drug formulation of claim 109,

wherein the choroidal malady ocular neovascularization, polypoidal choroidal vasculopathy, choroidal sclerosis, central sirrus choroidopathy, a multi-focal choroidopathy or a choroidal dystrophy.

120. The drug formulation of claim 119,

wherein the choroidal malady is a choroidal dystrophy and the choroidal dystrophy is central gyrate choroidal dystrophy, serpiginous choroidal dystrophy or total central choroidal atrophy.

121. The drug formulationof any one of claims 110-112,

wherein the prior therapy comprises intravitreal administration of the drug formulation.

122. The drug formulation of any one of claims 109-121,

wherein prior to administration of the drug formulation, a polypoidal lesion is present in the eye of the patient, and

administration of the effective amount of the drug to the SCS of the patient reduces the size of the polypoidal lesion as compared to the identical dosage of the drug administered intravitreally.

123. The drug formulation of any one of claims 109-121,

wherein prior to administration of the drug formulation, polypoidal lesions of varying sizes are present in the eye of the patient, and

administration of the effective amount of the drug to the SCS reduces the variability in size of the polypoidal lesions as compared to the identical dosage of the drug administered intravitreally.

124. The drug formulation of any one of claims 109-121,

wherein administration of the effective amount of the drug to the SCS reduces the vascular permeability of the eye, compared to the identical dosage of the drug administered intravitreally.

125. The drug formulation of claim 122,

wherein the polypoidal lesion is present in the peripapillary area of the eye.

126. The drug formulation of claim 123,

wherein the one or more of the polypoidal lesions is present in the peripapillary area of the eye.

127. The drug formulation of claim 122,

wherein the polypoidal lesion is present in the central macula of the eye.

128. The drug formulation of claim 123,

wherein the one or more of the polypoidal lesions is present in the central macula of the eye.

129. The drug formulation of any one of claims 109-128,

wherein prior to administration of the drug formulation, dilated and branching inner choroidal vessels of varying sizes are present in the eye of the patient, and

administration of the effective amount of the drug to the SCS reduces the variability in size of the inner choroidal vessels, compared to the identical dosage of the drug administered intravitreally

130. The drug formulation of any one of claims 109-128,

wherein prior to administration of the drug formulation, atherosclerosis is present in the choroidal vessels of the eye of the patient, and

administration of the effective amount of the drug to the SCS reduces the level of atherosclerosis of the choroidal vessels, compared to the identical dosage of the drug administered intravitreally.

131. The drug formulation of any one of claims 109-128,

wherein prior to administration of the drug formulation, a choroidal vessel of the eye of the patient is hyalinized, and

administration of the effective amount of the drug to the SCS reduces the level of hyalinization of the choroidal vessels, compared to the identical dosage of the drug administered intravitreally.

132. The drug formulation of any one of claims 109-128,

wherein prior to administration of the drug formulation, the patient experiences a level of subretinal bleeding, and

administration of the effective amount of the drug to the SCS reduces the level of subretinal bleeding, compared to the identical dosage of the drug administered intravitreally.

133. The drug formulation of any one of claims 109-128,

wherein the visual acuity of the patient is improved upon administration of the effective amount of the drug to the SCS, as compared to the identical dosage of the drug administered intravitreally.

134. The drug formulation of any one of claims 109-128,

wherein prior to administration of the drug formulation, the eye of the patient experiences recurrent neovascularization or serosanguineous, and

administration of the effective amount of the drug to the SCS reduces the recurrent neovascularization or serosanguineous detachments in the eye, as compared to the identical dosage of the drug administered intravitreally.

135. The drug formulation of any one of claims 109-128,

wherein prior to administration of the drug formulation, a subretinal lipid deposition is present in the eye of the patient, and

administration of the effective amount of the drug to the SCS reduces the subretinal lipid deposition compared to the identical dosage of the drug administered intravitreally.

136. The drug formulation of any one of claims 109 and 118-120,
wherein the choroidal malady affects both eyes of the subject, and
administration of the drug formulation to the SCS is performed in both eyes.

137. The drug formulation of any one of claims 109-136, wherein the patient has concomitant drusen.

138. The drug formulation of any one of claims 109-137, wherein the patient is Caucasian.

139. The drug formulation of any one of claims 109-137, wherein the subject is of a pigmented race.

140. The drug formulation of any one of claims 109-137, wherein the subject is African American.

141. The drug formulation of any one of claims 109-137, wherein the subject is Asian.

142. The drug formulation of any one of claims 109-141,
wherein the administering step comprises inserting a hollow microneedle into the sclera at an insertion site, the microneedle having a tip end with an opening and
infusing the drug formulation into the SCS through the inserted microneedle.

143. The drug formulation of claim 142,
wherein the insertion site is at about the equator of the eye, or between the equator and the limbus of the eye.

144. The drug formulationof claim 142 or 143,
wherein the microneedle has a length of from about 500 μm and about 1500 μm.

145. The drug formulation of claim 142 or 143,
wherein the microneedle has a diameter of from about 200 μm to about 600 μm.

146. The drug formulation of any one of claims 142-145,

wherein the microneedle comprises a beveled tip.

147. The drug formulation of claim 146,
wherein the microneedle has a bevel angle of about 5 degrees to about 30 degrees.

148. The drug formulation of claim 146,
wherein the microneedle has a bevel height from about 100 μm to about 500 μm.

149. The drug formulation of claim 146,
wherein the beveled tip has an angle from about 10 degrees to about 20 degrees.

150. The drug formulation of any one of claims 146-149,
wherein the beveled tip has an aspect ratio of from about 1:1.5 to about 1:10.

151. The drug formulation of claim 146,
wherein the beveled tip has a height of from about 500 μm to about 1 mm.

152. The drug formulationof any one of claims 146-151,
wherein the microneedle is inserted into the sclera without penetrating through the sclera.

153. The drug formulation of any one of claims 146-151
wherein the microneedle is inserted into the sclera without penetrating through the choroid.

154. The drug formulation of any one of claims 146-153,
wherein the microneedle comprises a cylindrical shaft having an outer diameter of from about 200 microns to about 600 microns.

155. The drug formulation of any one of claims -109-154,
wherein the drug formulation is has a volume of from about 10 μL to about 200 μL.

156. The drug formulation of any one of claims 109-154,
wherein the drug formulation is has a volume of from about 30 μL to about 100 μL

157. The drug formulation of any one of claims 109-156,

wherein the microneedle is inserted into the surface of the sclera at an angle of from about 70 degrees to about 110 degrees.

158. The drug formulation of any one of claims 109-154,

wherein the microneedle is inserted into the surface of the sclera at an angle of about 90 degrees.

159. The drug formulation of any one of claims 109-158,

wherein administration of the drug formulation to the SCS results in a decreased number of side effects experienced by the patient, or a reduced severity of a side effect experienced by the patient, compared to the identical dosage of the drug administered intravitreally.

160. The drug formulation of claim 159,

wherein administration of the drug formulation to the SCS results in a decreased number of side effects experienced by the patient, compared to the number of side effects experienced by the patient when the identical dosage of the drug is administered intravitreally.

161. The drug formulation of claim 159,

wherein administration of the drug formulation to the SCS results in a reduced severity of a side effect experienced by the patient, compared to the severity of the side effect experienced by the patient when the identical dosage of the drug is administered intravitreally.

162. The drug formulation of any one of claims 109-161,

wherein the dosage of the drug sufficient to elicit a therapeutic response in the patient, when administered to the SCS, is less than the dosage of the drug sufficient to elicit a therapeutic response in the patient, when administered intravitreally.

163. The drug formulation of claim 162,

wherein the dosage of the drug sufficient to elicit a therapeutic response when administered to the SCS is 75% or less of the dosage of the drug sufficient to elicit a therapeutic response when administered intravitreally.

164. The drug formulation of claim 162,

wherein the dosage of the drug sufficient to elicit a therapeutic response when administered to the SCS is 50% or less of the dosage of the drug sufficient to elicit a therapeutic response when administered intravitreally.

165. The drug formulation of claim 162,

wherein the dosage of the drug sufficient to elicit a therapeutic response when administered to the SCS of the patient is 25% or less of the dosage of the drug sufficient to elicit a therapeutic response when administered intravitreally to the patient.

166. The drug formulation of claim 162,

wherein the dosage of the drug sufficient to elicit a therapeutic response when administered to the SCS of the patient is 10% or less of the dosage of the drug sufficient to elicit a therapeutic response when administered intravitreally to the patient.

167. The drug formulation of claim 117,

wherein the retention of the drug in the posterior segment of the eye is greater than the retention of the drug in the posterior segment of the eye when administered intravitreally.

168. The drug formulation of any one of claims 109-167,

wherein the intraocular $t_{1/2}$ of the drug administered to the SCS is greater than the intraocular $t_{1/2}$ of the drug when administered intravitreally.

169. The drug formulation of any one of claims 109-168,

wherein the systemic exposure of the drug administered to the SCS is less than the systemic exposure of the drug when the drug is administered intravitreally.

170. The drug formulation of any one of claims 109-169,

further comprising subjecting the patient to at least one additional therapy selected from the group consisting of photodynamic therapy, laser photocoagulation, and transpupillary thermotherapy.

171. The drug formulation of any one of claims 109-170-,

wherein the patient has an additional macular abnormality, and wherein the patient is treated for the one or more additional macular abnormalities by administering an effective amount of a second drug formulation to the SCS of the eye.

172. The drug formulation of claim 171,

wherein the additional macular abnormality is sickle cell retinopathy, central serous chorioretinopathy, typical neovascular (type 1 or 2) age-related macular degeneration, melanocytoma of the optic nerve, circumscribed choroidal hemangioma, the tilted disk syndrome, pathological myopia, or choroidal osteoma.

173. The drug formulation of any one of claims -109-172, wherein the drug formulation comprises an effective amount of a VEGF modulator.

174. The drug formulation of claim 173,

wherein the VEGF modulator is a VEGF antagonist selected from the group consisting of a VEGF-receptor kinase antagonist, an anti-VEGF antibody or fragment thereof, an anti-VEGF receptor antibody, an anti- VEGF aptamer, a small molecule VEGF antagonist, a thiazolidinedione, a quinoline and a designed ankyrin repeat protein (DARPin).

175. The drug formulation of claim 173,

wherein the VEGF modulator is a VEGF antagonist selected from the group consisting of a VEGF-receptor kinase antagonist, an anti-VEGF antibody or fragment thereof, an anti-VEGF receptor antibody, an anti- VEGF aptamer, a small molecule VEGF antagonist, a thiazolidinedione, a quinoline and a designed ankyrin repeat protein (DARPin).

176. The drug formulation of claim 173,

wherein the VEGF modulator is a VEGF antagonist selected from the group consisting of aflibercept, zivaflibercept, bevacizumab, ranibizumab, vandetanib, cabozantinib, ponatinib, ziv-afibercept, lapatinib, sunitinib, sorafenib, plitidepsin,

regorafenib, verteporfin, bucillamine, axitinib, pazopanib, fluocinolone acetonide, nintedanib, AL8326, 2C3 antibody, AT001 antibody, XtendVEGF antibody, HuMax-VEGF antibody, R3 antibody, AT001/r84 antibody, HyBEV, ANG3070, APX003 antibody, APX004 antibody, ponatinib, BDM-E, VGX100 antibody, VGX200, VGX300, COSMIX, DLX903/1008 antibody, ENMD2076, INDUS815C, R84 antibody, KD019, NM3, MGCD265, MG516, MP0260, NT503, anti-DLL4/VEGF bispecific antibody, PAN90806, Palomid 529, BD0801 antibody, XV615, lucitanib, motesanib diphosphate, AAV2-sFLT01, soluble Flt1 receptor, cediranib, AV-951,Volasertib, CEP11981, KH903, lenvatinib, lenvatinib mesylate, terameprocol, PF00337210,PRS050, SP01, carboxyamidotriazole orotate, hydroxychloroquine, linifanib, ALG1001,AGN150998, MP0112, AMG386, AVA101, BMS690514, KH902, golvatinib (E7050), dovitinib lactate (TKI258, CHIR258), ORA101, ORA102, Axitinib (Inlyta, AG013736), PTC299, pegaptanib sodium, troponin, EG3306, vatalanib, Bmab100, GSK2136773, Anti-VEGFR Alterase, Avila, CEP7055, CLT009, ESBA903, GW654652, HMPL010, GEM220, HYB676, JNJ17029259, TAK593, Nova21012, Nova21013, CP564959,smart Anti-VEGF antibody, AG028262, AG13958, CVX241, SU14813, PRS055, PG501,PG545, PTI101, TG100948, ICS283, XL647, enzastaurin hydrochloride, BC194, COT601M06.1, COT604M06.2, MabionVEGF, Apatinib and AL3818.

177. The drug formulation of any one of claims -109-172,

wherein the drug formulation comprises an effective amount of an angiogenesis inhibitor.

178. The drug formulation of claim 177, wherein the angiogenesis inhibitor is angiopoietin-1, angiopoietin-2, angiostatin, endostatin, vasostatin, thrombospondin, calreticulin, platelet factor-4, TIMP, CDAI, interferon α, interferon β,vascular endothelial growth factor inhibitor (VEGI) meth-1, meth-2, prolactin, VEGI, SPARC, osteopontin, maspin, canstatin, proliferin-related protein (PRP), restin, TSP-1, TSP-2, interferon gamma 1β, ACUHTR028, αVβ5, aminobenzoate potassium, amyloid P, ANG1122, ANG1170, ANG3062, ANG3281, ANG3298, ANG4011, anti-CTGF RNAi, Aplidin, astragalus membranaceus extract with salvia and schisandra chinensis, atherosclerotic plaque blocker, Azol, AZX100, BB3, connective tissue growth factor antibody, CT140, danazol, Esbriet, EXC001, EXC002, EXC003, EXC004, EXC005, F647, FG3019, Fibrocorin, Follistatin, FT011, a galectin-3 inhibitor, GKT137831, GMCT01, GMCT02, GRMD01, GRMD02,

GRN510, Heberon Alfa R, interferon α-2β, ITMN520, JKB119, JKB121, JKB122, KRX168, LPA1 receptor antagonist, MGN4220, MIA2, microRNA 29a oligonucleotide, MMI0100, noscapine, PBI4050, PBI4419, PDGFR inhibitor, PF-06473871, PGN0052, Pirespa, Pirfenex, pirfenidone, plitidepsin, PRM151, Px102, PYN17, PYN22 with PYN17, Relivergen, rhPTX2 fusion protein, RXI109, secretin, STX100, TGF-β Inhibitor, transforming growth factor, β-receptor 2 oligonucleotide,VA999260 or XV615.

179. The drug formulation of any one of claims 109-172,

wherein the drug formulation comprises an effective amount of an anti-inflammatory drug.

180. The drug formulation of claim 179,

wherein the anti-inflammatory drug is a steroidal compound.

181. The drug formulation of claim 180,

wherein the steroidal compound is hydrocortisone, hydrocortisone-17-butyrate, hydrocortisone-17-aceponate, hydrocortisone-17-buteprate, cortisone, tixocortol pivalate, prednisolone, methylprednisolone, prednisone, triamcinolone, triamcinolone acetonide, mometasone, amcinonide, budesonide, desonide, fluocinonide, halcinonide, bethamethasone, bethamethasone dipropionate, dexamethasone, fluocortolone, hydrocortisone-17-valerate, halometasone, alclometasone dipropionate, prednicarbate, clobetasone-17-butyrate, clobetasol-17-propionate, fluocortolone caproate, fluocortolone pivalate, fluprednidene acetate or prednicarbate.

182. The drug formulation of claim 181,

wherein the steroidal compound is triamcinolone, triamcinolone acetonide or dexamethasone.

183. The drug formulation of claim 179,

wherein the anti-inflammatory drug is a non-steroidal anti-inflammatory drug (NSAID).

184. The drug formulationof claim 183,

wherein the non-steroidal anti-inflammatory drug (NSAID) is a salicylate.

185. The drug formulationof claim 183,

wherein the non-steroidal anti-inflammatory drug (NSAID) is a propionic acid derivative.

186. The drug formulation of claim 183,

wherein the non-steroidal anti-inflammatory drug (NSAID) is an acetic acid derivative.

187. The drug formulation of claim 183,

wherein the non-steroidal anti-inflammatory drug (NSAID) is an enolic acid derivative.

188. The drug formulation of claim 183,

wherein the non-steroidal anti-inflammatory drug (NSAID) is a fenamic acid derivative.

189. The drug formulation of claim 183,

wherein the non-steroidal anti-inflammatory drug (NSAID) is a cyclooxygenase-2 (COX-2) inhibitor.

190. The drug formulation of claim 183 or 184,

wherein the non-steroidal anti-inflammatory drug (NSAID) is acetylsalicylic acid, diflunisal or salsalate.

191. The drug formulation of claim 183 or 185,

wherein the non-steroidal anti-inflammatory drug (NSAID) is ibuprofen, dexibuprofen, naproxen, fenoprofen, keotoprofen, dexketoprofen, flurbiprofen, oxaprozin or loxaprofen.

192. The drug formulation of claim 183 or 186,

wherein the non-steroidal anti-inflammatory drug (NSAID) is indomethacin, tolmetin, sulindac, etodolac, ketorolac, diclofenac or nabumetone.

193. The drug formulation of claim 183 or 187,

wherein the non-steroidal anti-inflammatory drug (NSAID) is piroxicam, meloxicam, tenoxicam, droxicam, lornoxicam or isoxicam.

194. The drug formulation of claim 183 or 188,

wherein the non-steroidal anti-inflammatory drug (NSAID) is mefanamic acid, meclofenamic acid, flufenamic acid or tolfenamic acid.

195. The drug formulation of claim 183 or 189,

wherein the non-steroidal anti-inflammatory drug (NSAID) is celecoxib, refecoxib, valdecoxib, parecoxib, lumiracoxib, etoricoxib or firocoxib.

196. The drug formulation of any one of claims 109-172,

wherein the drug formulation comprises an effective amount of a platelet derived growth factor (PDGF) modulator.

197. The drug formulation of claim 196,

wherein the platelet derived growth factor (PDGF) modulator is a PDGF antagonist.

198. The drug formulation of claim 197,

wherein the platelet derived growth factor (PDGF) antagonist is a PDGF-receptor antagonist, an anti-PDGF antibody or fragment thereof, an anti- PDGF receptor antibody or fragment thereof, an anti-PDGF aptamer or a small molecule PDGF antagonist.

199. The drug formulationof claim 197,

wherein the platelet derived growth factor (PDGF) antagonist is an antagonist of the PDGF receptor-α (PDGFR-α) or PDGF receptor-β (PDGFR-β).

200. The drug formulation of claim 197,

wherein the PDGF antagonist is the anti-PDGF-β aptamer E10030, sunitinib, axitinib, sorefenib, imatinib, imatinib mesylate, nintedanib, pazopanib HCl, ponatinib, MK-2461, dovitinib, pazopanib, crenolanib, PP-121, telatinib, imatinib, KRN 633, CP 673451, TSU-68, Ki8751, amuvatinib, tivozanib, masitinib, motesanib diphosphate, dovitinib dilactic acid or linifanib (ABT-869).

201. The drug formulation of any one of claims 109-172,

wherein the drug formulation comprises an effective amount of an immunosuppressive agent.

202. The drug formulation of claim 201,

wherein the immunosuppressive agent is a glucocorticoid, cytokine inhibitor, cytostatic, alkylating agent, anti-metabolite, folic acid analogue, cytotoxic antibiotic, interferon, opioid, T-cell receptor directed antibody or an IL-2 receptor directed antibody .

203. The drug formulation of claim 202,

wherein the anti-metabolite is a purine analog, pyrimidine analogue, folic acid analogue or a protein synthesis inhibitor.

204. The drug formulation of claim 201,

wherein the immunosuppressive agent is an interleukin-2 inhibitor.

205. The drug formulation of claim 201,

wherein the immunosuppressive agent is cyclophosphamide, nitrosourea, methotrexate, azathioprine, mercaptopurine, fluorouracil, dactinomycin, anthracycline, mitomycin C, bleomycin, mithramycin, muromonab-CD3, cyclosporine, tacrolimus, sirolimus or mycophenolate.

206. The drug formulation of claim 204,

wherein the interleukin-2 inhibitor is basiliximab or daclizumab

207. The drug formulation of claim 203 or 205,

wherein the immunosuppressive agent is mycophenolate.

208. The drug formulation of any one of claims 109-172,

wherein the drug formulation comprises an effective amount of a vascular permeability inhibitor.

209. The drug formulation of claim 208,

wherein the vascular permeability inhibitor is a vascular endothelial growth factor (VEGF) antagonist or an angiotensin converting enzyme (ACE) inhibitor.

210. The drug formulation of claim 209,

wherein the vascular permeability inhibitor is an angiotensin converting enzyme (ACE) inhibitor and the ACE inhibitor is captopril.

211. Use of an effective amount of an interfering RNA molecule targeting a gene selected from the group consisting of HTRA1, CFH, elastin, and ARMS2, such that the expression of the targeted gene is downregulated upon administration of the interfering RNA in the manufacture of a medicament for treating or preventing polypoidal choroidal vasculopathy (PCV) in a patient.

212. The drug formulation of claim 211,

wherein the interfering RNA molecule is an siRNA, miRNA, or shRNA.

213. The drug formulation of claim 211 or 212,

wherein the targeted gene is CFH, and wherein the interfering RNA molecule targets a polymorphism selected from the group consisting of rs3753394, rs800292, rs3753394, rs6680396, rs1410996, rs2284664, rs1329428, and rs1065489.

214. The drug formulation of any one of claims 109-213,

further comprising a photosensitizer.

215. The method of claim 214, wherein the photosensitizer is verteporfin.

216. Use of a choroidal malady diagnostic agent to the SCS in the manufacture of a diagnostic agent diagnosing a patient with a choroidal malady.

217. The use of claim 216,

wherein the diagnostic agent is to be delivered to the SCS of one or both eyes of the patient via a hollow microneedle comprising a tip and an opening.

218. The use of a triamcinolone composition in the manufacture of a medicament for treating an ocular disorder in the eye of a patient, wherein said medicament is to be:

(a) inserted using a hollow microneedle into the eye at an insertion site, the microneedle having a tip end with an opening;

(b) applied a selected pressure to the triamcinolone composition, which comprises triamcinolone microparticles, to induce infusion of the triamcinolone composition through the
inserted microneedle;

(c) determined whether the triamcinolone composition has flowed into the suprachoroidal space of the eye and away from the insertion site;

(d) if the determination in step (c) is that the triamcinolone composition has flowed into the suprachoroidal space away from the insertion site, then infusing a selected volume of the triamcinolone composition and thereupon removing the pressure, or if the determination in step (c) is that substantially none of the triamcinolone composition has flowed into the suprachoroidal space away from the insertion site, then repositioning the inserted microneedle and repeating steps (b)-(d) until a selected volume of the triamcinolone composition has been infused.

219. The use of claim 218,
wherein the triamcinolone is triamcinolone acetonide.

220. The use of claim 219,
wherein the composition comprises nanoparticles.

221. The use of claim 219 or 220,
wherein the composition comprises microparticles.

222. The use of claim 221,
wherein the microparticles have a D_{50} of 2 μm or less.

223. The use of claim 221 or 222,
wherein the microparticles have a D_{99} of less than 10 μm.

224. The use of any one of claims 219-223,

wherein the triamcinolone is present in the composition at about 40 mg/mL.

225. The use of any one of claims 219-223, wherein the drug formulation further comprises sodium chloride.

226. The use of any one of claims 219-223, wherein the drug formulation further comprises carboxymethylcellulose sodium.

227. The use of any one of claims 219-223,
wherein the drug formulation further comprises polysorbate 80.

228. The use of any one of claims 219-223,
wherein the drug formulation further comprises $CaCl_2$, $MgCl_2$, sodium acetate, sodium citrate, or a combination thereof.

229. A pharmaceutical composition comprising triamcinolone particles having a D_{50} of less than 3 μm.

230. The pharmaceutical composition of claim 229,
wherein the triamcinolone is present in the composition at 40 mg/mL.

231. The pharmaceutical composition of claim 229 or 230,
wherein the D_{90} of the particles is less than or equal to 10 μm.

232. The pharmaceutical composition of claim 231,
wherein the D_{90} of the particles is less than 10 μm.

233. The pharmaceutical composition of any one of claims 229-232, further comprising polysorbate 80.

234. The pharmaceutical composition of any one of claims 229-233, further comprising carboxymethylcellulose sodium.

235. The pharmaceutical composition of any one of claims 229-234, further comprising one or more of $CaCl_2$, $MgCl_2$, KCl, sodium acetate, sodium citrate.

236. The pharmaceutical composition of any one of claims 229-235, wherein the pH of the composition is from about 6.0 to about 7.5.

237. The pharmaceutical composition of any one of claims 229-236, wherein the D50 of the particles is about 2 μm.

238. The pharmaceutical composition of any one of claims 229-237, wherein the D50 of the particles is less than about 2 μm.

239. The pharmaceutical composition of any one of claims 229-238, wherein the D50 of the particles is less than about 1 μm.

240. The pharmaceutical composition of any one of claims 229-239, wherein the triamcinolone is triamcinolone acetonide.