

CLAIMS

What is claimed is:

1. A method for predicting a subject's risk for having or developing Vascular Associated Maculopathy in a human subject, comprising: determining in the subject the identity of one or more SNPs in the HTRA1, ARMS2, or CFH genes, wherein the one or more SNPs are (i) the rs11200638 in the HTRA1 gene, rs1049331 in the HTRA1 gene, rs2672587 in the HTRA1 gene, rs10490924 in the ARMS2 gene, rs3750848 in the ARMS2 gene, rs1061170 in the CFH gene, or rs800292 in the CFH gene, or (ii) a SNP in linkage disequilibrium with the SNPS of (i), wherein the presence of one or more of the SNPs is predictive of the subject's risk for having or developing Vascular Associated Maculopathy.

2. The method of claim 1, wherein an A at the rs11200638 SNP, a T at the rs1049331 SNP, a G at the rs2672587 SNP, a T at the rs10490924 SNP, a G at the rs3750848 SNP, a C at the rs1061170 SNP, or a G at the rs800292 SNP is predictive of the subject's risk for having or developing Vascular Associated Maculopathy.

3. The method of claim 2, wherein an A at the rs11200638 SNP, a T at the rs1049331 SNP, a G at the rs2672587 SNP, a T at the rs10490924 SNP, a G at the rs3750848 SNP, a C at the rs1061170 SNP, or a G at the rs800292 SNP is predictive of the subject's increased risk for having or developing Vascular Associated Maculopathy.

4. The method of claim 1, wherein a G at the rs11200638 SNP, a C at the rs1049331 SNP, a C at the rs2672587 SNP, a G at the rs10490924 SNP, a T at the rs3750848 SNP, a T at the rs1061170 SNP, or an A at the rs800292 SNP is predictive of the subject's risk for having or developing Vascular Associated Maculopathy.

5. The method of claim 4, wherein a G at the rs11200638 SNP, a C at the rs1049331 SNP, a C at the rs2672587 SNP, a G at the rs10490924 SNP, a T at the rs3750848 SNP, a T at the rs1061170 SNP, or an A at the rs800292 SNP is predictive of the subject's decreased risk for having or developing Vascular Associated Maculopathy.

6. The method of claim 1, further comprising: generating an image of an eye of the subject, detecting the presence of aberrant choriocapillaris lobules in the eye of the subject using the image, wherein the presence of aberrant choriocapillaris lobules in the eye of the

subject is predictive of the subject's risk for having or developing Vascular Associated Maculopathy.

7. The method of claim 1, wherein the Vascular Associated Maculopathy further comprises one or more symptoms associated with Vascular Associated Maculopathy, wherein the one or more symptoms of Vascular Associated Maculopathy is macular degeneration, age-related macular degeneration, cardiac microvascular disease, Stargardt's, Pseudoxanthoma Elasticum (PXE), Alagille syndrome, subcortical leukoencephalopathy, preeclampsia, hypertension, diabetes mellitus, myocardial ischemia, aneurysms, vasculitis due to autoimmune disease or infectious agents, deep vein thrombosis, lymphedema, varicose veins, peripheral artery disease, renal artery disease, Raynaud's disease, Buerger's disease, peripheral venous disease, venous blood clots, atherosclerosis, arteriosclerosis, arteriolar sclerosis, coronary artery disease, angina, congestive heart failure, hardening of the arteries, thrombotic or embolic stroke, or myocardial infarction.

8. The method of claim 1, further comprising: examining an eye of the subject with an ophthalmologic procedure.

9. The method of claim 1, wherein the Vascular Associated Maculopathy causes decreased perfusion in the choriocapillaris lobules in the eye.

10. The method of claim 1, wherein the Vascular Associated Maculopathy causes partial or total closure of choriocapillaris lobules in the eye.

11. The method of claim 1, further comprising determining the ratio of the diameters of retinal arteries or veins, wherein a ratio of the diameters of retinal arteries (A) or veins (V) of about 0.60 to about 1.48 is predictive of the subject's risk for having or developing Vascular Associated Maculopathy.

12. A method for predicting a subject's risk for having or developing Vascular Associated Maculopathy in a human subject, comprising: generating an image of an eye of the subject, detecting the presence of aberrant choriocapillaris lobules in the eye of the subject using the image, wherein the presence of aberrant choriocapillaris lobules in the eye of the subject is predictive of the subject's risk for having or developing Vascular Associated Maculopathy.

13. The method of claim 12, wherein the Vascular Associated Maculopathy further comprises one or more symptoms associated with Vascular Associated Maculopathy, wherein the one or more symptoms of Vascular Associated Maculopathy is macular degeneration, age-related macular degeneration, cardiac microvascular disease, Stargardt's, Pseudoxanthoma Elasticum (PXE), Alagille syndrome, subcortical leukoencephalopathy, preeclampsia, hypertension, diabetes mellitus, myocardial ischemia, aneurysms, vasculitis due to autoimmune disease or infectious agents, deep vein thrombosis, lymphedema, varicose veins, peripheral artery disease, renal artery disease, Raynaud's disease, Buerger's disease, peripheral venous disease, venous blood clots, atherosclerosis, arteriosclerosis, arteriolar sclerosis, coronary artery disease, angina, congestive heart failure, hardening of the arteries, thrombotic or embolic stroke, or myocardial infarction.

14. The method of claim 12, further comprising: examining an eye of the subject with an ophthalmologic procedure.

15. The method of claim 12, wherein the Vascular Associated Maculopathy causes decreased perfusion in the choriocapillaris lobules in the eye.

16. The method of claim 12, wherein the Vascular Associated Maculopathy causes partial or total closure of choriocapillaris lobules in the eye.

17. The method of claim 12, further comprising determining the ratio of the diameters of retinal arteries or veins, wherein a ratio of the diameters of retinal arteries (A) or veins (V) of about 0.60 to about 1.48 is predictive of the subject's risk for having or developing Vascular Associated Maculopathy.

18. The method of claim 12, wherein the image is generated using near infrared imaging, combined with spectral domain optical coherence tomography (SD-OCT).

19. The method of claim 12, wherein the image is a Doppler image.

20. The method of claim 12, further comprising: determining in the subject the identity of one or more SNPs in the HTRA1, ARMS2, or CFH genes, wherein the one or more SNPs are (i) the rs11200638 in the HTRA1 gene, rs1049331 in the HTRA1 gene, rs2672587 in the HTRA1 gene, rs10490924 in the ARMS2 gene, rs3750848 in the ARMS2 gene, rs1061170 in the CFH gene, or rs800292 in the CFH gene, or (ii) a SNP in linkage disequilibrium with the

SNPs of (i), wherein the presence of one or more variants of the SNPs is predictive of the subject's risk for having or developing Vascular Associated Maculopathy.

21. The method of claim 20, wherein an A at the rs11200638 SNP, a T at the rs1049331 SNP, a G at the rs2672587 SNP, a T at the rs10490924 SNP, a G at the rs3750848 SNP, a C at the rs1061170 SNP, or a G at the rs800292 SNP is predictive of the subject's risk for having or developing Vascular Associated Maculopathy.

22. The method of claim 21, wherein an A at the rs11200638 SNP, a T at the rs1049331 SNP, a G at the rs2672587 SNP, a T at the rs10490924 SNP, a G at the rs3750848 SNP, a C at the rs1061170 SNP, or a G at the rs800292 SNP is predictive of the subject's increased risk for having or developing Vascular Associated Maculopathy.

23. The method of claim 20, wherein a G at the rs11200638 SNP, a C at the rs1049331 SNP, a C at the rs2672587 SNP, a G at the rs10490924 SNP, a T at the rs3750848 SNP, a T at the rs1061170 SNP, or an A at the rs800292 SNP is predictive of the subject's risk for having or developing Vascular Associated Maculopathy.

24. The method of claim 23, wherein a G at the rs11200638 SNP, a C at the rs1049331 SNP, a C at the rs2672587 SNP, a G at the rs10490924 SNP, a T at the rs3750848 SNP, a T at the rs1061170 SNP, or an A at the rs800292 SNP is predictive of the subject's decreased risk for having or developing Vascular Associated Maculopathy.

25. A method for diagnosing a subject with Vascular Associated Maculopathy, comprising: in a sample obtained from the subject, determining the identity of one or more SNPs in the HTRA1, ARMS2, or CFH genes, wherein the one or more SNPs are (i) the rs11200638 in the HTRA1 gene, rs1049331 in the HTRA1 gene, rs2672587 in the HTRA1 gene, rs10490924 in the ARMS2 gene, rs3750848 in the ARMS2 gene, rs1061170 in the CFH gene, or rs800292 in the CFH gene, or (ii) a SNP in linkage disequilibrium with the SNPs of (i), thereby diagnosing the subject based on the presence of the one or more variants of the SNPs in (i) or (ii).

26. The method of claim 25, wherein an A at the rs11200638 SNP, a T at the rs1049331 SNP, a G at the rs2672587 SNP, a T at the rs10490924 SNP, a G at the rs3750848 SNP, a C at the rs1061170 SNP, or a G at the rs800292 SNP diagnoses the subject with Vascular Associated Maculopathy.

27. The method of claim 25, wherein a G at the rs11200638 SNP, a C at the rs1049331 SNP, a C at the rs2672587 SNP, a G at the rs10490924 SNP, a T at the rs3750848 SNP, a T at the rs1061170 SNP, or an A at the rs800292 SNP diagnoses the subject without Vascular Associated Maculopathy.

28. The method of claim 27, wherein the Vascular Associated Maculopathy further comprises one or more symptoms associated with Vascular Associated Maculopathy, wherein the one or more symptoms of Vascular Associated Maculopathy is macular degeneration, age-related macular degeneration, cardiac microvascular disease, Stargardt's, Pseudoxanthoma Elasticum (PXE), Alagille syndrome, subcortical leukoencephalopathy, preeclampsia, hypertension, diabetes mellitus, myocardial ischemia, aneurysms, vasculitis due to autoimmune disease or infectious agents, deep vein thrombosis, lymphedema, varicose veins, peripheral artery disease, renal artery disease, Raynaud's disease, Buerger's disease, peripheral venous disease, venous blood clots, atherosclerosis, arteriosclerosis, arteriolar sclerosis, coronary artery disease, angina, congestive heart failure, hardening of the arteries, thrombotic or embolic stroke, or myocardial infarction.

29. The method of claim 25, wherein the Vascular Associated Maculopathy causes decreased perfusion in the choriocapillaris lobules in the eye.

30. The method of claim 25, wherein the Vascular Associated Maculopathy causes partial or total closure of choriocapillaris lobules in the eye.

31. The method of claim 25, further comprising determining the ratio of the diameters of retinal arteries or veins, wherein a ratio of the diameters of retinal arteries (A) or veins (V) of about 0.60 to about 1.48 diagnoses the subject with Vascular Associated Maculopathy.

32. A method for diagnosing a subject with Vascular Associated Maculopathy, comprising: generating an image of an eye of the subject, detecting the presence of aberrant choriocapillaris lobules in the image of eye of the subject, whereby the presence of aberrant choriocapillaris lobules in the eye of the subject results in a diagnosis of Vascular Associated Maculopathy.

33. The method of claim 32, wherein the absence of aberrant choriocapillaris lobules in the eye of the subject results in a diagnoses that the subject does not have Vascular Associated Maculopathy.

34. The method of claim 32, wherein the Vascular Associated Maculopathy further comprises one or more symptoms associated with Vascular Associated Maculopathy, wherein the one or more symptoms of Vascular Associated Maculopathy is macular degeneration, age-related macular degeneration, cardiac microvascular disease, Stargardt's, Pseudoxanthoma Elasticum (PXE), Alagille syndrome, subcortical leukoencephalopathy, preeclampsia, hypertension, diabetes mellitus, myocardial ischemia, aneurysms, vasculitis due to autoimmune disease or infectious agents, deep vein thrombosis, lymphedema, varicose veins, peripheral artery disease, renal artery disease, Raynaud's disease, Buerger's disease, peripheral venous disease, venous blood clots, atherosclerosis, arteriosclerosis, arteriolar sclerosis, coronary artery disease, angina, congestive heart failure, hardening of the arteries, thrombotic or embolic stroke, or myocardial infarction.

35. The method of claim 32, further comprising: examining an eye of the subject with an ophthalmologic procedure.

36. The method of claim 32, wherein the Vascular Associated Maculopathy causes decreased perfusion in the choriocapillaris lobules in the eye.

37. The method of claim 32, wherein the Vascular Associated Maculopathy causes partial or total closure of choriocapillaris lobules in the eye.

38. The method of claim 32, further comprising determining the ratio of the diameters of retinal arteries or veins, wherein a ratio of the diameters of retinal arteries (A) or veins (V) of about 0.60 to about 1.48 diagnoses the subject with Vascular Associated Maculopathy.

39. The method of claim 32, further comprising: in a sample obtained from the subject, determining the identity of one or more SNPs in the HTRA1, ARMS2, or CFH genes, wherein the one or more SNPs are (i) the rs11200638 in the HTRA1 gene, rs1049331 in the HTRA1 gene, rs2672587 in the HTRA1 gene, rs10490924 in the ARMS2 gene, rs3750848 in the ARMS2 gene, rs1061170 in the CFH gene, or rs800292 in the CFH gene, or (ii) a SNP in linkage disequilibrium with the SNPs of (i), thereby diagnosing the subject based on the presence of the one or more SNPs in (i) or (ii).

40. The method of claim 39, wherein an A at the rs11200638 SNP, a T at the rs1049331 SNP, a G at the rs2672587 SNP, a T at the rs10490924 SNP, a G at the rs3750848 SNP, a C

at the rs1061170 SNP, or a G at the rs800292 SNP diagnoses the subject with Vascular Associated Maculopathy.

41. The method of claim 39, wherein a G at the rs11200638 SNP, a C at the rs1049331 SNP, a C at the rs2672587 SNP, a G at the rs10490924 SNP, a T at the rs3750848 SNP, a T at the rs1061170 SNP, or an A at the rs800292 SNP diagnoses the subject without Vascular Associated Maculopathy.

42. A method for predicting a subject's risk for having or developing severe maculopathy or last stage maculopathy in a human subject, comprising: determining in the subject the identity of one or more SNPs in the HTRA1, ARMS2, or CFH genes, wherein the one or more SNPs are (i) the rs11200638 in the HTRA1 gene, rs1049331 in the HTRA1 gene, rs2672587 in the HTRA1 gene, rs10490924 in the ARMS2 gene, rs3750848 in the ARMS2 gene, rs1061170 in the CFH gene, or rs800292 in the CFH gene, or (ii) a SNP in linkage disequilibrium with the SNPs of (i), wherein the presence of one or more of the SNPs is predictive of the subject's risk for having or developing having or developing severe maculopathy or last stage maculopathy.

43. The method of claim 42, wherein an A at the rs11200638 SNP, a T at the rs1049331 SNP, a G at the rs2672587 SNP, a T at the rs10490924 SNP, a G at the rs3750848 SNP, a C at the rs1061170 SNP, or a G at the rs800292 SNP is predictive of the subject's risk for having or developing severe maculopathy or last stage maculopathy.

44. The method of claim 43, wherein an A at the rs11200638 SNP, a T at the rs1049331 SNP, a G at the rs2672587 SNP, a T at the rs10490924 SNP, a G at the rs3750848 SNP, a C at the rs1061170 SNP, or a G at the rs800292 SNP is predictive of the subject's increased risk for having or developing severe maculopathy or last stage maculopathy

45. The method of claim 42, wherein a G at the rs11200638 SNP, a C at the rs1049331 SNP, a C at the rs2672587 SNP, a G at the rs10490924 SNP, a T at the rs3750848 SNP, a T at the rs1061170 SNP, or an A at the rs800292 SNP is predictive of the subject's risk for having or developing severe maculopathy or last stage maculopathy.

46. The method of claim 45, wherein a G at the rs11200638 SNP, a C at the rs1049331 SNP, a C at the rs2672587 SNP, a G at the rs10490924 SNP, a T at the rs3750848 SNP, a T

at the rs1061170 SNP, or an A at the rs800292 SNP is predictive of the subject's decreased risk for having or developing severe maculopathy or last stage maculopathy.

47. The method of claim 42, further comprising: from an image of an eye of the subject, detecting the presence of aberrant choriocapillaris lobules in the eye of the subject, wherein the presence of aberrant choriocapillaris lobules in the eye of the subject is predictive of the subject's risk for having or developing severe maculopathy or last stage maculopathy.

48. The method of claim 42, further comprising: examining an eye of the subject with an ophthalmologic procedure.

49. The method of claim 42, wherein the severe maculopathy or last stage maculopathy causes decreased perfusion in the choriocapillaris lobules in the eye.

50. The method of claim 42, wherein the severe maculopathy or last stage maculopathy causes partial or total closure of choriocapillaris lobules in the eye.

51. The method of claim 42, further comprising determining the ratio of the diameters of retinal arteries or veins, wherein a ratio of the diameters of retinal arteries (A) or veins (V) of about 0.60 to about 1.48 is predictive of the subject's risk for having or developing severe maculopathy or last stage maculopathy.

52. A method for predicting a subject's risk for having or developing severe maculopathy or last stage maculopathy in a human subject, comprising: generating an image of an eye of the subject, detecting the presence of aberrant choriocapillaris lobules in the eye of the subject using the image, wherein the presence of aberrant choriocapillaris lobules in the eye of the subject is predictive of the subject's risk for having or developing severe maculopathy or last stage maculopathy.

53. The method of claim 52, further comprising: examining an eye of the subject with an ophthalmologic procedure.

54. The method of claim 52, wherein the severe maculopathy or last stage maculopathy causes decreased perfusion in the choriocapillaris lobules in the eye.

55. The method of claim 52, wherein the severe maculopathy or last stage maculopathy causes partial or total closure of choriocapillaris lobules in the eye.

56. The method of claim 52, further comprising determining the ratio of the diameters of retinal arteries or veins, wherein a ratio of the diameters of retinal arteries (A) or veins (V) of about 0.60 to about 1.48 is predictive of the subject's risk for having or developing severe maculopathy or last stage maculopathy.

57. The method of claim 52, further comprising: determining in the subject the identity of one or more SNPs in the HTRA1, ARMS2, or CFH genes, wherein the one or more SNPs are (i) the rs11200638 in the HTRA1 gene, rs1049331 in the HTRA1 gene, rs2672587 in the HTRA1 gene, rs10490924 in the ARMS2 gene, rs3750848 in the ARMS2 gene, rs1061170 in the CFH gene, or rs800292 in the CFH gene, or (ii) a SNP in linkage disequilibrium with the SNPs of (i), wherein the presence of one or more of the SNPs is predictive of the subject's risk for having or developing severe maculopathy or last stage maculopathy.

58. The method of claim 57, wherein an A at the rs11200638 SNP, a T at the rs1049331 SNP, a G at the rs2672587 SNP, a T at the rs10490924 SNP, a G at the rs3750848 SNP, a C at the rs1061170 SNP, or a G at the rs800292 SNP is predictive of the subject's risk for having or developing severe maculopathy or last stage maculopathy.

59. The method of claim 58, wherein an A at the rs11200638 SNP, a T at the rs1049331 SNP, a G at the rs2672587 SNP, a T at the rs10490924 SNP, a G at the rs3750848 SNP, a C at the rs1061170 SNP, or a G at the rs800292 SNP is predictive of the subject's increased risk for having or developing severe maculopathy or last stage maculopathy.

60. The method of claim 57, wherein a G at the rs11200638 SNP, a C at the rs1049331 SNP, a C at the rs2672587 SNP, a G at the rs10490924 SNP, a T at the rs3750848 SNP, a T at the rs1061170 SNP, or an A at the rs800292 SNP is predictive of the subject's risk for having or developing severe maculopathy or last stage maculopathy.

61. The method of claim 60, wherein a G at the rs11200638 SNP, a C at the rs1049331 SNP, a C at the rs2672587 SNP, a G at the rs10490924 SNP, a T at the rs3750848 SNP, a T at the rs1061170 SNP, or an A at the rs800292 SNP is predictive of the subject's decreased risk for having or developing severe maculopathy or last stage maculopathy.

62. A method for diagnosing a subject with severe maculopathy or last stage maculopathy, comprising: in a sample obtained from the subject, determining the identity of one or more SNPs in the HTRA1, ARMS2, or CFH genes, wherein the one or more SNPs are

(i) the rs11200638 in the HTRA1 gene, rs1049331 in the HTRA1 gene, rs2672587 in the HTRA1 gene, rs10490924 in the ARMS2 gene, rs3750848 in the ARMS2 gene, rs1061170 in the CFH gene, or rs800292 in the CFH gene, or (ii) a SNP in linkage disequilibrium with the SNPs of (i), thereby diagnosing the subject based on the presence of the one or more SNPs in (i) or (ii).

63. The method of claim 62, wherein an A at the rs11200638 SNP, a T at the rs1049331 SNP, a G at the rs2672587 SNP, a T at the rs10490924 SNP, a G at the rs3750848 SNP, a C at the rs1061170 SNP, or a G at the rs800292 SNP diagnoses the subject with severe maculopathy or last stage maculopathy.

64. The method of claim 62, wherein a G at the rs11200638 SNP, a C at the rs1049331 SNP, a C at the rs2672587 SNP, a G at the rs10490924 SNP, a T at the rs3750848 SNP, a T at the rs1061170 SNP, or an A at the rs800292 SNP diagnoses the subject without severe maculopathy or last stage maculopathy.

65. The method of claim 62, wherein the severe maculopathy or last stage maculopathy causes decreased perfusion in the choriocapillaris lobules in the eye.

66. The method of claim 62, wherein the severe maculopathy or last stage maculopathy causes partial or total closure of choriocapillaris lobules in the eye.

67. The method of claim 62, further comprising determining the ratio of the diameters of retinal arteries or veins, wherein a ratio of the diameters of retinal arteries (A) or veins (V) of about 0.60 to about 1.48 diagnoses the subject with severe maculopathy or last stage maculopathy.

68. A method for diagnosing a subject with severe maculopathy or last stage maculopathy, comprising: generating an image of an eye of the subject, detecting the presence of aberrant choriocapillaris lobules in the eye of the subject using the image, thereby diagnosing the subject based on the presence of aberrant choriocapillaris lobules in the eye of the subject.

69. The method of claim 68, wherein the presence of aberrant choriocapillaris lobules in the eye of the subject diagnoses the subject with severe maculopathy or last stage maculopathy.

70. The method of claim 68, wherein the absence of aberrant choriocapillaris lobules in the eye of the subject diagnoses the subject without severe maculopathy or last stage maculopathy.

71. The method of claim 68, further comprising: examining an eye of the subject with an ophthalmologic procedure.

72. The method of claim 68, wherein the severe maculopathy or last stage maculopathy causes decreased perfusion in the choriocapillaris lobules in the eye.

73. The method of claim 68, wherein the severe maculopathy or last stage maculopathy causes partial or total closure of choriocapillaris lobules in the eye.

74. The method of claim 68, further comprising determining the ratio of the diameters of retinal arteries or veins, wherein a ratio of the diameters of retinal arteries (A) or veins (V) of about 0.60 to about 1.48 diagnoses the subject with severe maculopathy or last stage maculopathy.

75. The method of claim 68, wherein the image is generated using near infrared imaging, combined with spectral domain optical coherence tomography (SD-OCT).

76. The method of claim 68, wherein the image is a Doppler image.

77. The method of claim 68, further comprising: in a sample obtained from the subject, determining the identity of one or more SNPs in the HTRA1, ARMS2, or CFH genes, wherein the one or more SNPs are (i) the rs11200638 in the HTRA1 gene, rs1049331 in the HTRA1 gene, rs2672587 in the HTRA1 gene, rs10490924 in the ARMS2 gene, rs3750848 in the ARMS2 gene, rs1061170 in the CFH gene, or rs800292 in the CFH gene, or (ii) a SNP in linkage disequilibrium with the SNPs of (i), thereby diagnosing the subject based on the presence of the one or more SNPs in (i) or (ii).

78. The method of claim 77, wherein an A at the rs11200638 SNP, a T at the rs1049331 SNP, a G at the rs2672587 SNP, a T at the rs10490924 SNP, a G at the rs3750848 SNP, a C at the rs1061170 SNP, or a G at the rs800292 SNP diagnoses the subject with severe maculopathy or last stage maculopathy.

79. The method of claim 77, wherein a G at the rs11200638 SNP, a C at the rs1049331 SNP, a C at the rs2672587 SNP, a G at the rs10490924 SNP, a T at the rs3750848 SNP, a T at the rs1061170 SNP, or an A at the rs800292 SNP diagnoses the subject without severe maculopathy or last stage maculopathy.

80. A method for predicting a subject's risk for having or developing aberrant choriocapillaris lobules in a human subject, comprising: determining in the subject the identity of one or more SNPs in the HTRA1, ARMS2, or CFH genes, wherein the one or more SNPs are (i) the rs11200638 in the HTRA1 gene, rs1049331 in the HTRA1 gene, rs2672587 in the HTRA1 gene, rs10490924 in the ARMS2 gene, rs3750848 in the ARMS2 gene, rs1061170 in the CFH gene, or rs800292 in the CFH gene, or (ii) a SNP in linkage disequilibrium with the SNPs of (i), wherein the presence of one or more of the SNPs is predictive of the subject's risk for having or developing aberrant choriocapillaris lobules.

81. The method of claim 80, wherein an A at the rs11200638 SNP, a T at the rs1049331 SNP, a G at the rs2672587 SNP, a T at the rs10490924 SNP, a G at the rs3750848 SNP, a C at the rs1061170 SNP, or a G at the rs800292 SNP is predictive of the subject's risk for having or developing aberrant choriocapillaris lobules.

82. The method of claim 81, wherein an A at the rs11200638 SNP, a T at the rs1049331 SNP, a G at the rs2672587 SNP, a T at the rs10490924 SNP, a G at the rs3750848 SNP, a C at the rs1061170 SNP, or a G at the rs800292 SNP is predictive of the subject's increased risk for having or developing aberrant choriocapillaris lobules.

83. The method of claim 80, wherein a G at the rs11200638 SNP, a C at the rs1049331 SNP, a C at the rs2672587 SNP, a G at the rs10490924 SNP, a T at the rs3750848 SNP, a T at the rs1061170 SNP, or an A at the rs800292 SNP is predictive of the subject's risk for having or developing aberrant choriocapillaris lobules.

84. The method of claim 81, wherein a G at the rs11200638 SNP, a C at the rs1049331 SNP, a C at the rs2672587 SNP, a G at the rs10490924 SNP, a T at the rs3750848 SNP, a T at the rs1061170 SNP, or an A at the rs800292 SNP is predictive of the subject's decreased risk for having or developing aberrant choriocapillaris lobules.

85. A kit comprising an assay for detecting one or more SNPs in a nucleic acid sample of a subject, wherein the SNP is (i) rs11200638 in the HTRA1 gene, rs1049331 in the HTRA1

gene, rs2672587 in the HTRA1 gene, rs10490924 in the ARMS2 gene, rs3750848 in the ARMS2 gene, rs1061170 in the CFH gene, or rs800292 in the CFH gene; (ii) combinations of the SNPs of (i); or (iii) a SNP in linkage disequilibrium with the SNPs of (i)

86. The kit of claim 85, further comprising instructions for correlating the assay results with the subject's risk for having or developing Vascular Associated Maculopathy.

87. The kit of claim 85, further comprising instructions for correlating the assay results with the subject's risk for having or developing severe maculopathy or late stage maculopathy.

88. The kit of claim 85, further comprising instructions for correlating the assay results with the subject's risk for having or developing aberrant choriocapillaris lobules.

89. The kit of claim 85, further comprising instructions for correlating the assay results with diagnosing a subject with Vascular Associated Maculopathy.

90. The kit of claim 85, further comprising instructions for correlating the assay results with diagnosing a subject with severe maculopathy or late stage maculopathy.

91. A non-human animal model of Vascular Associated Maculopathy, wherein one or more cells of the animal express recombinant HTRA1 polypeptide.

92. The non-human animal of claim 91, wherein the recombinant HTRA1 polypeptide is expressed in the animal's Retinal Pigment Epithelium.

93. The non-human animal of claim 91, wherein the recombinant HTRA1 polypeptide is overexpressed in the animal's Retinal Pigment Epithelium.

94. The non-human animal of claim 91, wherein the one or more cells of the animal comprise a nucleic acid encoding a recombinant HTRA1 polypeptide operably linked to a RPE-specific human vitelliform macular dystrophy 2 promoter.

95. A system for identifying aberrant choriocapillaris lobules comprising a device for imaging an eye, the device configured to provide a recognizable image of aberrant choriocapillaris lobules, and instructions for identifying aberrant choriocapillaris lobules.

96. The system of claim 95, wherein the device is an near-infrared reflectance and SD-OCT device.

97. The system of claim 95, wherein the device is a Doppler imaging device.

CLAIMS

What is claimed is:

1. A method for predicting a subject's risk for having or developing Vascular Associated Maculopathy in a human subject, comprising: determining in the subject the identity of one or more SNPs in the HTRA1, ARMS2, or CFH genes, wherein the one or more SNPs are (i) the rs11200638 in the HTRA1 gene, rs1049331 in the HTRA1 gene, rs2672587 in the HTRA1 gene, rs10490924 in the ARMS2 gene, rs3750848 in the ARMS2 gene, rs1061170 in the CFH gene, or rs800292 in the CFH gene, or (ii) a SNP in linkage disequilibrium with the SNPs of (i), wherein the presence of one or more of the SNPs is predictive of the subject's risk for having or developing Vascular Associated Maculopathy.
2. The method of claim 1, wherein an A at the rs11200638 SNP, a T at the rs1049331 SNP, a G at the rs2672587 SNP, a T at the rs10490924 SNP, a G at the rs3750848 SNP, a C at the rs1061170 SNP, or a G at the rs800292 SNP is predictive of the subject's risk for having or developing Vascular Associated Maculopathy.
3. The method of claim 2, wherein an A at the rs11200638 SNP, a T at the rs1049331 SNP, a G at the rs2672587 SNP, a T at the rs10490924 SNP, a G at the rs3750848 SNP, a C at the rs1061170 SNP, or a G at the rs800292 SNP is predictive of the subject's increased risk for having or developing Vascular Associated Maculopathy.
4. The method of claim 1, wherein a G at the rs11200638 SNP, a C at the rs1049331 SNP, a C at the rs2672587 SNP, a G at the rs10490924 SNP, a T at the rs3750848 SNP, a T at the rs1061170 SNP, or an A at the rs800292 SNP is predictive of the subject's risk for having or developing Vascular Associated Maculopathy.
5. The method of claim 4, wherein a G at the rs11200638 SNP, a C at the rs1049331 SNP, a C at the rs2672587 SNP, a G at the rs10490924 SNP, a T at the rs3750848 SNP, a T at the rs1061170 SNP, or an A at the rs800292 SNP is predictive of the subject's decreased risk for having or developing Vascular Associated Maculopathy.
6. The method of claim 1, further comprising: generating an image of an eye of the subject, detecting the presence of aberrant choriocapillaris lobules in the eye of the subject using the image, wherein the presence of aberrant choriocapillaris lobules in the eye of the subject is predictive of the subject's risk for having or developing Vascular Associated Maculopathy.

7. The method of claim 1, wherein the Vascular Associated Maculopathy further comprises one or more symptoms associated with Vascular Associated Maculopathy, wherein the one or more symptoms of Vascular Associated Maculopathy is macular degeneration, age-related macular degeneration, cardiac microvascular disease, Stargardt's, Pseudoxanthoma Elasticum (PXE), Alagille syndrome, subcortical leukoencephalopathy, preeclampsia, hypertension, diabetes mellitus, myocardial ischemia, aneurysms, vasculitis due to autoimmune disease or infectious agents, deep vein thrombosis, lymphedema, varicose veins, peripheral artery disease, renal artery disease, Raynaud's disease, Buerger's disease, peripheral venous disease, venous blood clots, atherosclerosis, arteriosclerosis, arteriolar sclerosis, coronary artery disease, angina, congestive heart failure, hardening of the arteries, thrombotic or embolic stroke, or myocardial infarction.

8. The method of claim 1, further comprising: examining an eye of the subject with an ophthalmologic procedure.

9. The method of claim 1, wherein the Vascular Associated Maculopathy causes decreased perfusion in the choriocapillaris lobules in the eye.

10. The method of claim 1, wherein the Vascular Associated Maculopathy causes partial or total closure of choriocapillaris lobules in the eye.

11. The method of claim 1, further comprising determining the ratio of the diameters of retinal arteries or veins, wherein a ratio of the diameters of retinal arteries (A) or veins (V) of about 0.60 to about 1.48 is predictive of the subject's risk for having or developing Vascular Associated Maculopathy.

12. A method for diagnosing a subject with Vascular Associated Maculopathy, comprising: in a sample obtained from the subject, determining the identity of one or more SNPs in the HTRA1, ARMS2, or CFH genes, wherein the one or more SNPs are (i) the rs11200638 in the HTRA1 gene, rs1049331 in the HTRA1 gene, rs2672587 in the HTRA1 gene, rs10490924 in the ARMS2 gene, rs3750848 in the ARMS2 gene, rs1061170 in the CFH gene, or rs800292 in the CFH gene, or (ii) a SNP in linkage disequilibrium with the SNPs of (i), thereby diagnosing the subject based on the presence of the one or more variants of the SNPs in (i) or (ii).

13. The method of claim 12, wherein an A at the rs11200638 SNP, a T at the rs1049331 SNP, a G at the rs2672587 SNP, a T at the rs10490924 SNP, a G at the rs3750848 SNP, a C at the rs1061170 SNP, or a G at the rs800292 SNP diagnoses the subject with Vascular Associated Maculopathy.

14. The method of claim 12, wherein a G at the rs11200638 SNP, a C at the rs1049331 SNP, a C at the rs2672587 SNP, a G at the rs10490924 SNP, a T at the rs3750848 SNP, a T at the rs1061170 SNP, or an A at the rs800292 SNP diagnoses the subject without Vascular Associated Maculopathy.

15. The method of claim 14, wherein the Vascular Associated Maculopathy further comprises one or more symptoms associated with Vascular Associated Maculopathy, wherein the one or more symptoms of Vascular Associated Maculopathy is macular degeneration, age-related macular degeneration, cardiac microvascular disease, Stargardt's, Pseudoxanthoma Elasticum (PXE), Alagille syndrome, subcortical leukoencephalopathy, preeclampsia, hypertension, diabetes mellitus, myocardial ischemia, aneurysms, vasculitis due to autoimmune disease or infectious agents, deep vein thrombosis, lymphedema, varicose veins, peripheral artery disease, renal artery disease, Raynaud's disease, Buerger's disease, peripheral venous disease, venous blood clots, atherosclerosis, arteriosclerosis, arteriolar sclerosis, coronary artery disease, angina, congestive heart failure, hardening of the arteries, thrombotic or embolic stroke, or myocardial infarction.

16. The method of claim 12, wherein the Vascular Associated Maculopathy causes decreased perfusion in the choriocapillaris lobules in the eye.

17. The method of claim 12, wherein the Vascular Associated Maculopathy causes partial or total closure of choriocapillaris lobules in the eye.

18. The method of claim 12, further comprising determining the ratio of the diameters of retinal arteries or veins, wherein a ratio of the diameters of retinal arteries (A) or veins (V) of about 0.60 to about 1.48 diagnoses the subject with Vascular Associated Maculopathy.

19. A method for predicting a subject's risk for having or developing severe maculopathy or last stage maculopathy in a human subject, comprising: determining in the subject the identity of one or more SNPs in the HTRA1, ARMS2, or CFH genes, wherein the one or more SNPs are (i) the rs11200638 in the HTRA1 gene, rs1049331 in the HTRA1 gene, rs2672587 in the HTRA1 gene, rs10490924 in the ARMS2 gene, rs3750848 in the ARMS2 gene, rs1061170 in the CFH gene, or rs800292 in the CFH gene, or (ii) a SNP in linkage disequilibrium with the SNPs of (i), wherein the presence of one or more of the SNPs is predictive of the subject's risk for having or developing having or developing severe maculopathy or last stage maculopathy.

20 . The method of claim 19, wherein an A at the rs11200638 SNP, a T at the rs1049331 SNP, a G at the rs2672587 SNP, a T at the rs10490924 SNP, a G at the rs3750848 SNP, a C at the rs1061170 SNP, or a G at the rs800292 SNP is predictive of the subject's risk for having or developing severe maculopathy or last stage maculopathy.

21 . The method of claim 20, wherein an A at the rs11200638 SNP, a T at the rs1049331 SNP, a G at the rs2672587 SNP, a T at the rs10490924 SNP, a G at the rs3750848 SNP, a C at the rs1061170 SNP, or a G at the rs800292 SNP is predictive of the subject's increased risk for having or developing severe maculopathy or last stage maculopathy

22 . The method of claim 19, wherein a G at the rs11200638 SNP, a C at the rs1049331 SNP, a C at the rs2672587 SNP, a G at the rs10490924 SNP, a T at the rs3750848 SNP, a T at the rs1061170 SNP, or an A at the rs800292 SNP is predictive of the subject's risk for having or developing severe maculopathy or last stage maculopathy.

23 . The method of claim 22, wherein a G at the rs11200638 SNP, a C at the rs1049331 SNP, a C at the rs2672587 SNP, a G at the rs10490924 SNP, a T at the rs3750848 SNP, a T at the rs1061170 SNP, or an A at the rs800292 SNP is predictive of the subject's decreased risk for having or developing severe maculopathy or last stage maculopathy.

24 . The method of claim 19, further comprising: from an image of an eye of the subject, detecting the presence of aberrant choriocapillaris lobules in the eye of the subject, wherein the presence of aberrant choriocapillaris lobules in the eye of the subject is predictive of the subject's risk for having or developing severe maculopathy or last stage maculopathy.

25 . The method of claim 19, further comprising: examining an eye of the subject with an ophthalmologic procedure.

26 . The method of claim 19, wherein the severe maculopathy or last stage maculopathy causes decreased perfusion in the choriocapillaris lobules in the eye.

27 . The method of claim 19, wherein the severe maculopathy or last stage maculopathy causes partial or total closure of choriocapillaris lobules in the eye.

28 . The method of claim 19, further comprising determining the ratio of the diameters of retinal arteries or veins, wherein a ratio of the diameters of retinal arteries (A) or veins (V) of about 0.60 to about 1.48 is predictive of the subject's risk for having or developing severe maculopathy or last stage maculopathy.

29 . A method for diagnosing a subject with severe maculopathy or last stage maculopathy, comprising: in a sample obtained from the subject, determining the identity of one or more SNPs in the HTRA1, ARMS2, or CFH genes, wherein the one or more SNPs are (i) the rs11200638 in the HTRA1 gene, rs1049331 in the HTRA1 gene, rs2672587 in the HTRA1 gene, rs10490924 in the ARMS2 gene, rs3750848 in the ARMS2 gene, rs1061170 in the CFH gene, or rs800292 in the CFH gene, or (ii) a SNP in linkage disequilibrium with the SNPs of (i), thereby diagnosing the subject based on the presence of the one or more SNPs in (i) or (ii).

30 . The method of claim 29, wherein an A at the rs11200638 SNP, a T at the rs1049331 SNP, a G at the rs2672587 SNP, a T at the rs10490924 SNP, a G at the rs3750848 SNP, a C at the rs1061170 SNP, or a G at the rs800292 SNP diagnoses the subject with severe maculopathy or last stage maculopathy.

31 . The method of claim 29, wherein a G at the rs11200638 SNP, a C at the rs1049331 SNP, a C at the rs2672587 SNP, a G at the rs10490924 SNP, a T at the rs3750848 SNP, a T at the rs1061170 SNP, or an A at the rs800292 SNP diagnoses the subject without severe maculopathy or last stage maculopathy.

32 . The method of claim 29, wherein the severe maculopathy or last stage maculopathy causes decreased perfusion in the choriocapillaris lobules in the eye.

33 . The method of claim 29, wherein the severe maculopathy or last stage maculopathy causes partial or total closure of choriocapillaris lobules in the eye.

34 . The method of claim 29, further comprising determining the ratio of the diameters of retinal arteries or veins, wherein a ratio of the diameters of retinal arteries (A) or veins (V) of about 0.60 to about 1.48 diagnoses the subject with severe maculopathy or last stage maculopathy.