

References - Pathogenic Mechanisms

1. Gariano RF, Gardner TW. Retinal angiogenesis in development and disease. *Nature* 2005;438:960-6.
2. Cunha-Vaz JG. The blood-retinal barriers system. Basic concepts and clinical evaluation. *Exp Eye Res* 2004;78:715-21.
3. Rizzolo LJ. Development and role of tight junctions in the retinal pigment epithelium. *Int Rev Cytol* 2007;258:195-234.
4. Friedman E, Ts'o MO. The retinal pigment epithelium. II. Histologic changes associated with age. *Arch Ophthalmol* 1968;79:315-20.
5. Gass JDM. Stereoscopic atlas of macular diseases: diagnosis and treatment, 4th ed. St. Louis: Mosby, 1997.
6. de Jong PT. Age-related macular degeneration. *N Engl J Med* 2006;355:1474-85.
7. Saint-Geniez M, Maharaj AS, Walshe TE, et al. Endogenous VEGF is required for visual function: evidence for a survival role on müller cells and photoreceptors. *PLoS ONE* 2008;3:e3554.
8. Jaeger EA, Anderson DR, Glaser JS, et al. Duane's ophthalmology on CD-ROM, 2006 ed. Philadelphia: Lippincott Williams & Wilkins, 2006:1 computer optical disc.
9. Huang JD, Presley JB, Chimento MF, Curcio CA, Johnson M. Age-related changes in human macular Bruch's membrane as seen by quick-freeze/deep-etch. *Exp Eye Res* 2007;85:202-18.
10. Hayreh SS. Segmental nature of the choroidal vasculature. *Br J Ophthalmol* 1975;59:631-48.
11. Ramrattan RS, van der Schaft TL, Mooy CM, de Brujin WC, Mulder PG, de Jong PT. Morphometric analysis of Bruch's membrane, the choriocapillaris, and the choroid in aging. *Invest Ophthalmol Vis Sci* 1994;35:2857-64.
12. Grossniklaus HE, Nickerson JM, Edelhauser HF, Bergman LAMK, Berglin L. Anatomic alterations in aging and age-related diseases of the eye. *Invest Ophthalmol Vis Sci* 2013;54:ORSF23-7.
13. Ambati J, Atkinson JP, Gelfand BD. Immunology of age-related macular degeneration. *Nat Rev Immunol* 2013;13(6): 438-451.

14. Starita C, Hussain AA, Pagliarini S, Marshall J. Hydrodynamics of ageing Bruch's membrane: implications for macular disease. *Exp Eye Res* 1996;62:565-72.
15. Gilmore AP. Anoikis. *Cell Death Differ* 2005;12(Suppl 2):1473-7.
16. Penfold PL, Liew SC, Madigan MC, Provis JM. Modulation of major histocompatibility complex class II expression in retinas with age-related macular degeneration. *Invest Ophthalmol Vis Sci* 1997;38:2125-33.
17. Guymer RH, Bird AC, Hageman GS. Cytoarchitecture of choroidal capillary endothelial cells. *Invest Ophthalmol Vis Sci* 2004;45:1660-6.
18. Feeney-Burns L, Burns RP, Gao CL. Age-related macular changes in humans over 90 years old. *Am J Ophthalmol* 1990;109:265-78.
19. Feeney-Burns L, Hilderbrand ES, Eldridge S. Aging human RPE: morphometric analysis of macular, equatorial, and peripheral cells. *Invest Ophthalmol Vis Sci* 1984;25:195-200.
20. Feeney L. Lipofuscin and melanin of human retinal pigment epithelium. Fluorescence, enzyme cytochemical, and ultrastructural studies. *Invest Ophthalmol Vis Sci* 1978;17:583-600.
21. Sparrow JR, Boulton M. RPE lipofuscin and its role in retinal pathobiology. *Exp Eye Res* 2005;80:595-606.
22. Coleman HR, Chan CC, Ferris FL, 3rd, Chew EY. Age-related macular degeneration. *Lancet* 2008;372:1835-45.
23. Tabandeh H, Dubovy S, Green WR. Bilateral midperipheral large drusen and retinal pigment epithelial detachments associated with multifocal areas of choroidal neovascularization: a histopathologic study. *Retina* 2006;26:1063-9.
24. Sarks S, Cherepanoff S, Killingsworth M, Sarks J. Relationship of Basal laminar deposit and membranous debris to the clinical presentation of early age-related macular degeneration. *Invest Ophthalmol Vis Sci* 2007;48:968-77.
25. Van der Schaft TL, Mooy CM, de Brujin WC, Oron FG, Mulder PG, de Jong PT. Histologic features of the early stages of age-related macular degeneration. A statistical analysis. *Ophthalmology* 1992;99:278-86.
26. Curcio CA, Millican CL. Basal linear deposit and large drusen are specific for early age-related maculopathy. *Arch Ophthalmol* 1999;117:329-39.
27. Ding X, Patel M, Chan CC. Molecular pathology of age-related macular degeneration. *Prog Retin Eye Res* 2009;28:1-18.

28. Hageman GS, Luthert PJ, Victor Chong NH, Johnson LV, Anderson DH, Mullins RF. An integrated hypothesis that considers drusen as biomarkers of immune-mediated processes at the RPE-Bruch's membrane interface in aging and age-related macular degeneration. *Prog Retin Eye Res* 2001;20:705-32.
29. Crabb JW, Miyagi M, Gu X, et al. Drusen proteome analysis: an approach to the etiology of age-related macular degeneration. *Proc Natl Acad Sci U S A* 2002;99:14682-7.
30. Umeda S, Suzuki MT, Okamoto H, et al. Molecular composition of drusen and possible involvement of anti-retinal autoimmunity in two different forms of macular degeneration in cynomolgus monkey (*Macaca fascicularis*). *FASEB J* 2005;19:1683-5.
31. Wang J, Ohno-Matsui K, Yoshida T, et al. Amyloid-beta up-regulates complement factor B in retinal pigment epithelial cells through cytokines released from recruited macrophages/microglia: Another mechanism of complement activation in age-related macular degeneration. *J Cell Physiol* 2009;220:119-28.
32. Gass JD. Pathogenesis of disciform detachment of the neuroepithelium. *Am J Ophthalmol* 1967;63:Suppl:1-139.
33. Bird AC, Bressler NM, Bressler SB, et al. An international classification and grading system for age-related maculopathy and age-related macular degeneration. The International ARM Epidemiological Study Group. *Surv Ophthalmol* 1995;39:367-74.
34. Klein R, Klein BE, Jensen SC, Meuer SM. The five-year incidence and progression of age-related maculopathy: the Beaver Dam Eye Study. *Ophthalmology* 1997;104:7-21.
35. Yannuzzi LA, Green WR, Guyer DR. The retina atlas. [St. Louis, MO]: Mosby, 1998.
36. Bressler NM, Silva JC, Bressler SB, Fine SL, Green WR. Clinicopathologic correlation of drusen and retinal pigment epithelial abnormalities in age-related macular degeneration. *Retina* 1994;14:130-42.
37. Sarks SH, Arnold JJ, Killingsworth MC, Sarks JP. Early drusen formation in the normal and aging eye and their relation to age related maculopathy: a clinicopathological study. *Br J Ophthalmol* 1999;83:358-68.
38. Gass JD. Drusen and disciform macular detachment and degeneration. *Arch Ophthalmol* 1973;90:206-17.
39. Bressler NM, Bressler SB, West SK, Fine SL, Taylor HR. The grading and prevalence of macular degeneration in Chesapeake Bay watermen. *Arch Ophthalmol* 1989;107:847-52.

40. Bressler SB, Maguire MG, Bressler NM, Fine SL. Relationship of drusen and abnormalities of the retinal pigment epithelium to the prognosis of neovascular macular degeneration. The Macular Photocoagulation Study Group. *Arch Ophthalmol* 1990;108:1442-7.
41. Whitcomb EA, Shang F, Taylor A. Common cell biologic and biochemical changes in aging and age-related diseases of the eye: toward new therapeutic approaches to age-related ocular diseases. *Invest Ophthalmol Vis Sci* 2013;54:ORSF31-ORSF36.
42. Bowes Rickman C, Farsiu S, Toth CA, Klingeborn M. Dry age- related macular degeneration: mechanisms, therapeutic targets, and imaging. *Invest Ophthalmol Vis Sci* 2013;54:ORSF68-ORSF80.
43. Zarbin M. Current Concepts in the Pathogenesis of Age-Related Macular Degeneration. *Arch Ophthalmol* 2004;122(4):598-614.
44. McLeod DS, Taomoto M, Otsuji T, Green WR, Sunness JS, Lutty GA. Quantifying changes in RPE and choroidal vasculature in eyes with age-related macular degeneration. *Invest Ophthalmol Vis Sci* 2002;43:1986-93.
45. Lutty G, Grunwald J, Majji AB, Uyama M, Yoneya S. Changes in choriocapillaris and retinal pigment epithelium in age-related macular degeneration. *Mol Vis* 1999;5:35.
46. Sarks JP, Sarks SH, Killingsworth MC. Morphology of early choroidal neovascularisation in age-related macular degeneration: correlation with activity. *Eye* 1997;11(Pt 4):515-22.
47. Grossniklaus HE, Green WR. Choroidal neovascularization. *Am J Ophthalmol* 2004;137:496-503.
48. Penfold PL, Madigan MC, Gillies MC, Provis JM. Immunological and aetiological aspects of macular degeneration. *Prog Retin Eye Res* 2001;20:385-414.
49. Anderson DH, Mullins RF, Hageman GS, Johnson LV. A role for local inflammation in the formation of drusen in the aging eye. *Am J Ophthalmol* 2002;134:411-31.
50. Chen J, Connor KM, Smith LE. Overstaying their welcome: defective CX3CR1 microglia eyed in macular degeneration. *J Clin Invest* 2007;117:2758-62.
51. Kim SY, Sadda S, Pearlman J, et al. Morphometric analysis of the macula in eyes with disciform age-related macular degeneration. *Retina* 2002;22:471-7.
52. Jalkh AE, Avila MP, Trempe CL, McMeel JW, Schepens CL. Choroidal neovascularization in fellow eyes of patients with advanced senile macular degeneration. Role of laser photocoagulation. *Arch Ophthalmol* 1983;101:1194-7.

53. Klein RJ, Zeiss C, Chew EY, et al. Complement factor H polymorphism in age-related macular degeneration. *Science* 2005;308:385-9.
54. Yang Z, Camp NJ, Sun H, et al. A variant of the HTTR1 gene increases susceptibility to age-related macular degeneration. *Science* 2006;314:992-3.
55. Allikmets R, Dean M. Bringing age-related macular degeneration into focus. *Nat Genet* 2008;40:820-1.

[View PDF](#)