
Age-related Macular Degeneration

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Editors

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Second Edition

 Springer

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Preface to the Second Edition

The diagnosis of age-related macular degeneration (AMD), particularly the exudative form, was dreaded by patients and doctors alike. This nearly always meant blindness for the patient as the doctor was helpless to intervene. Laser photocoagulation was an important development in therapy, but that treatment helped only a small minority of affected patients. Fortunately recent landmark developments in several interrelated fields have changed the outlook for patients with exudative AMD. Many patients now have visual acuity improvement or stabilization. There are still daunting tasks ahead however. Demographic trends and higher life expectancy mean the condition will become more prevalent in years to come. There are other aspects of AMD that threaten visual function and these are the subject of intensive research.

Knowledge of the subject has increased considerably since the first edition of this book. This has been primarily due to the intensification of broad-based, multidisciplinary research. Not only new methodological tools from areas such as molecular and cell biology, biochemistry, and molecular genetics have contributed to this status, but also further developments in the area of imaging and pharmacology. We are therefore optimistic that therapies for an ever increasing number of AMD patients will become available as a result of current and future developments in treatment.

The chapters in the 2nd edition have been fundamentally revised and relevant new developments and findings considered. In the field of pathogenetic factors a chapter has now been devoted to the role of the complement system in multifactorial, complex AMD. Furthermore, the role of imaging procedures including spectral-domain optical coherence tomography and fundus autofluorescence is addressed in detail. New therapeutic approaches based on deep insights into the underlying molecular mechanisms are examined both with respect to neovascular and progressive dry AMD.

A main objective of the book is to summarize clearly and understandably the current level of knowledge of pathogenesis, diagnostics and therapy of AMD and to point to the possibilities and limits presented by the therapeutic approaches. The bibliography is necessarily a selection from the considerably large number of publications of recent years.

We would like to thank the outstanding scientists and clinicians who have contributed their expertise to the various chapters. Our thanks also extend to our mentors, colleagues, patients and students for their diverse scientific and clinical suggestions. We thank the staff at the publishing company Springer for their professional and punctual realization of the book in the fast moving and expanding field of AMD.

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List of Abbreviations

ABCA1	ATP-binding cassette, subfamily A
AD	Alzheimer's disease
AGE	Advanced glycation end products
ALA	Alpha linoleic acid
AMD	Age-related macular degeneration
APC	Alternative pathway of complement
APOE	Apolipoprotein E
ARM	Age-related maculopathy
ARMS2	Age-related maculopathy susceptibility 2
BCEA	Bivariate contour ellipse calculated area
BCVA	Best corrected visual acuity
BLD	Basal laminar deposits
BM	Bruch's membrane
BMI	Body mass index
CC	Choriocapillaris
CCD	Charge-coupled device
CCTV	Closed circuit television system
CDCV	Common disease – common variant
CDRV	Common disease – rare variant
CEP	Carboxyethylpyrrole
CETP	Cholesteryl ester transfer protein
CFB	Complement factor B
CFH	Complement factor H
CFI	Complement factor I
CI	Confidence interval
CME	Cystoid macular edema
CNP	Copy number polymorphism
CNTF	Ciliary neurotrophic factor
CNV	Choroidal neovascularization
CR1	Complement receptor 1
CRP	C-reactive protein
CRT	Central retinal thickness
CSC	Central serous chorioretinopathy
cSLO	Confocal scanning laser ophthalmoscope
DA	Disc area
DAF	Decay-accelerating factor
DHA	Docosahexaenoic acid
ECM	Extracellular matrix

EDI-OCT	Enhanced depth imaging spectral-domain optical coherence tomography
EOG	Electro-oculogram
EPA	Eicosapentanoic acid
ESR	Erythrocyte sedimentation rate
F1	Factor 1
FAF	Fundus autofluorescence
FAZ	Foveolar avascular zone
FDA	Food and Drug Administration
FP	Fundus perimetry
FVPED	Fibrovascular pigment epithelial detachment
GA	Geographic atrophy
GCL	Ganglion cell layer
GWAS	Genome-wide association study
HDL-c	High-density lipoprotein cholesterol
HTRA1	High temperature requirement factor A1
ICG	Indocyanine green
ICAM	Intracellular adhesion molecules
IL6	Interleukin 6
IOP	Intraocular pressure
IPE	Iris pigment epithelium
IR	Infrared
IV	Inverse variance
IVB	Intravitreal bevacizumab
IVR	Intravitreal ranibizumab
IVTA	Intravitreal triamcinolone
LCPUFA	Long-chain polyunsaturated fatty acids
LDC	Linkage disequilibrium
LDL	Low density lipoprotein
LF	Lipofuscin
LIPC	Lipase C
LLUS	Late leakage of undetermined source
logMAR	Logarithm of the minimum angle of resolution
LPL	Lipoprotein lipase
LSC	Long spaced collagen
LVA	Low vision aid
MAC	Membrane attack complex
MAF	Minor allele frequency
MBL	Mannose-binding lectin
MCP	Membrane cofactor protein
MHC	Major histocompatibility complex
MMP	Matrix metalloproteinase
MPGN	Membranoproliferative glomerulonephritis
MPOD	Macular pigment optical density
NV-AMD	Neovascular age-related macular degeneration
OCT	Optical coherence tomography
OR	Odds ratio
ORCA	Occult retinal choroidal anastomosis

PAMP	Pathogen-associated molecular pattern
PAR	Population attributable risk
PATCH	Pigment epithelium-choroid-translocation
PCV	Polypoid choroidal vasculopathy
PD	Pupillary distance
PDGF	Platelet-derived growth factor
PDT	Photodynamic therapy
PE	Pigment epithelium
PED	Pigment epithelium detachment
PEDF	Pigment epithelium derived factor
PFCL	Perfluorocarbon liquid
PHP	Preferential hyperacuity perimeter
PLGF	Placental growth factor
PLEKHA1	Pleckstrin homology domain-containing protein family A member 1
PNH	Paroxysmal nocturnal hemoglobinuria
PON1	Paraoxonase 1 gene
POS	Photoreceptor outer segment
PRL	Preferred retinal locus
PRN	Pro re nata
PRR	Pattern recognition receptor
PSDDS	Posterior segment drug delivery system
PVR	Proliferative vitreoretinopathy
RAP	Retinal angiomatous proliferation
RBP	Retinol-binding protein
RCA	Regulators of complement activation
RCOphth	Royal College of Ophthalmologists
RCT	Randomized controlled trial
RF	Reduced fluence rate
RNFL	Retinal nerve fiber layer
ROS	Reactive oxygen species
RPE	Retinal pigment epithelium
RR	Relative risk
RTK	Receptor tyrosine kinases
rTPA	Recombinant tissue plasminogen activator
RVAC	Retinal vascular anomalous complexes
SD-OCT	Spectral domain optical coherence tomography
SF	Standard fluence rate
SLD	Superluminescent diodes
SLO	Scanning laser ophthalmoscope
SNP	Single nucleotide polymorphism
SOD2	Superoxide Dismutase 2
Sr-90	Strontium-90
SS-OCT	Swept source optical coherence tomography
TD-OCT	Time domain optical coherence tomography
TIMP	Tissue inhibitor of metalloproteinases
TLR	Toll-like receptor
TP-H	TEMPOL-H

UTR	Untranslated region
VA	Visual acuity
VCM	Visual cycle modulators
VEGF	Vascular endothelial growth factor
VPDT	Verteporfin photodynamic therapy
WVC	White cell count