RETINAL DEGENERATIVE DISEASES

Edited by Joe G. Hollyfield, Robert E. Anderson, and Matthew M. LaVail
RETINAL DEGENERATIVE DISEASES
ADVANCES IN EXPERIMENTAL MEDICINE AND BIOLOGY

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This book is dedicated to Paul A. Sieving, M.D., Ph.D., in recognition of his dedication to the advancement of basic and clinical sciences focused on understanding the causes, treatment and elimination of blinding diseases; and for his leadership as Director of the National Eye Institute, National Institutes of Health, Bethesda, Maryland.
A Symposium on Retinal Degenerations has been held in conjunction with the biennial International Congress of Eye Research (ICER) since 1984. These Retinal Degeneration Symposia have allowed scientists and clinicians from around the world to convene and present their new research findings. The Symposia have been organized to allow sufficient time for discussions and one-on-one interactions in a relaxed atmosphere, where international friendships and collaborations would be fostered.

The XI International Symposium on Retinal Degeneration (also known as RD2004) was held from August 23-28, 2004 in Perth, Western Australia. The meeting brought together 151 scientists, retinal specialists in ophthalmology and trainees in the field from all parts of the world. In the course of the meeting, 36 platform and 80 poster presentations were given, and a majority of these are presented in this proceedings volume. New discoveries and state of the art findings from most research areas in the field of retinal degenerations were presented. The RD2004 meeting was highlighted by three special lectures. The first was given by Dr. Paul Sieving, Director of the National Eye Institute, National Institutes of Health, Bethesda, Maryland, USA. Dr. Sieving discussed the evolution of understanding ocular diseases. The second lecture by Professor Ian Constable, Director of the Lions Eye Institute, Nedlands, Western Australia, covered clinical imperatives in retinal degeneration research. The third was by Professor Thaddeus Dryja, Harvard Medical School, Boston, Massachusetts, USA, who discussed the progress to date on understanding the etiology of RP and allied diseases.

We want to give special acknowledgement to the local organizers of the Symposium, Drs. Elizabeth P. Rakoczy, Sasha Pendar and Brian King from Perth. Mrs. Stacey Scaffardi, Administrative Assistant to Professor Rakoczy, worked tirelessly for months preparing an extraordinarily smooth meeting, a wonderful social program and excursion. We also thank the staff of the Burswood International Resort Hotel, the venue of the meeting, for all their help.

The Symposium received international financial support from a number of organizations. We are particularly pleased to thank The Foundation Fighting Blindness, Owings Mills, Maryland, for its continuing support of this and the previous biennial Symposia, without which we could not have held these important meetings. In addition, for the second time, the National Eye Institute of the National Institutes of Health contributed to the
meeting. This additional funding allowed us to provide 20 Travel Awards to young investigators and trainees working in the field of retinal degenerations. The Foundation Fighting Blindness also contributed to the Travel Awards program providing 14 Travel Awards. The response to the Travel Awards program was extraordinary, with 74 applicants competed for the 34 Awards.

We also acknowledge the diligent and outstanding efforts of Ms. Holly Whiteside, who carried out most of the administrative aspects of the RD2004 Symposium, designed and maintained the meeting website. Holly is the Administrative Manager of Dr. Anderson’s laboratory at the Oklahoma Health Sciences Center, and she has become the permanent Coordinator for the Retinal Degeneration Symposia. Her dedicated efforts with the Symposia since RD2000 have provided continuity heretofore not available, and we are deeply indebted to her.

We thank Ms. Laura Hogan, Administrative Assistant in Dr. Hollyfield’s program in the Cole Eye Institute at The Cleveland Clinic Foundation, for her help in assembling this volume. Thanks also go to Springer Science+Business Media for its publication.

Joe G. Hollyfield
Robert E. Anderson
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Cleveland, Ohio
April 2005
Joe G. Hollyfield, Ph.D., is Director of Ophthalmic Research and Professor of Molecular Medicine in the Cole Eye Institute at The Cleveland Clinic Foundation, Cleveland, Ohio. He received a Ph.D. from the University of Texas at Austin and was a postdoctoral fellow at the Hubrecht Laboratory in Utrecht, The Netherlands. He has held faculty positions at Columbia University College of Physicians and Surgeons in New York City and at Baylor College of Medicine in Houston, TX. He was Director of the Retinitis Pigmentosa Research Center while in Houston from 1978 until his move to The Cleveland Clinic Foundation in 1995. He is currently Director of the Foundation Fighting Blindness Research Center at The Cleveland Clinic Foundation. Dr. Hollyfield has published over 170 papers in the area of cell and developmental biology of the retina in health and disease. He has edited twelve books, eleven on retinal degenerations and one on the structure of the eye. Dr. Hollyfield received the Marjorie W. Margolin Prize (1981, 1994), the Sam and Bertha Brochstein Award (1985) and the Award of Merit in Retina Research (1998) from the Retina Research Foundation; the Olga Keith Wiess Distinguished Scholars’ Award (1981), two Senior Scientific Investigator Awards (1988, 1994) from Research to Prevent Blindness; an award for Outstanding Contributions to Vision Research from the Alcon Research Institute (1987); the Distinguished Alumnus Award (1991) from Hendrix College, Conway, Arkansas; and the Endre A. Balazs Prize (1994) from the International Society for Eye Research (ISER). He is currently Editor-in-Chief of the journal, Experimental Eye Research published by Elsevier Press. Dr. Hollyfield has held elected leadership roles in the Association for Research in Vision and Ophthalmology (ARVO) serving on the Program Committee, as a Trustee representing Retina Cell Biology, and as President. He is also a past President and former Secretary of the International Society of Eye Research. He currently serves on the Scientific Advisory Boards of The Foundation Fighting Blindness, Research to Prevent Blindness, The Helen Keller Eye Research Foundation, The Knights Templar Eye Foundation, the Macular Degeneration program of the American Health Assistance Foundation, Retina South Africa Fighting Blindness, and is Co-Chairman of the Medical and Scientific Advisory Board of Retina International.

Robert E. Anderson, M.D., Ph.D., is Professor and Chair of Cell Biology, Dean A. McGee Professor of Ophthalmology, and Adjunct Professor of Biochemistry & Molecular Biology and Geriatric Medicine at The University of Oklahoma Health Sciences Center in
Oklahoma City, Oklahoma. He is also Director of Research at the Dean A. McGee Eye Institute. He received his Ph.D. in Biochemistry (1968) from Texas A&M University and his M.D. from Baylor College of Medicine in 1975. In 1968, he was a postdoctoral fellow at Oak Ridge Associated Universities. At Baylor, he was appointed Assistant Professor in 1969, Associate Professor in 1976, and Professor in 1981. He joined the faculty of the University of Oklahoma in January of 1995. Dr. Anderson has published over 200 research articles in the areas of lipid metabolism in the retina and biochemistry of retinal degenerations. He has edited twelve books, eleven on retinal degenerations and one on the biochemistry of the eye. Dr. Anderson has received the Sam and Bertha Brochstein Award for Outstanding Achievement in Retina Research from the Retina Research Foundation (1980), the Dolly Green Award (1982) and two Senior Scientific Investigator Awards (1990 and 1997) from Research to Prevent Blindness, Inc. He received an Award for Outstanding Contributions to Vision Research from the Alcon Research Institute (1985), and the Marjorie Margolin Prize (1994). He has served on the editorial boards of Investigative Ophthalmology and Visual Science, Journal of Neuroscience Research, Neurochemistry International, Current Eye Research and Experimental Eye Research. Dr. Anderson has been involved in leadership roles in the Association for Research in Vision and Ophthalmology (ARVO) and is a former trustee representing the Biochemistry and Molecular Biology section. He has served on the Vision Research Program Committee and Board of Scientific Counselors of the National Eye Institute and the Board of the Basic and Clinical Science Series of The American Academy of Ophthalmology. Currently he is a member of the Macular Degeneration grant review panel of the American Health Assistance Foundation. Dr. Anderson is currently the President of the International Society for Eye Research and has served as a past Councilor and Treasurer of this society.

Matthew M. LaVail, Ph.D., is Professor of Anatomy and Ophthalmology at the Beckman Vision Center of the University of California, San Francisco School of Medicine. He received his Ph.D. degree in Anatomy (1969) from the University of Texas Medical Branch in Galveston and was subsequently a postdoctoral fellow at Harvard Medical School. Dr. LaVail was appointed Assistant Professor of Neurology-Neuropathology at Harvard Medical School in 1973. In 1976, he moved to UCSF, where he was appointed Associate Professor of Anatomy. He was appointed to his current position in 1982, and in 1988, he also became director of the Retinitis Pigmentosa Research Center at UCSF, later named the Kearn Family Center for the Study of Retinal Degeneration. Dr. LaVail has published extensively in the research areas of photoreceptor-retinal pigment epithelial cell interactions, retinal development, circadian events in the retina, genetics of pigmentation and ocular abnormalities, inherited retinal degenerations, light-induced retinal degeneration, and pharmaceutical and gene therapy for retinal degenerative diseases. He has identified several naturally occurring murine models of human retinal degenerations and has developed transgenic mouse and rat models of others. He is the author of more than 140 research publications and has edited eleven books on inherited and environmentally induced retinal degenerations. Dr. LaVail has received the Fight for Sight Citation (1976); the Sundial Award from the Retina Foundation (1976); the Friedenwald Award from the Association for Research in Vision and Ophthalmology (ARVO, 1981); two Senior Scientific Investigators Awards from Research to Prevent Blindness (1988 and 1998); a MERIT Award from the National Eye Institute (1989); an Award for Outstanding Contributions to Vision Research from the Alcon Research Institute (1990); the Award of Merit from the Retina Research Foundation (1990); the first John A. Moran Prize for Vision Research from the University of Utah (1997); and the first Trustee
Award from The Foundation Fighting Blindness (1998). He has served on the editorial board of *Investigative Ophthalmology and Visual Science* and is currently on the editorial board of *Experimental Eye Research*. Dr. LaVail has been an active participant in the program committee of ARVO and has served as a Trustee (Retinal Cell Biology Section) of ARVO. He has been a member of the program committee and a Vice President of the International Society for Eye research. He has also served on the Scientific Advisory Board of the Foundation Fighting Blindness since 1973.
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