

# CURRICULUM VITAE

## PERSONAL DATA

- Name: Anand Swaroop
- Citizenship
- Email address

## EDUCATION

- 1973–75 B.Sc. (Chemistry, Zoology, Botany). Meerut University, India.  
1975–77 M.Sc. (Biochemistry; mentor: Prof. UK Misra). G.B. Pant University, India.  
1977–82 Ph.D. (Biochemistry; mentor: Prof. T Ramasarma). Indian Institute of Science, Bangalore, India.

## POSTDOCTORAL TRAINING

- 1982–1986 Post-doctoral Associate, Department of Molecular Biophysics & Biochemistry, Yale University, New Haven, CT (Laboratory of Prof. Alan Garen).  
1986–1987 Associate Research Scientist, Department of Human Genetics, Yale University School of Medicine, New Haven, CT (Laboratory of Prof. Uta Francke).  
1987–1988 NRSA Post-doctoral Fellow, Department of Human Genetics, Yale University School of Medicine, New Haven, CT (Laboratory of Prof. Sherman M. Weissman).  
1988–1990 Associate Research Scientist, Department of Human Genetics, Yale University School of Medicine, New Haven, CT (Laboratory of Prof. Sherman M. Weissman).

## PROFESSIONAL DEVELOPMENT

- 07–12/2000 Scientist (on sabbatical), Department of Genetics, Salk Institute, La Jolla, CA (Laboratory of Prof. Fred H. Gage).  
10-12/2010 NIH Senior Leadership Program, University of Maryland, College Park, MD.

## ACADEMIC/PROFESSIONAL APPOINTMENTS

- 1990–1996 Assistant Professor, Department of Ophthalmology, University of Michigan, Ann Arbor, MI.  
1990–1998 Assistant Professor, Department of Human Genetics, University of Michigan, Ann Arbor, MI.  
1990–1994 Co-Director, Library Core, Michigan Human Genome Center.  
1991–2007 Faculty Member, Graduate Program in Cellular & Molecular Biology.  
1992–1998 Member, University of Michigan Cancer Center.  
1996–2000 Associate Professor, Department of Ophthalmology, University of Michigan, Ann Arbor, MI.  
1996–2007 Faculty Member, Neuroscience Graduate Program.  
1997–2007 Faculty Member, Center for Organogenesis.  
1998–2002 Associate Professor, Department of Human Genetics, University of Michigan, Ann Arbor, MI.

2000–2007 Professor, Department of Ophthalmology & Visual Sciences, University of Michigan, Ann Arbor, MI.

2000–2007 Director, Sensory Gene Microarray Node, Kellogg Eye Center

2001–2007 Coordinator/Director, Center for Retinal and Macular Degeneration, Kellogg Eye Center, UM-Medical School

2002–2007 Professor, Department of Human Genetics, University of Michigan, Ann Arbor

2003–2007 Harold F. Falls Collegiate Professor of Ophthalmology & Visual Sciences

2006–2007 Member, Center for Computational Medicine and Biology, University of Michigan

Sept 2007 – Senior Investigator and Chief, Neurobiology-Neurodegeneration & Repair Laboratory (N-NRL), National Eye Institute, National Institutes of Health, Bethesda, MD.

Sept 2007 – Principle Investigator (joint appointment), National Institute of Neurological Disease & Stroke.

July 2014 –

June 2017 Clinical Professor (part-time), Institute of Biomedical Sciences, The George Washington University, Washington, D.C.

April 2015 – Distinguished Medical Scientist (visiting), Prof. P.N. Chhuttani Chair, Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh, India.

## SCIENTIFIC ACTIVITIES

- Currently Reviewer of manuscripts for IOVS, NEJM, JCI, Cell, Cell Stem Cell, PLoS Genetics, PLoS Biology, Neuron, Science, PNAS, Nature Reviews, Nature Genetics, Nature Medicine, Stem Cell, AJHG, HMG, JBC, J Neurosci, Human Mutation and others.
- Guest Editor, August 2013 Special Issue on Vision and Novel Therapeutics, *Clinical Genetics*, Wiley.
- Guest Editor: *PNAS*, *PLoS Genetics*
- Editorial Board, *PLoS One*, 2012– .
- Editorial Review Board, *Cilia*, 2011– .
- Editorial Review Board, *Molecular Vision*, 1995– .
- Executive Editor, *Annals of Neurosciences*, 2009–2015.
- Editorial Board, *Investigative Ophthalmology & Visual Science*. June 2002–December 2007.
- Reviewed manuscripts for journals, including Atherosclerosis, Annals of Human Genetics, Archives of Ophthalmology, BioTechniques, Brain Research, Current Eye Research, Cytogenetics and Cell Genetics, Development Genes and Evolution, European Journal of Human Genetics, Experimental Eye Research, Gene, Genes and Immunity, Genome Research, Genetics, Genomics, Human Genetics, JMB, Journal of Medical Genetics, Journal of Neurochemistry, Mammalian Genome, Mechanisms of Development, Molecular and Cellular Biochemistry, Neurobiology of Disease, Nucleic Acids Research, Ophthalmic Genetics, Vision Research, Nature Biotechnology, Genome Biology, MCB, MCP, BMC journals, J Cell Sci..
- Regular Member, BDPE study section (Biology and Diseases of the Posterior Eye) (formerly Visual Sciences C). February 2003– June 2005.
- Member, NEI special study section ZEY1 VSN (01), July 2006.
- Director, “International Resource for X-Linked Retinitis Pigmentosa,” supported by The Foundation Fighting Blindness, Baltimore, MD.
- Principal Investigator, Kellogg Eye Center Shared Genetics, Cell and Molecular Biology Facility, 1995–2002.

- Grants Reviewer for The Wellcome Trust, London, U.K. Since 1997–2005.
- Grants Reviewer for Comitato Promotore Telethon, Roma, Italy. Since 1997–
- Grants Reviewer for The Foundation Fighting Blindness, Hunt Valley, MD. Since 1997–
- Member (ad hoc), NIH Visual Sciences C Study Section, February 1998.
- Member, The Genetics Committee, The Foundation Fighting Blindness, Hunt Valley, MD. 1998–2007.
- Invited faculty, CME course at Johns Hopkins University Medical Institutions, Baltimore, MD. Symposium on "Pathogenesis and Treatment of Age-Related Macular Degeneration". June 4–6, 1998.
- Guest Editorial Board Member, *Investigative Ophthalmology & Visual Science*. 1998–2002.
- Organizer, Special Interest Group (SIG) meeting at the 1999 ARVO on "Retinal Degenerations: After the Gene Cloning". May 13, 1999.
- Planning Committee member and Co-Chair, IIIrd International Symposium in Organogenesis, University of Michigan. May 2000.
- Member, The Foundation Fighting Blindness Site Visit Committee to review the RP Center at the Jules Stein Eye Institute at UCLA. November 1999.
- Grants reviewer for The South Africa Retinitis Pigmentosa Foundation. 1999–2000.
- Grants reviewer for The Medical Research Council of Canada. Since 1999–2000.
- Grants Reviewer for the Canadian Foundation Fighting Blindness. Since 2000–2001.
- Invited participant at the Retinal Genetics Workshop organized by Foundation Fighting Blindness, Hunt Valley, MD. June 1–3, 2000.
- Session Chairman and Speaker, Fifth Annual Vision Research Conference on "Animal models of retinal degeneration: new approaches and applications." Fort Lauderdale, FL, April 27–28, 2001.
- Session Chairman and Speaker, FASEB summer research conference "The Biology and Chemistry of Vision." Tucson, AR, June 23–28, 2001.
- Ad-hoc member, National Eye Institute Board of Scientific Counselors (BSC). June 2001.
- Grants Review Committee, Juvenile Diabetes Research Foundation. July 2001.
- Chair, Grants Review Committee, Juvenile Diabetes Research Foundation. October 2001.
- Ad-hoc member, Visual Sciences C study section. October 2001.
- Loris and David Rich Lecture, University of Alabama at Birmingham, Birmingham, AL. December 2001.
- Ad-hoc Member, Visual Sciences C study section. February 2002.
- Planning Committee member, Vth International Symposium in Organogenesis, University of Michigan. May 2003.
- Director, Microarray Module, Vision Core Facilities, Kellogg Eye Center. May 2002–
- Invited speaker at the Gordon Conference on "Visual System Development." June 2002.
- Ad-hoc Member, Visual Sciences C study section. June 2002.
- Invited speaker at Treatment Strategies for Retinal Degeneration symposium in Lund, Sweden. September 2002.
- Invited Speaker at EVER symposium, Alicante, Spain. October 2002.
- Invited Speaker and Co-Chair of session at ICER, Geneva, Switzerland. October 2002.
- Invited Speaker, Novartis-FFB Symposium, Baltimore. October 2002.
- Ad-hoc Member, Visual Sciences C study section. October 2002.
- Member, National Scientific Advisory Council, American Federation for Aging Research, 2003.
- Member, Liaison Committee for the Foundation Fighting Blindness Pathophysiology Facility. 2003–2007.

- Reviewer for MacArthur Fellowship.
- Grants Reviewer for Medical Research Council, U.K., 2005–2010.
- Ph.D. thesis external examiner for Maya Shrinivas, graduate student of Dr. Douglas Forrest, Department of Human Genetics, Mount Sinai Medical School, New York, NY. April 6, 2005.
- Panel Discussion on Age-related Macular Degeneration, Association for Research in Vision and Ophthalmology (ARVO) Symposium, April 30, 2005.
- Panel Discussion on Age-related Macular Degeneration, Association for Research in Vision and Ophthalmology (ARVO) Symposium, April 29, 2006.
- Session moderator for "Genetic Risk Factors" at the ARVO Summer Eye Research Conference on "Towards the Prevention of Age-related Macular Degeneration." July 2006.
- Grants Reviewer, National Science Foundation, 2006.
- Organizer/moderator, session on "Photoreceptor Transcriptional Regulation," XVII International Congress of Eye Research, Buenos Aires, Argentina. October 30, 2006.
- Member, Stem Cell Biology Group, The Foundation Fighting Blindness. 2006 – 2007.
- Member, Genetics Advisory Committee, Age – Related Eye Disease Study 2 (ARED2), National Eye Institute. 2006 – 2007.
- Member, National Scientific Advisory Council, American Federation for Aging Research, 2007.
- Organizer, session moderator, 11<sup>th</sup> Annual Vision Research Conference on Retinal Degeneration and Gene Therapy. Fort Lauderdale, FL. May 4-5, 2007.
- Grants Reviewer for The Wellcome Trust, London, U.K. 2007
- System Biology Grants reviewer for ANR-BBSRC, UK. 2007.
- Organizer and/or moderator of three sessions at ARVO 2008.
- Evaluation of investigators for appointments and promotions – multiple institutions. 2005, 2006, 2007, 2008, 2009, 2010, 2011
- Moderator, Stem Cell Biology Press Conference at Society of Neuroscience 2008 meeting.
- Arnold and Mabel Beckman Conference on Atrophic Macular Degeneration, Backman Center of the National Academies of Sciences and Engineering, Irvine, CA. January 23-25, 2009.
- Member, Review Committee for HHMI-NIH Research Scholars Program, March 13, 2009.
- Reviewer for Israel Science Foundation, 2009.
- Arnold and Mabel Beckman Conference on Atrophic Macular Degeneration, Backman Center of the National Academies of Sciences and Engineering, Irvine, CA. January 28-30, 2010.
- Reviewer for Austrian Science Fund, Vienna, 2010.
- Member, Review Panel for Emerging Team Grants, Canadian Institute of Health Research, Ottawa, Canada. 2010.
- Reviewer, International Retina Research Foundation Grants, 2010.
- Discussion Leader, Glaucoma genetics session, Catalyst meeting sponsored by Glaucoma Research Foundation, San Francisco, CA. September 9-11, 2010.
- Reviewer, Wellcome Trust, UK. 2010.
- Founding lead member, AMD Gene Consortium for the meta-analysis of AMD-GWAS. 2010-2013.
- Arnold and Mabel Beckman Conference on Atrophic Macular Degeneration, Backman Center of the National Academies of Sciences and Engineering, Irvine, CA. January 23-25, 2009. January 20-23, 2011.
- Reviewer, Austrian Science Fund. 2011.
- Reviewer, Israel Science Foundation. 2011.



- Reviewer, Blanc SVSE 1 program, ANR / French National Research Agency, France. 2011.
- Presenter and participant at two sessions of the VISIONS 2011 meeting organized by The Foundation Fighting Blindness, Baltimore, MD. June 24-25, 2011.
- Reviewer of Abstracts for newsworthy content, Society for Neuroscience, June 2011.
- Revision of section on Vision in *Brain Facts*, a publication of Society for Neuroscience. July 2011.
- Member, Scientific Advisory Board and Selection Committee of the Institut de la Vision, Paris, France. 2011- .
- Reviewer, Director's Challenge Awards, Intramural Research Program, National Institutes of Health, Bethesda, MD. 2011.
- PhD Thesis Evaluation for All India Institute of Medical Sciences, New Delhi, India. 2011.
- Organizer/moderator, symposium on "Primary Cilia" at NIH Research Festival; Oct 24, 2011.
- Invited Participant in IRRF/Lasker Foundation Symposia on "Diabetic Retinopathy", June 2011, March 2012.
- Ad-hoc Member, "Genetics of Health and Disease" Study Section, June 2012.
- Lead member, AMD Exome Chip consortium. 2012 – 2015.
- Reviewer, Grant proposal for Division for Earth and Life Sciences, The Netherlands Organization for Scientific Research (NWO), September 2012.
- Reviewer, Grant proposal for Breakout Labs, The Thiel Foundation, October 2012.
- Organizer/moderator, Invited Session "Age-related Macular Degeneration (AMD) - GWAS and Beyond: Guiding Light for the Complex Neurodegenerative Diseases" at the annual meeting of American Society of Human Genetics, San Francisco, CA. Nov 6-10, 2012.
- Member, Federal panel for "Audacious Goals Planning Initiative," National Eye Institute, December 2012 – February 2013.
- Member, International Advisory Committee, Asia-ARVO meeting in New Delhi, India. May – October 2013.
- Member, Genetics Advisory Committee, The Diabetic Retinopathy Clinical Research Network (DRCR.net). 2013 – .
- Member, Scientific Advisory Board, Center for Vision Research, SUNY Upstate Medical University, Syracuse, NY. 2013.
- Reviewer of grants for German Research Foundation (Deutsche Forschungsgemeinschaft), Austrian Science Fund and Action Medical Research for Children, U.K. 2013.
- Member, Scientific Advisory Board, GenSight Biologics, Paris, France. March 2014.
- Member, NEI-IRP Planning Committee. March – April 2014.
- Reviewer, French National Research Agency (Agence Nationale de la Recherche), Paris. May 2014.
- Scientific Advisory Board, The Foundation Fighting Blindness. Usher 1c Projects Review. November 20, 2014.
- Advisor to the Director of Kellogg Eye Center, University of Michigan. Jan 2015.
- Evaluator, "Follow that Cell" Challenge proposals, The single cell analysis program (SCAP), NIH Common Fund, National Institute of Health. February 2015.
- External evaluator, Ph.D. thesis of Virginie J.M. Verhoeven (advisors, Caroline C.W. Klaver and J.R. Vingerling), Erasmus Medical Center, Rotterdam, The Netherlands.
- Distinguished Medical Scientist (visiting), Prof. P.N. Chhuttani Chair, Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh, India. July 14-23, 2015.
- Grant Reviewer, Medical Research Council, UK. August 2015.

- External evaluator, Ph.D. thesis from National Brain Research Center, Gurgaon, India. August-September 2015.
- Grant Reviewer for Deutsche Forschungsgemeinschaft (DFG), Bonn, Germany. October 2015.
- Distinguished Medical Scientist (visiting), Prof. P.N. Chhuttani Chair, Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh, India. February 16-March 1, 2016
- Grant Reviewer, Swiss National Science Foundation, Bern, Switzerland. April-May 2016
- Grant Reviewer, Deutsche Forschungsgemeinschaft (DFG), Bonn, Germany. April-May 2016.
- Grant Reviewer, Israel Science Foundation, Jerusalem, Israel. June-July 2016.

## **GRANT SUPPORT**

### **History (P.I. on all listed grants unless indicated)**

1. National Society to Prevent Blindness, Schaumburg, IL. "Molecular cloning of the gene for X-linked Ocular Albinism". Total Direct Costs: \$10,000. April 1988-March 1989.
2. Fight For Sight, Inc., Baltimore, MD. "Isolation of candidate cDNAs for X-linked ocular diseases using a novel strategy". Total Direct Costs: \$9,914. July 1988-June 1989.
3. National Eye Institute, NIH (R29 EY07961). "X-linked Ocular Albinism and Retinitis Pigmentosa". Total Direct Costs during the last budget year: \$104,462 (incl. minority supplements). January 1989-December 1993.
4. The RP Foundation Fighting Blindness, Baltimore. Young Investigator Award. Total Direct Costs per year: \$30,000. July 1990-June 1993.
5. The RP Foundation Fighting Blindness, Baltimore. "An alternative reverse genetics strategy to isolate the genetic loci for X-linked Retinitis Pigmentosa". Total Direct Costs during the last budget year: \$87,934. September 1990-August 1993.
6. National Center for Human Genome Research, NIH. As part of Library Core, Michigan Human Genome Center. "Construction of high-fidelity cDNA libraries from human tissues and cell lines". Total Direct Costs per year: approx. \$25,000. August 1990-July 1993. P.I. Francis Collins.
7. National Center for Human Genome Research, NIH. Pilot Project, Michigan Human Genome Center. "Region and chromosome-specific cDNA libraries". Total Direct Costs per year: \$20,000. August 1990-July 1992.
8. The Geriatrics Center, University of Michigan. Pilot project. "Genetic factors in age-related retinal dysfunction". Total Direct Costs: \$7,500. September 1992-August 1993.
9. The University of Michigan Cancer Center. "Molecular characterization of a candidate gene for Von Hippel-Lindau disease". Total Direct Costs: \$7,500. April 1993-March 1994.
10. The RP Foundation Fighting Blindness, Baltimore. "Identification of candidate genes for retinal degeneration disorders". Total Direct Costs: \$30,000. September 1993-August 1994.
11. National Center for Human Genome Research, NIH; As part of Library Core, Michigan Human Genome Center. "Optimization of a novel cDNA selection strategy". Total Direct Costs: approx. \$25,000. August 1993-July 1994.

12. The Retinitis Pigmentosa Foundation Fighting Blindness, Baltimore, MD. "International Resource for X-linked Retinitis Pigmentosa". TDC for the grant period: \$43,675. May 1995–April 1996.
13. The Retinitis Pigmentosa Foundation Fighting Blindness, Hunt Valley, MD. "Molecular cloning of the X-linked retinitis pigmentosa locus RP3". Total Direct Costs for the last budget year: \$31,574. TDC for the grant period: \$61,934. September 1994–August 1996.
14. Office of the Vice President for Research, Univ of Mich. "Kellogg Eye Center Shared Genetics, Cell and Molecular Biology Facility". TDC: \$21,000. Nov 1995–Oct 1996.
15. Midwest Eye-Banks and Transplantation Center, Ann Arbor, MI. "Functional inactivation of the bZIP transcription factor Nrl in photoreceptors of transgenic mice". TDC for the grant period: \$10,000. July 1995–June 1996, no cost extension until June 1997.
16. Bayer Corporation, West Haven CT. "Molecular Biology Training Project". TDC for the grant period: \$50,000. September 1995–March 1997, no cost extension until September 1997.
17. The Retinitis Pigmentosa Foundation Fighting Blindness, Hunt Valley, MD. "International Resource for X-linked Retinitis Pigmentosa". TDC for the grant period: \$49,000. July 1996–June 1997.
18. National Center for Human Genome Research, NIH. "A Sandwich-Hybridization Strategy for cDNA Selection". TDC for the last budget year: \$40,000. TDC for the grant period: \$80,000. September 1995–September 1997. Shannon Award. R55 HG/OD01322.
19. National Eye Institute, NIH. "X-linked Retinitis Pigmentosa". Total Direct Costs for the last budget year: \$193,180. TDC for the grant period: \$799,726. January 1994–December 1997. RO1 EY07961.
20. The Foundation Fighting Blindness, Hunt Valley, MD. "International Resource for X-linked Retinitis Pigmentosa". TDC for the grant period: \$60,625. July 1997–June 1998.
21. The Foundation Fighting Blindness, Hunt Valley, MD. "Genetic And Molecular Analysis of X-Linked Retinal Dystrophies". TDC for the current year: \$54,080. TDC for the grant period: \$156,080. September 1996–August 1999.
22. Research to Prevent Blindness Lew R. Wasserman Merit Award. \$50,000. July 1997–June 1998 (no cost extension until December 1999).
23. National Eye Institute, NIH. "Molecular Mechanisms of Retina-Specific Gene Expression". TDC for the current year: \$141,126. TDC for the grant period: \$426,001. December 1996–November 1999. 1 RO1 EY11115.
24. The Foundation Fighting Blindness, Hunt Valley, MD. "Resource for X-linked Retinitis Pigmentosa and other Retinal Dystrophies". TDC for the current year: \$99,944. TDC for the grant period: \$299,986. July 1998–June 2001.
25. Undergraduate Research Opportunities Program, Univ Michigan. Faculty Mini-Grant on "Generation of Eye Gene Microarrays." TDC for the grant period: \$5,500. June 2001–August 2001.
26. The Foundation Fighting Blindness, Hunt Valley, MD. "Molecular Mechanisms of Pathogenesis of X-Linked Retinal Dystrophies". TDC for the grant period: \$433,419. September 1999–June 2005. Now FFB Center Module VI.

27. Pearle Vision Foundation, Dallas, TX. "Genetic Analysis of Age-Related Macular Degeneration." TDC: \$2,250. Feb 15, 2000–Oct 30, 2001.
28. National Eye Institute, NIH. "X-linked Retinitis Pigmentosa". Total Direct Costs for the current year: \$231,946. TDC for the grant period: \$914,071. January 1998–December 2001. RO1 EY07961.
29. Macula Vision Research Foundation. "Genetic Risk Factors in Age-Related Macular Degeneration". TDC for the first year: \$80,000. TDC for the grant period: \$240,000. March 1999–February 2002.
30. National Eye Institute, NIH. "Administrative Supplement for Eye Gene Microarray Facility". TDC for the grant period: \$349,980. May 2000–December 2001.
31. Oakland University, Rochester, MI. "For the University of Michigan Sensory Gene Microarray Facility." TDC for the current year: \$19,200. September 2000–August 2003.
32. Juvenile Diabetes Research Foundation, New York, NY. "Custom Gene Microarrays to Investigate Diabetic Complications. TDC for the grant period: \$50,000. July 2002 – June 2003.
33. Marshfield Medical Research Foundation, Marshfield, WI. "Identification of Genetic Susceptibility Loci for Age-Related Macular Degeneration." Genotyping service for 450 individuals. No monetary support. June 2002 – January 2003.
34. National Eye Institute, NIH. "Administrative supplement for Technology Enhancement". TDC for the grant period: \$333,233. May 2002–November 2003.
35. The Foundation Fighting Blindness, Hunt Valley, MD. "Center for the study of Retinal Degenerative Diseases at the University of Michigan." TDC for the current year: \$450,345. July 1, 2001–June 30, 2005. Multiple modules.  
Module I--Human Clinical Studies (co-PI with Dr. Andrew Vine): TDC for the year 2002-2003 – \$127,050. Co-Director from July 1, 2001 to December 31, 2003.
36. The Foundation Fighting Blindness, Hunt Valley, MD. "Resource Facility for X-linked Retinitis Pigmentosa and Inherited Retinal and Macular Dystrophies". TDC for the 2003-2004 year: \$82,658. TDC for the grant period: \$255,488. July 2001 – June 2004.
37. National Eye Institute, NIH. "Molecular Mechanisms of Retina-Specific Gene Expression". TDC for the current year: \$207,091. TDC for the grant period: \$985,290. December 1999 – November 2004. RO1 EY11115-8.
38. Macula Vision Research Foundation. "Molecular and Genetic Studies of Age-Related Macular Degeneration". TDC for the each year: \$80,000. TDC for the grant period: \$240,000. March 2002 – February 2005.
39. The Foundation Fighting Blindness, Hunt Valley, MD. "Center for the study of Retinal Degenerative Diseases at the University of Michigan." TDC for the 2004-2005 year: \$544,546. July 1, 2001–June 30, 2005. Multiple modules. [Co-P.I. with Dr. John Heckenlively]  
Module III--Animal Models (PI): TDC for the current year--\$78,060;  
Module VI--Molecular Mechanisms of Pathogenesis of X-Linked Retinal Dystrophies (PI): TDC for the current year--\$77,587.

40. Elmer and Sylvia Sramek Charitable Foundation, Chicago, IL. "Interactive and Integrated Genetic Databases for the Study of Age-related Macular Degeneration (AMD)." TDC for the grant period: \$636,970. November 2002 – October 2006.
41. National Eye Institute, NIH. "X-linked Retinitis Pigmentosa." TDC for the current year: \$329,259. TDC for the grant period: \$1,218,747 + Supplement \$329,259. January 2002 – December 2006. RO1 EY007961-18S1. No cost extension until June 30, 2007.
42. The Foundation Fighting Blindness, Hunt Valley, MD. "Resource Facility for X-linked Retinitis Pigmentosa and Age-related Macular Degeneration". TDC for the current year: \$75,218. TDC for the grant period: \$219,144. July 2004 – June 2007.
43. George M. O'Brien Kidney Research Center, University of Michigan Medical School. Pilot/ Feasibility Project "Function of ciliary protein RPGR in renal epithelial cells: Possible implications for renal-retinal diseases." TDC for the current year: \$60,000. TDC for the project period: \$120,000. August 2005 – June 2007.
44. BMRC bridging grant from UM Medical School for "X-linked retinitis pigmentosa." April 1, 2007 – June, 2007. Total costs: \$40,000.

**Active grants transferred to investigators at the Kellogg Eye Center in September 2007 when I joined NIH intramural program (P.I. on all grants unless mentioned otherwise)**

1. National Eye Institute, NIH. "Molecular Mechanisms of Retina-Specific Gene Expression". TDC for the current year: \$330,809. TDC for the grant period: \$1,368,325. December 2004 – November 2008. RO1 EY011115-11.
2. National Eye Institute, NIH. "Genetic Variations in Age-related Macular Degeneration." TDC for the current year: \$284,741. TDC for the project period: \$1,464,426. March 1, 2006 – February 28, 2011. RO1 EY016862-02.
3. National Eye Institute, NIH. "X-linked Retinitis Pigmentosa." TDC for the first year: \$288,162. TDC for the grant period: \$901,215. April 2007 – March 2010. RO1 EY007961-19.
4. The Foundation Fighting Blindness, Hunt Valley, MD. "Resource Facility for X-linked Retinitis Pigmentosa and Age-related Macular Degeneration". TDC for the current year: \$ . TDC for the grant period: \$ . July 2007 – June 2010.
5. The Foundation Fighting Blindness, Hunt Valley, MD. "Center for the study of Retinal Degenerative Diseases at the University of Michigan." TDC for the current year: \$498,757. Total TDC for the grant period: \$2,544,146. July 1, 2005–June 30, 2010. Multiple modules.  
 Module III--Animal Models (PI): TDC for the current year--\$81,581;  
 Module VI--Molecular Mechanisms of Pathogenesis of X-Linked Retinal Dystrophies (PI): TDC for the current year--\$60,233.
6. Elmer and Sylvia Sramek Charitable Foundation, Chicago, IL. "Interactive and Integrated Genetic Databases for the Study of Age-related Macular Degeneration (AMD): The Gladiator 2 Project." TDC for the first year: \$150,000. TDC for the project period: \$468,240. November 2006 – October 2009.

7. National Science Foundation, NSF. "Integrated Biological Sequence Data Management." [P.I. Dr. Jignesh Patel, EECS]. TDC for the first year: \$220,059. Total costs (direct + indirect) for the project period: \$575,105. October 1, 2006 – April 30, 2008. DBI 0543272.

#### **Pending**

None

#### **Grant Support at the National Eye Institute, NIH**

In addition to the annual support from DIR/NEI, the following competitive awards/grants were obtained:

1. NIH Center for Regenerative Medicine, NIH. "iPS cell based therapy for CEP290-LCA". 2010-11. \$145,000.
2. 2011 Alcon Research Institute Award, Fort Worth, TX. Discretionary support for research in translational therapeutics of retinal and macular diseases. \$150,000.
3. NIH Center for Regenerative Medicine, NIH. "iPS cell based therapy for CEP290-LCA". 2011-12. \$140,000.
4. United States – Israel Binational Science Foundation. "Identification and characterization of novel cone-dominated retinal disease genes." Co-P.I. with Prof. Dror Sharon, Hadassah Medical Organization, Israel. Dec 2013 – Nov 2016. Approx. \$39K/year.
5. FNIH, Foundation for Retina Research. "NPHP5 Therapy." 2014-15. \$75K.

#### **CERTIFICATION AND LICENSURE**

None

#### **MILITARY SERVICE**

None

#### **AWARDS AND HONORS**

- Junior Research Fellowship of the University Grants Commission, India, 1977–80.
- Senior Research Fellowship of the Indian Council of Medical Research, India, 1980–82.
- Virginia Boyce Award of the National Society to Prevent Blindness, Schaumburg, IL, 1988.
- First Young Investigator Award of the National Retinitis Pigmentosa Foundation, Baltimore, MD, 1990.
- Research to Prevent Blindness Lew R. Wasserman Merit Award, 1997.
- Employee Recognition Award for outstanding service to the Department of Ophthalmology and Visual Sciences, 1999.
- Research to Prevent Blindness Research Sabbatical Award, June 2000.
- 2001 Inventor Recognition Award, University of Michigan.
- Harold F. Fall Collegiate Professor of Ophthalmology and Visual Sciences, 2003.
- Harrington RPB (Research to Prevent Blindness) Senior Scientific Investigator Award, 2003.



- Honored as Jackson General by the Mayor of the City of Jackson, Kentucky. 2003.
- The Foundation Fighting Blindness Board of Directors Award in recognition of outstanding research achievements, January 26, 2007.
- Distinguished Faculty Lectureship Award, 2007. The highest honor bestowed by the Univ of Michigan Medical School on a scientist/faculty member.
- Bireswar Chakrabarti Memorial Oration, awarded by Indian Eye Research Group at their 17<sup>th</sup> annual meeting in Madurai, India. July 26-27, 2008.
- Inducted in the inaugural class of ARVO Fellows, ARVO Silver Fellow, 2009.
- Director's Award, National Eye Institute, 2010.
- Alcon Research Institute Award, 2011.
- Elected Gold Fellow by Association for Research in Vision and Ophthalmology, 2012.
- NIH Director's Ruth L. Kirschstein Award "For exemplary performance while demonstrating significant leadership, skill and ability in serving as a mentor," June 2013.
- Certificate of Appreciation, M.S. Biochemistry and Molecular Biology Program, Georgetown Medical Center, Washington DC. December 2015
- Distinguished Medical Scientist (visiting), Prof. P.N. Chhuttani Chair, Post Graduate Institute of Medical Education and Research (PGIMER), Chandigarh, India. July 2015, Feb-Mar 2016.

#### **PATENTS/DISCLOSURES**

- NPHP Nucleic Acids and Proteins (US Patent application number 20050214864, September 29, 2005). NPHP6 Nucleic Acids and Proteins (Filing date 04/05/07, serial number 11/732,919). The USPTO patent number is 7,838,231 and the corresponding file number at UM is Office of Technology Transfer file #3427.
- Photoreceptor Precursor Cells (Provisional Patent applications filed in Oct 2006 and in Feb 2007).
- Compositions and Methods for Diagnosing and Treating Macular Degeneration. The USPTO patent number is 8,119,348, and the corresponding file number is Office of Technology Transfer file #4435 (Univ of Mich).
- RP2 and RPGR Vectors for Treating X-linked Retinitis Pigmentosa. US Patent Application number: 62/131,661 filed March 11, 2015. Filed by NIH/HHS.

#### **CURRENT AND PAST MEMBERSHIPS IN PROFESSIONAL SOCIETIES**

- Member, American Association for the Advancement of Science
- Member, American Society for Microbiology
- Member, American Society of Human Genetics
- Member, Association for Research in Vision and Ophthalmology
- Member, Society for Neuroscience
- Member, American Society for Biochemistry and Molecular Biology