

BIOGRAPHICAL SKETCH

Provide the following information for the key personnel in the order listed on Form Page 2.
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME Marc, Robert E.		POSITION TITLE Professor of Ophthalmology	
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
University of Texas El Paso, TX	B.S.	1971	Biology
University of Texas Houston, TX	Ph.D.	1975	Neuroscience
UCLA School of Medicine	Post-doctoral	1976-77	Neuroanatomy

A. Positions and Honors.**Employment**

1978-1982 Assistant Professor of Neural Sciences, University Texas at Houston
 1982-1986 Associate Professor of Neural Sciences, University Texas at Houston
 1986-1993 Professor of Neural Sciences, University Texas at Houston
 1993- Professor of Ophthalmology & Physiology, Univ Utah School of Medicine

Experience

1982-1986 NIH-NEI Study Section VIS A2
 1985-1992 Executive Editor, *Experimental Eye Research*
 1989-1991 Retinal Cell Biology Program Planning Committee, ARVO
 1991 Chair, Retinal Cell Biology Program Planning Committee, ARVO
 1991-1993 Editorial Board, *Visual Neuroscience*
 1996-2001 Associate Editor, *Visual Neuroscience*

Honors**Honors**

1967-1971 Stevens Scholar and BS with Honors, University Texas at El Paso
 1972 Student Fellow, Argonne Nat'l Laboratories Conference on Photobiology
 1976 Glenn Fry Award, American Academy of Optometry
 1981 Outstanding Graduate & Commencement Speaker, U Texas/Houston
 1985-1990 Dean's Teaching Excellence List, University Texas at Houston
 1986 Robert Greer Professorship, University Texas at Houston
 1989 Teaching Excellence Award, University Texas at Houston
 1993-2001 Jules and Doris Stein Research to Prevent Blindness Professorship
 2003 Mary H. Boesche Professor of Ophthalmology, University of Utah
 2004 Research to Prevent Blindness Senior Scholar

B. Selected publications in chronological order (65 total)

- Marc RE, HG Sperling 1976 The color receptor identities of goldfish cones. *Science* 191:487-489.
- Marc RE, HG Sperling 1977 The chromatic organization of primate cones. *Science* 196:454-456.
- Marc RE, WK Stell, D Bok, DMK Lam 1978 GABAergic pathways in the goldfish retina. *J Comp Neurol* 182:221-246.
- Lam DMK, YYY Su, L Swain, RE Marc, C Brandon, JY Wu 1979 Immunocytochemical localization of glutamic acid decarboxylase in the goldfish retina. *Nature* 278:565-567
- Marc RE, DMK Lam 1981 Uptake of aspartic and glutamic acid by goldfish photoreceptors. *Proc Natl Acad Sci USA* 78:7185-7189.
- Marc RE, WLS Liu 1984 Horizontal cell synapses onto glycine-accumulating interplexiform cells. *Nature* 311:266-269.
- Marc RE, WLS Liu 1985 Glycine-accumulating neurons in the human retina. *J Comp Neurol* 232: 241-260.
- Marc RE 1986 Neurochemical stratification in the inner plexiform layer of the vertebrate retina. *Vision Res* 26:223-238.
- Marc RE, WLS Liu, M Kalloniatis, S Raiguel, E Van Haesendonck 1990 Patterns of glutamate immunoreactivity in the goldfish retina. *J Neuroscience* 10:4006-4034.
- Marc RE, RF Murry, SF Basinger 1995 Pattern recognition of amino acid signatures in retinal neurons. *J Neuroscience* 15: 5106-5129.
- Kalloniatis M, Marc RE, RF Murry 1996 Amino signatures in the primate retina. *J Neuroscience* 16: 6807-6829.
- Marc RE, RF Murry, SK Fisher, KA Linberg, GP Lewis. 1998 Amino acid signatures in the detached cat retina. *Invest Ophthalmol Vis Sci* 39: 1694-1702.
- Marc RE 1999 Mapping glutamatergic drive in the vertebrate retina with a channel permeant organic cation. *J Comp Neurol* 407:47-64.
- Marc RE, WL Liu 2000 Fundamental GABAergic amacrine cell circuitries in the retina: Nested feedback, concatenated inhibition, and axosomatic synapses. *J Comp Neurol* 425: 560-582.
- Marc RE, BW Jones 2002 Molecular phenotyping of retinal ganglion cells. *J Neurosci* 22:413-427.
- Marc RE, D Cameron 2002 A molecular phenotype atlas of the zebrafish retina. *J Neurocytol.* 30: 593-654.
- Jones BW, C Watt, JM Frederick, W Baehr, CK Chen, E Levine, A Milam, MM LaVail, RE Marc 2003 Retinal remodeling triggered by photoreceptor degenerations. *J Comp Neurol* 464: 1-16
- Marc RE, BW Jones 2003 Phenotyping neurons with pattern recognition of molecular mixtures. *IEEE, International Symposium on Signal Processing and its Applications*, S1571.
- Marc RE, BW Jones, CB Watt and E Strettoi 2003 Neural Remodeling in Retinal Degeneration. *Progress in Retinal and Eye Research* 22: 607-655.
- Marc RE 2004 "Retinal Neurotransmitters" in *The Visual Neurosciences* (Chalupa and Werner, Eds.). MIT Press, pp 315-330.
- Sarthy VP, L Pignataro, T Pannicke, M Weick, A Reichenbach, T Harada, K Tanaka and RE Marc 2004 Glutamate transport by retinal Müller cells in glutamate /aspartate transporter -knockout mice. *Glia* 49:184-196.
- Rohrer B, R Blanco, RE Marc, MB Lloyd, D Bok, DM Schneeweis, LF Reichardt 2005 Functionally intact glutamate-mediated signaling in bipolar-cells of the *Trkb* knockout mouse retina. *Visual Neurosci*: 21:703-713
- Marc RE, M Kalloniatis, and BW Jones. 2005 Excitation mapping with the organic cation AGB^{2+} . *Vision Research*, 45: 3454-3468.
- Marc RE 2006 Functional anatomy of the neural retina. *Principles and Practice of Ophthalmology 3d Edition*. Eds. Albert and Jakobiec. In preparation.

C. Research Support

ACTIVE AWARDS

NIH NEI RO1 EY02576-30 ... 35, Title: *Structural Neurochemistry of Retinal Circuits*. Period 01 Jan 2006 – 31 Dec 2010. Role & Objectives: Robert E. Marc, PI; Aims: (1) Generate a comprehensive retinal map of connectivity steered by computational classification; (2) resolve the neurochemical identities of key interneurons; (3) resolve the scaling parameters for glutamatergic drive through the retina..

NIH NEI RO1 EY015128-01 ... 04, *Retinal Remodeling* Period: 01 July 2004 – 30 June 2008. Role & Objectives: Robert E. Marc, PI; Aims: (1) Define patterns and chronologies of remodeling in retinal degenerations; (2) Map anomalous rewiring patterns; (3) Determine the mechanisms and regulation of remodeling.

NIH NEI P30 EY014800, *Core Grant for Vision Research*, Period: 1 April 2005 – 30 Mar 2010. Role & Objectives: Robert E. Marc, PI and Director; Aims: Develop imaging, molecular biology and functional assessment resources for 12 NEI grant holders.

NIH NIBIB, Title: *Large-scale computational reconstruction of three-dimensional neural connectivity from serial-section microscopy*, PI: T Tasdizen, Univ Utah School of Computing. Period 01 Jul 2005 – 30 Jun 2009. Role & Objectives: Robert E. Marc, co-Investigator; Aim: Develop high-capacity software tools for precise, non-linear, automated image mosaicking/registration; process segmentation/tracking; texture mapping; and synapse identification in Tbyte ultrastructural datasets from the mammalian retina.

New Zealand Marsden Grant: *Excitation mapping of identified retinal neurons* PI: M Kalloniatis. Period: 1 June 2005 – 30 May 2008. Role & Objectives: Robert E. Marc Co-investigator; Ultrastructural mapping of retinal neurons concurrently labeled by excitation reporters and intrinsic macromolecules as class discriminators.

PLANNED SUBMISSIONS

NIH NIBIB, Title: *Visualizing the Metabolome*. Period 01 Sep 2006 – 31 Aug 2011 Role & Objectives: Robert E. Marc, PI; Aims: The aims of this program are realization of a comprehensive metabolite map for the mammalian body and definition of the basic small molecule profiles of all cells.

COMPLETED AWARDS: N/A