

## CURRICULUM VITAE

**Edward Chaum, M.D., Ph.D.**

**Margy Ann and J. Donald M. Gass Chair, Professor of Ophthalmology and Visual Sciences,  
Professor of Pathology, Microbiology & Immunology, and Biomedical Engineering  
Vanderbilt University Medical Center**

### EDUCATION

Undergraduate:

**Johns Hopkins University**, (Baltimore, MD), **B.A.**, May 1979, *Natural Sciences*

Graduate:

**Cornell Graduate School of Medical Sciences** (New York, NY), **Ph.D.**, May 1986  
*Cell Biology and Genetics*

**Cornell University Medical College** (New York, NY), **M.D.**, May 1987

Postgraduate Training:

Residencies:

**Pediatrics**, Massachusetts General Hospital (Boston, MA), July 1987 - June 1990

**Ophthalmology**, Boston University Hospital (Boston, MA), July 1990 - June 1993

Fellowship:

**Retina**, Massachusetts Eye & Ear Infirmary (Boston, MA), July 1993 - June 1994

### BOARD CERTIFICATION

The National Board of Medical Examiners, July 1988

The American Board of Pediatrics, November 1990, Re-certified 5/1999, 12/2005, (retired 2016)

The American Board of Ophthalmology, May 1995, Re-certified 12/2005, 12/2015 (active)

### ACADEMIC APPOINTMENTS

**University of Massachusetts Medical Center, Worcester, MA**

- Assistant Professor of Ophthalmology, Pediatrics and Cell Biology July 1994 – June 2000
- Interim Chief, Division of Ophthalmology, October 1998 - June 2000

**University of Tennessee Health Science Center, College of Medicine, Memphis, TN**

Plough Foundation Professor of Retinal Diseases, 2000 – 2018 (emeritus)

- Assistant Professor of Ophthalmology and Pediatrics, 2000 – 2001
- Associate Professor of Ophthalmology (with tenure), Assoc. Professor of Pediatrics 2001-6
- Professor of Ophthalmology, July 2006
- Professor of Pediatrics, Anatomy and Neurobiology, and Biomedical Engineering, July 2007.
- Hamilton Eye Institute, Director of Research: July 2014 - 2018

**University of Tennessee Health Science Center, College of Graduate Health Sciences**

Graduate School Faculty, December 2004 - present

**University of Memphis, Memphis, TN**

Adjunct Graduate Faculty, Department of Biomedical Engineering, July 2005 – present

**Vanderbilt University Medical Center, Nashville, TN**

Margy Ann and J. Donald M. Gass Chair, Professor of Ophthalmology & Visual Sciences, 2018 -

Professor of Pathology, Microbiology & Immunology, 2018 -

Professor of Biomedical Engineering 2018 -

## HOSPITAL APPOINTMENTS

### Tennessee

Vanderbilt University Medical Center – 2018

## PROFESSIONAL EXPERIENCE (Administrative)

UMass Memorial Health Care, Worcester, MA

Interim Chief, Division of Ophthalmology and Director, Vitreoretinal Service

October 1998 - June 2000, 8 physician, 15 staff member hospital Division

## PROFESSIONAL ORGANIZATIONS

American Academy of Ophthalmology

Alpha Omega Alpha Honor Medical Society

Retina Society, Macula Society

Association for Research in Vision and Ophthalmology

American Telemedicine Association

Research to Prevent Blindness, Fight for Sight

## PROFESSIONAL ACTIVITIES

### Intramural - UTHSC

UTHSC Institutional Review Board, 2000 – 2007

Clinical Research Center, Scientific Advisory Committee, 2001 – 2011

UTMG Professional Practices Committee, 2005 – 2015

CTSI Scientific Advisory Board, 2008 – 2013

Strategic Planning Steering Committee, 2009 – 2018

Vice Chancellor for Research Search Committee, 2010

Post-Graduate Grievance Committee, 2011 – 2018

Director HEI Vision Core, 2013- 2017

UTHSC-ORNL Center for Biomedical Informatics Governance Committee – 2014

HEI, Director of Research, 2014 - 2018

Molecular Resource Center Advisory Board, 2016 - 2018

Ophthalmology Chair Search Committee, 2017

### Intramural - VUMC

Store and Forward Telemedicine Committee, VUMC

Neurology Chair Search Committee, VUMC

Snyder Chair Review Committee, VUMC

Edge Review Committee, VUMC. Internal mock Study Section

### Extramural

- National Eye Institute, NIH. Peer Review Study Sections, VisC, BDPE, DPVS, others; 2006 – 22
- Academic Editor: PLoS ONE, 2011-16
- Editorial Reviewer: 2000 - present

American Journal of Ophthalmology, Archives of Ophthalmology, Autophagy, British Journal of Ophthalmology, British Journal of Pharmacology, Experimental Eye Research, Investigative Ophthalmology and Visual Science, Journal of Cellular Biochemistry, Journal of Cellular Physiology, Journal of Gene Medicine, Journal of Pharmacy and Pharmacology, Lipids, Molecular Vision, Ophthalmology, Pan American Journal of Public Health, PLoS ONE, Retina, Survey of Ophthalmology, IEEE Transactions in Medical Imaging, IEEE Computers in Biology and Medicine, SPIE, and others.

- Invited Grant and Fellowship Reviewer for International Funding Agencies  
Wellcome Trust, Great Britain, The Health Research Board, Ireland,  
Erwin Schroedinger-Post-Doctoral Research Fellowship, Austrian Science Fund; Fight for  
Sight, New York, NY, Prevent Blindness America, ARVO, Technology Foundation STW  
(Netherlands); Catalan Agency for Health Technology Assessment and Research, Spain;  
Medical Research Council, Great Britain; Canada Innovation Research, others

### Other Professional Activities

Executive Committee Advisor, Fight for Sight, New York, NY, 2005- 2017  
Board of Directors, Juvenile Diabetes Research Foundation, West TN Chapter, 2007 - 2011  
Oak Ridge National Laboratory, External Advisory Board, Biomedical Science & Engineering, 2012  
SENSORIUM: University of Memphis – Founding Principal Researcher, 2013 - present  
Board of Directors, Research Inc., Memphis VA Medical Center, 2014 – 2018  
VUMC Endowed Chair Review Committees (various) 2019- present

### Entrepreneurial

#### 1. Hubble Telemedical - Founder and CMO

Winner, R&D100 Award, 2010 – TRIAD Telemedical Network  
Winner Federal Laboratory Consortium Award for Technology Transfer, 2010  
Winner, American Telemedicine Association Innovation Award, 2011  
USDA Phase I SBIR 2012, Phase II SBIR 2013  
Venture-backed telemedicine start up company. Acquired by Welch Allyn, 2015

#### 2. Infusense – Founder and CMO

Angel-backed start up in the biomedical sensor space  
SEBIO Finalist 2011, DOD Phase I SBIR, 2012

#### 3. Plexitome - Founder and CMO

Venture-backed start up in the surgical device space

#### 4. Focal Point Pharmaceuticals, Co-Founder and CSO

Venture-backed start up company.

#### 5. Ipax Pharmaceuticals, Co-Founder and CMO

Grant-backed start up company.

### Issued Patents

1. *Method and system for the diagnosis of disease using retinal image content and an archive of diagnosed human patient data* US 8243999, Sept. 20, 2012
2. *Method and system for assigning a confidence metric for automated determination of optic disc location* US 8218838, July 10, 2012
3. *Retinal instrument* US 8425596, April 23, 2013
4. *Microfabricated instruments and methods to treat recurrent corneal erosions*, US 8591481, Nov. 26, 2013
5. US 9044299, Jun. 02, 2015
6. *Method and device for detection of bioavailable drug concentration in a fluid sample*  
US #9700246, July 11, 2017.
7. #9983162, 5/29/2018
8. Notice of Allowance US Application No. 15/989,765
9. Canada CLP #2740421; August 28, 2018, #2875003; September 29, 2020
10. EPO #2856133, April 12, 2018

## Special Awards and Recognition

- 1992 Alpha Omega Alpha, Honor Medical Society
- 1998 Research Career Award (K08), National Eye Institute, NIH
- 2000 Plough Foundation Professor of Retinal Diseases, University of Tennessee, endowed Chair
- 2006-13 Best Doctors in America®
- 2009 Keynote Speaker: 1st Annual Biomedical Science & Engineering Conf., Oak Ridge Natl. Lab.
- 2009 Senior Scientist Award, Research to Prevent Blindness, New York, NY
- 2010 R&D100 Award – Life Sciences: “TRIAD Network”
- 2010 Federal Laboratory Consortium Award for Technology Transfer, with ORNL
- 2011 American Telemedicine Association Innovation Award: *Hubble Telemedical, Inc.*
- 2013 Memphis Business Quarterly, Inaugural 2013 Innovation Award
- 2013 B. Otto Wheeley Award for Excellence in Technology Transfer, University of Tennessee
- 2014 Hamilton Eye Institute, Director of Research
- 2018 Elected to Retina Society
- 2018 Elected to Macula Society
- 2018 Margy Ann and J. Donald M. Gass Chair, Professor of Ophthalmology and Visual Sciences

## Invited Lectures

- New England Ophthalmological Society, April 1999
- Keynote Speaker: Tennessee Academy of Sciences, Collegiate Division, May, 2005
- Keynote Speaker: 1st Biomedical Science & Engineering Conference, ORNL, March, 2009
- Keynote Speaker: National Council of University Research Administrators, April 2013
- Keynote Speaker: St Jude Children’ Research Hospital, March 2013
- University of Memphis, Fogelman College of Business, 2015, 2017

## RESEARCH PROGRAMS:

### Clinical Science – Multicenter Clinical Trials

*Diabetes Prevention Program Outcomes Studies, DCCT and EDIC:* 2005- present

Clinical Study Center, Clinical Co-investigator UTHSC/VUMC study site

Clinical outcomes of diabetes prevention and treatment programs

*Age-Related Eye Disease Study II (AREDS2)* 2006 - present

Clinical Study Center, Clinical Co-investigator UTHSC study site

Clinical outcomes of diabetes prevention and treatment programs

<https://www.vumc.org/ophthalmology/chaum-laboratory-translational-bioengineering-and-medicine>

<https://orcid.org/0000-0003-3542-8376>

## Publications and Presentations:

### A. Basic Science Research and Clinical Retina – Peer-reviewed Manuscripts:

1. Chaum, E., Ellsworth, R.M., Haik, B.G., Kitchin, F.D., Chaganti, R.S.K. (1984) Cytogenetic analysis of retinoblastoma: Evidence for multifocal origin and in vivo gene amplification. *Cytogenet Cell Genet* 38: 82-91.
2. Chaum, E., Doucette, L.A., Ellsworth, R.M., Haik, B.G., Kitchin, F.D., Chaganti, R.S.K. (1984) Bleomycin-induced chromosome breakage in G2 lymphocytes of retinoblastoma patients. *Cytogenet Cell Genet* 38:152-154.

3. Sakai, K., Kanda, N., Shiloh, Y., Donlon, T., Schreck, R., Shipley, J., Dryja, T., Chaum, E., Chaganti, R.S.K., Latt, S. (1985). Molecular and cytologic analysis of DNA amplification in retinoblastoma. *Cancer Genet Cytogenet* 17: 95-112.
4. Chaum E. (1987) Cytogenetic and Molecular Studies of the Role of Oncogenes in Transformation in Retinoblastoma. Cornell University GSMS. Copyright TX 2 084 403.
5. Chaum, E. and Hatton, M.P. (1999) Congenital nystagmus associated with multiple congenital anomalies of extraocular muscles. *J Ped Ophthalmol Strab* 36:155-157.
6. Chaum, E., Hatton, M.P. and Stein, G. (1999) Polyplex-mediated gene transfer into human retinal pigment epithelial cells in vitro. *J Cell Biochem* 76 (1): 153-160.
7. Chaum, E., Drewry, RD, Ware, GT, Charles, S. (2001) Nerve fiber bundle visual field defect resulting from a giant peripapillary cotton-wool spot. *J Neuro-Ophthalmol*, 21:276-277.
8. Chaum, E. (2001) Comparative analysis of the uptake and expression of plasmid vectors in human ciliary and retinal pigment epithelial cells in vitro. *J Cell Biochem*, 83:671-677.
9. Chaum, E. and Greenwald, MA (2002) Retinochoroidal anastomoses and a choroidal neovascular membrane in a macular exudate following treatment for retinal macroaneurysms. *Retina*, 22:363-6.
10. Chaum, E., Yang, H. (2002) Transgenic expression of IGF-1 modifies the proliferative potential of human retinal pigment epithelial cells. *Invest Ophthalmol Vis Sci*, 43:3758-3764.
11. Yang, H., Chaum, E. (2003) A Reassessment of Insulin-like Growth Factor Binding Protein Gene Expression in the Human Retinal Pigment Epithelium. *J Cell Biochem*, 89:933-943.
12. Martin AC., Thornton JD, Liu J, Wang X, Zuo, J, Jablonski MM, Chaum E., Zindy F, Skapek SX. (2004) Pathogenesis of persistent hyperplastic primary vitreous in mice lacking the Arf tumor suppressor gene. *Invest Ophthalmol Vis Sci*, 45(10):3387-96.
13. Ashmore, E, Kerr, NC, Greenwald, M., Chaum, E. (2004) Natural History of Acquired Retinal Oxalosis in a Child. *J Ped Ophthalmol Strab*, 41:308-311.
14. Chaum E., Fawzi A, Chang TS, Shah GK. (2006) Diagnostic and therapeutic challenges. *Retina*. 26:219-22.
15. Yang, H., Yang, X., Lang, J.C., Chaum, E. (2006) Tissue Culture Methods Can Strongly Upregulate Immediate Early Gene Expression in Retinal Pigment Epithelial Cells. *J Cell Biochem*. 98:1560-1569.
16. Karnowski, T.P., Govindasamy, V.P., Tobin, K.W., Chaum, E., "Locating the Optic Nerve in Retinal Images: Comparing Model-Based and Bayesian Decision Methods," 28th Annual International Conf. of the IEEE EMBS, August 2006.
17. Tobin, K.W., Chaum, E., Govindasamy, V.P., Karnowski, T.P., Sezer, O., "Characterization of the Optic Disk in Retinal Imagery using a Probabilistic Approach", SPIE International Symposium on Medical Imaging, San Diego, California, Proceedings of SPIE, Vol. 6144:61443F, February 2006.
18. Tobin, K.W., Chaum, E., Govindasamy, V.P., Karnowski, T.P. (2007) "Detection of Anatomic Structures in Human Retinal Imagery," *IEEE Transactions on Medical Imaging*, 26(12):1729-39.
19. Tobin KW, Abdelrahman, M, Chaum E., Govindasamy VP, Karnowski TP. (2007) A Probabilistic Framework for Content-Based Diagnosis of Retinal Disease. *Conf Proc IEEE Eng Med Biol Soc*; 2007:6744-6747.
20. Tobin, KW, Abramoff, MD, Chaum, E., Giancardo, L, Govindasamy, VP, Karnowski, TP, Tennant, MTS. (2008) Using a Patient Image Archive to Diagnose Retinopathy. *Conf. Proc. IEEE Eng Med Biol Soc* 1:5441-5444.
21. Karnowski, TP, Govindasamy, VP, Tobin, KW, Chaum, E., Abramoff, MD. (2008). Retina Lesion and Microaneurysm Segmentation using Morphological Reconstruction Methods with Ground-Truth Data. *Conf. Proc. IEEE Eng Med Biol Soc* 1:5433-5436.

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