Harvard Medical School/Harvard School of Dental Medicine

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Place of Birth: Philadelphia, PA, USA

Education

9/1991-6/1995	B.A.	Latin and Greek Languages	Stanford University
9/1991-6/1996	B.S.	Biological Sciences	Stanford University
3/1995-6/1996	M.S.	Biological Sciences	Stanford University
9/1996-5/2004	M.D.		University of Pennsylvania School of Medicine
9/1998-6/2002	Ph.D.	Neuroscience (Mark Fortini, Ph.D.)	University of Pennsylvania School of Medicine

Postdoctoral Training

6/2004-6/2005	Intern	Transitional year internship	Presbyterian Hospital, University of Pennsylvania School of Medicine
7/2005-6/2008	Resident	Ophthalmology	Massachusetts Eye and Ear Infirmary, Harvard Medical School
7/2008-6/2009	Clinical Fellow	Pediatric Ophthalmology	Children’s Hospital Boston, Harvard Medical School
7/2009-6/2010	Clinical Fellow	Neuro-Ophthalmology	Massachusetts Eye and Ear Infirmary, Harvard Medical School

Faculty Academic Appointments

7/2010-present	Instructor	Ophthalmology	Harvard Medical School

Appointments at Hospitals/Affiliated Institutions

7/2009-present	Staff physician	Ophthalmology	Children's Hospital Boston
7/2009-present	Active staff	Ophthalmology	Massachusetts Eye and Ear Infirmary
9/2009-present	Affiliated staff	Newborn Medicine	Brigham and Women's Hospital

Committee Service

Local

9/1997-2/1998	Medical School Admissions	University of Pennsylvania School of Medicine Interviewer
1/2000-1/2001	Frontiers in Genetics seminar speaker series	University of Pennsylvania School of Medicine Co-coordinator
2000	Internal review of the Neuroscience Graduate Group	University of Pennsylvania School of Medicine Panelist
2000	NIH review Committee for the Genetics Training Grant	University of Pennsylvania School of Medicine Panelist
7/2005-10/2007	Surgical Case Review Committee	Massachusetts Eye and Ear Infirmary Member

Professional Societies

1996-2003	Pennsylvania Medical Society	Member
1997-2003, 2010-present	American Medical Association	Member
2004, 2006-present	Association for Research in Vision and Ophthalmology	Member
2005-present	American Academy of Ophthalmology	Member
2008-	American Association for Pediatric	Member

present	Ophthalmology and Strabismus	
2009-present	Massachusetts Medical Society	Member

Editorial Activities

Ad hoc reviewer for the following journals:

Clinical Ophthalmology
Clinical and Experimental Dermatology
Digital Journal of Ophthalmology
Archives of Ophthalmology

Other Editorial Roles

7/2008-7/2009	Assistant Editor	*Digital Journal of Ophthalmology*

Honors and Prizes

1992	Fairclough Book Award in Classics	Stanford University	Academic excellence
1993	Classics Stipend for Study Abroad Program	Stanford University	Academic potential
1994	Classics Scholarship for Senior Year	Stanford University	Academic excellence
1995	Senior Classics Award	Stanford University	Academic excellence
7/1998-5/2004	Medical Scientist Training Program	University of Pennsylvania School of Medicine	Research potential
2000	Selected attendee to Schmitt Symposium on "Cell Cycle Genes in Development, Aging, and Neurodegeneration."	Schmitt Program for Integrative Brain Research at University of Rochester	
2003	Robert M. Toll Prize for Best Research in Mental Health	University of Pennsylvania School of Medicine	Research excellence
2004	Alpha Omega Alpha Medical Honor Society	University of Pennsylvania School of Medicine	Academic excellence
2007	Heed Foundation	Heed Ophthalmic Foundation	Academic potential

	Retreat Attendee		
2007	ARVO Travel Grant Recipient	National Eye Institute	Research excellence
2008	Farley Fellowship Award	Children's Hospital Boston	
2008	Heed Ophthalmic Foundation Fellowship Award	Heed Ophthalmic Foundation	Academic potential

Report of Funded and Unfunded Projects

Funding Information

Past

9/1995-3/1996
Research Assistantship
Awarded through Stanford University Department of Genetics
Role: Investigator
Candidate gene screening for causative gene in Rett syndrome.

7/1997-8/1997
Short-term Training Award in the Health Professions
NIH Institutional National Research Service Award (NRSA) awarded through University of Pennsylvania School of Medicine.
T35 HD 072170
Role: Investigator
Characterization of expression pattern of collapsins in chick cerebellum.

7/1998-6/1999
Medical Scientist Training Program Award
NIH Institutional NRSA awarded through University of Pennsylvania School of Medicine
T32 GM 07170
Grant support for graduate work in neuroscience

9/1999-8/2001
Training grant in Developmental Biology
NIH Institutional NRSA awarded through University of Pennsylvania School of Medicine
T32 HD 07516
Grant support for graduate work in neuroscience

9/2001-5/2004
Modeling Human Tauopathies in *Drosophila melanogaster*
NIH Individual pre-doctoral NRSA awarded through the National Institute of Neurological Disease and Stroke
F31 NS 42705
Role: PI
Identification of the *Drosophila tau* homologue, development of a transgenic tau model in the fly and characterization of the intrinsic cellular role of the tau protein in neurodevelopment in the fly.

2008	Heed Ophthalmology Foundation Fellowship Award Individual award from the Heed Ophthalmology Foundation Role: PI Genetic analysis to identify a new recessive congenital fibrosis of the extraocular muscles locus.

Current

2010	Children's Hospital Ophthalmology Foundation Faculty Research Award Career development award Role: PI Non-invasive monitoring of elevated intracranial pressure in patients with idiopathic intracranial hypertension.

Current Unfunded Projects

10/2006-present	Investigator/ Prevalence and course of strabismus in patients after congenital cataract surgery. Retrospective chart review to analyze strabismus outcomes in a large cohort of patients with a history of congenital cataract removal at Children's Hospital Boston.
6/2009-present	Investigator/ Surgical management of patients with congenital fibrosis of the extraocular muscles (CFEOM). Retrospective chart review to analyze surgical outcomes of patients at Children's Hospital Boston with CFEOM.
2/2010-present	Investigator/ Visual fields, optical coherence tomography (OCT) and optic nerve appearance in pseudotumor cerebri patients. Retrospective chart review of OCT results in pseudotumor cerebri patients to clarify whether optic nerve height and volume correlate with visual function.

Report of Local Teaching and Training

Teaching of Students in Courses

9/1999-12/1999	Introduction to Brain and Behavior BBB109 Undergraduate students	University of Pennsylvania Teaching assistant (TA) Weekly 1 hour teaching session prepared by TA and grading of exams
9/2009-present	Patient-Doctor II Course Harvard Medical students	Harvard Medical School 1 half-day session orienting HMS students to the ophthalmology exam

Formal Teaching of Residents, Clinical Fellows and Research Fellows (post-docs)

2005-2010	Massachusetts Eye and Ear Infirmary Grand Rounds/ MEEI residents, fellows and attendings	Massachusetts Eye and Ear Infirmary (MEEI) Ten separate thirty minute lectures

2005-2008	MEEI Chandler Lecture/ MEEI residents, fellows and attendings	MEEI Three separate twenty minute lectures
9/2005- 10/2005	MEEI Macula Conference/ MEEI retina fellows and attendings	MEEI Retina service Five one hour lectures
2006	Congenital Fibrosis of the Extraocular Muscles/ MEEI residents, fellows and attendings	MEEI Resident's Course Twenty minute lecture
2008	Pediatric Nystagmus/ Department of Ophthalmology	Children's Hospital Boston One hour lecture
2008-2009	Morbidity and Mortality Report/ Department of Ophthalmology	Children's Hospital Boston Led several of the monthly M and M discussions during the fellowship year One hour discussion
2008-2009	Ophthalmology Case Conference/ Department of Ophthalmology	Children's Hospital Boston Monthly one hour case presentations co-led with co-fellow
2008	Retinopathy of prematurity: current concepts in molecular pathogenesis/ MEEI residents, fellows and attending	MEEI Fellows' Course Twenty minute lecture
2009	Use of optical coherence tomography to evaluate papilledema and pseudopapillema/MEEI residents, fellows and attending	MEEI Fellows' Course Twenty minute lecture
2009	Surgical management of patients with Duane syndrome/ Department of ophthalmology	Children's Hospital Boston One hour lecture
8/2009- 6/2010 2010	Neuro-ophthalmology Management conference/ Neuro-ophthalmology service Pediatric Nystagmus/ Department of Ophthalmology	MEEI Neuro-ophthalmology department Weekly 1 hour lecture Children's Hospital Boston One hour lecture

Clinical Supervisory and Training Responsibilities

2009- present	Attending pediatric ophthalmology Children's Hospital Boston	Direct daily interaction with ophthalmology fellows, residents and rotating medical students with responsibilities both towards clinical and surgical teaching.

Laboratory and Other Research Supervisory and Training Responsibilities

6/2000-9/2000	Supervision of rotating graduate student/ University of Pennsylvania	Daily supervision for approximately 3 months.
6/2000-9/2000	Mentored high school student in basic science research project as part of a high school accelerated academic program: Academy Scholars Program/ University of Pennsylvania	Weekly supervision for approximately 3 months. Research was awarded multiple top prizes at local, regional and state science competitions in Pennsylvania.

Local Invited Presentations

No presentations below were sponsored by outside entities.

2000 Modeling human tauopathies in Drosophila melanogaster/ Lecture
First Annual Retreat for the Center for Neurodegenerative Disease Research
University of Pennsylvania School of Medicine

2010 Non-invasive assessment of intracranial pressure using otoacoustic emissions in patients with idiopathic intracranial hypertension/ Lecture
Massachusetts Eye and Ear Infirmary Annual Research Retreat

2010 Clinical assessment of amblyopia and strabismus/ Lecture
Massachusetts Eye and Ear Infirmary Ophthalmic Medical Assistant Program lecture series

Report of Regional, National and International Invited Teaching and Presentations

Invited Presentations and Courses

No presentations below were sponsored by outside entities.

Regional

2010 Pediatric nystagmus/Lecture
Lancaster Course in Ophthalmology, Colby College, Maine

2010 Visual Impairment in infants and children/Lecture
Lancaster Course in Ophthalmology, Colby College, Maine

National

2008 Combined extracapsular cataract extraction and Boston Keratoprosthesis Type I in the treatment of Peters Anomaly/ Video presentation
Presented by co-author Dr. Kathryn A. Colby
American Society for Cataract and Refractive Surgery (ASCRS) symposium on Challenging cataract cases in children.

Report of Clinical Activities and Innovations

Current Licensure and Certification

2005	Massachusetts Medical License
2010	Board Certification, American Board of Ophthalmology

Practice Activities

7/2009-6/2010	Attending pediatric ophthalmologist	Children's Hospital Boston and affiliated satellite locations including Massachusetts Eye and Ear Infirmary	20% effort: Clinical evaluation and surgery, primarily for children and adults with strabismus.
7/2009-6/2010	Neuro-ophthalmology fellow	Massachusetts Eye and Ear Infirmary	80% effort: Clinical evaluation of children and adults with neuro-ophthalmic disease.
7/2010-present	Attending pediatric ophthalmologist and attending pediatric neuro-ophthalmologist	Children's Hospital Boston and affiliated satellite locations including Massachusetts Eye and Ear Infirmary	80% effort: Clinical evaluation and surgery of children and adults with strabismus as well as children with neuro-ophthalmic disease.

Clinical Innovations

Spectral domain OCT and papilledema	Utilizing the newest generation of optical coherence tomography (OCT), spectral-domain OCT to evaluate optic nerve height and volume in patients with papilledema. This may serve to significantly augment treatment response in pediatric patients who may not otherwise be able to participate in formal visual testing.
Non-invasive assessment of elevated intracranial pressure using otoacoustic emissions in patients with idiopathic intracranial hypertension (IIH or pseudotumor cerebri)	Developing application of a technique to non-invasively monitor intracranial pressure in patients with IIH. This may serve to dramatically alter the method by which patients are followed for treatment response, i.e. replace serial lumbar punctures with a non-invasive quick technique.

Report of Education of Patients and Service to the Community

Activities

9/1996-1/1998	Students Teaching A.I.D.S. to Students/ Taught A.I.D.S. awareness to middle school students in West Philadelphia.
1/1997-1/998	United Community Clinic Mentoring Program/ Initiated a mentoring program of high school students in West Philadelphia who were interested in pursuing a career

in medicine in conjunction with a free community health clinic.

Report of Scholarship

Publications

Peer reviewed publications in print or other media

1. **Heidary, G.**, Hampton, L.L., Schanen,N.C., Rivkin ,M.J., Darras, B.T., Battey, J., Francke U. (1998) Exclusion of the gastrin-releasing peptide receptor (GRPR) locus as a candidate gene for Rett Syndrome. *American Journal of Medical Genetics* 78: 173-175.

2. **Heidary, G.**, Fortini, M.E. (2001) Identification and characterization of the *Drosophila tau* homolog. *Mechanisms of Development* 108: 171-178.

3. **Heidary, G.**, Ying, G.-S., Maguire, M.G., Young, T.L. (2005) The association of astigmatism and spherical refractive error in a high myopia cohort**.** *Journal of Optometry and Vision Science* 82: 244-247.

Non-peer reviewed scientific or medical publications/materials in print or other media

1. **Heidary, G.** and Kazlas, M. Pediatric Ophthalmology. In: Pavan-Langston, D., ed. *Manual of Ocular Diagnosis and Therapy, 6th Edition.* Philadelphia: Lippincott Williams & Wilkins.

2. **Heidary, G.**, Engle, E.C., Hunter, D.G. (2008) Congenital fibrosis of the extraocular muscles. *Seminars in Ophthalmology* 23:3-8.

3. **Heidary, G.**, VanderVeen, D. K., Smith, L. E. (2009) Retinopathy of prematurity: current concepts in molecular pathogenesis. *Seminars in Ophthalmology* 24: 77-81.

4. **Heidary, G.**, Löfqvist, C., Mantagos, I.S., VanderVeen, D.K., Hellström, A., Smith, L.E. (2009) Retinopathy of prematurity: clinical insights from molecular studies ***NeoReviews*** 10: e550 - e557.

5. **Heidary, G.**, Traboulsi, E. I., Engle, E.C. The Genetics of Strabismus: Congenital Cranial Dysinnervation Disorders. In: Traboulsi, E.I., ed. *Genetic diseases of the eye: a textbook and atlas, second edition*. Oxford University Press, New York, in press.

6. **Heidary, G.**, Rizzo, J.F. (2010) Use of optical coherence tomography to evaluate papilledema and pseudopapilledema. *Seminars in Ophthalmology*, in press.

Clinical Guidelines and Reports

1. I created the online Ophthalmology consultation template in the Children's Hospital Boston Power Chart medical record system which is used for the entire department of Ophthalmology. This became active in September 2009 and has been in use since that time.

Thesis

Heidary, G. (2002) Identification and characterization of the *Drosophila* tau homologue. Doctoral thesis, Department of Neuroscience, University of Pennsylvania School of Medicine, Philadelphia, PA, 131 p.

Abstracts, Poster Presentations and Exhibits Presented at Professional Meetings

1. Schanen, N.C., Hofferbert, S., **Heidary, G.**, Zoghbi, H., Francke, U. (1997) Molecular genetics of Rett syndrome. *European Child and Adolescent Psychiatry* 6: 93-94, Suppl. 1.

2. **Heidary, G.**, Yin, W., Fortini, M.E. (2001) Modeling human tauopathies in *Drosophila melanogaster*. Keystone Meeting on the Molecular Basis of Neurodegenerative Disease 58.

3. **Heidary, G.**, Chaum, E., Mukai, S. (2006) Acute retinal necrosis in children**.** *Invest. Ophthalmol. Vis. Sci.* 47: ARVO E-Abstract 5271.

4. **Heidary, G.**, Chaum, E., Mukai, S. (2006) Acute retinal necrosis in children**.** *Massachusetts Eye and Ear Infirmary Annual Research Meeting.*

5. **Heidary, G.**, Krishnamurthy, R, VanderVeen, D. (2007) Prevalence and course of strabismus in patients after congenital cataract surgery. *Invest. Ophthalmol. Vis. Sci.* 48: ARVO E-Abstract 4863.

6. Gangwani, B.K., **Heidary, G.**, VanderVeen, D. (2008) Surgical and visual outcomes of unilateral cataracts in infants. *Invest. Ophthalmol. Vis. Sci.* 49: ARVO E-Abstract 5663.

7. VanderVeen, D., **Heidary, G.**, Gangwani, B.K. (2008) Prevalence and risk factors for development of glaucoma after infantile cataract surgery. *Invest. Ophthalmol. Vis. Sci.* 49: ARVO E-Abstract 4170.

8. **Heidary G.**, Miyake, N., Yamada, K., Andrews, C., Traboulsi, E. I., Engle, E. C. (2009) Evidence for a new recessive CFEOM locus. *Journal of American Association for Pediatric Ophthalmology and Strabismus* 13: e17-e18.

9. **Heidary G.**, Miyake, N., Yamada, K., Andrews, C., Traboulsi, E. I., Engle, E. C. (2009) Evidence for a new recessive CFEOM locus. *Invest. Ophthalmol. Vis. Sci.* 50: E-Abstract 4129.

10. **Heidary, G.**, Biffi, A., Voss, S., Rizzo, J.F. (2010) Non-invasive assessment of intracranial pressure using otoacoustic emissions in patients with idiopathic intracranial hypertension. Accepted for 2010 North American Neuro-Ophthalmology Society (NANOS) Meeting, Tucson, AZ.

11. **Heidary, G.**, Andrews, C., Engle, E.C, Hunter, D.G. (2010) Surgical Management in Congenital Fibrosis of the Extraocular Muscles. *Journal of American Association for Pediatric Ophthalmology and Strabismus* 14: e19.

Narrative Report **(limit to 500 words)**

Overview:
I am a clinician-scientist and the only dually fellowship-trained ophthalmologist with specialization in pediatric ophthalmology and neuro-ophthalmology at Children's Hospital Boston and the Harvard medical system at large. This unique clinical expertise affords me the opportunity in my clinical/surgical practice (80%) to care for patients with complex strabismus as well as with a broad

spectrum of neuro-ophthalmic disease processes that afflict children. My research (15%) has included clinical and translational efforts that build upon my background in neurogenetics and my clinical experience in the areas of pediatric and neuro-ophthalmology. My teaching efforts (5%) are focused towards training ophthalmology residents and medical students who rotate through the Children's Hospital Boston ophthalmology service. I also am working towards augmenting the fellowship experience of the neuro-ophthalmology fellows at Massachusetts Eye and Ear Infirmary through offering an observership in pediatric neuro-ophthalmology at Children's Hospital Boston.

Clinical Expertise and Innovation:
My primary clinical expertise is pediatric neuro-ophthalmology. Uniquely positioned, I have the opportunity to develop a robust pediatric neuro-ophthalmology practice at Children's Hospital Boston and at Massachusetts Eye and Ear Infirmary through collaboration with my former fellowship mentors there.

For the past year I have been working on two research projects that utilize new technologies to augment the treatment and management of patients with elevated intracranial pressure (ICP) secondary to idiopathic intracranial hypertension (IIH) or pseudotumor cerebri. One study involves the application of the spectral-domain optical coherence tomography (OCT) to monitor treatment response in patients with IIH through a quantitative assessment of optic nerve height and volume. The second study has focused on non-invasive assessment of intracranial pressure through the use of otoacoustic emissions. This technique has been validated in the ICU setting but has never been applied in the outpatient setting and the preliminary results of this pilot study show promise. To date, neither technology has been utilized in the pediatric ophthalmology setting at Children's Hospital Boston but each has the potential to greatly improve the ability to evaluate our pediatric patients with IIH. Specifically, these patients because of their age cannot participate fully in visual function testing. OCT of the nerve may serve as a quantitative measure that assists the clinician to determine whether there has been worsening of optic nerve swelling that may be difficult to discern clinically. Non-invasive monitoring of ICP would alleviate the great burden to our patients and their families of repeated lumbar punctures which is currently the standard of care for ICP monitoring at Children's Hospital Boston. In support of these efforts, I have been given a Children's Hospital Foundation Faculty Research Award.

Investigation:
The unifying theme of my previous research work has been utilization of genetics, molecular biology, and immunohistochemistry to characterize mechanisms of human neurodegenerative disease. I was initiated into this field through my work performing candidate gene screening for young children who suffer from the devastating neurodegenerative disease Rett syndrome. The primary focus of my Ph.D. thesis work in Neuroscience was the utilization of the genetic model system of *Drosophila melanogaster* to characterize the mechanism of tau-related neurodegeneration which has been implicated in Alzheimer's disease and Frontotemporal dementia and parkinsonism. I was the first to publish the cloning and characterization of the *Drosophila tau* homologue and for this work, I secured a competitive pre-doctoral individual National Research Service Award from the National Institute of Neurological Disease and Stroke. More recently, I have sought to deepen my understanding of human genetics through recent work as a Heed Fellow analyzing data from a single-nucleotide polymorphism genome-wide screen on patients with congenital fibrosis of the extraocular muscles, a neurodevelopmental disease, in the laboratory of Dr. Elizabeth Engle. These experiences have established a strong foundation for academic research and in particular for fusing a clinically driven question with basic science research.

Teaching and education:

My teaching has focused on clinical and surgical training of ophthalmology residents. With the development of a dedicated neuro-ophthalmology practice at Children's, residents and clinical fellows are offered a unique opportunity to deepen their understanding of this specific area of ophthalmic disease.