BIOGRAPHICAL SKETCH

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NAME Theodore Leng	POSITION TITLE Clinical Assistant Professor of Ophthalmology; Director of Clinical and Translational Research;
eRA COMMONS USER NAME (credential, e.g., agency login) LENG.THEODORE	Director of Ophthalmic Diagnostics

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	MM/YY	FIELD OF STUDY
Stanford University, Stanford, CA	AB	06/1999	Philosophy
Stanford University, Stanford, CA	BS	06/1999	Biological Sciences
Stanford University, Stanford, CA	MS	03/2000	Biological Sciences
Stanford University School of Medicine, Stanford, CA	MD	06/2005	Medicine
Huntington Hospital/University of Southern California Keck School of Medicine, Pasadena, CA	Post-Doctoral	06/2006	Internal Medicine
Bascom Palmer Eye Institute/Jackson Memorial Hospital/University of Miami Miller School of Medicine, Miami, FL	Post-Doctoral	06/2009	Ophthalmology
Stanford University School of Medicine, Stanford, CA	Post-Doctoral	06/2010	Vitreoretinal Diseases and Surgery

B. Positions/Employment, Memberships and Honors

Positions and Employment

2015-	Director, Clinical and Translational Research
2010-	Clinical Assistant Professor Ophthalmology, Stanford University School of Medicine, Stanford, CA
2010-	Director, Ophthalmic Diagnostics at the Stanford University School of Medicine, Stanford, CA

Professional Memberships

Association for Research in Vision and Ophthalmology, American Society of Retina Specialists, Retina Society, Macula Society, Vit-Buckle Society, American Academy of Ophthalmology, American College of Surgeons, Society of Heed Fellows

Honors

1999	Firestone Medal for Excellence in Research
2000	Stanford Department of Biological Sciences Award for Excellence in Teaching
2001	Baxter Foundation Scholar, Stanford Medical Scholars Research Fellowship
2001	AMA National Convention Travel Award
2001	Kolos Scholar, Stanford Medical Scholars Research Fellowship
2002	Best Oral Presentation, Stanford Medical Student Research Symposium
2003	National Eye Institute ARVO Travel Award

2003   NASA Certificate of Recognition for Creative Development of a Technical Innovation to be Published as a Technical Brief
2003   NASA Certificate of Recognition for a Patent Filed with the USPTO
2003   Stanford Medical Scientist Research Fellowship
2003   Howard Hughes Medical Institute Research Training Fellowship for Medical Students
2008   Heed Ophthalmic Foundation Residents' Retreat
2009   Pan-American Ophthalmological Foundation Paul Kayser International Travel Scholar
2009   Annenberg Center for Health Sciences at Eisenhower Mentoring Program Scholarship
2010   Heed Ophthalmic Foundation Fellowship
2012-2014   America's Top Ophthalmologists, Consumer's Research Council of America
2015   NASA Certificate of Recognition for Creative Development of a Technical Innovation

C. Contributions to Science (selected from 84 peer-reviewed articles)

1. My research includes automated analysis of ocular images that has successfully produced the publications below.
a. Rubin DL, de Sisternes L, Chen Q, Leng T, Zheng LL. Quantitative evaluation of drusen on photographs. *Ophthalmol.* 2013;120(3):644-644e2.
b. Chen Q, Leng T, Zheng L, Kutzscher L, Ma J, de Sisternes L, Rubin DL. Automated drusen segmentation and quantification in SD-OCT images. *Med Image Anal.* 2013;17(8):1058-1072.
c. Chen Q, Leng T, Zheng L, Kutzscher L, de Sisternes L, Rubin DL. An improved OCT-derived fundus projection image for drusen visualization. *Retina.* 2014;34(5):996-1005.
d. Chen Q, de Sisternes L, Leng T, Zheng L, Kutzscher L, Rubin DL. Semi-automatic geographic atrophy segmentation for SD-OCT images. *Biomed Opt Express.* 2013;4(12):2729-2750.
e. Chen Q, Leng T, Niu S, Shi J, de Sisternes L, Rubin DL. A false color fusion strategy for drusen and GA visualization in OCT images. *Retina.* 2014;34:2346-2358.
f. de Sisternes L, Simon N, Tibshirani R, Leng T, Rubin DL. Quantitative SD-OCT imaging biomarkers as indicators of age-related macular degeneration progression. *Invest Ophthalmol Vis Sci.* 2014;55(11):7093-7109.
g. Chen Q, de Sisternes L, Leng T, Rubin DL. Application of improved homogeneity similarity based denoising in optical coherence tomography retinal images. *J Digital Imaging,* 2014 Nov 18 [Epub ahead of print].
h. de Sisternes L, Hu J, Rubin DL, Leng T. Visual prognosis of eyes recovering from macular hole surgery through automated quantitative analysis of SD-OCT scans. *Invest Ophthalmol Vis Sci.* 2015;56(8):4631-4643.
i. Chen Q, Niu S, Shen H, Leng T, de Sisternes L, Rubin DL. Restricted summed-area projection for geographic atrophy visualization in SD-OCT images. *Trans Vis Sci Tech.* 2015 Sep 1;4(5):2.
j. Wu M, Leng T, de Sisternes L, Rubin DL, Chen Q. Automated segmentation of optic disc in SD-OCT images and cup-to-disc ratio quantification by patch searching-based neural canal opening detection. *Optics Express.* 2015;23(24):31216-31229.
k. Niu S, de Sisternes L, Chen Q, Leng T, Rubin DL. Automated geographic atrophy segmentation for SD-OCT images using region-based C-V model via local similarity. *Biomed Opt Express.* 2016;7(2):581-600.
l. Niu S, de Sisternes L, Chen Q, Rubin DL, Leng T. Fully automated prediction of geographic atrophy growth using quantitative spectral-domain optical coherence tomography imaging biomarkers. *Ophthalmol.* 2016 (in press)

2. I have also explored the interactions of laser therapies to retinal tissue.

a. Paulus YM, Jain A, Nomoto H, Sramek C, Gariano RF, Andersen D, Schuele G, Leung L, Leng T, Palanker DV. Selective retinal therapy with microsecond exposure using a continuous line scanning laser. *Retina*. 2011;31(2):380-388.
b. Leng T, Sanislo SR, Jack RL. Photodynamic therapy rescue for subretinal fluid exacerbation after focal laser treatment in idiopathic central serous chorioretinopathy. *Open Ophthalmol J.* 2011;5:6-9.

c. Sramek C, Leung LS, Leng T, Brown J, Paulus YM, Schuele G, Palanker DV. Improving the therapeutic window of retinal photocoagulation by spatial and temporal modulation of the laser beam. *J Biomed Opt.* 2011 Mar-Apr;16(2):028004.
d. Wood EH, Leng T, Schachar IH, Karth PA. Multi-modal longitudinal evaluation of sub-threshold laser lesions in human retina, including scanning laser ophthalmoscope-adaptive optics imaging. *Ophthalmic Surg Lasers Imaging Retina.* 2016;47(3):268-275.

3. In addition to my work in OCT image analysis in macular degeneration. I have also contributed to the scientific literature in pediatric retinal disease and specifically in the field of telemedicine screening for retinopathy of prematurity.

   a. Leng T, Moshfeghi DM. Retinopathy of prematurity in an infant with Aicardi's syndrome. *Eye.* 2011;25(2):257-258.
   b. Leng T. Two cases of of X-linked retinoschisis with different spectral domain optical coherence tomography findings. *Clin Ophthalmol.* 2012;6:1563-1565.
   c. Fijalkowski N, Zheng LL, Hendreson MT, Wang SK, Wallenstein MB, Leng T, Moshfeghi DM. Stanford University network for diagnosis of retinopathy of prematurity (SUNDROP): Five years of screening with telemedicine. *Ophthalmic Surg Lasers Imaging Retina.* 2014;45(2):106-113.
   d. Wang SK, Callaway NF, Wallenstein MB, Henderson MT, Leng T, Moshfeghi DM. SUNDROP: six years of screening for retinopathy of prematurity with telemedicine. *Can J Ophthalmol.* 2015 Apr;50(2):101-106.

4. I have also contributed to the literature surrounding intraocular infection—its incidence, its causative organisms, its diagnosis, and its prevention.

   a. Leng T, Flynn Jr. HW, Miller D, Murray TG, Smiddy WE. Endophthalmitis caused by *Proteus* species: antibiotic sensitivities and visual acuity outcomes. *Retina.* 2009;29(7):1019-1024.
   b. Leng T, Miller D, Flynn Jr. HW, Gedde SJ. Delayed-onset bleb-associated endophthalmitis (1996-2008): Causative organisms and visual acuity outcomes. *Retina.* 2011;31(2):344-352.
   c. Moshfeghi AA, Albini TA, Kitchens JW, Leng T, Moshfeghi DM. The vitreous trap: a simple, surgeon-controlled technique for obtaining undiluted vitreous and subretinal specimens during pars plana vitrectomy. *Retina.* 2011;31(2):426-427.
   d. Doshi RR, Leng T, Fung AE. Povidone-iodine before lidocaine gel anesthesia achieves surface antisepsis. *Ophthalmic Surg Lasers Imaging.* 2011;42(4):346-349.
   e. Jacobs DJ, Leng T, Flynn Jr. HW, Shi W, Miller D, Gedde SJ. Delayed-onset bleb-associated endophthalmitis: presentation and outcome by culture result. *Clin Ophthalmol.* 2011;5:739-744
   f. Doshi RR, Wender JD, Jumper JM, Sanislo SR, Leng T. Endogenous Candida albicans endophthalmitis following spontaneous abortion and IUD removal. *Ophthalmic Surg Lasers Imaging.* 2011;42:e132-134.
   g. Jacobs DJ, Pathengay A, Flynn Jr. HW, Leng T, Miller D, Shi W. Intravitreal dexamethasone in the management of delayed-onset bleb-associated endophthalmitis. *Int J Inflammation.* 2012;12:1-5.
   h. Doshi RR, Leng T, Fung AE. Reducing oral flora contamination of intravitreal injections with face mask or silence. *Retina.* 2012;32(3):473-476.
   i. Leng T, Moshfeghi DM. Valved 25-gauge cannula for vitreous tap and injection. *Ophthalmic Surg Lasers Imaging Retina.* 2014 (in press)
   j. Paulus YM, Cheng S, Karth PA, Leng T. Prospective trial of endogenous fungal endophthalmitis and chorioretinitis rates, clinical course and outcomes. *Retina.* 2015 Dec 11

5. Finally, I have explored the application of muti-modal imaging technologies.

   a. Leng T, Lujan BJ, Yoo SH, Wang J. Three dimensional spectral-domain optical coherence tomography of a clear corneal cataract incision. *Ophthalmic Surg Lasers Imaging.* 2008;39(4):S132-S134.
   b. Leng T, Rosenfeld PJ, Gregori G, Puliafito CA, Punjabi OS. Spectral domain optical coherence tomography characteristics of cuticular drusen. *Retina.* 2009;29(7):988-993.
   c. Ide T, Wang J, Tao A, Leng T, Kymionis GD, O'Brien TP, Yoo SH. Intraoperative use of three-dimensional spectral-domain optical coherence tomography. *Ophthalmic Surg Lasers Imaging.* 2010;41(2):250-254.

d. Leng T, Blumenkranz MS. The evolution of OCT technology. *Retina.* 2011;31(4):815-816.

e. Leng T, Marmor MF, Kellner U, Thompson DA, Renner AB, Moore W, Sowden J. Foveal cavitation as an optical coherence tomography sign in central cone dysfunction. *Retina*. 2012;32(7):1411-1419.

f. Sisk RA, Leng T. Multimodal imaging and multifocal electroretinography demonstrate autosomal recessive Stargardt disease may present like occult macular dystrophy. *Retina.* 2014;34(8):1567-1575.

Complete List of Published Work in My Bibliography:

D. Research Support

Ongoing Research Support

OHR-1601   Leng (PI)   08/01/2016 to 07/31/2020
Sponsored Research – Ohr Pharmaceuticals
A phase III study of the efficacy and safety of squalamine lactate ophthalmic solution, 0.2% twice daily in subjects with neovascular age-related macular degeneration (MAKO)
Role: Principal Investigator

QRK207   Liao (PI)
A phase II/III, randomized, double-masked, sham-controlled trial of QPI-1007 delivered by single or multi-dose intravitreal injection(s) to subjects with acute nonarteritic anterior ischemic optic neuropathy (NAION)
Role: Co-Investigator

ALN-TTRSC-004   Witteles (PI)
Sponsored Research – Alynlam Pharmaceuticals
A Phase 3 Multicenter, Multinational, Randomized, Double-Blind, Placebo-Controlled Study to Evaluate the Efficacy and Safety of ALN-TTRSC in Patients With Transthyretin (TTR) Mediated Familial Amyloidotic Cardiomyopathy (FAC)
Role: Co-Investigator

GX29185   Leng (PI)   03/04/2015 to 10/31/2017
Sponsored Research – Genentech/Roche
A phase III, multicenter, randomized, double-masked, sham-controlled study to assess the efficacy and safety of lampalizumab administered intravitreally to patients with geographic atrophy secondary to age-related macular degeneration (SPECTRI)
Role: Principal Investigator

MK-8931-019   Kerchner/Sha (PI)
Sponsored Research – Merck, Inc.
A phase III, randomized, placebo-controlled, parallel-group, double blind clinical trial to study the efficacy and safety of MK-8931 (SCH900931) in subjects with amnestic mild cognitive impairment due to Alzheimer's disease (prodromal AD)
Role: Co-Investigator

150998-006   Leng (PI)   01/22/2016 to 05/31/2020
Sponsored Research – Allergan
Safety and efficacy of abicipar pegol (AGN-150998) in patients with neovascular age-related macular degneration (SEQUOIA)
Role: Principal Investigator

<u>Completed Research Support</u>

CL-AMD-201   Leng (PI)   11/01/2015 to 09/30/2018
Sponsored Research – StemCells, Inc.
A phase II proof-of-concept study of the safety and efficacy of HuCNS-SC subretinal transplantation in subjects with geographic atrophy of age-related macular degeneration (RADIANT)
Role: Principal Investigator

IT-002   Silva (PI)   06/12/2015 to 05/31/2017
Study evaluating intravitreal hI-con1 in patients with choroidal neovascularization secondary to age-related macular degeneration (EMERGE)
Role: Co-Investigator

CL-N02-AMD   Leng (PI)   05/10/2015 to 04/30/2019
Long-Term Follow-up Study of the Phase I/II Safety and Preliminary Efficacy of Human Central Nervous System Stem Cells (HuCNS-SC) Subretinal Transplantation in Subjects with Geographic Atrophy of Age-Related Macular Degeneration
Role: Principal Investigator

CL-N01-AMD   Leng (PI)   03/01/2013 to 02/29/2016
Sponsored Research – StemCells, Inc.
A phase I/II study of the safety and preliminary efficacy of human central nervous system stem cells (HuCNS-SC) transplanted into the subretinal space in subjects with geographic atrophy in age-related macular degeneration
Role: Principal Investigator