



## Robert Chang, MD

Assistant Professor of Ophthalmology at the Stanford University Medical Center

 Curriculum Vitae available Online

### CLINICAL OFFICES

- **Stanford Byers Eye Institute**

2452 Watson Ct

MC 5353

Palo Alto, CA 94303

**Tel** (650) 723-6995

**Fax** (650) 725-6619

### ACADEMIC CONTACT INFORMATION

- **Alternate Contact**

Theresa Menzies - Administrative Associate

**Email** tmenzies@stanford.edu

**Tel** 650-725-5743

### Bio

---

#### BIO

Dr. Chang runs a busy glaucoma and cataract surgical practice with special expertise in minimally invasive glaucoma surgery (MIGS such as iStent, ECP, trabectome, KDB, Omni, Cyclo G6 Micropulse, Cypass, Xen) and complex cataract removal using the latest technologies including intraop aberrometry (ORA) and toric lenses as well as multifocals/EDOF including Restor and Symphony. He is an expert on optical coherence tomography (OCT) having helped the normative data development of Zeiss Stratus and Cirrus. Besides providing state of the art clinical care, delving into cutting edge research, and delivering world class education, he is involved in the development of novel mobile health devices and digital health startups as well as scientific advisor to multiple pharmaceutical and medical device companies. Current research interests include: high myopia and glaucoma, sensors during surgery, improving glaucoma therapy compliance, validating eye care delivery systems leveraging mobile devices, developing computer vision machine learning algorithms, and aggregating big data with differential privacy features.

Dr. Chang co-invented the EyeGo Smartphone imaging adapter, which was commercialized as the Paxos Scope. He is co-founder of a new seed stage consumer health startup, AVA. Currently, he is Vice President of the Asia Pacific Tele Ophthalmology Society and medical director of employer based optometry services. One of his original contributions is the creation of the digital health design sprint, a week-long, end-to-end project-based learning experience to help innovators be more aware of the challenges in starting a healthcare company. <http://medcatalyst.stanford.edu>

#### CLINICAL FOCUS

- Ophthalmology
- Glaucoma and cataract surgery
- Minimally Invasive Surgical Procedures
- Medical Education
- Mobile Health
- Optical Coherence Tomography
- Myopia
- Vision Screening
- trabectome
- istent
- ECP

#### ACADEMIC APPOINTMENTS

- Assistant Professor - Med Center Line, Ophthalmology

- Member, Bio-X

## **ADMINISTRATIVE APPOINTMENTS**

- Medical Director, Stanford Employer Based Optometry, (2016- present)
- Glaucoma Fellowship Co-Director, Stanford Ophthalmology, (2009- present)

## **HONORS AND AWARDS**

- Heed Fellow, Heed Foundation (2007)
- America Glaucoma Society MAPS grant, AGS (2011)
- Bio-X Undergraduate Summer Research Program Grant, Stanford (2013)
- Winner Best Pivot, Stanford Startxmed Innovation Challenge (2013)
- Stanford Center Peking University Faculty Fellowship Program Award, SCPKU (2014)
- Stanford Society of Physician Scholars (SSPS) Grant, SSPS (2014)
- Stanford Spectrum Medtech Innovation Grant, Spectrum (2014)
- Circular 2D Polarized LCD TV on Improvement of Eye Fatigue and Eye Movement Control, TCL Research America Grant (2014-2015)
- First Place, Philips Healthsuite Hackathon (2015)
- Stanford Center Peking University Graduate Seminar Program, SCPKU (2015)
- Digital Health Bootcamp, SCPKU (2016)
- Medical Innovation Curriculum, Stanford UAR (2016)
- Robert Howard Next Step Award, Lunar (2016)
- Stanford Spectrum Medtech Innovation Grant, Spectrum (2016)
- Center for Innovation in Global Health Grant, CIGH Stanford (2017)
- Machine Learning Grant, Santen (2017)

## **BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS**

- Fellow, AAO American Academy of Ophthalmology (2009 - present)
- Member, AGS American Glaucoma Society (2009 - present)
- Fellow, CIGH Center for Innovation in Global Health (2015 - present)
- Member and Co-Chair mHealth, PHS Population Health Sciences (2015 - 2016)
- Vice President, APTOS Asia Pacific Tele-Ophthalmology Society (2016 - present)

## **PROFESSIONAL EDUCATION**

- Fellowship: Bascom Palmer Eye Institute Ophthalmology Training (2009) FL
- Residency: Washington University Ophthalmology Residency (2007) MO
- Internship: NorthShore University Health System Internal Medicine Residency (2004) IL
- Medical Education: University of Missouri Kansas City School of Medicine Registrar (2002) MO
- Board Certification: Ophthalmology, American Board of Ophthalmology (2008)

## **COMMUNITY AND INTERNATIONAL WORK**

- Stanford Center at Peking University (SCPKU) Ignite Health, Beijing
- Smartphone Imaging and Eye Exam Testing
- Lifeline Express Volunteer Educator, GangsuSichuanXinjiangYunnanShaanxiGuangdongJiangxiHebeiZhejiangHenanJiangsuJilinHeilongjiang

## PATENTS

- Robert Chang. "United States Patent 62/138,271 Modular Smartphone Adapters for Mobile Ophthalmoscopy", Leland Stanford Junior University, Mar 25, 2015
- Robert Chang. "United States Patent 14/893,951 Modular Lens Adapters for Mobile Anterior and Posterior Segment Ophthalmoscopy," Leland Stanford Junior University, May 30, 2014

## LINKS

- LinkedIn: <http://www.linkedin.com/in/ankimo>
- Teaching Digital Health Innovation: <http://www.dhealthclass.com>
- HK Medtech Hackathon 2016: <http://www.dreamcatchers.hku.hk/?p=1268>
- HK Medtech Hackathon 2017: <http://www.dreamcatchers.hku.hk/?p=1838>
- HK Medtech Hackathon 2018: [http://www.dreamcatchers.hku.hk/?page\\_id=57107](http://www.dreamcatchers.hku.hk/?page_id=57107)
- I am a Biodesign Faculty Fellow: <http://biodesign.stanford.edu/programs/fellowships/faculty-fellowship.html>
- Curitiba Biodesign 2016: <http://hipuc.com>
- Sao Paulo Einstein Biodesign 2018: <http://einsteinbiodesign.com>

## Research & Scholarship

---

### CURRENT RESEARCH AND SCHOLARLY INTERESTS

I am a clinician-scientist focusing on patient care, physician innovation and biodesign educator, and digital health technology.

Selected Interests:

- 1) Young Chinese Myopes with Minimally Progressive Field Defects
- 2) Visual Field and Optical Coherence Tomography Specificity for Progression in Glaucoma
- 3) Patient Satisfaction in Ophthalmology
- 4) Automated Visual Field Screening for Glaucoma Using Mobile Devices
- 5) Smartphone-Based Tele-Ophthalmology Screening For Eye Disease
- 6) Smartphone-Based Contrast Sensitivity Testing and the Mobile Eye Exam
- 7) Computer Vision Machine Learning for Ophthalmology
- 8) Compliance with Medication Monitoring and Realtime Intervention

### CLINICAL TRIALS

- Comparing Safety and Efficacy of BOL-303259-X With Timolol Maleate in Subjects With Open-Angle Glaucoma or Ocular Hypertension, Not Recruiting
- Macular Ganglion Cell Analysis (GCA) of the Cirrus HD-OCT in Glaucoma, Not Recruiting
- Safety and Efficacy of Bimatoprost Sustained-Release (SR) in Patients With Open-Angle Glaucoma or Ocular Hypertension, Not Recruiting

## Publications

---

### PUBLICATIONS

- **Dry eye and sleep quality: a large community-based study in Hangzhou.** *Sleep*  
Yu, X., Guo, H., Liu, X., Wang, G., Min, Y., Chen, S. S., Han, S. S., Chang, R. T., Zhao, X., Hsing, A., Zhu, S., Yao, K.  
2019
- **Comparison of 1 year effectiveness of trabecular microbypass stent implantation (iStent) among mild, moderate, and severe primary open angle glaucoma**  
Chansangpetch, S., Ittarat, M., Yang, S., Fisher, A. C., Singh, K., Lin, S. C., Chang, R.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2019

- **A 3D Deep Learning System for Detecting Referrable Glaucoma Using Full OCT Macular Cube Scans**  
Russakoff, D. B., Mannil, S. S., Oakley, J. D., Chang, R.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2019
- **Recombinant human nerve growth factor (rhNGF) eye drops for glaucoma: Results from a prospective double - masked randomized controlled trial**  
Nunez, M., Popova, L., Nguyen, B. T., Groth, S. L., Dennis, A., Li, Z., Khavari, T., Wang, S. Y., Chang, R., Fisher, A. C., Goldberg, J. L.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2019
- **Novel deep learning based algorithm for Macula and Optic Nerve Head segmentation versus Cirrus Optical Coherence Tomography in identifying glaucoma**  
Mannil, S., Oakley, J. D., Russakoff, D. B., Chang, R.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2019
- **Smartphone-based Retinal Imaging to Characterize Early Functional Retinal Vascular Changes in Diabetic Retinopathy**  
Cheung, C., Wang, Y., Liu, J. K., Lai, K. W., Chang, R., Wong, T.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2019
- **Diagnostic Assessment of RNFL Segmentation using a Hybrid Deep Learning Approach**  
Oakley, J. D., Mannil, S. S., Russakoff, D. B., Chang, R.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2019
- **A 3D Deep Learning System for Detecting Glaucomatous Optic Neuropathy from Volumetric and En Face Optical Coherence Tomography Scans**  
Ran, A., Wang, X., Luo, L., Chan, P., Chang, R., Mannil, S., Chen, H., Heng, P., Tham, C. Y., Cheung, C.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2019
- **Development and validation of a deep learning algorithm for the detection of neovascular age-related macular degeneration from color fundus photographs.** *Clinical & experimental ophthalmology*  
Keel, S., Li, Z., Scheetz, J., Robman, L., Phung, J., Makeyeva, G., Aung, K. Z., Liu, C., Yan, X., Meng, W., Guymmer, R., Chang, R., He, et al  
2019
- **Glaucoma Suspect: Diagnosis and Management.** *Asia-Pacific journal of ophthalmology (Philadelphia, Pa.)*  
Chang, R. T., Singh, K.  
; 5 (1): 32–37
- **Update on the Medical Treatment of Primary Open-Angle Glaucoma.** *Asia-Pacific journal of ophthalmology (Philadelphia, Pa.)*  
Cheema, A., Chang, R. T., Shrivastava, A., Singh, K.  
; 5 (1): 51–58
- **Characteristics of cataract surgery patients influencing patient satisfaction scores** *JOURNAL OF CATARACT AND REFRACTIVE SURGERY*  
Lee, M. D., Chen, S. P., Chen, T. A., Leibold, C., Li, Z., Fisher, A., Lin, C. C., Singh, K., Chang, R. T.  
2019; 45 (4): 437–42
- **Characteristics of cataract surgery patients influencing patient satisfaction scores.** *Journal of cataract and refractive surgery*  
Lee, M. D., Chen, S. P., Chen, T. A., Leibold, C., Li, Z., Fisher, A. C., Lin, C. C., Singh, K., Chang, R. T.  
2019
- **Corneal Biomechanics Using a Scheimpflug-Based Noncontact Device in Normal-Tension Glaucoma and Healthy Controls.** *Asia-Pacific journal of ophthalmology (Philadelphia, Pa.)*  
Hong, K., Wong, I. Y., Singh, K., Chang, R. T.  
2019
- **Corneal Biomechanics Using a Scheimpflug-Based Noncontact Device in Normal-Tension Glaucoma and Healthy Controls** *ASIA-PACIFIC JOURNAL OF OPHTHALMOLOGY*  
Hong, K., Wong, I. H., Singh, K., Chang, R. T.  
2019; 8 (1): 22–29
- **Development and Validation of a Deep Learning System to Detect Glaucomatous Optic Neuropathy Using Fundus Photographs.** *JAMA ophthalmology*  
Liu, H., Li, L., Wormstone, I. M., Qiao, C., Zhang, C., Liu, P., Li, S., Wang, H., Mou, D., Pang, R., Yang, D., Jiang, L., Chen, et al  
2019

- **Understanding Patient Attitudes Toward Multifocal Intraocular Lenses in Online Medical Forums Through Sentiment Analysis.** *Studies in health technology and informatics*  
Wang, S. Y., Hernandez-Boussard, T., Chang, R. T., Pershing, S.  
2019; 264: 1378–82
- **Ocular Antihypertensive Medication Use After iStent Implantation Concurrent With Cataract Surgery vs Cataract Surgery Alone in a Large US Health Care Claims Database** *JAMA OPHTHALMOLOGY*  
Wang, S. Y., Singh, K., Stein, J. D., Chang, R. T.  
2019; 137 (1): 21–27
- **An Extended Hackathon Model for Collaborative Education in Medical Innovation (vol 42, 239, 2018 )** *JOURNAL OF MEDICAL SYSTEMS*  
Wang, J. K., Pamnani, R. D., Capasso, R., Chang, R. T.  
2019; 43 (1)
- **Correction to: An Extended Hackathon Model for Collaborative Education in Medical Innovation.** *Journal of medical systems*  
Wang, J. K., Pamnani, R. D., Capasso, R., Chang, R. T.  
2018; 43 (1): 15
- **An Automated Grading System for Detection of Vision-Threatening Referable Diabetic Retinopathy on the Basis of Color Fundus Photographs** *DIABETES CARE*  
Li, Z., Keel, S., Liu, C., He, Y., Meng, W., Scheetz, J., Lee, P., Shaw, J., Ting, D., Wong, T., Taylor, H., Chang, R., He, et al  
2018; 41 (12): 2509–16
- **An Extended Hackathon Model for Collaborative Education in Medical Innovation** *JOURNAL OF MEDICAL SYSTEMS*  
Wang, J. K., Pamnani, R. D., Capasso, R., Chang, R. T.  
2018; 42 (12)
- **Institutionalizing healthcare hackathons to promote diversity in collaboration in medicine** *BMC MEDICAL EDUCATION*  
Wang, J. K., Roy, S. K., Barry, M., Chang, R. T., Bhatt, A. S.  
2018; 18
- **Institutionalizing healthcare hackathons to promote diversity in collaboration in medicine.** *BMC medical education*  
Wang, J. K., Roy, S. K., Barry, M., Chang, R. T., Bhatt, A. S.  
2018; 18 (1): 269
- **An Extended Hackathon Model for Collaborative Education in Medical Innovation.** *Journal of medical systems*  
Wang, J. K., Pamnani, R. D., Capasso, R., Chang, R. T.  
2018; 42 (12): 239
- **An Automated Grading System for Detection of Vision-Threatening Referable Diabetic Retinopathy on the Basis of Color Fundus Photographs.** *Diabetes care*  
Li, Z., Keel, S., Liu, C., He, Y., Meng, W., Scheetz, J., Lee, P. Y., Shaw, J., Ting, D., Wong, T., Taylor, H., Chang, R., He, et al  
2018
- **Ocular Antihypertensive Medication Use After iStent Implantation Concurrent With Cataract Surgery vs Cataract Surgery Alone in a Large US Health Care Claims Database.** *JAMA ophthalmology*  
Wang, S. Y., Singh, K., Stein, J. D., Chang, R. T.  
2018
- **Efficacy of a Deep Learning System for Detecting Glaucomatous Optic Neuropathy Based on Color Fundus Photographs** *OPHTHALMOLOGY*  
Li, Z., He, Y., Keel, S., Meng, W., Chang, R. T., He, M.  
2018; 125 (8): 1199–1206
- **Automatic identification of referral-warranted diabetic retinopathy using deep learning on mobile phone images**  
Leng, T., Greven, M., Smith, S., Ludwig, C., Chang, R., Gargeya, R.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2018
- **Comparison of Automated Self-Refraction Using NETRA with Table-Mounted Autorefractor and Subjective Refraction in an Academic Optometry Clinic**  
Li, Z., Leibold, C., Binder, S. W., Beyer, J., Warner, K. A., Chang, R.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2018

- **Characteristics of cataract surgery patients influencing Press Ganey patient satisfaction scores**  
Lee, M., Chen, S., Chen, T., Fisher, A., Lin, C. C., Singh, K., Chang, R.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2018
- **Impact of Race on Press Ganey Measures of Ophthalmology Clinic Visits**  
Chen, T., Chen, S., Lee, M., Fisher, A., Lin, C. C., Singh, K., Chang, R.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2018
- **Reduction of Ocular Antihypertensive Medication Use After IStent Implantation in a Large US Managed Care Network**  
Wang, S., Chang, R.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2018
- **A deep learning system for detecting glaucomatous optic neuropathy and age-related macular degeneration based on color fundus photographs**  
He, M., Li, Z., Keel, S., Chang, R.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2018
- **The development and validation of a deep learning algorithm for referable diabetic retinopathy**  
Keel, S., Li, Z., He, Y., Meng, W., Chang, R., He, M.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2018
- **Recombinant human nerve growth factor (rhNGF) eye drops for glaucoma: Interim results**  
Popova, L., Nunez, M., Bac Tien Nguyen, Groth, S., Dennis, A., Li, Z., Khavari, T., Wang, S., Chang, R., Fisher, A., Goldberg, J. L.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2018
- **Specific Location of Disc Hemorrhage is Linked to Nerve Fiber Layer Defects.** *Optometry and vision science*  
Yoo, Y. C., Kim, J. M., Park, H. S., Yoo, C., Shim, S. H., Won, Y. S., Park, K. H., Chang, R. T.  
2017; 94 (6): 647-653
- **Three year follow-up of serial structural and function testing in high myopes without elevated intraocular pressure**  
Au, T. J., Lee, M., Singh, K., Chang, R.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2017
- **Reply.** *Retina (Philadelphia, Pa.)*  
He, L., Toy, B., Blumenkranz, M., Chang, R., Myung, D.  
2017; 37 (6)
- **Deep convolutional neural networks for automated OCT pathology recognition**  
Russakoff, D. B., Oakley, J. D., Chang, R.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2017
- **Serial Spectral-Domain Optical Coherence Tomography Findings in Acute Retinal Pigment Epitheliitis and the Correlation to Visual Acuity.** *Ophthalmology*  
Iu, L. P., Lee, R., Fan, M. C., Lam, W., Chang, R. T., Wong, I. Y.  
2017; 124 (6): 903-909
- **Training time and quality of smartphone-based anterior segment screening in rural India.** *Clinical ophthalmology (Auckland, N.Z.)*  
Ludwig, C. A., Newsom, M. R., Jais, A., Myung, D. J., Murthy, S. I., Chang, R. T.  
2017; 11: 1301-7
- **Eye Fatigue During TV Watching: An Infrared Oculography Study of Linearly vs. Circularly Polarized LCD TV**  
Shariati, A., Liao, K., Yu, C., Witthayaweerasak, J., Chang, R. T., Sun, M., Liao, Y.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2016
- **Comparison of Peristat Online Perimetry with the Humphrey Perimetry in a Clinic-Based Setting** *TRANSLATIONAL VISION SCIENCE & TECHNOLOGY*  
Lowry, E. A., Hou, J., Hennein, L., Chang, R. T., Lin, S., Keenan, J., Wang, S. K., Ianchulev, S., Pasquale, L. R., Han, Y.  
2016; 5 (4)
- **Novel Parameter of Corneal Biomechanics That Differentiate Normals From Glaucoma** *JOURNAL OF GLAUCOMA*  
Lee, R., Chang, R. T., Wong, I. Y., Lai, J. S., Lee, J. W., Singh, K.  
2016; 25 (6): E603-E609

- **SMARTPHONE-BASED DILATED FUNDUS PHOTOGRAPHY AND NEAR VISUAL ACUITY TESTING AS INEXPENSIVE SCREENING TOOLS TO DETECT REFERRAL WARRANTED DIABETIC EYE DISEASE** *RETINA-THE JOURNAL OF RETINAL AND VITREOUS DISEASES*  
Toy, B. C., Myung, D. J., He, L., Pan, C. K., Chang, R. T., Polkinhorne, A., Merrell, D., Foster, D., Blumenkranz, M. S.  
2016; 36 (5): 1000-1008
- **Effectiveness of Glaucoma Counseling on Rates of Follow-up and Glaucoma Knowledge in a South Indian Population** *AMERICAN JOURNAL OF OPHTHALMOLOGY*  
Do, A. T., Pillai, M. R., Balakrishnan, V., Chang, R. T., Robin, A. L., Singh, K., Lee, B. W.  
2016; 163: 180-189
- **A novel smartphone ophthalmic imaging adapter: User feasibility studies in Hyderabad, India** *INDIAN JOURNAL OF OPHTHALMOLOGY*  
Ludwig, C. A., Murthy, S. I., Pappuru, R. R., Jais, A., Myung, D. J., Chang, R. T.  
2016; 64 (3): 191-200
- **Assessment of corneal biomechanical parameters in myopes and emmetropes using the Corvis ST** *CLINICAL AND EXPERIMENTAL OPTOMETRY*  
Lee, R., Chang, R. T., Wong, I. Y., Lai, J. S., Lee, J. W., Singh, K.  
2016; 99 (2): 157-162
- **Factors Associated with Patient Press Ganey Satisfaction Scores for Ophthalmology Patients.** *Ophthalmology*  
Long, C., Tsay, E. L., Jacobo, S. A., Papat, R., Singh, K., Chang, R. T.  
2016; 123 (2): 242-247
- **Reversible Conjunctival Pigmentation Associated With Prostaglandin Use** *JOURNAL OF GLAUCOMA*  
Choi, D. Y., Chang, R. T., Yegnashankaran, K., Friedman, N. J.  
2016; 25 (1): E56-E57
- **Visual field defect classification in the Zhongshan Ophthalmic Center-Brien Holden Vision Institute High Myopia Registry Study.** *The British journal of ophthalmology*  
Ding, X., Chang, R. T., Guo, X., Liu, X., Johnson, C. A., Holden, B. A., He, M.  
2016
- **Effectiveness of glaucoma counseling on patient follow-up rates and glaucoma knowledge in a South Indian population**  
Do, A., Singh, K., Pillai, M., Balakrishnan, V., Chang, R., Lee, B.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2015
- **Quantitative Measurement of Fixation Stability During RareBit Perimetry and Humphrey Visual Field Testing.** *Journal of glaucoma*  
Lin, S. R., Lai, I. N., Dutta, S., Singh, K., Chang, R. T.  
2015; 24 (2): 100-104
- **Effectiveness of low vision services in improving patient quality of life at Aravind Eye Hospital.** *Indian journal of ophthalmology*  
Do, A. T., Ilango, K., Ramasamy, D., Kalidasan, S., Balakrishnan, V., Chang, R. T.  
2014; 62 (12): 1125-1131
- **Optic nerve pit-associated choroidal cleft.** *JAMA ophthalmology*  
Silva, R. A., Chang, R. T., Moshfeghi, D. M., Leng, T.  
2014; 132 (9): 1142-?
- **Diagnostic performance of optical coherence tomography ganglion cell-inner plexiform layer thickness measurements in early glaucoma.** *Ophthalmology*  
Mwanza, J., Budenz, D. L., Godfrey, D. G., Neelakantan, A., Sayyad, F. E., Chang, R. T., Lee, R. K.  
2014; 121 (4): 849-854
- **Corneal Applanation Velocity as a Risk Factor for Normal Tension Glaucoma**  
Hong, K., Chang, R., Wong, I., Singh, K.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2014
- **iPhone Photography of Eye Pathology for Remote Triage**  
He, L., Myung, D., Pershing, S., Chang, R.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2014
- **Corneal changes after a single session of selective laser trabeculoplasty for open-angle glaucoma** *EYE*

- Lee, J. W., Chan, J. C., Chang, R. T., Singh, K., Liu, C. C., Gangwani, R., Wong, M. O., Lai, J. S.  
2014; 28 (1): 47-52
- **Parallel rarebits: A novel, large-scale visual field screening method.** *Clinical & experimental optometry : journal of the Australian Optometrical Association*  
Lin, S. R., Fijalkowski, N., Lin, B. R., Li, F., Singh, K., Chang, R. T.  
2014; 97 (6): 528-33
  - **An emerging treatment option for glaucoma: Rho kinase inhibitors.** *Clinical ophthalmology (Auckland, N.Z.)*  
Wang, S. K., Chang, R. T.  
2014; 8: 883-890
  - **Simple, Low-Cost Smartphone Adapter for Rapid, High Quality Ocular Anterior Segment Imaging: A Photo Diary** *Journal of Mobile Technology and Medicine*  
Myung, D., Jais, A., He, L., Chang, R. T.  
2014; 3 (1)
  - **Combining Frequency Doubling Technology Perimetry and Scanning Laser Polarimetry for Glaucoma Detection.** *Journal of glaucoma*  
Mwanza, J. C., Warren, J. L., Hochberg, J. T., Budenz, D. L., Chang, R. T., Ramulu, P. Y.  
2014
  - **The Prevalence of Cirrus SD-OCT Ganglion Cell Segmentation Errors in High Myopes**  
Johung, T., Oakley, J., Russako, D., Sabhlok, S., Li, F., Chang, R.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2013
  - **Novel Corneal Biomechanical Parameters in Myopes vs Emmetropes**  
Lee, R., Chang, R., Wong, I., Lai, J., Lee, J., Singh, K.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2013
  - **Diagnostic Efficacy of RNFL Thickness Sectors for Glaucoma Detection**  
Lee, G., Budenz, D., Chang, R., Crandall, A., Girkin, C., Leung, C., Neelakantan, A., Peace, J., Werner, J., Wollstein, G.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2013
  - **Clinical Utility of Web-based Office and Home Peristat for the Detection of Visual Field Defects in Patients with Glaucoma**  
Wang, S., Hou, J., Ianchulev, S., Chon, B., Han, Y., Chang, R.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2013
  - **Analyzing Shape Parameterization of SD-OCT Optic Nerve Head Images in High Myopes as a Predictor of Visual Field Defects**  
Sabhlok, S., Russako, D., Johung, T., Oakley, J., Li, F., Singh, K., Chang, R.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2013
  - **Comparison of Web-based Perimetry and office-based Humphrey Visual Field (HVF) in Patients with Glaucoma**  
Hou, J., Wang, S., Keenan, J., Chon, B., Subramanian, N., Ianchulev, T., Stamper, R., Chang, R., Han, Y.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2013
  - **Myopia and glaucoma: diagnostic and therapeutic challenges** *CURRENT OPINION IN OPHTHALMOLOGY*  
Chang, R. T., Singh, K.  
2013; 24 (2): 96-101
  - **VITREO-RETINAL INTERFACE SEGMENTATION FROM SPECTRAL-DOMAIN OCT USING CHANGE DETECTION AND BELIEF PROPAGATION**  
Lu, W., Oakley, J., Russakoff, D., Chang, R., IEEE  
IEEE.2013: 1320-23
  - **Timely cataract surgery for improved glaucoma management** *JOURNAL OF CATARACT AND REFRACTIVE SURGERY*  
Chang, R. T., Shingleton, B. J., Singh, K.  
2012; 38 (10): 1709-1710
  - **Glaucoma Diagnostic Accuracy of Ganglion Cell-Inner Plexiform Layer Thickness: Comparison with Nerve Fiber Layer and Optic Nerve Head** *OPHTHALMOLOGY*  
Mwanza, J., Durbin, M. K., Budenz, D. L., Sayyad, F. E., Chang, R. T., Neelakantan, A., Godfrey, D. G., Carter, R., Crandall, A. S.  
2012; 119 (6): 1151-1158



- **Macular Ganglion Cell-Inner Plexiform Layer: Automated Detection and Thickness Reproducibility with Spectral Domain-Optical Coherence Tomography in Glaucoma** *INVESTIGATIVE OPHTHALMOLOGY & VISUAL SCIENCE*  
Mwanza, J., Oakley, J. D., Budenz, D. L., Chang, R. T., Knight, O. J., Feuer, W. J.  
2011; 52 (11): 8323-8329
- **Myopia and glaucoma.** *International ophthalmology clinics*  
Chang, R. T.  
2011; 51 (3): 53-63
- **Reproducibility of Peripapillary Retinal Nerve Fiber Layer Thickness and Optic Nerve Head Parameters Measured with Cirrus HD-OCT in Glaucomatous Eyes** *INVESTIGATIVE OPHTHALMOLOGY & VISUAL SCIENCE*  
Mwanza, J., Chang, R. T., Budenz, D. L., Durbin, M. K., Gendy, M. G., Shi, W., Feuer, W. J.  
2010; 51 (11): 5724-5730
- **The Utility of the Monocular Trial Data from the Ocular Hypertension Treatment Study** *OPHTHALMOLOGY*  
Bhorade, A. M., Wilson, B. S., Gordon, M. O., Palmberg, P., Weinreb, R. N., Miller, E., Chang, R. T., Kass, M. A.  
2010; 117 (11): 2047-2054
- **Reproducibility of Optic Nerve Head Parameters Measured With Cirrus HD-OCT in Glaucomatous Eyes**  
Chang, R. T., Mwanza, J., Gendy, M. G., Oakley, J. D., Feuer, W. J., Budenz, D. L.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2010
- **Sensitivity and Specificity of Time-Domain versus Spectral-Domain Optical Coherence Tomography in Diagnosing Early to Moderate Glaucoma** *OPHTHALMOLOGY*  
Chang, R. T., Knight, O. J., Feuer, W. J., Budenz, D. L.  
2009; 116 (12): 2294-2299
- **Comparison of Retinal Nerve Fiber Layer Measurements Using Time Domain and Spectral Domain Optical Coherent Tomography** *39th Annual Meeting of the Association-of-University-Professors-of-Ophthalmology*  
Knight, O. J., Chang, R. T., Feuer, W. J., Budenz, D. L.  
ELSEVIER SCIENCE INC.2009: 1271-77
- **Diagnosing glaucoma progression.** *International ophthalmology clinics*  
Chang, R. T., Budenz, D. L.  
2008; 48 (4): 13-28
- **Calibration of fundus images using spectral domain optical coherence tomography** *OPHTHALMIC SURGERY LASERS & IMAGING*  
Lujan, B. J., Wang, F., Gregori, G., Rosenfeld, P. J., Knighton, R. W., Puliafito, C. A., Danis, R. P., Hubbard, L. D., Chang, R. T., Budenz, D. L., Seider, M. I., Knight, O.  
2008; 39 (4): S15-S20
- **New developments in optical coherence tomography for glaucoma** *CURRENT OPINION IN OPHTHALMOLOGY*  
Chang, R., Budenz, D. L.  
2008; 19 (2): 127-135
- **Reproducibility of retinal nerve fiber thickness measurements using the stratus OCT in normal and glaucomatous eyes** *Annual Meeting of the Association-for-Research-in-Vision-and-Ophthalmology*  
Budenz, D. L., Chang, R. T., Huang, X. R., Knighton, R. W., Tielsch, J. M.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2005: 2440-43
- **Prospective randomized comparison of 2 different methods of 5% povidone-iodine applications for anterior segment intraocular surgery.** *Archives of ophthalmology*  
Miño de Kaspar, H., Chang, R. T., Singh, K., Egbert, P. R., Blumenkranz, M. S., Ta, C. N.  
2005; 123 (2): 161-165
- **Prospective Randomized comparison of 2 different methods of 5% povidone-iodine applications for anterior segment, Intraocular surgery** *106th Annual Meeting of the American-Academy-of-Ophthalmology*  
de Kaspar, H. M., Chang, R. T., Singh, K., Egbert, P. R., Blumenkranz, M. S., Ta, C. N.  
AMER MEDICAL ASSOC.2005: 161-65
- **Sensitivity and specificity of the StratusOCT for perimetric glaucoma** *OPHTHALMOLOGY*

Budenz, D. L., Michael, A., Chang, R. T., McSoley, J., Katz, J.  
2005; 112 (1): 3-9

- **Three-day application of topical ofloxacin reduces the contamination rate of microsurgical knives in cataract surgery - A prospective randomized study** *Annual Meeting of the Association-for-Research-in-Vision-and-Ophthalmology*  
de Kaspar, H. M., Chang, R. T., Shriver, E. M., Singh, K., Egbert, P. R., Blumenkranz, M. S., Ta, C. N.  
ELSEVIER SCIENCE INC.2004: 1352-55
- **Antibiotic resistance patterns of ocular bacterial flora - A prospective study of patients undergoing anterior segment surgery** *Annual Meeting of the Association-for-Research-in-Vision-and-Ophthalmology*  
Ta, C. N., Chang, R. T., Singh, K., Egbert, P. R., Shriver, E. M., Blumenkranz, M. S., de Kaspar, H. M.  
ELSEVIER SCIENCE INC.2003: 1946-51
- **Bacterial contamination of paracentesis blades used in cataract surgery** *Annual Meeting of the Association-for-Research-in-Vision-and-Ophthalmology*  
Chang, R. T., Ta, C. N., Egbert, P. R., Singh, K., Haw, W. W., Shriver, E. M., Espinosa, L., Williams, D. Y., Blumenkranz, M. S., de Kaspar, H. M.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2002: U73-U73
- **Antibiotic susceptibility pattern of coagulase-negative staphylococci in patients undergoing Intraocular surgery** *Annual Meeting of the Association-for-Research-in-Vision-and-Ophthalmology*  
Ta, C. N., de Kaspar, H. M., Chang, R. T., Shriver, E. M., Egbert, P. R., Singh, K., Blumenkranz, M. S.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2002: U1275-U1275
- **Multiresistant Staphylococcus epidermidis on the conjunctiva prior to intraocular surgery** *Annual Meeting of the Association-for-Research-in-Vision-and-Ophthalmology*  
Shriver, E. M., Ta, C. N., Egbert, P. R., Singh, K., Chang, R. T., Blumenkranz, M. S., de Kaspar, H. M.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2002: U860-U860
- **Role of topical ciprofloxacin and 5%-povidone-iodine prior to cataract surgery: a randomized study in Paraguay**  
Froehlich, S. J., Samudio, M., Laspina, F., Carron, J., Klauss, Chang, R., de Kasper, H. M.  
ASSOC RESEARCH VISION OPHTHALMOLOGY INC.2002: U349

## PRESENTATIONS

- Updates on Portable Ophthalmic Imaging - APGC (9/27/2014)
- Innovation in Mobile Healthcare: Using Smartphones as Medical Devices - SCPKU (6/12/2014)
- Mobile Health in Ophthalmology: a View From Silicon Valley - COS (5/31/2014)
- Endocyclophotocoagulation - WGC (4/5/2014)
- Structure and Function in Glaucoma Diagnostics: The Trials and their Impact on the Development of New Technologies - Hawaiian Eye (1/21/2014)
- Smartphone and Gadgets - NANOS (3/6/2014)
- Smartphone Adapters for Ocular Image Capture - Glaucoma 360 (2/8/2014)
- 6 Lessons Using SD-OCT - Glaucoma Update Thailand (12/27/2013)
- Myopia and Glaucoma: Visual Field Defects in High Myopes - ISO (11/11/2013)
- Glaucoma: Early Diagnosis and Prevention of Blindness - Pan American Ophthalmology Congress (8/10/2013)
- Genetics of Glaucoma - Stanford (7/24/2013)
- Glaucoma and Myopia: Challenges and Pearls for Progression Detection - World Glaucoma Congress (7/19/2013)
- Update in Ophthalmology - Dominican Hospital (7/12/2013)
- Fixing the Plumbing of the Eye - ASORN (4/27/2013)
- The Art of Fundus Photo Interpretation - Glaucoma Research Foundation (2/2/2013)
- iPhone Physician Education and Reference Tools - American Academic of Ophthalmology (11/11/2012)
- OCT Diagnostic Performance Studies - FDA (10/5/2012)
- Collagen Disease and Glaucoma - Asia Pacific Academy of Ophthalmology (4/16/2012)

- Myopia and Glaucoma - Glaucoma 360 (2/3/2012)
- Iphone Apps and the Present/Future of Patient Education - Grand Rounds Stanford (11/1/2011)
- Management of Acute Angle Closure - Asia Pacific Academy of Ophthalmology (3/21/2011)
- Trabeculectomy Failure - World Glaucoma Congress (7/2/2011)
- Glaucoma Technology: Surgical Innovation - Stanford Biodesign (1/29/2011)
- Glaucoma Devices: Diagnostic and Therapeutic - Stanford Biodesign (8/26/2010)
- Retcam Goniography - AGS PreSurgical Meeting (3/3/2010)
- Vision and Aging: Glaucoma, Macular Degeneration, and Cataracts - Stanford (1/12/2015)
- New Clinical Dimensions in Glaucoma Diagnostics - Hawaiian Eye (1/20/2015)
- Smartphone-Based Tele-Ophthalmology Screening For Diabetic Eye Disease - UC Berkeley (2/6/2015)
- The EyeGo and Mobile Health Innovation - UC Berkeley (2/12/2015)
- New Developments in OCT Imaging for Glaucoma: Update on the Macula - AGS (3/1/2015)
- Smartphone and Tablet Computers for Ophthalmic Information for Private Study or by the Bedside: Ophthalmic Imaging Anterior and Posterior Segment - APAO (4/15/2015)
- When and What Treatment to Start in Glaucoma Suspect - WGC (June 7, 2015)
- Digital Health Innovation: A Personal Journey in Silicon Valley - SCPKU (7/24/2015)
- Applications of Machine Learning in Ophthalmology - ISO (10/31/2015)
- Similarities and Differences Between Chinese and American Policies in Medical Innovation - Caixin Annual Summit (11/7/2015)