

Ophthalmology

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Major Scientific Interests of the Group

To investigate quality of vision and life in patients with ocular diseases. To improve outcomes of ocular therapies especially surgical treatments.

Projects for Regular Students in Doctoral or Master's Programs

- 1) Development of artificial vitreous and its clinical application
- 2) Comprehensive assessment and improvement of visual function in patients after cataract and vitreo-retinal surgery
- 3) Development of new generation of optical coherence tomography
- 4) Assessment of surgical outcomes of new intraocular lenses
- 5) Suppression of myopia progression in children
- 6) Establishment of infrastructure for artificial and big data study in ophthalmology
- 7) Development voltage-controlled accommodating intraocular lens

Study Programs for Short Stay Students (one week – one trimester)

- 1) To learn the methods to comprehensively assess visual function of patients rather than visual acuity
- 2) To understand how to improve outcomes of cataract surgery using premium intraocular lenses

Selected Publications

- 1) Fukuda S, Fujita A, Kasaragod D, Beheregaray S, Ueno Y, Yasuno Y, Oshika T. Comparison of intensity, phase retardation, and local birefringence images for filtering blebs using polarization-sensitive optical coherence tomography. *Sci Rep* 2018;8(1):7519. doi: 10.1038/s41598-018-25884-w.
- 2) Oshika T, Inamura M, Inoue Y, Ohashi T, Sugita T, Fujita Y, Miyata K, Nakano S. Incidence and outcomes of repositioning surgery to correct misalignment of toric intraocular lenses. *Ophthalmology* 2018;125:31-35. doi: 10.1016/j.ophtha.2017.07.004.
- 3) Hayashi K, Okamoto F, Hoshi S, Katashima T, Zujur DC, Li X, Shibayama M, Gilbert EO, Chung U, Ohba S,

Oshika T, Sakai T: Fast-forming hydrogel with ultralow polymeric content as an artificial vitreous body. *Nature Biomedical Engineering* 1: 0044, 2017.

- 4) Fukuda S, Fujita A, Kasaragod D, Ueno Y, Hoshi S, Kishino G, Beheregaray S, Yasuno Y, Oshika T: Quantitative evaluation of phase retardation in filtering blebs using polarization-sensitive optical coherence tomography. *Invest Ophthalmol Vis Sci* 2016;57:5919-5925. doi: 10.1167/iovs.16-19548
- 5) Horiuchi T, Mihashi T, Fujikado T, Oshika T, Asaka K: Voltage-controlled accommodating IOL system using an ion polymer metal composite actuator. *Opt Express* 2016 Oct 3;24(20):23280-23288. doi: 10.1364/OE.24.023280.
- 6) Hoshi S, Okamoto F, Arai M, Hirose T, Fukuda S, Sugiura Y, Oshika T: Polyethylene glycol-based synthetic hydrogel sealant for closing vitrectomy wounds: An in vivo and histological study. *Transl Vis Sci Technol* 2016 May 17;5(3):7. eCollection 2016 May
- 7) Kasaragod D, Fukuda S, Ueno Y, Hoshi S, Oshika T, Yasuno Y: Objective evaluation of functionality of filtering bleb based on polarization-sensitive optical coherence tomography. *Invest Ophthalmol Vis Sci* 2016;57:2305-2310. doi: 10.1167/iovs.15-18178.
- 8) Ueno Y, Hiraoka T, Miyazaki M, Ito M, Oshika T: Corneal thickness profile and posterior corneal astigmatism in normal corneas. *Ophthalmology* 2015;122:1072-1078. doi: 10.1016/j.ophtha.2015.01.021. Epub 2015 Mar 11.
- 9) Hiraoka T, Kakita T, Okamoto F, Oshika T: Influence of ocular wavefront aberrations on axial length elongation in myopic children treated with overnight orthokeratology. *Ophthalmology* 2015;122:93-100. doi: 10.1016/j.ophtha.2014.07.042.
- 10) Okamoto F, Sugiura Y, Okamoto Y, Hiraoka T, Oshika T: Time course of changes in aniseikonia and foveal microstructure after vitrectomy for epiretinal membrane. *Ophthalmology* 2014;121:2255-2260. doi: 10.1016/j.ophtha.2014.05.016.