

## Rupesh Agrawal



Senior Consultant and Deputy Head (Research) and Head of Junior Doctors Research Programme, NHG Eye Institute, TTSH Associate Professor, Lee Kong Chian School of Medicine, NTU Adjunct Associate Professor, Duke-NUS Medical School Co-Head, Ocular Infections and Antimicrobials, SERI

### Research Interests:

- Ocular imaging
- Ocular inflammation
- Ocular infection
- Biomarkers
- Sustained drug delivery for back of the eye

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### Biography

After completing his medical studies from Nagpur (India), A/Prof Rupesh did his post-graduation and fellowship in uveitis and ocular trauma from Sankara Netralaya, Chennai (India). He was subsequently working as Consultant Ophthalmologist (Uveitis, Ocular Trauma and Cataract) at Shri Ganapati Netralaya, Jalna (India) and LV Prasad Eye Institute before migrating to Singapore in 2009. Besides his clinical duties, he has been actively involved in significant translational and basic science research projects. He was awarded overseas research training fellowship in 2012 by National Medical Research Council (NMRC), Ministry of Health (MOH), Singapore at University College London on assessment of ocular flow dynamics. He is furthering his research on corpuscular properties in microvascular disorders. As a visiting scholar, he also had an opportunity to work with Prof Carlos Pavesio and accomplished numerous research projects at prestigious Moorfields Eye Hospital, London, UK from 2012-14. Alongside, he underwent Global Clinical Scholars Research Training (GCSRT) from prestigious Harvard Medical School.

His areas of interest are ocular inflammatory disorders including cytokines, ocular tuberculosis and HIV, blood corpuscular abnormalities in context of microvascular disorders and ocular imaging. He has invented and validated imaging biomarker 'Choroidal Vascularity Index (CVI)' and set up a global consortium on ocular imaging – Comprehensive ocular imaging network (COIN). With his research on ocular tuberculosis, he has established a global platform of Collaborative Ocular Tuberculosis Study (COTS). He has published extensively on ocular inflammation and ocular trauma in peer reviewed journals and has presented numerous free papers and delivered lectures on

Ocular trauma and Uveitis both nationally and internationally. He has to his credit 230+ peer reviewed publications and 50+ book chapters with h-index of 31. He is recipient of many grants for numerous basic science projects pertinent to ocular inflammation including his clinician scientist award on ocular tuberculosis. He is currently secretary of International Society of Ocular trauma and Asia Pacific Ophthalmic Trauma Society and leading international efforts for recognising ophthalmic trauma through International Globe and Adnexal Trauma Epidemiology Study (IGATES). He was also conferred with Healthcare Humanity Award in 2011 and awarded President Voluntarism Philanthropy Award in 2018 by President of Republic of Singapore for his humanitarian and pro-bono projects in remote areas of the world.

### Selected Publications

- Agrawal R, Gunasekeran DV, Grant R, Agarwal A, Kon OM, Nguyen QD, Pavesio C, Gupta V; Collaborative Ocular Tuberculosis Study (COTS)–1 Study Group. Clinical Features and Outcomes of Patients With Tubercular Uveitis Treated With Antitubercular Therapy in the Collaborative Ocular Tuberculosis Study (COTS)-1. *JAMA Ophthalmol*. 2017; 135(12):1318-1327. doi: 10.1001/jamaophthalmol.2017.4485. PMID: 29075752; PMCID: PMC6583556.
- Tan JLL, Balne PK, Leo YS, Tong L, Ng LFP, Agrawal R. Persistence of Zika virus in conjunctival fluid of convalescence patients. *Sci Rep*. 2017; 7(1):11194. doi: 10.1038/s41598-017-09479-5. PMID: 28894118; PMCID: PMC5594005.
- Agrawal R, Gunasekeran DV, Raje D, Agarwal A, Nguyen QD, Kon OM, Pavesio C, Gupta V; Collaborative Ocular Tuberculosis Study Group. Global Variations and Challenges with Tubercular Uveitis in the Collaborative Ocular Tuberculosis Study. *Invest Ophthalmol Vis Sci*. 2018; 59(10):4162-4171. doi: 10.1167/iovs.18-24102. PMID: 30120485.
- Nivison-Smith L, Khandelwal N, Tong J, Mahajan S, Kalloniatis M, Agrawal R. Normal aging changes in the choroidal angioarchitecture of the macula. *Sci Rep*. 2020; 10(1):10810. doi: 10.1038/s41598-020-67829-2. PMID: 32616774; PMCID: PMC7331638.
- Agrawal R, Ding J, Sen P, Rouselot A, Chan A, Nivison-Smith L, Wei X, Mahajan S, Kim R, Mishra C, Agarwal M, Suh MH, Luthra S, Munk MR, Cheung CY, Gupta V; CVI.grid. Exploring choroidal angioarchitecture in health and disease using choroidal vascularity index. *Prog Retin Eye Res*. 2020; 77:100829. doi: 10.1016/j.preteyeres.2020.100829. PMID: 31927136.
- Namgung B, Lee T, Tan JKS, Poh DKH, Park S, Chng KZ, Agrawal R, Park SY, Leo HL, Kim S. Vibration motor-integrated low-cost, miniaturized system for rapid quantification of red blood cell aggregation. *Lab Chip*. 2020. doi: 10.1039/d0lc00619j. PMID: 32966494.
- Nirmal J, Barathi VA, Dickescheid A, Wey YS, Nirmal S, Raja MM, Venkatraman S, Agrawal R. Potential of subconjunctival aflibercept in treating choroidal neovascularization. *Exp Eye Res*. 2020; 199:1081-87. doi: 10.1016/j.exer.2020.108187. PMID: 32795527.

- Tan JKS, Wei X, Wong PA, Fang J, Kim S, Agrawal R. Altered red blood cell deformability-A novel hypothesis for retinal microangiopathy in diabetic retinopathy. *Microcirculation*. 2020; e12649. doi: 10.1111/micc.12649. PMID: 32663357.
- Agrawal R, Testi I, Lee CS, Tsui E, Blazes M, Thorne JE, Okada AA, Smith JR, McCluskey PJ, Kempen JH, Tappeiner C, Agarwal M, Bodaghi B, Nguyen QD, Gupta V, De Smet MD, Zierhut M, Pavesio C; COVID-19 IMT Study Group. Evolving consensus for immunomodulatory therapy in non-infectious uveitis during the COVID-19 pandemic. *Br J Ophthalmol*. 2020. bjophthalmol-2020-316776. doi: 10.1136/bjophthalmol-2020-316776. PMID: 32586933; PMCID: PMC7313529.
- Seah IYJ, Anderson DE, Kang AEZ, Wang L, Rao P, Young BE, Lye DC, Agrawal R. Assessing Viral Shedding and Infectivity of Tears in Coronavirus Disease 2019 (COVID-19) Patients. *Ophthalmology*. 2020; 127(7):977-979. doi: 10.1016/j.opthta.2020.03.026. PMID: 32291098; PMCID: PMC7151491.
- Agrawal R, Testi I, Mahajan S, Yuen YS, Agarwal A, Kon OM, Barisani-Asenbauer T, Kempen JH, Gupta A, Jabs DA, Smith JR, Nguyen QD, Pavesio C, Gupta V; Collaborative Ocular Tuberculosis Study Consensus Group. Collaborative Ocular Tuberculosis Study Consensus Guidelines on the Management of Tubercular Uveitis- Report 1: Guidelines for Initiating Antitubercular Therapy in Tubercular Choroiditis. *Ophthalmology*. 2020; S0161-6420(20)30013-0. doi: 10.1016/j.opthta.2020.01.008. PMID: 32115264.
- Agrawal R, Testi I, Bodaghi B, Barisani-Asenbauer T, McCluskey P, Agarwal A, Kempen JH, Gupta A, Smith JR, de Smet MD, Yuen YS, Mahajan S, Kon OM, Nguyen QD, Pavesio C, Gupta V; Collaborative Ocular Tuberculosis Study Consensus Group. Collaborative Ocular Tuberculosis Study Consensus Guidelines on the Management of Tubercular Uveitis-Report 2: Guidelines for Initiating Antitubercular Therapy in Anterior Uveitis, Intermediate Uveitis, Panuveitis, and Retinal Vasculitis. *Ophthalmology*. 2020; S0161-6420(20)30598-4. doi: 10.1016/j.opthta.2020.06.052. PMID: 32603726.

#### Notable Research Awards & Grants From Past 5 Years

Name of Awards & Grants	Year Obtained
National Medical Research Council (NMRC) New Investigator Grant (NIG)	2015
NHG Clinician Scientist Career Scheme (CSCS)	2016
National Medical Research Council (NMRC) Clinician Scientist Award (CSA) Investigator Category	2020

## Translating Research into Healthcare

- Researchers eye new way to detect dengue. *The Straits Times*. Published 14 June 2016. <https://www.straitstimes.com/singapore/health/researchers-eye-new-way-to-detect-dengue>
- Did you know that tuberculosis (TB) can also occur in the eye? *Tan Tock Seng Hospital (TTSH) Facebook Page*. Published 5 October 2018. <https://www.facebook.com/TanTockSengHospital/posts/did-you-know-that-tuberculosis-tb-can-also-occur-in-the-eye-latent-tb-can-remain/10156796918963069/>
- Controversy in Treatment of Ocular TB. *PIE Magazine*. Published 20 February 2020. <https://piemagazine.org/controversy-in-treatment-of-ocular-tb/>
- Study: Low Risk of COVID-19 Transmission Via Tears, Eyewear Is Still Important. *Forbes*. Published 29 March 2020. <https://www.forbes.com/sites/farahqaiser/2020/03/29/study-low-risk-of-covid-19-transmission-via-tears-eyewear-is-still-important/#7d8d597a2e98>
- Orchestrating Collaborative Research and Clinical Trials during COVID-19 Pandemic - A New Normal. *Ocul Immunol Inflamm*. Published in 2020.