BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
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NAME: Meshkin, Ryan Sameen

POSITION TITLE: Ophthalmology Resident

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

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Virginia Commonwealth University Honors College (Guaranteed Medical Acceptance Program)	BS	05/2017	Biology (Minors: Music & Chemistry)
Harvard Medical School	--	05/2021	Scholarly Research Year – Ophthalmology
Harvard Medical School	MD	05/2022	Doctor of Medicine
Massachusetts Eye and Ear	Residency	07/2026	Ophthalmology
Duke Eye Center	Fellowship (Expected)	07/2028	Vitreoretinal Surgery

A. Personal Statement

I am an ophthalmology resident pursuing vitreoretinal surgery fellowship at Duke Eye Center under the directorship of Dr. Lejla Vajzovic. My research integrates surgical outcomes analysis, health economics, and medical education. During residency, I led investigations examining surgical outcomes and value in retinal detachment repair, including a first-author analysis comparing academic and community retinal detachment surgery published in *Ophthalmology Retina* (PMID: 38697515). I have also conducted long-term outcome studies evaluating proliferative vitreoretinopathy (PVR), redetachment risk, and single-surgery success after primary vitrectomy and scleral buckle repair, contributing to contemporary understanding of surgical durability and complication profiles. My vision is to become a residency program director who integrates excellence in patient care with leadership in medical education and impactful clinical research. Building on my prior initiatives in curriculum design, I will continue to collaborate with the AUPO to create open-access educational resources. Clinically, I aim to build a surgical practice encompassing the full spectrum of adult and pediatric vitreoretinal disease. My research will center on vitreoretinal surgical outcomes, health economics, and medical education, with a particular focus on developing quantitative methods to characterize intraoperative decision-making in retinal surgery under Dr. Yannek Leiderman's mentorship. I aim to expand my current collaborations with the ASRS Health Economics Committee to advance cost-effective care and generate the requisie data to guide actionable policy reform around surgical reimbursement. I also intend to serve as a principal investigator for pivotal clinical trials and engage in the peer-review process, helping ensure that published research is methodologically rigorous and clinically meaningful. Attending the Heed Resident Retreat will not only assist me in the process of cultivating my intended career in academic ophthalmology, but will also enable me to instill in my future trainees that a career in academics is both fulfilling and achievable.

Selected publications relevant to this work:

1. **Meshkin RS**, Blumenthal J, Hoyek S, et al. Academic versus community retinal surgery for primary retinal detachment: characteristics, duration, and value analysis of teaching modifier. *Ophthalmol Retina*. 2024;8(10):994–1001. doi:10.1016/j.oret.2024.04.021. [PMID: 38697515]
2. **Meshkin RS**, Pandiri S, Patel P, Chaaya C, Hoyek S, Miller JB, Patel NA. Primary scleral buckle surgery for rhegmatogenous retinal detachment: long-term rates of operative success, redetachment, and proliferative vitreoretinopathy. *J Vitreoretin Dis*. 2025; [Accepted, in press].
3. **Meshkin RS**, Hoffman SE, Chaaya C, Pandiri S, Yannuzzi NA, Al-Khersan H, Ghorayeb G, Leung EH, Busquets MA, Gong DA, Kolomeyer AM, Niles PI, Lai MM, Grewal DS, Patel NA. Time-Driven Activity-Based Cost Analysis of Secondary Intraocular Lens Implantation: A Breakeven Analysis. *J Vitreoretin Dis*. 2025; [Accepted, in press].
4. **Meshkin RS,** Fazal O, Strand R, Yousuf A, Pan A, Chaaya C, Pandiri S, Eliott D, Miller JB, Patel NA. Outcomes of Redetachment Repair for Rhegmatogenous Retinal Detachment: Single and Double Operation Success Rates. (Under review) *OSLI Retina*. February 10, 2026.

B. Positions, Scientific Appointments, and Honors

Positions

2026 – 2028	Vitreoretinal Surgery Fellow, Duke Eye Center, Duke University, Durham, NC
2022 – 2026	Ophthalmology Resident, Massachusetts Eye and Ear / Harvard Medical School
2020 – 2021	Scholarly Research Student in Ophthalmology, Harvard Medical School

Scientific Appointments and Service

2025	AUPO Program Directors Council	Presenter
2025 – Present	Retina Round-Up Editorial	Contributor
2024 – Present	Mass. Society for Eye Physicians & Surgeons, Young Ophthalmologist Committee	Member
2024 – Present	Harvard Ophthalmology Resident Community Engagement Committee	Member
2024	MEE Paul A Chandler Visiting Professorship	Co-Chair
2024	MGB MedEd Center of Excellence Clinical Teaching Skills Course	Participant
2023 – Present	Vit-Buckle Society	Member in Training
2023 – Present	American Academy of Ophthalmology	Member in Training
2023 – Present	MGB Graduate Medical Education Committee	Resident Representative
2023 – 2025	Harvard Vitrectomy Course	Resident Volunteer
2022 – Present	Harvard Ophthalmology Research Scholars Program	Mentor
2022 – Present	Association for Research in Vision in Ophthalmology	Member
2022 – Present	American Society of Retina Specialists	Member in Training
2022 – Present	New England Ophthalmological Society	Member in Training

2021 – 2022	Massachusetts Medical Society Representative Committee on Medical Education	Representative
2021 – Present	Harvard Medical School Post-Clerkship Steering Committee	Member
2020 – Present	Mass General Hospital Revere Diabetic Retinopathy Screening Program	Collaborator
2020 – Present	AAO/AUPO National Medical Student Virtual Ophthalmic Surgery Curriculum	Creator
2019 – 2020	Harvard Medical School Advanced Integrated Science Committee	Member

Honors and Awards

2026	Resident/Fellow as Teacher Award (1 trainee recipient across MGB health system)
2026	Vit Buckle Society – Mid-Year Forum Ambassador Grant Recipient
2026	Atlantic Coast Retina Club – Best Case Award
2025	Real World Ophthalmology Extraordinary Mentorship Award
2025	JVRD Distinguished Contributor Award
2025	FLORetina-ICOOR – Best Paper Award
2025	VitreoRetinal Surgery Foundation Research Award
2025	Vit-Buckle Society Travel Grant
2025	ARVO 'Retinal Detachment' Paper Session, Co-Moderator
2024	Massachusetts Eye and Ear Paul A Chandler Conference Co-Chair
2022	Harvard Medical School's Community Service Award
2020	AUPO/Research to Prevent Blindness - Resident & Fellow Research Forum Nominee, Mass Eye and Ear
2017	*Summa Cum Laude* – Highest Honors Graduation Distinction, Virginia Commonwealth University Honors College
2017	VCU Mohamed Shaaban Humanitarian Award *(2017) – Highest Biology Departmental Award; 1 student selected/year*
2013 – 2017	Presidential Scholar, Virginia Commonwealth University
2016	Outstanding Undergraduate Biology Award, Virginia Commonwealth University, *1 student selected/year*
2016	National Goldwater Scholarship Nominee – For Excellence in Research
2016	Undergraduate Research Fellowship Grant Award - *Designated as "highest ranked amongst all submitted proposals in the College",* Virginia Commonwealth University

Research Support

2025 FLORetina Young Ophthalmologists Grant
- Awarded to the top 10 abstracts submitted by young ophthalmologists and residents worldwide

2025 Vitreoretinal Surgery Foundation Research Award
- Awarded (up to $4,000) for research proposal “Vitamin D Status and Proliferative Vitreoretinopathy: A Multimodal Investigation Using Real-World Data and Translational in vitro Fibrosis Models” under the mentorship of Drs. Leo Kim and Dr. Nimesh Patel.

2025 Vit-Buckle Society Academic Travel Grant
- Awarded to top submitted abstracts for Vit-Buckle Society 2026 Annual Meeting

2021 The Alcon Foundation Grant
- Awarded The Alcon Foundation grant ($200,000) in collaboration with Drs. Alice Lorch and Grayson Armstrong to launch a pilot program to provide comprehensive ophthalmology care and disease screenings to underserved Boston communities lacking adequate access to eye care.

2021 Mass General Brigham (MGB) United Against Racism Grant
- Awarded the Mass General Brigham UAR grant ($200,000) in collaboration with Drs. Alice Lorch and Grayson Armstrong.
- Seeks to address and eliminate racism within MGB by supporting partnerships with community organizations to advance social justice and equity goals. Our pilot program to extend ophthalmology care to underserved Boston communities was selected as the 2021 recipient.

2020 AUPO Medical Student Educator Research Grant
- Awarded the inaugural AUPO MSE research grant ($1,000) for proposal submitted with Drs. Ankoor Shah and Grayson Armstrong: " An ophthalmology surgical video library for medical students for hybrid learning utilization in clinical electives" presented at the 2021 AUPO Annual Meeting.
- Project has grown to involve medical student education leaders across the country and has received support of the AUPO/AAO medical education taskforce to publish curriculum on AAO medical student website.

C. Contributions to Science

1. **Surgical Outcomes in Retinal Detachment Repair** – My work has focused on characterizing operative variables and long-term outcomes in retinal detachment surgery, including proliferative vitreoretinopathy risk, redetachment patterns, and durability of repair strategies. This research has contributed to contemporary evaluation of surgical success metrics, including introduction of refined outcome definitions beyond single-operation success.
   a. **Meshkin RS**, Blumenthal J, Hoyek S, et al. Academic versus community retinal surgery for primary retinal detachment: characteristics, duration, and value analysis of teaching modifier. *Ophthalmol Retina*. 2024;8(10):994–1001. doi:10.1016/j.oret.2024.04.021. [PMID: 38697515]
   b. **Meshkin RS**, Pandiri S, Patel P, Chaaya C, Hoyek S, Miller JB, Patel NA. Primary scleral buckle surgery for rhegmatogenous retinal detachment: long-term rates of operative success, redetachment, and proliferative vitreoretinopathy. *J Vitreoretin Dis*. 2025; [Accepted, in press].
   c. **Meshkin RS,** Fazal O, Strand R, Yousuf A, Pan A, Chaaya C, Pandiri S, Eliott D, Miller JB, Patel NA. Outcomes of Redetachment Repair for Rhegmatogenous Retinal Detachment: Single and Double Operation Success Rates. (Under review) *OSLI Retina*. February 10, 2026.
   d. Pandiri S, Patel P, **Meshkin RS**, Chaaya C, Woodward R, Fazal O, Stovall NM, Hoffman SE, Hoyek S, Miller JB, Patel NA. Subretinal Hemorrhage Associated with Scleral Buckle Surgery for Retinal Detachment: A Consecutive Case Series. *Ophthalmic Surg Lasers and Imaging Retina*. 2025; 56(12):736-741. doi: 10.3928/23258160-20250818-01. [PMID: 41115297]

2. **Health Economics and Value-Based Surgical Care** – In collaboration with the ASRS Health Economics Committee, I conducted time-driven, activity-based cost analyses of vitreoretinal surgical procedures, quantifying resource utilization and reimbursement alignment under current Medicare structures. This work provides objective cost benchmarks to inform value-based care discussions in retina practice.
    a. **Meshkin RS**, Hoffman SE, Chaaya C, Pandiri S, Yannuzzi NA, Al-Khersan H, Ghorayeb G, Leung EH, Busquets MA, Gong DA, Kolomeyer AM, Niles PI, Lai MM, Grewal DS, Patel NA. Time-Driven Activity-Based Cost Analysis of Secondary Intraocular Lens Implantation: A Breakeven Analysis. *J Vitreoretin Dis*. 2025; [Accepted, in press].
    b. Blumenthal J, **Meshkin RS**, Hoyek S, Feng Y, Patel NA. Operative times in scleral buckle surgery: influencing factors and cost analysis. *J Vitreoretin Dis*. 2024;8(4):360–365. doi:10.1177/24741264241293904. [PMID: 39583984]
    c. **Meshkin RS**, Strand E, Armstrong GW, Gardiner M, Bleicher I. Fall-associated Open Globe Injuries Predict Systemic Health Changes. *Eye (Nature)*. 2026; [Accepted, in press].
    d. Zhang S, Chaaya C, Hoffman SE, Bhatnagar A, Hoyek S, **Meshkin RS**, Patel NA. Cost Analysis of Aflibercept 8 mg vs. Aflibercept 2 mg for the Treatment of Diabetic Macular Edema in the PHOTON Trial. Vit-Buckle Society (VBS) Annual Meeting; Las Vegas, NV; April 9–11, 2026.

3. **Innovation in Surgical Education –** My educational research has examined structured curricula to enhance trainee wellness, feedback culture, and professional development. I have also contributed to national surgical video curriculum initiatives adopted by the American Academy of Ophthalmology and the Association of University Professors of Ophthalmology.
    a. **Meshkin RS**, Eliott D. Refractory macular hole surgery: a review of recent surgical innovations. *Int Ophthalmol Clin*. 2025;65(2):161–173. doi:10.1097/IIO.0000000000000443. [PMID: 40601506]
    b. Johnson MC, **Meshkin RS**, Shah AS, Armstrong GW. Utilizing real-time video display to enable interactive and collaborative slit-lamp biomicroscopy learning. *J Acad Ophthalmol*. 2024;16(1):e93–e102. doi.10.62199/2475-4757.1001
    c. Aziz K, Sherif NA, **Meshkin RS**, Lorch AC, Armstrong GW. Telemedicine curriculum in an ophthalmology residency program. *J Acad Ophthalmol*. 2022;14(2):e147–e153. doi:10.1055/s-0042-1743580. [PMID: 37388485]
    d. **Meshkin RS**, Blumenthal J, Armstrong GW, Shah A. Cataract surgery (Basic): Ophthalmic Surgery for Medical Students [Video]. *Am Acad Ophthalmol Med Student Website*. 2025.

4. **Artificial Intelligence and Quantitative Surgical Science** – My emerging research focuses on the application of artificial intelligence to quantitative analysis in retinal disease and surgery. In addition to planned work applying AI-based surgical video analytics within the DRCR Retina Network, I have contributed to published investigations utilizing machine learning for retinal pathology detection. In collaboration with colleagues, I co-authored a study demonstrating the use of artificial intelligence for detection of maculopathy in pediatric patients with sickle cell disease, illustrating the feasibility of automated image-based disease identification in complex retinal populations. This work complements my planned efforts to extend AI applications from diagnostic imaging to intraoperative surgical phenotyping, with the long-term goal of enabling reproducible, objective measurements of operative technique embedded within multicenter clinical trial infrastructure.
    a. Hoyek S, Chaaya C, Abidi M, Altamirano F, **Meshkin RS,** Giridharan V, Shah K, Gonzalez E, Pinsky E, Patel NA. Artificial intelligence for the detection of maculopathy in pediatric patients with sickle cell disease. *Retina.*2026;46(1):179-186. doi:10.1097/IAE.0000000000004663. PMID: 41021897.

Complete List of Published Work in MyBibliography:
https://www.ncbi.nlm.nih.gov/myncbi/1dOId8O_R5fYEx/bibliography/public