

**BIOGRAPHICAL SKETCH**

Provide the following information for the Senior/key personnel and other significant contributors.  
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Kelly, Elizabeth Ciociola

eRA COMMONS USER NAME (credential, e.g., agency login):

POSITION TITLE: Heed fellowship

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	Start Date	Completion Date	FIELD OF STUDY
University of North Carolina at Chapel Hill	BA	08/2014	05/2018	Chemistry
University of North Carolina School of Medicine	MD	08/2019	05/2023	Medicine
Wilmer Eye Institute, Johns Hopkins University	Residency	07/2023	Anticipated 06/2027	Ophthalmology

**A. Personal Statement**

My interest in research and medicine began as an undergraduate research assistant in Dr. Samuel Lai's molecular pharmaceuticals lab, where I spent 2.5 years studying nanoparticle drug delivery and pharmacokinetics. I learned to think critically about experimental design and answer meaningful clinical questions with research. After college, I joined the Duke Clinical Research Institute and collaborated with pediatric cardiac intensivists, leading a first-author study of pediatric cardiac surgery outcomes related to preoperative ventilation strategies. That work sparked my interest in becoming an academic clinician–scientist who bridges patient care and rigorous investigation. In medical school, I discovered ophthalmology while leading a student-run eye clinic, providing exams alongside attendings and training junior students. The field's compelling pathology, precise surgical techniques, and meaningful patient outcomes drew me in and revealed a passion for teaching. I pursued clinical research that could directly improve outcomes, learning to design studies using large clinical databases and to code for data analysis. This culminated in first author publications on heritable anatomic predictors of angle closure, IRIS Registry analyses of glaucoma surgical outcomes, and multicenter investigations of endophthalmitis management. As a resident, I have continued to develop clinically, academically, and as an educator. I was recently selected as co-administrative chief in recognition of my teaching and leadership among the residents. My research has expanded: I received a Vitreoretinal Research Society Foundation grant and the first-place Mitchell Prize among residents for an OCT study evaluating morphologic outcomes after retinal surgery. I also broadened our multicenter endophthalmitis project to include Johns Hopkins and other institutions to enable robust analysis of this rare, complex condition. Vitreoretinal surgery appeals to me because it combines complex surgical problem solving with opportunities to impact patients facing high unmet need in a field ripe with new advances and drug development. My ultimate goal remains unchanged – to become an academic clinician-scientist focused on clinical outcomes research, surgical excellence, and trainee education and mentorship. Attending the Heed Fellowship retreat would accelerate this trajectory by providing targeted leadership training, mentorship from established academic ophthalmologists, and a network of peers at varied career stages.

**B. Positions and Scientific Appointments**

2026 – Present    Co-administrative Residency Class Chief for upcoming academic year  
2024                Advocacy Ambassador, AAO Mid-Year Forum  
2023 – Present    Ophthalmology resident

2022 – 2023	Chief Class Advocate, UNC School of Medicine Student Government
2021 – 2023	VP of Research Opportunities, UNC School of Medicine Research Society
2021 – 2023	Admissions Ambassador, UNC School of Medicine Admissions Committee
2019 – 2023	Clinic leader and volunteer, Ophthalmology student-run volunteer clinic
2019 – 2023	Medical student mentor, UNC School of Medicine Mentorship Program
2019 – 2023	Medical student, UNC School of Medicine, Chapel Hill NC
2018 – 2019	Clinical study coordinator, UNC Epidemiology Research Team
2018 – 2019	Clinical research assistant, Duke Clinical Research Institute
2016 – 2018	Undergraduate research assistant, UNC Samuel Lai Molecular Pharmaceutics Lab

## Honors

2025	Wilmer Iliff-Kress Patient Excellence Award
2025	Wilmer Eye Institute Mitchell Research Prize (first place)
2024	Wilmer Eye Institute Mitchell Research Prize (third place)
2023	Vitreoretinal Surgery Foundation Research Grant Award
2022	American Medical Association Physician of Tomorrow Scholarship
2022	Alpha Omega Alpha Honor Society
2022	Top 5 plenary oral presentation at American Glaucoma Society
2021	First place poster at NC Society of Eye Physicians and Surgeons
2021	UNC Medical Student Research Award
2021	ARVO Travel Grant
2017	Phi Beta Kappa Honor Society

## C. Contributions to Science

**1. Undergraduate and Gap Year Research:** I worked as a research assistant in Dr. Samuel Lai's molecular pharmaceutics and nanoparticle drug delivery laboratory at UNC Chapel Hill for 2.5 years. I focused on immune responses to polyethylene glycol (PEG) coatings used to enhance drug delivery and on strategies to mitigate anti-PEG antibody effects. I helped design a pharmacokinetic model of anti-PEG antibodies and contributed to the development of a therapeutic intervention using pre-infusion of high-molecular-weight PEG to overcome these antibodies. In the gap year between college and medical school, I joined the Duke Clinical Research Institute as a research assistant with the pediatric cardiology division. There I led a first-author study of pediatric cardiac surgery outcomes related to preoperative ventilation strategies, published the manuscript, and delivered my first podium presentation at a national meeting.

- **Ciociola EC**, Karan KR, Zimmerman KO, Thompson EJ, Harward M, Sullivan LN, Turek JW, Hornik CP. (2019) "Association between preoperative respiratory support and outcomes in pediatric cardiac surgery," *Cardiol Young* 1-8.
- Thompson EJ, Foote HP, King CE, Srinivasan S, **Ciociola EC**, Leung D, Rotta AT, Hill KD, Cohen-Wolkowicz M, Hornik CP. (2021), "A Systematic Review of the Evidence Supporting Postoperative Medication Use in Congenital Heart Disease," *Cardiol Young* 31(5): 707-733.
- McSweeney MD, Shen L, DeWalle AC, Joiner JB, **Ciociola EC**, Raghuwanshi D, Macauley MS, Lai SK. (2020) "Pre-treatment with high molecular weight free PEG effectively suppresses anti-PEG antibody induction by PEG-liposomes in mice," *J Contro Release* 0168-3659.
- McSweeney MD, Price LSL, Wessler T, **Ciociola EC**, Herity LB, Piscitelli JA, DeWalle AC, Harris TN, Chan AK, Saw RS, Hu P, Jennette JC, Forest MG, Cao Y, Montgomery SA, Zamboni WC, Lai SK. (2019) "Overcoming anti-PEG antibody mediated accelerated blood clearance of PEGylated liposomes by pre-infusion with high molecular weight free PEG," *J Contro Release* 311-312: 138-146
- McSweeney MD, Wessler T, Price LSL, **Ciociola EC**, Herity LB, Piscitelli JA, Zamboni WC, Forest MG, Cao Y, Lai SK. (2018) "A minimal physiologically based pharmacokinetic model that predicts anti-PEG antibody-mediated clearance of PEGylated drugs in human and mouse," *J Contro Release* 284: 171-178.

**2. Medical Student Research:** As a medical student, I worked with Dr. Nazlee Zebardast at Massachusetts Eye and Ear on glaucoma clinical outcomes research. In a prospective sibling study conducted at the Aravind Eye Institute, we identified heritable anatomic traits that predicted angle closure among South Indian siblings.

Using the IRIS Registry, we performed multiple large database analyses of real-world glaucoma surgery outcomes and found that up to 25% of patients undergoing minimally invasive glaucoma surgery required an additional operation within two years, and that traditional filtering surgery combined with phacoemulsification was not inferior to stand-alone filtering surgery. We also used the IRIS Registry to analyze disparities in glaucoma care by race, demonstrating that minority populations experienced worse visual outcomes and less frequent monitoring. These projects resulted in multiple first-author publications and oral podium presentations at ARVO and AGS.

- **Ciociola EC**, Sekimitsu S, Smith S, Lorch AC, Miller JW, Elze T, Zebardast NZ. Racial Disparities in Vision Outcomes and Eye Care Utilization Among Glaucoma Patients: An IRIS® Registry Analysis. *Am J of Ophthalmol*. 2024 Mar 26;S0002-9394(24)00126-0.
- **Ciociola EC**, Yang S, Hall N, Lorch AC, Miller JW, Friedman DS, Boland MV, Elze T, Zebardast N. “Effectiveness of Trabeculectomy and Tube Shunt With Versus Without Concurrent Phacoemulsification: IRIS Registry Longitudinal Analysis.” *Ophthalmology Glaucoma*. doi: 10.1016/j.ogla.2022.07.003
- Yang S, **Ciociola EC**, Hall N, Lorch AC, Miller JW, Friedman DS, Boland MV, Elze T, Zebardast N. “Effectiveness of Micro-invasive Glaucoma Surgery in the United States: IRIS Registry Analysis 2013-2019.” *Ophthalmology*. 2022 Oct 29;S0161-6420(22)00853-3
- **Ciociola EC**, Kavitha S, Sengupta S, Wiggs JL, Kader MA, Raman GV, Rajendrababu S, Ramulu PY, Venkatesh R, Zebardast N. (2021) “The Heritability of Primary Angle Closure Anatomic Traits and Predictors of Angle Closure in South Indian Siblings.” *Am J Ophthalmol*. 230: 188-199.

I also collaborated with Drs. Sharon Fekrat and Margaret Greven on a tri-center study of endogenous endophthalmitis across Duke, Wake Forest, and UNC, producing two first-author publications. In patients with device-related endogenous endophthalmitis, visual prognosis was poor, and bacterial pathogens caused more severe complications than fungal organisms. Among intravenous drug users, presentations were often indolent with frequently negative cultures, underscoring the need for a high index of suspicion for diagnosis.

- **Ciociola EC**, Powell JC, Barnwell E, Zehden JA, Robbins CB, Soundararajan S, Singh P, Zhang AY, Fekrat S, Greven MA. Endogenous Endophthalmitis Associated with Injection Drug Use Compared with Other Etiologies. *Retina*. 2023 Nov 1;43(11):1996-2002.
- **Ciociola EC**, Powell JC, Zehden JA, Robbins CB, Zhang AY, Fekrat S, Greven MA. “Endogenous endophthalmitis associated with indwelling medical devices over 8 years.” *Ophthalmology Retina* 2022 Oct 25;S2468-6530(22)00515-2. doi: 10.1016/j.oret.2022.10.013

**3. Residency Research:** As a resident, I have continued glaucoma research with Drs. Pradeep Ramulu and Kunal Parikh. In a cross-sectional study at Aravind, we assessed the accuracy of reused iCare tonometer probes and found probes could be safely reused up to five times without compromising accuracy, reducing cost and waste. Additionally, I have collaborated with an engineering team at Johns Hopkins and with Dr. Swati Upadhyaya at Aravind Eye Institute to develop software for a reminder system, for which we are actively enrolling participants in a randomized trial to evaluate its efficacy in improving glaucoma patient appointment-follow-up adherence. Under Drs. James Handa and Thomas Johnson, I investigated OCT morphologic outcomes after internal limiting membrane removal and found glaucomatous eyes are more likely to develop degenerative retinoschisis and cystoid fluid changes; this study is submitted as a first-author publication and will be presented at ARVO. I have also expanded the endogenous endophthalmitis multicenter study to include Johns Hopkins and seven other centers to enable more robust outcome analyses. Data aggregation and analysis are ongoing, with plans for presentation and submission in the coming months.

- **Vedesh K and Ciociola EC**, Vardhan A, Sundar B, Rajendrababu S, Ramulu P. A comparative analysis of IOP measurement accuracy with reused iCare probes. *Ophthalmol Glaucoma*. 2024 Feb 23;S2589-4196(24)00032-2.
- **Ciociola Kelly E**, Niknahad A, Lee H, Pavlak M, Ahmed A, Mehta S, Thangamathesvaran L, Heng J, Yohannan J, Fortune B, Johnson TV, Handa JT. Increased Prevalence of Intraretinal fluid and Schisis following Membrane Peel Surgery Among Glaucoma Patients. Poster presentation at the Association for Research in Vision and Ophthalmology meeting; 2026 May 3-7; Denver, CO.
- Arevalo JF, Rustam Z, Khan MJ, Mishra K, **Ciociola Kelly E**, Ifikhar M. Management of Intraocular Foreign Bodies: The Zivojnovic EVRS Award Lecture 2025. Taiwan Journal Ophthalmology.
- **Ciociola Kelly E**, Scott A. (2025). Pediatric Considerations in Sickle Cell Disease. *Retina Atlas*. American Society of Retina Specialists

Complete List of Published Work in My Bibliography:

<https://www.ncbi.nlm.nih.gov/myncbi/elizabeth.ciociola.1/bibliography/public/>

#### D. Scholastic Performance

YEAR	COURSE TITLE	GRADE
	UNC Chapel Hill	
2014	Principles of Biology	A
2014	Introductory Biology Lab	A
2014	Introductory Italian 1	A
2014	International Religion and World Policy	A
2014	General Psychology	A
2015	General Chemistry 1	A
2015	General Chemistry Lab 1	A-
2015	Introductory Italian 2	A
2015	Introductory Statistics	A
2015	Anthropology Local Cultures and Global Forces	A-
2015	English Composition and Rhetoric	A
2015	General Chemistry 2	A
2015	General Chemistry Lab 2	A
2015	Introductory Economics	A
2015	Topics in American Studies	A
2015	Accounting	A
2015	Analytical Chemistry	A
2015	Analytical Chemistry Lab	A-
2015	Advanced Ballet	A
2015	History of Native North America	A
2016	Molecular Biology and Genetics	A
2016	Organic Chemistry 1	A
2016	Sociology 101	A
2016	Statistics and Operations	A
2016	Human Biology	A
2016	Human Biology and Anatomy Lab	A
2016	Principles of Marketing	A-
2016	Organic Chemistry 2	A
2016	Organic Chemistry Lab 2	A
2016	Bioethics	A
2017	Africans in Colonial America	A
2017	Corporate Finance	A
2017	Biological Chemistry	A-
2017	Calculus 2	A
2017	Strategic Business management	A
2017	Gender in the workplace	A
2017	Inorganic chemistry	A
2017	Biophysical chemistry	A-
2018	Business operations	A
2018	Sustainability in Business	A
2018	Global Reproductive Health	A
2018	Synthetic Chemistry Lab	A
2018	Global Issues and Globalization	A

YEAR	COURSE TITLE	GRADE
UNC School of Medicine		
2019-2021	Medical Science	P (graded P/F)
2019-2021	Patient Centered Care	P (graded P/F)
2019-2021	Social and Health Systems	P (graded P/F)
2021	Medicine Clerkship	Honors
2021	Surgery Clerkship	Honors
2021	Pediatrics Clerkship	Honors
2021	Obstetrics and Gynecology Clerkship	Honors
2021	Psychology Clerkship	Honors
2022	Family medicine Clerkship	Honors
2022	Emergency Medicine Clerkship	Honors
2022	Ophthalmology Clerkship	Honors
2022	ICU Clerkship	Honors
2022	Anesthesiology Clerkship	Honors
2022	Ophthalmology Elective	Honors

\*Clerkships graded as fail/pass/high pass/honors