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**Heed Ophthalmic Foundation 2026 Resident Retreat – Personal Statement**

"Look up and left." I tilted my lens, bringing the inky black bone spicules of pigment into view. JD was 23 — my age at the time. He had just bought his first car and was going to pick it up after the appointment. Despite his 20/20 vision, JD had already lost most of his visual field. We broke the difficult news to him that he could not drive safely. We sent JD home heartbroken, his mother in tears. "There's nothing we can do for him now," sighed my attending. "Eventually, he'll lose his central vision too." Seeing a patient so young and so close to my age lose his vision and independence to retinitis pigmentosa left an enduring impression just as I was starting medical school. I have since felt compelled to pursue ophthalmology and to research ways to restore vision to patients like JD.

At the first opportunity, I signed up to volunteer for my medical school's free mobile "Guerrilla Eye Service" (GES) clinic. I quickly fell in love with clinical ophthalmology and volunteered at 32 clinics, leading the other students at 19 of them. During graduate school, I ran the organization. We expanded our reach to four new clinics, recruited new volunteers, and held 20% more clinics per year during my time. The increased utilization took its toll on our equipment. I applied my skills from tinkering with lab instruments in graduate school to repair the electronics in our slit lamp, indirect, and fundus camera. Leading GES kept me engaged in learning and teaching ophthalmology while I completed my PhD in chemistry.

Since my first foray into research in college, my passion has been applying chemistry to study and to treat diseases. My first project focused on developing blood testing and developing both a natural and synthetic approach to obtain the treatment for GM3 Synthase Deficiency, a devastating neurologic disease. During graduate school, I pivoted to research focused on creating new amino acids that respond to light, and using them to engineer optically-triggered proteins in live cells and, thanks to excellent colleagues, in zebrafish embryos. In parallel, I also developed approaches to activating protein function using designer small molecules. As the capstone to my MD/PhD training, I completed a miniature postdoctoral fellowship in Dr. Susana da Silva's lab to apply these techniques for the first time in retinal organoids and in the chick retina, and later learned to perform the technique in zebrafish embryos myself. These techniques enable precise spatial and temporal control over protein function. I have explored applications of these techniques in studying development of the eye, photocrosslinking of proteins, protein labeling, post-translational modifications, and the precise control of antibody function. This research lays the groundwork for enhanced therapeutics with applications to corneal and retinal diseases, as well as for generating enhanced light-responsive proteins to enable vision restoration approaches. Further, the technique I used involved genetic code expansion, which is readily applied to correcting pathologic mutations in inherited retinal disease. My training has prepared me to continue my research to help patients like JD with these sorts of mutations.

My work so far, and the history of ophthalmology, has confirmed for me the importance of interdisciplinary research at the intersection of different fields. I stand at a challenging crossroads during residency as I must learn to balance research in chemistry as it applies to clinical work in ophthalmology. The Heed Resident Retreat is a fantastic opportunity for me to learn from experts who have successfully balanced research and clinical work, and I would be honored to learn from their wisdom. I look forward to building a career taking care of patients and creating new chemical tools for vision restoration so that one day, we will have something to offer patients like JD.