BIOGRAPHICAL SKETCH

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NAME: Kevin C. Allan

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

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)*	Start Date MM/YYYY	Completion Date MM/YYYY	FIELD OF STUDY
University of Rochester, Rochester, NY	BS	07/2010	05/2014	Neuroscience
Case Western Reserve University School of Medicine, Cleveland, OH	PhD	07/2014	07/2021	Genetics and Genomics
Case Western Reserve University School of Medicine, Cleveland, OH	MD	07/2014	05/2023	Medicine
Cole Eye Institute, Cleveland Clinic Foundation, Cleveland, OH	Residency	07/2023	07/2027	Ophthalmology

A. Personal Statement

I am currently a resident training in Ophthalmology with research interests including drug discovery and repurposing, stem cell modeling of disease, and the epigenetic regulation of cell fate decisions. My scientific background in neuroscience led me to pursue a PhD in the laboratory of Dr. Paul Tesar, where I leveraged induced pluripotent stem cell technology to model white matter development and pathology for drug screening and genomic profiling. Through this work, I developed intellectual independence and skills in project management, leadership, and scientific communication. I gained extensive experience in high-throughput phenotypic drug screening, epigenomic and transcriptomic analyses, and animal models of disease while collaborating across interdisciplinary fields. During my graduate school training, I was able to secure funding from multiple sources including an F30 grant from the National Institute of Child Health and Human Development (NICHD), a T32 training grant in neurodegeneration, and private philanthropic funding. Building on this foundation, my current interests focus on investigating the effects of glucagon-like peptide-1 receptor agonists (GLP-1RAs) on ocular health and disease, developing retinal and ocular oncology disease models for phenotypic screening, and elucidating epigenetic signatures that define cell states in development and disease.

B. Positions, Scientific Appointments and Honors

Positions and Scientific Appointments

2025-Present Independent peer reviewer for the following journals: *Ophthalmology, Ophthalmology Retina, Ophthalmology Science, Drug Discovery Today, Biomedicine and pharmacotherapy, American Journal of Ophthalmology International, Graefe's Archive for Clinical and Experimental Ophthalmology, Canadian Journal of Ophthalmology, iScience*
2024-Present Vit-Buckle Society Member
2023-Present Ophthalmology Resident, Cole Eye Institute, Cleveland Clinic Foundation, Cleveland, OH
2022-Present American Society of Retina Specialists Member/Trainee
2022-Present American Academy of Ophthalmology Member and Mentor within the LGBTQ+ Community
2024-2025 Cole Eye Residency Social Chair

2024	Cole Eye Residency Admissions Committee Resident Representative
2017-2020	Medical Scientist Training Program (MSTP) Council Recruiting Committee Member, CWRU School of Medicine, Cleveland, OH
2015-2016	Liaison Committee on Medical Education (LCME) Student Survey Committee Student Representative, CWRU School of Medicine, Cleveland, OH
2014-2016	Student Committee of Medical Education Chair, CWRU School of Medicine, Cleveland, OH

Honors:

2025	Top 25 Reviewer for *Ophthalmology Retina*
2025	Richard Tam MD Memorial Award for top OKAP score, Cole Eye Institute, Cleveland, OH
2025	Fostering Careers for Upcoming Stars (FOCUS) fellowship recipient, Vit-Buckle Society
2024	Program in Lasting Leadership and Academic Representation (PILLAR) fellowship recipient, Stanford, CA
2023	Merit and Conference Travel award, International Society for Stem Cell Research (ISSCR)
2023	Martin Wahl Outstanding MSTP Graduate Award, CWRU School of Medicine, Cleveland, OH
2022	Elsevier and Heliyon Trainee Registration Scholarship, Cell Symposia Conference
2022	Department of Excellence Award in Genetics and Genome Sciences, CWRU School of Medicine, Cleveland, OH
2015	Medical Education Fellowship Award, CWRU School of Medicine, Cleveland, OH
2014	Alice DeSimone Leadership Award, University of Rochester, Rochester, NY

C. Contributions to Science

1. Impact of Glucagon-Like Peptide-1 Receptor Agonists (GLP-1RA) on Ocular Health and Disease

Glucagon-like peptide-1 receptor agonists (GLP-1RAs) are prescribed with increasing frequency due to expanding FDA indications and evidence of protective effects across numerous organ systems. As their use continues to grow, it is critical to determine whether these agents confer ocular benefits or carry potential risks for vision-related disease. To address this need, I have collaborated with Dr. Aleksandra Rachitskaya and Dr. Katherine Talcott to establish a dedicated GLP-1RA research group that meets weekly to investigate the ocular impact of these medications. Our research framework begins with large-scale retrospective analyses using an electronic health records database to identify potential safety or efficacy signals. We then validate these findings through institutional data from the Cole Eye Institute and plan to advance promising leads into prospective imaging and biometric studies. In addition to this work, I have been invited to review manuscripts for *Ophthalmology*, *Ophthalmology Retina*, *Ophthalmology Science*, *iScience*, and others that explore GLP-1RA-related mechanisms and outcomes, further deepening my engagement with this evolving field.

a. **Allan KC**, Joo JH, Kim S, Shaia J, Kaelber DC, Singh R, Talcott KE, Rachitskaya AV. Glucagon-like Peptide-1 Receptor Agonist Impact on Chronic Ocular Disease Including Age-Related Macular Degeneration. ***Ophthalmology***. 2025.
b. **Allan KC**, Cohn EF, Bala S, Kim SB, Kaelber DC, Singh RP, Talcott KE, Mammo DA, Rachitskaya AV. Glucagon-like Peptide-1 Receptor Agonist Use and Risk of Neovascular Age-Related Macular Degeneration in a National Cohort Study**.** ***Ophthalmology Retina.*** 2025.
c. Joo JH, Zhao AH, Chalasani M, **Allan KC**, Rachitskaya AV. Impact of Glucagon-Like Peptide-1 Receptor Agonists on Age-Related Macular Degeneration at a Tertiary Ophthalmology Center. ***Ophthalmology Retina.*** 2025.
d. Bala S, **Allan KC**, Decker NL, Abbass NJ, Joo JH, Zhao A, Talcott KE, Rachitskaya AV. Glucagon-like peptide-1 receptor agonists: What ophthalmologists need to know. ***Survey of Ophthalmology.*** 2025.
e. Abbass NJ, Nahlawi R, Shaia JK, **Allan KC**, Kaelber DC, Talcott KE, Singh RP. The Effect of Semaglutide and GLP-1 RAs on Risk of Nonarteritic Anterior Ischemic Optic Neuropathy. ***AJO.*** 2025.

2. Phenotypic High-Throughput Drug Screening and Discovery

A cornerstone of my graduate training was developing cell-based assays optimized for high-throughput small molecule phenotypic screening. By linking small molecule targets to specific cellular phenotypes, these approaches enable unbiased mechanistic insight into disease pathology and normal physiology while identifying candidate compounds with therapeutic potential. I have led and collaborated on multiple projects using phenotypic screening platforms across diverse developmental and disease contexts, resulting in identification and preclinical testing of top compounds. Moving forward, my goal is to apply these principles to

the development of cellular models of retinal and ocular oncologic disease that are compatible with high-throughput phenotypic screening to unlock discovery of novel ophthalmologic therapeutics.

a. **Allan KC**, Hu LR, Scavuzzo MA, Morton AR, Gevorgyan AS, Cohn EF, Clayton BLL, Bederman IR, Hung S, Bartels CF, Madhavan M, Tesar PJ. Non-canonical Targets of HIF1a Impair Oligodendrocyte Progenitor Cell Function. ***Cell Stem Cell***. 2020.
b. Clayton BLL, Kristell JD, **Allan KC**, Cohn EF, Karl M, Jerome AD, Garrison E, Maeno-Hikichi Y, Sturno AM, Kerr A, Shick HE, Sepeda JA, Freundt EC, Sas AR, Segal BM, Miller RH, Tesar PJ. A phenotypic screening platform for identifying chemical modulators of astrocyte reactivity. ***Nat Neurosci***. 2024.
c. Hubler Z, Allimuthu D, Bederman I, Elitt MS, Madhavan M, **Allan KC**, Shick HE, Garrison E, T Karl M, Factor DC, Nevin ZS, Sax JL, Thompson MA, Fedorov Y, Jin J, Wilson WK, Giera M, Bracher F, Miller RH, Tesar PJ, Adams DJ. Accumulation of 8,9-unsaturated sterols drives oligodendrocyte formation and remyelination. ***Nature***. 2018.
d. Elitt MS, Shick HE, Madhavan M, **Allan KC**, Clayton BLL, Weng C, Miller TE, Factor DC, Barbar L, Nawash BS, Nevin ZS, Lager AM, Li Y, Jin F, Adams DJ, Tesar PJ. Chemical Screening Identifies Enhancers of Mutant Oligodendrocyte Survival and Unmasks a Distinct Pathological Phase in Pelizaeus-Merzbacher Disease. ***Stem Cell Reports***. 2018.

3. Epigenetic and Transcriptomic Profiling of Cell States
An additional key component of my graduate research involved mastering cutting-edge genomic techniques, including transcriptomic and epigenomic profiling, to dissect the complex regulatory networks that govern cell fate and state transitions. By identifying transcriptional and epigenetic regulators underlying protective or pathogenic responses, we can uncover novel therapeutic targets for disease modification. I have led and collaborated on studies interrogating these mechanisms across multiple biological systems, providing insight into how gene regulatory architecture shapes cellular identity. This work culminated in a patent for targeting specific genetic regulators to promote cellular maturation in white matter disease.

a. **Allan KC*** & Zhan J*, Morton AR, Cohn EF, Scavuzzo MA, Nikhil A, Elitt MS, Clayton BLL, Hu LR, Vrabic JK, Olsen HE, Factor DC, Henninger JE, Bachmann G, Powers BE, Young RA, Lin CY, Scacheri PC, Miller TE, Tesar PJ. Cellular Maturation of Oligodendrocytes is Governed by Transient Gene Melting. ***Cell.*** 2025. *authors contributed equally
b. Chen YF, Ghazala M, Friedrich RM, Cordova BA, Petroze FN, Srinivasan R, **Allan KC**, Yan DF, Sax JL, Carr K, Tomchuck SL, Fedorov Y, Huang AY, Desai AB, Adams DJ. Targeting the chromatin binding of exportin-1 disrupts NFAT and T cell activation. ***Nat Chem Biol.*** 2024.
c. Martin S, **Allan KC**, Pinkard O, Sweet T, Tesar PJ, Coller, J. Oligodendrocyte differentiation alters tRNA modifications and codon optimality mediated mRNA decay. ***Nature Communications.*** 2022.
d. Factor DC, Barbeau AM, **Allan KC**, Hu LR, Madhavan M, Hoang AT, Hazel KEA, Hall PA, Nisraiyya S, Najm FJ, Miller TE, Nevin ZS, Karl RT, Lima BR, Song Y, Sibert AG, Dhillon GK, Volsko C, Bartels CF, Adams DJ, Dutta R, Gallagher MD, Phu W, Kozlenkov A, Dracheva S, Scacheri PC, Tesar PJ, Corradin O. Cell Type-Specific Intralocus Interactions Reveal Oligodendrocyte Mechanisms in MS. ***Cell***. 2020.

D. Scholastic Performance

YEAR	COURSE TITLE	GRADE
2026	OKAP	674
2025	OKAP	642
2023	USMLE STEP 3	262
2022	USMLE STEP 2 Clinical Knowledge (CK)	255
2016	USMLE STEP 1	257