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: **David Zhang**

eRA COMMONS USER NAME (credential, e.g., agency login): **n/a**

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 *(if applicable)*	Start Date MM/YYYY	Completion Date MM/YYYY	FIELD OF STUDY
University of Illinois at Chicago	BA	08/2015	05/2018	Psychology
University of Illinois at Chicago	BS	08/2015	05/2018	Biology
Northwestern University	MD	08/2019	05/2023	Medicine
Vanderbilt University Medical Center		07/2023	06/2024	Internship: General Surgery
Vanderbilt Eye Institute		07/2024	Present	Ophthalmology Residency

A. Personal Statement

My scientific work sits at the intersection of vitreoretinal surgery and translational ophthalmic research, with a particular focus on retinal detachment, pediatric retinal disease, and emerging ocular biomarkers. Beginning in undergraduate research at the University of Illinois at Chicago—where I investigated the KDM5A short isoform under Dr. Elizaveta Benevolenskaya—I developed a foundation in hypothesis-driven laboratory science that has since evolved into a sustained program of clinical and translational investigation.

During medical school at Northwestern, I pursued three parallel research tracks. Working with Drs. Michael Shapiro and Michael Blair at Retina Consultants, I studied retinopathy of prematurity (ROP) and Stickler syndrome, contributing to publications on foveal development after bevacizumab treatment for aggressive posterior ROP and a book chapter on Stickler syndrome and associated collagenopathies. Concurrently, under the mentorship of Dr. Safa Rahmani, I conducted a longitudinal study examining postnatal growth trajectories and neurodevelopmental outcomes in infants treated with bevacizumab for ROP—work that was presented at ARVO and AAPOS and published in Clinical Ophthalmology. A third line of inquiry, in collaboration with Drs. Rukhsana Mirza and Bahram Rahmani, focused on retinal ischemic perivascular lesions (RIPLs) as subclinical ocular biomarkers of systemic cardiovascular disease, resulting in multiple publications in Ophthalmology Retina and BMJ Open Ophthalmology and presentations at ARVO and The Retina Society.

Since beginning residency at Vanderbilt University Medical Center under the mentorship of Dr. Avni Finn, my research has centered on retinal detachment imaging. My work on ultra-widefield fundus autofluorescence as a non-invasive indicator of rhegmatogenous retinal detachment duration was published in Ophthalmology Science and presented at the Vit-Buckle Society meetings in 2025 and 2026, for which I received academic travel grants. I also contributed to a time-driven activity-based costing analysis of panretinal photocoagulation and an OCT biomarker study differentiating epiretinal membranes secondary to retinal detachment—the latter currently in press at Journal of VitreoRetinal Diseases. In addition to retinal detachment research, I have authored an invited review on GLP-1 receptor agonists and the eye in Current Opinion in Ophthalmology, reflecting my interest in the systemic-ocular disease interface.

Across more than 15 peer-reviewed publications, multiple national and international presentations, and research spanning pediatric retina, vascular ocular biomarkers, and vitreoretinal surgery, I have developed expertise in clinical study design, ophthalmic imaging analysis, and healthcare value research. I am committed to building a research program that advances the diagnosis and management of vitreoretinal disease, with a long-term goal of improving outcomes for patients with sight-threatening conditions.

B. Positions, Scientific Appointments and Honors

POSITIONS AND SCIENTIFIC APPOINTMENTS	
2026	Journal Peer Reviewer, Journal of VitreoRetinal Diseases
2025–Present	AAO Resident Input Panel — Content reviewer for BCSC updates, American Academy of Ophthalmology
2024–Present	Quality Improvement, Vanderbilt Eye Institute, Nashville, TN
2024–Present	Research, Vanderbilt University Medical Center, Nashville, TN (Advisor: Dr. Avni Finn)
2023–2027	Resident Physician (Internship in General Surgery + Residency in Ophthalmology), Vanderbilt University Medical Center, Nashville, TN
2020–2023	Clinic Chief, Education-Centered Medical Home (Primary Care Clinic), Northwestern University Feinberg School of Medicine, Chicago, IL
2019–2023	Research, Northwestern University Feinberg School of Medicine, Chicago, IL (Advisors: Drs. Bahram Rahmani, Rukhsana Mirza, Safa Rahmani)
2018–2020	Research, Retina Consultants Ltd., Des Plaines, IL (Advisors: Drs. Michael Shapiro & Michael Blair)
2018–2019	Ophthalmic Technician, Retina Consultants Ltd., Des Plaines, IL
2016–2017	Laboratory Technician, University of Illinois at Chicago, Chicago, IL (Advisor: Dr. Elizaveta Benevolenskaya)

HONORS	
2026	Vit-Buckle Society Academic Travel Grant, 14th Annual Meeting, Las Vegas, NV
2025	Vit-Buckle Society Academic Travel Grant, 13th Annual Meeting, Austin, TX
2023	Quality Improvement Award, Northwestern University Feinberg School of Medicine
2022	Senate Service Award, Northwestern University Feinberg School of Medicine
2022	Department of Ophthalmology Travel Grant, Northwestern University Feinberg School of Medicine
2022	Division of Ophthalmology Travel Grant, Ann & Robert H. Lurie Children's Hospital of Chicago
2021	Knights Templar Eye Foundation Travel Award, The Association for Research in Vision and Ophthalmology
2020	Area of Scholarly Concentration Research Grant, Northwestern University Feinberg School of Medicine
2019–2023	Merit Tuition Scholarship, Northwestern University Feinberg School of Medicine
2019	NIH/National Eye Institute Travel Award, Advances in Pediatric Retina Course
2018	Phi Beta Kappa, University of Illinois at Chicago
2018	Summa Cum Laude, University of Illinois at Chicago
2016	Liberal Arts and Sciences Undergraduate Research Initiative Grant, University of Illinois at Chicago

C. Contributions to Science

Undergraduate Research: Under the mentorship of Dr. Elizaveta Benevolenskaya, I investigated the KDM5A short isoform, a histone demethylase with implications in epigenetic regulation and cancer biology. This work introduced me to hypothesis-driven bench science and was presented at the UIC Student Research Forum in 2018, supported by a Liberal Arts and Sciences Undergraduate Research Initiative Grant.

1. Zhang DL, Aissa AF, Benevolenskaya EV. Identification and Analysis of the KDM5A Short Isoform. UIC Student Research Forum. April 11, 2018; Chicago, IL.

Medical School Research: Beginning in my gap year at Retina Consultants Ltd. under Drs. Michael Shapiro and Michael Blair, and continuing through medical school, I pursued three parallel research tracks in pediatric retinal disease, retinal vascular biomarkers, and health economics. My work on retinopathy of prematurity examined foveal development following bevacizumab treatment and longitudinal neurodevelopmental outcomes in treated infants, under the mentorship of Dr. Safa Rahmani. In parallel, collaborating with Drs. Rukhsana Mirza and Bahram Rahmani, I investigated retinal ischemic perivascular lesions (RIPLs) as subclinical ocular biomarkers of systemic cardiovascular disease using swept-source OCT angiography. I also contributed to cost analysis work in pediatric retinal oncology and authored a book chapter on Stickler syndrome and associated collagenopathies.

1. Zhang DL, Blair MP, Zeid JL, Basith S, Shapiro MJ. FEVR phenotype associated with Septo-optic dysplasia. *Ophthalmic Genet.* 2019;40(5):449–452.
2. Tiryaki S, Garcia-Gonzalez JM, Zhang DL, Shapiro MJ, Blair MP. Foveal development after use of bevacizumab for aggressive posterior retinopathy of prematurity. *Ophthalmic Surg Lasers Imaging Retina.* 2019;50(6):e185–e187.
3. Shapiro MJ, Blair MP, Solinski MA, Zhang DL, Jabbehdari S. The importance of early diagnosis of Stickler Syndrome. *Taiwan Journal of Ophthalmology.* 2018;8(4):189–195.
4. Zhang DL, Shapiro MJ, Schechet SA, Rabiah PK, Rodriguez SH, Blair MP. Macular sequelae following exudative retinal detachment after laser photocoagulation for retinopathy of prematurity. *Ophthalmic Surg Lasers Imaging Retina.* 2020;51(12):698–705.
5. Sternfeld A, Rahmani S, Rossen JL, Zhang DL, et al. Long-term retinal vasculature abnormalities following intravitreal bevacizumab for retinopathy of prematurity. *Graefes Arch Clin Exp Ophthalmol.* 2022;260(6):1915–1921.
6. Bison HS, Janetos TM, Gao HM, Zhang DL, et al. Comparison of uveitis incidence by medication in juvenile idiopathic arthritis. *Am J Ophthalmol.* 2022;11:70–76.
7. Zhang DL, Yoon H, DeRegnier RA, Arzu J, Rahmani S. Postnatal growth trajectories and neurodevelopmental outcomes following bevacizumab treatment for retinopathy of prematurity. *Clin Ophthalmol.* 2022;16:2713–2722.
8. Drakopoulos M, Zhang DL, Cheng BT, Sadiq S, et al. Swept-source OCT angiography metrics of retinal ischemic perivascular lesions in patients evaluated for carotid artery stenosis. *BMJ Open Ophthalmol.* 2023;8:e001226.
9. Zhang DL, Zhang KX, Cheng BT, et al. Retinal ischemic perivascular lesions are increased in carotid artery stenosis. *Ophthalmol Retina.* 2023;7(11):1020–1022.
10. Zhang DL, French DD, Rossen JL, Rahmani B. Direct medical costs of globe salvage in group C-E retinoblastoma. *J AAPOS.* 2023;27(6):338.e1–338.e6.
11. Zhang DL, Listernick RH, Rahmani S. Ocular ischemic syndrome in neurofibromatosis type 1 treated with corticosteroids. *J AAPOS.* 2023;27(4):239–242.
12. Shapiro MJ, Blair MP, Schechet SA, et al. Stickler Syndrome and Associated Collagenopathies. In: Wu WC, Lam WC (eds) *A Quick Guide to Pediatric Retina.* Springer, Singapore. 2021.

Post-Graduate Research: Since beginning residency at Vanderbilt under Dr. Avni Finn, my research has concentrated on vitreoretinal imaging, surgical outcomes, and systemic-ocular disease interfaces. My primary line of investigation has focused on ultra-widefield fundus autofluorescence as a non-invasive biomarker of rhegmatogenous retinal detachment duration, culminating in a publication in *Ophthalmology Science* and multiple presentations at the Vit-Buckle Society. I have also contributed to health economics research through a time-driven activity-based costing analysis of panretinal photocoagulation, authored an invited review on

GLP-1 receptor agonists and the eye in *Current Opinion in Ophthalmology*, and published clinical atlases and review articles on ILM flaps, uveal effusion, and nanophthalmos.

1. Berkowitz ST, Zhang DL, Pan WW, et al. Time-driven activity based costing analysis of panretinal photocoagulation. *Ophthalmol Retina.* 2025;9(5):498–501.
2. Drakopoulos M, Zhang KX, Zhang DL, et al. Independence of ocular biomarkers of cardiac risk in macular degeneration. *Ophthalmol Retina.* 2024;8(3):309–311.
3. Zhang DL, Bakis I, Dinh RH, Steinkerchner MS, Finn AP. Ultra-widefield fundus autofluorescence findings as an indicator of duration in rhegmatogenous retinal detachment. *Ophthalmol Sci.* 2025;6(2):101016.
4. Zhang DL, Finn AP. GLP-1 receptor agonists and the eye. *Curr Opin Ophthalmol.* 2025;36(5):407–413.
5. Besagar S, Lam S, Zhang DL, et al. Optical coherence tomography biomarkers differentiate epiretinal membranes secondary to retinal detachment. *J Vitreoretin Dis.* 2026, in press.

D. Scholastic Performance

Year	Course Title	Grade
2015	Genetics (BIOS 220)	A
2015	Organic Chemistry I (CHEM 232)	A
2015	Academic Writing II (ENGL 161)	A
2015	Freshman Orientation Seminar (HON 101)	SH
2015	Honors Core: Creative Arts / World Cultures (HON 127)	AH
2015	Introduction to Sociology (SOC 100)	A
2016	Genetics Lab (BIOS 221)	A
2016	Ecology and Evolution (BIOS 230)	A
2016	Organic Chemistry II (CHEM 234)	A
2016	The Evolution of Medicine (GAMD 200)	B
2016	Medicine as a Profession (GAMD 200)	A
2016	Honors Core: Creative Arts (HON 142)	AH
2016	Intro to Research in Psychology (PSCH 242)	A
2016	Cell Biology (BIOS 222)	A
2016	Cell Biology Laboratory (BIOS 223)	A
2016	Organic Chemistry Lab I (CHEM 233)	A
2016	Art & Science of Medicine (GAMD 200)	A
2016	Medicine, Health Policy & Society (GAMD 200)	A
2016	Abnormal Psychology (PSCH 270)	A
2016	Social Psychology (PSCH 312)	A
2017	Animal Physiology (BIOS 240)	A
2017	Biochemistry I (BIOS 452)	A
2017	Principles of Microeconomics (ECON 120)	A
2017	Behavioral Neuroscience (PSCH 262)	A
2017	Statistical Methods in Behavioral Sciences (PSCH 343)	A
2017	General Microbiology (BIOS 350)	A
2017	Microbiology Laboratory (BIOS 351)	A
2017	Independent Research (BIOS 399)	S
2017	Advanced Communication in Chinese (CHIN 200)	A
2017	Theories of Personality (PSCH 210)	A
2017	Social Psychology Lab (PSCH 313)	A
2018	Independent Research (BIOS 399)	S
2018	Biochemistry II (BIOS 454)	A
2018	Inorganic Chemistry (CHEM 314)	A
2018	Community Psychology (PSCH 231)	A
2019–2020	Block 1: Foundations 1, 2, and 3	P
2019–2020	Synthesis & Application Module 1	CR
2019–2020	Block 2: Cardiovascular, Blood, Pulmonary, Renal	P
2019–2020	Synthesis & Application Module 2	CR
2019–2020	Block 3: Musculoskeletal, Dermatology	P
2020–2021	Block 4: Head, Neck, Neuro, Psych	P
2020–2021	Block 5: Gastroenterology, Endocrinology	P
2020–2021	Block 6: Reproductive GU, Hematology/Oncology	P
2020–2021	Synthesis & Application Module 4	CR
2020–2021	Introduction to Phase 2	CR

2020–2021	Obstetrics & Gynecology Clerkship	HP
2020–2021	(ECMH) Longitudinal Primary Care Clerkship Phase 2	P
2021–2022	Neurology Clerkship	H
2021–2022	Surgery Clerkship	H
2021–2022	Synthesis & Application Module 6	CR
2021–2022	Ophthalmology Research Elective	CR
2021–2022	Medicine Clerkship	H
2021–2022	Pediatrics Clerkship	H
2021–2022	Intro to Ophthalmology Elective	CR
2021–2022	Psychiatry Clerkship	H
2021–2022	Interdisciplinary Curriculum Phase 2	CR
2021–2022	Ophthalmology Research Elective	CR
2021–2022	Introduction to Phase 3	CR
2021–2022	Ophthalmology Elective	H
2021–2022	(ECMH) Longitudinal Primary Care Phase 3	P
2022–2023	Critical Care Medicine — Adult Advanced Clerkship	HP
2022–2023	Intro to Radiology Elective	CR
2022–2023	Ophthalmology Research Elective	CR
2022–2023	Sub-Internship: Medicine	HP
2022–2023	Physical Medicine & Rehabilitation Advanced Clerkship	H
2022–2023	Personal Transition to the Profession	CR
2022–2023	Emergency Medicine Advanced Clerkship	HP

Grade Key — UIC: A = Excellent (4.0), S = Satisfactory, SH/AH = Honors grade, PS = Pass (transfer/AP credit) | Northwestern: H = Honors, HP = High Pass, P = Pass, CR = Credit