

RAHUL DHODAPKAR

PERSONAL

ADDRESS: 4937 Genevieve Ave., Los Angeles, CA 90041
TELEPHONE: +1 347 563 3757
EMAIL: rahul.dhodapkar@med.usc.edu

EDUCATION

MAY 2023 Doctor of Medicine, **Yale School of Medicine**, New Haven, CT

MAY 2017 Non-degree Postbacc, **New York University**, New York, NY

MAY 2015 Bachelor of Science in COMPUTER SCIENCE, **Yale University**, New Haven, CT

MAY 2011 High School, **Hopkins School**, New Haven, CT

WORK

CURRENT JUNE 2023	Resident Physician at KECK SCHOOL OF MEDICINE Los Angeles, CA, USA Resident physician in ophthalmology at Keck School of Medicine and LA General Medical Center.
SEP 2022 SEP 2021	Neuroinflammation Research Fellow at YALE SCHOOL OF MEDICINE New Haven, CT, USA Led single-nucleus RNA sequencing project to characterize activated Muller glia in glaucoma and identify potential targets for neuroregenerative therapeutics. Mentored undergraduate and postgraduate students, training them in laboratory techniques as well as scientific knowledge and approach. Contributed to analysis and experimental design for project to characterize microglial involvement in the development of age-related macular degeneration (AMD) and compare it to other neurodegenerative disorders.
MAY 2018 AUG 2015	Consulting Engineer at MONGODB INC. New York, NY, USA Architected and built information management systems for dozens of Fortune 500 clients, including: A critical resource management system used daily by over 7000 employees of the City of New York. A HIPAA-compliant database to store medical sensor data for thousands of patients in clinical trials. A globally distributed multi-terabyte database-as-a-service (DaaS) system with 99.999% uptime guarantee.
MAR 2015 AUG 2014	Consultant at SEARS HOLDINGS CORPORATION Hoffman Estates, IL, USA Standardized external product interfaces for Sears' integrated home platform. Wrote middleware to unify distributed callback mechanisms for internet of things (IoT) applications.

JUL 2014 MAY 2014	Software Engineering Intern at MONGODB INC. New York, NY, USA	Prototyped a new query optimization system for the MongoDB kernel, using machine learning techniques to reduce execution time.
JULY 2013 MAY 2013	Research and Development Intern at EPIC SYSTEMS Verona, WI, USA	Led a team of interns in building a web-application for mining patient data across hospitals using Epic. Wrote a graph-based clustering algorithm to connect physicians based on previously seen patient characteristics to promote collaboration in the diagnosis of ambiguously-presenting patients.
JULY 2012 MAY 2012	Software Development Intern at VANTAGELOCAL, (now FREQUENCY) Palo Alto, CA, USA	Developed a web application to automate quote generation for locally targeted, real time bid (RTB) advertising. Wrote Flash-based tools to assist advertising creative team in banner ad design.
FEB 2012 MAY 2008	Research Associate at YALE CHILD STUDY CENTER <i>Lab of DR. MATTHEW STATE (now at UNIVERSITY OF CALIFORNIA, SAN FRANCISCO)</i> New Haven, CT, USA	Wrote graphical interface for CNVision, a comprehensive toolkit for copy number variant (CNV) analysis of genotyping data. Developed custom scripts for data analysis and performed polymerase chain reaction (PCR) to generate samples for next-gen genome sequencing and RNA extraction for expression profiling of brain tissue.

SERVICE

JAN 2022 MAY 2021	Senior Clinical Team Member at HAVEN FREE CLINIC New Haven, CT, USA
MAY 2020 AUG 2018	Volunteer at YSM ANATOMY TEACHING PROGRAM New Haven, CT, USA
MAY 2020 AUG 2018	Volunteer at CODE HAVEN New Haven, CT, USA
MAY 2018 AUG 2016	Volunteer at MOUNT SINAI HOSPITAL, RUTTENBERG CANCER CENTER New York, NY, USA
MAY 2014 SEP 2014	Philanthropy Chair at SIGMA CHI FRATERNITY New Haven, CT, USA
MAY 2013 SEP 2012	Literacy Tutor at NEW HAVEN READS New Haven, CT, USA

JUN 2009	TA at MOVING ACADEMY OF MEDICINE AND BIOMEDICINE
MAY 2009	Pune, MH, Republic of India

LEADERSHIP

MAY 2022	Director of Medical Debt and Insurance Counseling
MAY 2021	HAVEN Free Clinic
MAY 2018	Cybersecurity Standardization Field Lead
AUG 2016	<i>MongoDB</i>
MAY 2014	Treasurer and Philanthropy Chair
AUG 2013	<i>Sigma Chi Fraternity at Yale</i>
JAN 2014	Director of Technology
SEP 2012	<i>Yale Event Management Association</i>
AUG 2013	Social Chair
SEP 2012	<i>Yale Equestrian Team</i>

FUNDING

JUN 2024	Colton Center for Autoimmunity Grant Co-investigator <i>AI-Simulated In Silico Humans: A New Paradigm for Modeling Autoimmunity:</i> a \$100,000 grant to develop new therapeutic targets for age-related macular degeneration (AMD) using a novel AI-driven <i>in silico</i> human perturbation screening platform.
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AWARDS AND HONORS

- DEC 2022 Yale/Boehringer Ingelheim Datathon Winner
Most outstanding multimodal data integration tool at the Yale/BI Datathon
- MAY 2022 SAIL Travel Award
Travel award to fund presentation at the Symposium on Artificial Intelligence for Learning Health Systems (SAIL)
- JAN 2022 Sigma Xi Scientific Research Honor Society
Nominated to full member of Sigma Xi honor society.
- JUNE 2021 Medical Student Research Award
Yale Ophthalmology department award for most outstanding medical student research.
- APR 2020 Honorable Mention: Marguerite Rush Lerner Contest
Medical student creative writing & art contest at Yale School of Medicine.
- MAR 2018 Young Investigator Award
Travel award from Thrombosis and Hemostasis Societies of North America.
- MAY 2015 Sigma Chi Chapter Balfour Prize
For most outstanding senior in the graduating class.
- AUG 2013 Sigma Chi J. Willard Marriott Scholarship
- JUN 2013 ThinkChicago Lollapalooza Winner
Municipal innovation pitch competition by the City of Chicago
- OCT 2012 Yale Venture Creation Program Fellow
- SEP 2012 Yale Entrepreneurial Society Elevator Pitch Competition Runner Up
- MAY 2011 New Haven Register Youth of the Year
- MAY 2011 National Merit Scholarship Finalist

ARTICLES

Contributions bolded; * indicates co-first author, † indicates co-corresponding author.

- IN PRESS Sean J. Miller, **Rahul M. Dhodapkar**, Hande Eda Sutova, Yao Xue, Seunghoon Lee, Robert Logan, Chongzhao Ran, Sagar Bhatta, Ashley Gomm, In Gyoung Ju, Michael Heyang, Marcello DiStasio, Rudolph E. Tanzi, Can Zhang, Z. Jimmy Zhou, Brian P. Hafler. *SARS-CoV-2 Virus and Spike protein Induces Alzheimer's disease-related Amyloid-Beta Pathology in ex vivo Human Retinal Explants and Retinal Organoids*. Science Advances.
- SEP 2024 **Rahul M. Dhodapkar**, Eric Jung, Sun Young Lee. *An eye on extracellular vesicles: Trends and clinical translations in vision research*. Ophthalmology Science.

- IN REVIEW **Rahul M. Dhodapkar**, Sean J. Miller, Abdelilah Majdoubi, Diego Martell, Rayyan Y. Darji, Hande Eda Sutova, Alex Dong, Michael Heyang, Marcello DiStasio, Brian P. Hafler. *Single-cell cross-species analysis reveals pathways promoting regeneration in the human retina*.
- JUL 2024 Daniel Levine, Sacha Lévy, Syed Asad Rizvi, Nazreen Pallikkavaliyaveetil, Xingyu Chen, David Zhang, Sina Ghadermarzi, Ruiming Wu, Zihe Zheng, Ivan Vrkic, Anna Zhong, Daphne Raskin, Insu Han, Antonio Henrique de Oliveira Fonseca, Josue Ortega Caro, Amin Karbasi, **Rahul M. Dhodapkar** †, David van Dijk †. *Cell2Sentence: Teaching Large Language Models the Language of Biology*. Proceedings of the International Conference on Machine Learning. <https://doi.org/10.1101/2023.09.11.557287>
- MAY 2024 Josue Ortega Caro, Antonio H. de O. Fonseca, Christopher Averill, Syed A. Rizvi, Matteo Rosati, James L. Cross, Prateek Mittal, Emanuele Zappala, Daniel Levine, **Rahul M. Dhodapkar**, Chadi G. Abdallah, David van Dijk. *BrainLM: A foundation model for brain activity recordings*. Proceedings of the International Conference on Learning Representations. <https://doi.org/10.1101/2023.09.12.557460>
- NOV 2023 Dong M, Wang B, Wei J, Fonseca A, Perry C, Ouerghi F, Foxman EF†, Ishizuka JJ†, **Dhodapkar RM**†, van Dijk D†. *Causal identification of single-cell experimental perturbation effects with CINEMA-OT*. Nature Methods.
- SEP 2023 Klein J*, Wood J*, Jaycox J*, **Dhodapkar RM***, Lu P*, Gelhausen JR*, Tabachnikova A*, Greene K, Tabacof L, Malik AA, Monteiro VS, Silva J, Kamath K, Zhang M, Dahl A, Ott I, Valle G, Pena-Hernandez M, Mao T, Bhattacharjee B, Takahashi T, Lucas C, Song E, McCarthy D, Breyman E, Tosto-Mancuso J, Dai Y, Perotti E, Akduman K, Tzeng TJ, Xu L, Geraghty AC, Monje M, Yildirim I, Shon J, Medzhitov R, Lutchmansingh D, Possick J, Kaminski N, Omer SB, Krumholz HM, Guan L, Dela Cruz CS, van Dijk D†, Ring AM†, Putrino D†, Iwasaki A†. *Distinguishing features of Long COVID identified through immune profiling*. Nature.
- MAY 2023 Kuchroo M, DiStasio M, Song E, Calapkulu E, Zhang L, Ige M, Sheth AH, Majdoubi A, Menon M, Tong A, Godavarthi A, Xing Y, Gigante S, Steach H, Huang J, Huguët G, Narain J, You K, Mourgos G, **Dhodapkar RM**, Hirn MJ, Bastian R, Wolf G, Krishnaswamy S†, Hafler BP†. *Single-cell analysis reveals inflammatory interactions driving macular degeneration*. Nature Communications. 2023 Mar 5.
- MAR 2023 Ascunce K, **Dhodapkar RM**, Huang D, Hafler BP. *Innate immune biology in age-related macular degeneration*. Frontiers in Cell and Developmental Biology. 2023;11.
- MAR 2023 **Dhodapkar RM**, Jin A, Liu J. *Acute Pain Management Protocol for Ophthalmic Procedures*. In First Aid Perioperative Ultrasound: Acute Pain Manual for Surgical Procedures 2023 Mar 3 (pp. 291-311). Cham: Springer International Publishing.
- JAN 2023 **Dhodapkar RM**, Spadaro JZ, Heng JS, Sinard JH, Lee YH, Habib LA, Pointdujour-Lim R. *NK/T-cell Lymphoma With Orbital Involvement: A Case Report and Systematic Review of the Literature*. Ophthalmic Plastic & Reconstructive Surgery. 2023 Jan 24:10-97.

- SEP 2022 **Dhodapkar RM**, Spadaro JZ, Adelman RA. A case of extrafoveal focal choroidal excavation. *American Journal of Ophthalmology Case Reports*. 2022 Sep 1;27:101682.
- AUG 2022 **Dhodapkar RM**, Li E, Nwanyanwu K, Adelman R, Krishnaswamy S, Wang JC. *Deep learning for quality assessment of optical coherence tomography angiography images*. *Scientific Reports*. 2022 Aug 12;12(1):13775.
- MAY 2022 **Dhodapkar RM**, Martell D, Hafler BP. *Glial-mediated neuroinflammatory mechanisms in age-related macular degeneration*. *Seminars in Immunopathology* 2022 May 5;doi: 10.1007/s00281-022-00939-3. Epub ahead of print.
- MAY 2020 **Dhodapkar RM** *A survey-wide association study to identify youth-specific correlates of major depressive episodes*. *PloS One*. 2020 May 8;15(5):e0232373.
- OCT 2017 Santolucito M, Zhai E, **Dhodapkar RM**, Shim A, and Piskac R. 2017. *Synthesizing Configuration File Specifications with Association Rule Learning*. *Proc. ACM Program. Lang.* 1, OOPSLA, Article 64 (October 2017), 20 pages. <https://doi.org/10.1145/3133888>
- JUN 2011 Sanders SJ, Ercan-Sencicek AG, Hus V, Luo R, Murtha MT, Moreno-De-Luca D, Chu SH, Moreau MP, Gupta AR, Thomson SA, Mason CE, Bilguvar K, Celestino-Soper PB, Choi M, Crawford EL, Davis L, Wright NR, **Dhodapkar RM**, ..., State MW. *Multiple recurrent de novo CNVs, including duplications of the 7q11.23 Williams syndrome region, are strongly associated with autism*. *Neuron*. 2011 Jun 9;70(5):863-85. doi: 10.1016/j.neuron.2011.05.002.

PREPRINTS

Contributions bolded; * indicates co-first author, † indicates co-corresponding author.

- APR 2025 Syed Asad Rizvi, Daniel Levine, Aakash Patel, Shiyang Zhang, Eric Wang, Sizhuang He, David Zhang, Cerise Tang, Zhuoyang Lyu, Rayyan Darji, Chang Li, Emily Sun, David Jeong, Lawrence Zhao, Jennifer Kwan, David Braun, Brian Hafler, Jeffrey Ishizuka, **Rahul M. Dhodapkar**, Hattie Chung, Shekoofeh Azizi, Bryan Perozzi, David van Dijk *Scaling Large Language Models for Next-Generation Single-Cell Analysis*. bioRxiv preprint <https://doi.org/10.1101/2025.04.14.648850>
- JUL 2024 Syed Asad Rizvi, Nazreen Pallikkavaliyaveetil, David Zhang, Zhuoyang Lyu, Nhi Nguyen, Haoran Lyu, Benjamin Christensen, Josue Ortega Caro, Antonio H. O. Fonseca, Emanuele Zappala, Maryam Bagherian, Christopher Averill, Chadi G. Abdallah, Amin Karbasi, Rex Ying, Maria Brbic, **Rahul M. Dhodapkar**, David van Dijk *FIMP: Foundation Model-Informed Message Passing for Graph Neural Networks*. arXiv preprint <https://arxiv.org/abs/2210.09475>
- MAR 2024 Julio Silva, Takehiro Takahashi, Jamie Wood, Peiwen Lu, Alexandra Tabachnikova, Jeff R Gehlhausen, Kerrie Greene, Bornali Bhattacharjee, Valter Silva Monteiro, Carolina Lucas, **Rahul M Dhodapkar**, Laura Tabacof, Mario Peña-Hernandez, Kathy Kamath, Tianyang Mao, Dayna Mccarthy, Ruslan Medzhitov, David van Dijk, Harlan M Krumholz, Lying Guan, David Putrino, Akiko Iwasaki *Sex differences in symptomatology and immune profiles of Long COVID*. medRxiv preprint medRxiv:2024.02. 29.24303568. 2024 Mar 4.
- JAN 2023 **Dhodapkar RM**. *A deep generative model of the SARS-CoV-2 spike protein predicts future variants*. bioRxiv. 2023:2023-01.
- OCT 2022 Rizvi SA, Nguyen N, Lyu H, Christensen B, Caro JO, Zappala E, Brbic M, **Dhodapkar RM***, Dijk DV.* *AMPNet: Attention as Message Passing for Graph Neural Networks*. arXiv preprint arXiv:2210.09475. 2022 Oct 17.
- SEP 2022 **Dhodapkar RM**. *Representing cells as sentences enables natural-language processing for single-cell transcriptomics*. bioRxiv. 2022:2022-09.

PATENTS

- PENDING **Rahul M. Dhodapkar**, David van Dijk *Artificial intelligence systems and methods for enabling natural language transcriptomics analysis*. US20250139386A1. 2024-10-28.

TALKS

Contributions bolded; * indicates co-first author, † indicates co-corresponding author.

- JUN 2025 Pigmented Lesions **Dhodapkar RM**, Nagiel A.
The Pacific Retina Club Annual Meeting
Los Angeles, CA, USA
- MAY 2022 Cross-species single-cell transcriptomic analysis reveals factors limiting Müller glia-mediated regeneration in humans. **Dhodapkar RM**, Martell D, Calapkulu E, Xing Y, Zhang L, Menon M, Jin A, Dong AJ, Hafler BP
The Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting
Denver, CO, USA
- APR 2022 Cross-species single-cell transcriptomic analysis reveals factors limiting Müller glia-mediated regeneration in humans. **Dhodapkar RM**, Martell D, Calapkulu E, Xing Y, Zhang L, Menon M, Jin A, Dong AJ, Hafler BP
Keystone Symposium for Single Cell Biology
Florence, Italy
- NOV 2019 Identifying adolescent-specific risk factors of major depressive events: a survey-wide association study. **Dhodapkar RM**
Klingenstein Third Generation Foundation National Medical Student Conference
Palo Alto, CA, USA
- MAR 2018 Association between variants in HRG and SERPINA10 with male gender in patients with venous thromboembolism. **Dhodapkar RM**, Dykas DJ, Ma D, Lee AI
Thrombosis and Hemostasis Societies of North America Summit
San Diego, CA, USA
- JUN 2017 Securing Distributed Database Technology
MongoDB World Conference
Chicago, IL, USA
- JUN 2016 Building Asynchronous Microservices
MongoDB World Conference
New York, NY, USA
- JUN 2016 Security in the Age of the Internet
World Scholars Leadership Conference
GEUMGANG UNIVERSITY, Nonsan, Republic of Korea

POSTERS

Contributions bolded; * indicates co-first author, † indicates co-corresponding author.

- SEP 2022 Natural Killer/T-Cell Lymphoma (NKTL) with Orbital Involvement: Systematic Review of the Literature. **Dhodapkar RM**, Spadaro JA, Heng JS, Sinard JH, Lee YH, Habib LA, Pointdujour-Lim R
American Society of Ophthalmic Plastic and Reconstructive Surgery Fall Scientific Symposium
Chicago, IL, USA
- MAY 2022 Deep learning for quality assessment of optical coherence tomography angiography images. **Dhodapkar RM**, Li E, Nwanyanwu K, Adelman RA, Krishnaswamy S, Wang JC
Symposium on Artificial Intelligence for Learning Health Systems
Bermuda
- MAY 2022 Deep learning for quality assessment of optical coherence tomography angiography images. Wang JC, **Dhodapkar RM**, Li E, Nwanyanwu K, Adelman RA, Krishnaswamy S
The Association for Research in Vision and Ophthalmology (ARVO) Annual Meeting
Denver, CO, USA
- MAY 2022 A case of IgLON5 encephalitis with ophthalmoplegia. **Dhodapkar RM**, Kohli AA, Megalla M.
North American Neuro-Ophthalmology Society (NANOS) Annual Meeting
Austin, TX, USA
- NOV 2020 Is it OK to drive home after an epidural steroid injection? **Dhodapkar RM**, Rajput K
American Society of Regional Anesthesia Pain Medicine Meeting
Virtual (per COVID-19)
- NOV 2018 Whole Exome Sequencing and Extended Thrombophilia Testing in Patients with Venous Thromboembolism. Shevell LM, Lee E, MD, **Dhodapkar RM** Dykas D, Popa A, Ma D, Bar N, Baluha A, Burns A, Chaar C, Dupont A, Gu S, Halene S, Luciano R, Marien R, Neparidze N, Parker T, Yao X, Camire R, Ebberink E, Garcia de Frutos P, Gnanasambandan K, Sayeski PP, Huntington JA, Lentz SR, Mertens K, Parish C, Rezaie R, Connors JM, Leavitt A, Bale A, Lee, AI
American Society of Hematology Annual Meeting
San Diego, CA, USA

OTHER PUBLISHED MATERIALS

- MAR 2023 Acute Pain Management Protocol for Ophthalmic Procedures
Dhodapkar RM, Jin A, Liu, J. *First Aid Perioperative Ultrasound, Book Chapter*
- MAY 2022 Focal Choroidal Excavation (FCE) **Dhodapkar RM**, Spadaro JZ, Adelman RA. *EyeWiki*
- MAY 2022 Growth Guidance Instrumentation with Hemivertebra Resection.
Molho D, **Dhodapkar RM**, Bouloussa H, DiLuna M, Tuason D. *Pediatric Orthopaedic Society of North America Academy*

NATURAL LANGUAGES

SPANISH: Advanced
HINDI: Basic
KOREAN: Basic

PROGRAMMING AND INFORMATION SYSTEMS

LANGUAGES: Python, Perl, JavaScript, Java, C, C++, R
EXPERTISE: Single Cell Genomics, Machine Learning, Information Architecture
TOOLS: MongoDB, PostgreSQL, Kerberos, LDAP, SAMtools