Rahul Dhodapkar

Personal

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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 neuroregnerative 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* Frequence*)*
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
Lab of Dr. Matthew State *(now at* University of California, San Francisco*)*
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 – May 2009 | TA at Moving Academy of Medicine and Biomedicine
Pune, MH, Republic of India

Leadership

May 2022 – May 2021 | Director of Medical Debt and Insurance Counseling
HAVEN Free Clinic

May 2018 – Aug 2016 | Cybersecurity Standardization Field Lead
MongoDB

May 2014 – Aug 2013 | Treasurer and Philanthropy Chair
Sigma Chi Fraternity at Yale

Jan 2014 – Sep 2012 | Director of Technology
Yale Event Management Association

Aug 2013 – Sep 2012 | Social Chair
Yale Equestrian Team

Funding

Jun 2024 | Colton Center for Autoimmunity Grant
Co-investigator
AI-Simulated In Silico Humans: A New Paradigm for Modeling Autoimmunity: a $100,000 grant to develop new therapeutic targets for age-related macular degeneration (AMD) using a novel AI-driven *in silico* human perturbation screening platform.

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 Hemostatsis 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.

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, Huguet G, Narain J, You K, Mourgkos 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.

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, Leying 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.

Talks

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

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 Hemostatis 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

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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, **Dhodpkar 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, Leavvitt A, Bale A, Lee, AI
American Society of Hematology Annual Meeting
San Diego, CA, USA

Other Published Materials

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, CUDA