Kejun "Albert" Ying, Ph.D.

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Studying aging at the intersection of biology and AI

Education

Harvard University Cambridge, MA

Ph.D., Biological Science in Public Health

- Advisor: Dr. Vadim Gladyshev, Harvard Medical School, Brigham and Women's Hospital
- Dissertation Advisory Committee: Dr. Brendan Manning, Dr. David Sinclair, Dr. Shamil Sunyaev
 Focused on understanding the mechanism of aging through multi-omic modeling & causal inference

Harvard University Cambridge, MA

M.S., Computational Science Engineering

• Secondary field during Ph.D. study

University of California, Berkeley Berkeley, CA

Visiting Student, Integrative Biology

Sun Yat-Sen University

Guangzhou, China

B.S., Life Science 2015 – 2019

- Thesis: Screening for the Interactome of hTERC based on Molecular Fluorescence Complementation System in Living Cells
- Yat-Sen Honor School Program (Top 0.5%)

Harvard T. H. Chan School of Public Health

National college admissions exam (Top 0.6%)

Experience

University of Washington Seattle, WA

Protein Design Visiting Scholar, David Baker's Lab

2025 – Present

Stanford University
Stanford, CA
Proteomics Visiting Scholar, Tony Wyss-Coray's Lab
2025 - Present

Avinasi Labs San Francisco, CA

Decentralized longevity data collection *Co-founder* 2025 – Present

Harvard Medical School, Brigham and Women's Hospital Boston, MA

Biological Aging Graduate Researcher, Vadim Gladyshev's Lab

2020 – Present

Harvard Medical School, Boston Children's Hospital

Boston, MA

RNA Modifications Graduate Researcher (Rotation), Eric Greer's Lab

Harvard Medical School Boston, MA

IPSC Reprogramming & DNA methylation Graduate Researcher (Rotation), David Sinclair's Lab 2019

mTORC1 Graduate Researcher (Rotation), Brendan Manning's Lab

Sun Yat-Sen University Guangzhou, China

Telomere & Telomerase Undergraduate Researcher, Zhou Songyang's Lab 2018 – 2019

Boston, MA

2019 - March 2025

2022 - 2024

2017 - 2018

University of Edinburgh Edinburgh, UK Population genetics Undergraduate Researcher, Xia Shen's Lab 2018 University of Washington Seattle, WA Acarbose & Rapamycin Undergraduate Researcher, Matt Kaeberlein's Lab 2018 **Buck Institute for Research on Aging** Novato, CA **Senolytics** Undergraduate Researcher, Judith Campisi's Lab 2018 University of California, Berkeley Berkeley, CA SIRT7 Undergraduate Researcher, Danica Chen's Lab 2017 Sun Yat-Sen University Guangzhou, China **Telomere & DNA Methylation** Undergraduate Researcher, Yikang Rong's Lab 2015 - 2017

Grants

Using causal aging biomarkers and protein design to develop novel anti-aging interventions NIH/NIA F99/K00, Transition to Aging Research for Predoctoral Students 2024 – 2028

- Award Document Number: FAG088431A (PI)
- Received a *perfect* Impact Score of **10**

Publications

Gladyshev, V. N., Anderson, B., Barlit, H., ..., Ying, K., Yunes, J., Zhang, B., & Zhavoronkov, A. (2024). Disagreement on foundational principles of biological aging. **PNAS Nexus**, 3(12), pgae499. https://doi.org/10.1093/pnasnexus/pgae499

Goeminne, L. J. E., Vladimirova, A., Eames, A., Tyshkovskiy, A., Argentieri, M. A., Ying, K., Moqri, M., & Gladyshev, V. N. (2024). Plasma protein-based organ-specific aging and mortality models unveil diseases as accelerated aging of organismal systems. **Cell Metabolism**, https://doi.org/10.1016/j.cmet.2024.03.007

Ying, K.† (2024). Causal inference for epigenetic ageing. Nature Reviews Genetics, 1–1. https://doi.org/10. 1038/s41576-024-00799-7

Ying, K., Castro, J. P., Shindyapina, A. V., Tyshkovskiy, A., Moqri, M., Goeminne, L. J. E., Milman, S., Zhang, Z. D., Barzilai, N., & Gladyshev, V. N. (2024). Depletion of loss-of-function germline mutations in centenarians reveals longevity genes. **Nature Communications**, 15(1), 5956. https://doi.org/10.1038/s41467-024-50098-2

Lyu, YX.*, Fu, Q.*, Wilczok, D.*, Ying, K.*, King, A., ..., Bakula, D. (2024). Longevity biotechnology: Bridging AI, biomarkers, geroscience and clinical applications for healthy longevity. **Aging**, *16*(1), 1–25. https://doi.org/10. 18632/aging.205397

Biomarkers of Aging Consortium⁺, Herzog, C. M. S., Goeminne, L. J. E., Poganik, J. R., Barzilai, N., Belsky, D. W., Betts-LaCroix, J., Chen, B. H., Chen, M., Cohen, A. A., Cummings, S. R., Fedichev, P. O., Ferrucci, L., Fleming, A., Fortney, K., Furman, D., Gorbunova, V., Higgins-Chen, A., Hood, L., Horvath, S., ... Gladyshev, V. N. (2024). Challenges and recommendations for the translation of biomarkers of aging. Nature Aging, 1–12. https://doi.org/10.1038/s43587-024-00683-3

Castro, J. P., Shindyapina, A. V., Barbieri, A., Ying, K., Strelkova, O. S., Paulo, J. A., Tyshkovskiy, A., Meinl, R., Kerepesi, C., Petrashen, A. P., Mariotti, M., Meer, M. V., Hu, Y., Karamyshev, A., Losyev, G., Galhardo,

[†] Corresponding author; ^{*} Co-first author; ⁺ Contributed as consortium author

- M., Logarinho, E., Indzhykulian, A. A., Gygi, S. P., Sedivy, J. M., Manis, J. P., & Gladyshev, V. N. (2024). Age-associated clonal B cells drive B cell lymphoma in mice. **Nature Aging**, 4(8), 1–15. https://doi.org/10.1038/s43587-024-00671-7
- Moqri, M., Cipriano, A., Simpson, D. J., Rasouli, S., Murty, T., de Jong, T. A., Nachun, D., de Sena Brandine, G., **Ying, K.,** Tarkhov, A., Aberg, K. A., van den Oord, E., Zhou, W., Smith, A., Mackall, C., Gladyshev, V. N., Horvath, S., Snyder, M. P., & Sebastiano, V. (2024). PRC2-AgeIndex as a universal biomarker of aging and rejuvenation. **Nature Communications**, 15(1), 5956. https://doi.org/10.1038/s41467-024-50098-2
- Tarkhov, A. E., Lindstrom-Vautrin, T., Zhang, S., Ying, K., Moqri, M., Zhang, B., Tyshkovskiy, A., Levy, O., & Gladyshev, V. N. (2024). Nature of epigenetic aging from a single-cell perspective. **Nature Aging**, 1–17. https://doi.org/10.1038/s43587-023-00555-2
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- Griffin, P. T., Kane, A. E., Trapp, A., Li, J., Arnold, M., Poganik, J. R., Conway, R. J., McNamara, M. S., Meer, M. V., Hoffman, N., Amorim, J. A., Tian, X., MacArthur, M. R., Mitchell, S. J., Mueller, A. L., Carmody, C., Vera, D. L., Kerepesi, C., Ying, K., ... Sinclair, D. A. (2024). TIME-seq reduces time and cost of DNA methylation measurement for epigenetic clock construction. Nature Aging, 1–14. https://doi.org/10.1038/s43587-023-00555-2
- Ying, K., Liu, H., Tarkhov, A. E., Sadler, M. C., Lu, A. T., Moqri, M., Horvath, S., Kutalik, Z., Shen, X., & Gladyshev, V. N. (2024). Causality-enriched epigenetic age uncouples damage and adaptation. **Nature Aging** (Featured on the February Cover), 1–16. https://doi.org/10.1038/s43587-023-00557-0
- Moqri, M., Herzog, C., Poganik, J. R., **Biomarkers of Aging Consortium**⁺, Justice, J., Belsky, D. W., Higgins-Chen, A., Moskalev, A., Fuellen, G., Cohen, A. A., Bautmans, I., Widschwendter, M., Ding, J., Fleming, A., Mannick, J., Han, J.-D. J., Zhavoronkov, A., Barzilai, N., Kaeberlein, M., ... Gladyshev, V. N. (2023). Biomarkers of aging for the identification and evaluation of longevity interventions. **Cell**, 186 (18), 3758–3775. https://doi.org/10.1016/j.cell.2023.08.003
- Liberman, N., Rothi, M. H., Gerashchenko, M. V., Zorbas, C., Boulias, K., MacWhinnie, F. G., Ying, A. K., Flood Taylor, A., Al Haddad, J., Shibuya, H., Roach, L., Dong, A., Dellacona, S., Lafontaine, D. L. J., Gladyshev, V. N., & Greer, E. L. (2023). 18S rRNA methyltransferases DIMT1 and BUD23 drive intergenerational hormesis. **Molecular Cell**, 83(18), 3268–3282.e7. https://doi.org/10.1016/j.molcel.2023.08.014
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- Ying, K., Zhai, R., Pyrkov, T. V., Shindyapina, A. V., Mariotti, M., Fedichev, P. O., Shen, X., & Gladyshev, V. N. (2021). Genetic and phenotypic analysis of the causal relationship between aging and COVID-19. **Communications Medicine**, *I*(1), 35. https://doi.org/10.1038/s43856-021-00033-z
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- Ying, K.[†], Song, J., Cui, H., Zhang, Y., Li, S., Chen, X., Liu, H., Eames, A., McCartney, D. L., Marioni, R. E., Poganik, J. R., Moqri, M., Wang, B., & Gladyshev, V. N. (2024). MethylGPT: a foundation model for the DNA methylome. bioRxiv. https://doi.org/10.1101/2024.10.30.621013
- Ying, K., Paulson, S., Reinhard, J., Camillo, L. P. L., Trauble, J., Jokiel, S., Biomarkers of Aging Consortium, Gobel, D., Herzog, C., Poganik, J. R., Moqri, M., & Gladyshev, V. N. (2024). An Open Competition for Biomarkers of Aging. bioRxiv. https://doi.org/10.1101/2024.10.29.620782
- Ying, K., Tyshkovskiy, A., Chen, Q., Latorre-Crespo, E., Zhang, B., Liu, H., Matei-Dediu, B., Poganik, J. R., Moqri, \overline{M} ., Kirschne, K., Lasky-Su, J., & Gladyshev, V. N. (2024). High-dimensional Ageome Representations of Biological Aging across Functional Modules. **bioRxiv**. https://doi.org/10.1101/2024.09.21.570935
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- Rothi, M. H., Sarkar, G. C., Al Haddad, J., Mitchell, W., Ying, K., Pohl, N., Sotomayor-Mena, R. G., Natale, J., Dellacono, S., Gladyshev, V. N., & Greer, E. L. (2024). The 18S rRNA Methyltransferase DIMT-1 Regulates Lifespan in the Germline Later in Life. bioRxiv. https://doi.org/10.1101/2024.05.15.570935
- Moqri, M., Poganik, J. R., Herzog, C., Ying, K., Chen, Q., Emamifar, M., Tyshkovskiy, A., Eames, A. W., Mur, J., Matei-Dediu, B., Goeminne, L., Mitchell, W., McCartney, D. L., Marioni, R. L., Lasky-Su, J. A., Snyder, M., & Gladyshev, V. N. (2024). Integrative epigenetics and transcriptomics identify aging genes in human blood. bioRxiv. https://doi.org/10.1101/2024.05.30.596713

Ying, K., Tyshkovskiy, A., Trapp, A., Liu, H., Moqri, M., Kerepesi, C., & Gladyshev, V. N. (2023). ClockBase: A comprehensive platform for biological age profiling in human and mouse. bioRxiv. https://doi.org/10.1101/2023. 02.28.530532

Zhang, B., Tarkhov, A. E., Ratzan, W., Ying, K., Moqri, M., Poganik, J. R., Barre, B., Trapp, A., Zoller, J. A., Haghani, A., Horvath, S., Peshkin, L., & Gladyshev, V. N. (2022). Epigenetic profiling and incidence of disrupted development point to gastrulation as aging ground zero in Xenopus laevis. bioRxiv. https://doi.org/10.1101/2022. 08.02.502559

Castro, J. P., Shindyapina, A. V., Barbieri, A., Ying, K., Strelkova, O. S., Paulo, J. A., Tyshkovskiy, A., Meinl, R., Kerepesi, C., Petrashen, A. P., Mariotti, M., Meer, M., Hu, Y., Karamyshev, A., Losyev, G., Indzhykulian, A. A., Gygi, S. P., Sedivy, J. M., Manis, J. P., & Gladyshev, V. N. (2021). Integrative analyses uncover mechanisms by which aging drives B cell lymphoma. bioRxiv. https://doi.org/10.1101/2021.02.23.432500

Patents

V. N. Gladyshev, K. Ying, "High-dimensional measurement of biological age" (2024). Provisional Patent Application V. N. Gladyshev, K. Ying, "Mapping CpG sites to quantify aging traits" (2024). WO2024039905A2

Software and Database

Biolearn (2024) https://bio-learn.github.io/ ClockBase (2023) https://www.clockbase.org/

Presentations

ORAL PRESENTATIONS

Keystone Symposia: Aging: New Frontiers in Rejuvenation and Gerotherapeutics Breckenridge, CO MethylGPT: A Foundation Model for the DNA Methylome 2025 Biomarkers of Aging Symposium Boston, MA Standardization of aging biomarkers and BoA challenge 2024 **Harvard GRIP Presentations** Boston, MA Causal Aging Biomarker enpowers Unbiased Anti-Aging Therapy Screening 2024 4th TimePie Longevity Forum Shanghai, China

Causal Aging Biomarker as a Tool for Unbiased Anti-Aging Therapy Screening

2023 Global Congress on Aesthetic and Anti-Aging (GCAA2023) Singapore Causal Aging Biomarker as a Tool for Unbiased Anti-Aging Therapy Screening

10th Aging Research and Drug Discovery conference (ARDD2023) Copenhagen, Denmark Causal Epigenetic Age Uncouples Damage and Adaptation

AGE 2023 51st Annual Meeting Oklahoma City, OK Causal Epigenetic Age Uncouples Damage and Adaptation

Broad Institute MPG Retreat Cambridge, MA Causal Epigenetic Age Uncouples Damage and Adaptation 2023

Harvard GRIP Presentations Causal Epigenetic Age Uncouples Damage and Adaptation	Boston, MA
Targeting Metabesity 2022, 'Honorable Mention' Causal Epigenetic Age Uncouples Damage and Adaptation	Virtual Conference
GSA 2021 Annual Scientific Meeting Genetic and phenotypic evidence for causal relationships between aging and COVID-19	Virtual Conference
Invited Talks	
St. Jude Children's Research Hospital , hosted by Dr. Zhaoming Wang <i>MethylGPT and Causality-enriched Epigenetic Clock</i>	Memphis, TN
The Alliance for Longevity Initiatives Scientist Spotlight, Episode 14: Albert Ying	Online Podcast
BioAge Seminar , hosted by Dr. Robert Hughes & Dr. Paul Timmers <i>Ageome: Biological age with higher-dimensionality</i>	Boston, MA
MRC Integrative Epidemiology Unit Seminar Epigenetic Clocks and Mendelian Randomization	Bristol, UK 2024
NIA EL Projects Joint Meeting, National Institute on Aging Aging Clocks	Online Webinar
Biomarkers of Aging Challenge, Foresight Institute Update Webinar with Foresight	Online Webinar 2024
Everything Epigenetics, podcast hosted by Hannah Went Causal Epigenetic Age Uncouples Damage and Adaptation	Online Podcast
Chinese University of Hong Kong, hosted by Dr. Xin Wang Causal Aging Biomarker as a Tool for Systemic Anti-Aging Therapy Screening	Hong Kong, China
Everything Epigenetics, podcast hosted by Hannah Went Causal Epigenetic Age Uncouples Damage and Adaptation	Online Podcast
Chinese University of Hong Kong, hosted by Dr. Xin Wang Causal Aging Biomarker as a Tool for Systemic Anti-Aging Therapy Screening	Hong Kong, China
Peking University , hosted by Dr. Jingdong Han Causal Aging Biomarker and ClockBase	Beijing, China 2023
Chinese Academy of Sciences, hosted by Dr. Xuming Zhou Causal Epigenetic Age Uncouples Damage and Adaptation	Beijing, China 2022
Foresight Institute, hosted by Allison Duettmann Genetic Variation, Aging & Relationship to COVID-19 Joris Deelen, Albert Ying	Online Seminar 2020
Honors	
Semifinalist, Harvard President's Innovation Challenge, Health Care and Life Sciences	Track 2025

 $\textbf{Best Poster Award}, In augural\ Biomarker\ of\ Aging\ Symposium$

2023

Best Poster Award, Gordon Research Conference, Systems Aging	2022	
Hackathon Winner, Longevity Hackathon, VitaDAO	202	
Yan-Sen Honor School Program, Sun Yat-Sen University	2016 – 2019	
Yan-Sen Scholarship, Sun Yat-Sen University	2016 - 2019	
Professional Experience		
Service & Leadership		
President, Harvard Interdisciplinary Discussion on Disease and Health	2024 – Presen	
Organizer, Biomarker of Aging Challenge	2024 – Presen	
Organizing Committee Member, Biomarker of Aging Symposium 2024	2024	
Organizing Committee Member, Biomarker of Aging Symposium 2023	202	
Teaching & Mentoring		
Mentor, Yuanpei Young Scholars Program	2023 - 2024	
Instructor , Harvard Public Health Symposium For Young Generation	202	
Students Supervised		
Predoctoral Students: Ali Doga Yucel, Siyuan Li, Hanna Liu, Donghyun Le	ee	
Journals Reviewed		
Nature Aging, Nature Communications, BMC Nephrology, Lipids in Healt Evidence-Based Complementary and Alternative Medicine, Scientific Report	h and Disease, Clinical Proteomics	
References		
Dr. Vadim Gladyshev , Dissertation Advisor Professor of Medicine, Harvard Medical School	vgladyshev@bwh.harvard.edu	
Dr. Steve Horvath , Collaborator Professor of Human Genetics, UCLA	shorvath@mednet.ucla.edu	
Dr. David Sinclair , Dissertation Advisory Committee Professor of Genetics, Harvard Medical School	david_sinclair@hms.harvard.edu	

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