Kejun "Albert" Ying, Ph.D.

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Studying aging at the intersection of biology and AI

Education & Professional Training

Stanford University & University of Washington　　　　　　　　　Stanford, CA & Seattle, WA
Postdoctoral Researcher, Tony Wyss-Coray's Lab & David Baker's Lab (co-mentorship)　　Jun 2025 – Present
- Co-advised by Dr. Wyss-Coray and Baker under NIH/NIA F99/K00 Fellowship
- Merging aging biology and protein design to tackle neurodegeneration
- Focused on the *de novo* design of disaggregase to act against protein aggregation in neurons
- Building advanced aging clock and the foundation model for proteomic data

Harvard University　　　　　　　　　　　　　　　　　　　　　Cambridge, MA
Ph.D., Biological Science in Public Health　　　　　　　　　　　July 2019 – May 2025
- Dissertation: "On the Quantification of Aging"
- 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
- Built the **first causality-enriched aging clock / current largest biological age database and agentic system (ClockBase Agent, 2M+ samples, 40K analysis) / first foundation model for the DNA methylome (MethylGPT)**

Harvard University　　　　　　　　　　　　　　　　　　　　　Cambridge, MA
M.S., Computational Science Engineering　　　　　　　　　　　July 2023 – May 2024
- Secondary field during Ph.D. study

University of California, Berkeley　　　　　　　　　　　　　　Berkeley, CA
Visiting Student, Integrative Biology　　　　　　　　　　　　　Aug 2017 – Dec 2017

Sun Yat-Sen University　　　　　　　　　　　　　　　　　　　Guangzhou, China
B.S., Life Science　　　　　　　　　　　　　　　　　　　　　Sep 2015 – Jun 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%)
- National college admissions exam (Top 0.6%)

Research Experience

Stanford University & University of Washington　　　　　　　　Stanford, CA & Seattle, WA
Protein Design for Aging *Postdoctoral Researcher, Wyss-Coray's Lab & Baker's Lab*　Jun 2025 – Present
Visiting Scholar, Wyss-Coray's Lab & Baker's Lab　　　　　　　Nov 2024 – May 2025

Avinasi Labs　　　　　　　　　　　　　　　　　　　　　　San Francisco, CA
Decentralized longevity data collection *Co-founder*　　　　　　Jan 2025 – Present

Harvard Medical School, Brigham and Women's Hospital　　　　　Boston, MA
Biological Aging *Graduate Researcher, Vadim Gladyshev's Lab*　　Mar 2020 – May 2025

Harvard Medical School, Boston Children's Hospital — Boston, MA
RNA Modifications *Graduate Researcher (Rotation), Eric Greer's Lab* — Jan 2020 – Mar 2020

Harvard Medical School — Boston, MA
Cell Reprogramming *Graduate Researcher (Rotation), David Sinclair's Lab* — Oct 2019 – Dec 2019

Harvard T. H. Chan School of Public Health — Boston, MA
mTORC1 *Graduate Researcher (Rotation), Brendan Manning's Lab* — July 2019 – Oct 2019

Undergraduate Research — 2015 – 2019

- **Sun Yat-Sen University**, *Telomere & Telomerase* — Zhou Songyang's Lab
- **University of Edinburgh**, *Population genetics* — Xia Shen's Lab
- **University of Washington**, *Acarbose & Rapamycin* — Matt Kaeberlein's Lab
- **Buck Institute for Research on Aging**, *Senolytics* — Judith Campisi's Lab
- **University of California, Berkeley**, *SIRT7* — Danica Chen's Lab
- **Sun Yat-Sen University**, *Telomere & DNA Methylation* — Yikang Rong's Lab

Grants

Koo Post-doctoral Transition Award NIH/NIA *Using causal aging biomarkers and protein design to develop novel anti-aging interventions,* — 2025 – 2028

F99 Transition to Aging Research for Predoctoral Students NIH/NIA *Using causal aging biomarkers and protein design to develop novel anti-aging interventions,* — 2024 – 2025

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

Publications

SELECTED PUBLICATIONS & PREPRINTS

Ying, K., Paulson, S., Eames, A., Tyshkovskiy, A., ..., Gladyshev, V. N. (2025). *A Unified Framework for Systematic Curation and Evaluation of Aging Biomarkers.* **Nature Aging**. https://www.nature.com/articles/s43587-025-00987-y

Moqri, M.*, **Ying, K.***, Poganik, J.*, Herzog, C.*, Chen, Q., Emamifar, M., ..., Gladyshev, V. N. (2025). Integrative epigenetics and transcriptomics identify aging genes in human blood. **Nature Communications (in press)**. https://doi.org/10.1101/2024.05.30.596713

Wu, X.*, Liu, H.*, **Ying, K.***† (2025). Biological Age, Aging Clocks, and the Interplay with Lymphoid Neoplasms: Mechanisms and Clinical Frontiers. **Lymphatics**, *3*(3), 19. https://doi.org/10.3390/lymphatics3030019

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., ..., 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

Ying, K., Liu, H., Tarkhov, A. E., ..., Gladyshev, V. N. (2024). Causality-enriched epigenetic age uncouples damage and adaptation. **Nature Aging (February Cover)**, 1–16. https://doi.org/10.1038/s43587-023-00557-0

Ying, K., Zhai, R., Pyrkov, T. V., ..., Gladyshev, V. N. (2021). Genetic and phenotypic analysis of the causal relationship between aging and COVID-19. **Communications Medicine**, *1*(1), 35. https://doi.org/10.1038/s43856-021-00033-z

Ying, K.,[*†] Tyshkovskiy, A., Moldakozhayev, A., ..., Gladyshev, V. N. (2025). Autonomous AI Agents Discover Aging Interventions from Millions of Molecular Profiles. **bioRxiv (Updated Version, Nature submitted)**. https://doi.org/10.1101/2023.02.28.530532

Ying, K.[†], Song, J., Cui, H., ..., Gladyshev, V. N[†]. (2024). MethylGPT: a foundation model for the DNA methylome. **bioRxiv (Nature Machine Intelligence submitted)**. https://doi.org/10.1101/2024.10.30.621013

Ying, K., Paulson, S., Reinhard, J., ..., 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., ..., Gladyshev, V. N. (2024). High-dimensional Ageome Representations of Biological Aging across Functional Modules. **bioRxiv (Nature Aging 2nd Revision)**. https://doi.org/10.1101/2024.09.21.570935

OTHER PUBLICATIONS

Mavrommatis, C., Belsky, D. W., **Ying, K.,** Moqri, M., Campbell, A., Richmond, A., Gladyshev, V. N., Chandra, T., McCartney, D. L., & Marioni, R. E. (2025). An unbiased comparison of 14 epigenetic clocks in relation to 174 incident disease outcomes. **Nature Communications**, *16*, 11164. https://doi.org/10.1038/s41467-025-66106-y

Zhang, O., Lin, H., Zhang, X., Wang, X., Wu, Z., Ye, Q., Zhao, W., Wang, J., **Ying, K.,**, Kang, Y., Hsieh, C.-Y., Hou, T. (2025). Graph neural networks in modern AI-aided drug discovery. **Chemical Reviews**, *125*, 10001–10103. https://doi.org/10.1021/acs.chemrev.5b00254

Zhang, O., ..., **Ying, K.,** Huang, Y., Zhao, H., Kang, Y., Pan, P., Wang, J., Guo, D., Zheng, S., Hsieh, C.-Y., & Hou, T. (2025). ECloudGen: leveraging electron clouds as a latent variable to scale up structure-based molecular design. **Nature Computational Science**. https://doi.org/10.1038/s43588-025-00886-7

Farinas, A., Rutledge, J., Bot, V. A., Western, D., **Ying, K.,** Lawrence, K. A., Oh, H. S. H., ..., Wyss-Coray, T. (2025). Disruption of the cerebrospinal fluid–plasma protein balance in cognitive impairment and aging. **Nature Medicine**, 1–12. https://doi.org/10.1038/s41591-025-03831-3

Rothi, M.H., Sarkar, G.C., Haddad, J.A., Mitchell, W., **Ying, K.,** et al. (2025). The 18S rRNA methyltransferase DIMT-1 regulates lifespan in the germline later in life. **Nature Communications**, 16, 6944. https://doi.org/10.1038/s41467-025-62323-7

Grzeczka, A., Iqbal, S., **Ying, K.,** Kordowitzki, P. (2025). Circular RNAs as regulators and biomarkers of mammalian ovarian ageing. **GeroScience**, 1–19. https://doi.org/10.1007/s11357-025-01798-0

Jacques, E., Herzog, C., **Ying, K.,** ... Gladyshev, V. N. (2025). Invigorating discovery and clinical translation of aging biomarkers. **Nature Aging**, 1–5.

Goeminne, L. J. E., Vladimirova, A., Eames, A., Tyshkovskiy, A., Argentieri, M. A., **Ying, K.,** Moqri, M., & Gladyshev, V. N. (2025). 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

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

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., ..., 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.,** ..., 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., ..., de Sena Brandine, G., **Ying, K.,** Tarkhov, A., ..., 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., ..., 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

Moqri, M., Herzog, C., Poganik, J. R., **Ying, K.,,** ... Ferrucci, L. (2024). Validation of biomarkers of aging. **Nature Medicine**, 1–13. https://doi.org/10.1038/s41591-023-02784-9

Griffin, P. T., ..., 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

Moqri, M., Herzog, C., Poganik, J. R., **Biomarkers of Aging Consortium**[+], ... 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., ..., 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

Bitto, A., Grillo, A. S., Ito, T. K., Stanaway, I. B., Nguyen, B. M. G., **Ying, K.,** ... Kaeberlein, M. (2023). Acarbose suppresses symptoms of mitochondrial disease in a mouse model of Leigh syndrome. **Nature Metabolism**, *5*(6), 955–967. https://doi.org/10.1038/s42255-023-00815-w

Emmrich, S., Trapp, A., Tolibzoda Zakusilo, F., Straight, M. E., **Ying, A. K.,** Tyshkovskiy, A., ..., Gorbunova, V. (2022). Characterization of naked mole-rat hematopoiesis reveals unique stem and progenitor cell patterns and neotenic traits. **The EMBO Journal**, *41*(15), e109694. https://doi.org/10.15252/embj.2021109694

Yang, Z., ..., Guo, H., **Ying, K.,** Gustafsson, S., ..., Shen, X. (2022). Genetic Landscape of the ACE2 Coronavirus Receptor. **Circulation**, *145*(18), 1398–1411. https://doi.org/10.1161/CIRCULATIONAHA.121.057888

Li, T., Ning, Z., Yang, Z., Zhai, R., Zheng, C., Xu, W., Wang, Y., **Ying, K.,** Chen, Y., & Shen, X. (2021). Total genetic contribution assessment across the human genome. **Nature Communications**, *12*(1), 2845. https://doi.org/10.1038/s41467-021-23124-w

Zhu, J., Xu, M., Liu, Y., Zhuang, L., **Ying, K.,** Liu, F., ..., Songyang, Z. (2019). Phosphorylation of PLIN3 by AMPK promotes dispersion of lipid droplets during starvation. **Protein & Cell**, *10*(5), 382–387. https://doi.org/10.1007/s13238-018-0593-9

OTHER PREPRINTS

Zhang, O., Zhang, X., Lin, H., Tan, C., Wang, Q., Mo, Y., ..., **Ying, K.,** Li, J., Zeng, Y., Lang, L., Pan, P., Cao, H., Song, Z., Qiang, B., Wang, J., Ji, P., Bai, L., Zhang, J., Hsieh, C.-Y., Heng, P. A., Sun, S., Hou, T., & Zheng, S. (2025). ODesign: A World Model for Biomolecular Interaction Design. **arXiv**. https://odesign1.github.io/

Mavrommatis, C., Belsky, D., **Ying, K.,** Moqri, M., Campbell, A., Richmond, A., ..., Gladyshev, V. N. (2025). *An unbiased comparison of 14 epigenetic clocks in relation to 10-year onset of 174 disease outcomes in 18,859 individuals*. **medRxiv**. https://doi.org/10.1101/2025.07.14.25331494

Galkin, F., ..., Tyshkovskiy, A., **Ying, K.,** Gladyshev, V. N., & Zhavoronkov, A. (2024). Precious3GPT: Multimodal Multi-Species Multi-Omics Multi-Tissue Transformer for Aging Research and Drug Discovery. **bioRxiv**. https://doi.org/10.1101/2024.07.25.605062

Tyshkovskiy, A., Kholdina, D., **Ying, K.,** Davitadze, M., ..., Gladyshev, V. N. (2024). Transcriptomic Hallmarks of Mortality Reveal Universal and Specific Mechanisms of Aging, Chronic Disease, and Rejuvenation. **bioRxiv**. https://doi.org/10.1101/2024.07.04.601982

Rothi, M. H., Sarkar, G. C., Al Haddad, J., Mitchell, W., **Ying, K.,** Pohl, 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

Zhang, B., Tarkhov, A. E., Ratzan, W., **Ying, K.,** Moqri, M., ..., 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

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

ClockBase Agent (2025)	https://www.clockbase.org/
MethylGPT (2024)	https://github.com/albert-ying/MethylGPT
Biolearn (2024)	https://bio-learn.github.io/
ClockBase (2023)	http://gladyshevlab.org:3838/ClockBase/

Presentations

ORAL PRESENTATIONS

Biomarkers of Aging Symposium 2025	Boston, MA
Massive AI agent mining of aging-modifying interventions from millions of molecular profile	2025
ASHG 2025 Annual Meeting	Boston, MA
Decoding the Aging Methylome: From Causal Inference to Foundation Models	2025
6th TimePie Longevity Forum	Shanghai, China
Massive AI agent mining of aging-modifying interventions from millions of molecular profile	2025

CSH-Asia Conference: Stem cell, Aging and Rejuvenation — Suzhou, China
Massive AI agent mining of aging-modifying interventions from millions of molecular profile — 2025

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 empowers 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 — 2023

10th Aging Research and Drug Discovery conference (ARDD2023) — Copenhagen, Denmark
Causal Epigenetic Age Uncouples Damage and Adaptation — 2023

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

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

Harvard GRIP Presentations — Boston, MA
Causal Epigenetic Age Uncouples Damage and Adaptation — 2022

Targeting Metabesity 2022, 'Honorable Mention' — Virtual Conference
Causal Epigenetic Age Uncouples Damage and Adaptation — 2022

GSA 2021 Annual Scientific Meeting — Virtual Conference
Genetic and phenotypic evidence for causal relationships between aging and COVID-19 — 2021

Invited Talks

St. Jude Children's Research Hospital, hosted by Dr. Zhaoming Wang — Memphis, TN
MethylGPT and Causality-enriched Epigenetic Clock — 2025

The Alliance for Longevity Initiatives Scientist Spotlight, — Online Podcast
Episode 14: Albert Ying — 2024

BioAge Seminar, hosted by Dr. Robert Hughes & Dr. Paul Timmers — Boston, MA
Ageome: Biological age with higher-dimensionality — 2024

MRC Integrative Epidemiology Unit Seminar — Bristol, UK
Epigenetic Clocks and Mendelian Randomization — 2024

NIA EL Projects Joint Meeting, National Institute on Aging — Online Webinar
Aging Clocks — 2024

Biomarkers of Aging Challenge, Foresight Institute — Online Webinar
Update Webinar with Foresight — 2024

Everything Epigenetics, podcast hosted by Hannah Went — Online Podcast
Causal Epigenetic Age Uncouples Damage and Adaptation — 2024

Chinese University of Hong Kong, hosted by Dr. Xin Wang — Hong Kong, China
Causal Aging Biomarker as a Tool for Systemic Anti-Aging Therapy Screening — 2024

Everything Epigenetics, podcast hosted by Hannah Went — Online Podcast
Causal Epigenetic Age Uncouples Damage and Adaptation — 2023

Chinese University of Hong Kong, hosted by Dr. Xin Wang — Hong Kong, China
Causal Aging Biomarker as a Tool for Systemic Anti-Aging Therapy Screening — 2023

Peking University, hosted by Dr. Jingdong Han — Beijing, China
Causal Aging Biomarker and ClockBase — 2023

Chinese Academy of Sciences, hosted by Dr. Xuming Zhou — Beijing, China
Causal Epigenetic Age Uncouples Damage and Adaptation — 2022

Foresight Institute, hosted by Allison Duettmann — Online Seminar
Genetic Variation, Aging & Relationship to COVID-19 | Joris Deelen, Albert Ying — 2020

Honors

Semifinalist, Harvard President's Innovation Challenge, Health Care and Life Sciences Track	2025
Best Poster Award, Inaugural Biomarker of Aging Symposium	2023
Best Poster Award, Gordon Research Conference, Systems Aging	2022
Hackathon Winner, Longevity Hackathon, VitaDAO	2021
Yat-Sen Honor School Program, Sun Yat-Sen University	2016 – 2019
Yat-Sen Scholarship, Sun Yat-Sen University	2016 – 2019

Professional Experience

SERVICE & LEADERSHIP

Board Member, Lifeboat Foundation	2025 – Present
Member, Norn Longevity Nexus	2025 – Present
Jury and Mentor, Agentic AI Against Aging Hackathon	2025
Core Member, Biomarkers of Aging Consortium	2024 – Present
Organizer, Biomarker of Aging Challenge	2024 – Present
President, Harvard Interdisciplinary Discussion on Disease and Health	2024 – 2025
Agenda Contributor, World Economic Forum	2024
Organizing Committee Member, Biomarker of Aging Symposium 2024	2024
Organizing Committee Member, Biomarker of Aging Symposium 2023	2023

Mentor, Yuanpei Young Scholars Program   2023 – 2024

Instructor, Harvard Public Health Symposium For Young Generation   2023

Students Supervised

Predoctoral Students: Ali Doga Yucel, Siyuan Li, Hanna Liu, Donghyun Lee, Yikun Zhang

Journals Reviewed

Nature Aging, Nature Communications, Communications Medicine, Genome Medicine, BMC Nephrology, Lipids in Health and Disease, Clinical Proteomics, Evidence-Based Complementary and Alternative Medicine, Scientific Reports

References

Dr. Tony Wyss-Coray, Postdoctoral Co-Advisor   twc@stanford.edu
D.H. Chen Distinguished Professor of Neurology and Neurological Sciences, Stanford University

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Professor of Pathology, University of Washington