

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

Postdoctoral Researcher, Tony Wyss-Coray’s Lab & David Baker’s Lab (co-mentorship)

Stanford, CA & Seattle, WA

Jun 2025 – Present

- Co-advised by Dr. Wyss-Coray and Baker under NIH/NIA F99/Koo 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

Ph.D., Biological Science in Public Health

Cambridge, MA

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

M.S., Computational Science Engineering

Cambridge, MA

July 2023 – May 2024

- Secondary field during Ph.D. study

University of California, Berkeley

Visiting Student, Integrative Biology

Berkeley, CA

Aug 2017 – Dec 2017

Sun Yat-Sen University

B.S., Life Science

Guangzhou, China

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

Protein Design for Aging Postdoctoral Researcher, Wyss-Coray’s Lab & Baker’s Lab

Stanford, CA & Seattle, WA

Jun 2025 – Present

Visiting Scholar, Wyss-Coray’s Lab & Baker’s Lab

Nov 2024 – May 2025

Avinasi Labs

Decentralized longevity data collection Co-founder

San Francisco, CA

Jan 2025 – Present

Harvard Medical School, Brigham and Women’s Hospital

Biological Aging Graduate Researcher, Vadim Gladyshev’s Lab

Boston, MA

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: FAGo88431A (PI)
- Received a perfect Impact Score of 10

Publications

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

SELECTED PUBLICATIONS & PREPRINTS

Moqri, M. ^{*}, **Ying, K.** ^{*}, Poganik, J. ^{*}, Herzog, C. ^{*}, ..., Marioni, R. E., Lasky-Su, J. A., Snyder, M. P., & Gladyshev, V. N. (2026). Integrative epigenetics and transcriptomics identify aging genes in human blood. **Nature Communications**, 16, 67369. <https://doi.org/10.1038/s41467-025-67369-1>

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>

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 (Nature under review)**. <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 Aging 1st Revision)**. <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/>

Lyu, Y.X.*., 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., ..., Sebastiani, 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). 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., Khodina, 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 <i>Massive AI agent mining of aging-modifying interventions from millions of molecular profile</i>	Suzhou, China 2025
Keystone Symposia: Aging: New Frontiers in Rejuvenation and Gerotherapeutics <i>MethylGPT: A Foundation Model for the DNA Methylome</i>	Breckenridge, CO 2025
Biomarkers of Aging Symposium <i>Standardization of aging biomarkers and BoA challenge</i>	Boston, MA 2024
Harvard GRIP Presentations <i>Causal Aging Biomarker empowers Unbiased Anti-Aging Therapy Screening</i>	Boston, MA 2024
4th TimePie Longevity Forum <i>Causal Aging Biomarker as a Tool for Unbiased Anti-Aging Therapy Screening</i>	Shanghai, China 2023
Global Congress on Aesthetic and Anti-Aging (GCAA2023) <i>Causal Aging Biomarker as a Tool for Unbiased Anti-Aging Therapy Screening</i>	Singapore 2023
10th Aging Research and Drug Discovery conference (ARDD2023) <i>Causal Epigenetic Age Uncouples Damage and Adaptation</i>	Copenhagen, Denmark 2023
AGE 2023 51st Annual Meeting <i>Causal Epigenetic Age Uncouples Damage and Adaptation</i>	Oklahoma City, OK 2023
Broad Institute MPG Retreat <i>Causal Epigenetic Age Uncouples Damage and Adaptation</i>	Cambridge, MA 2023
Harvard GRIP Presentations <i>Causal Epigenetic Age Uncouples Damage and Adaptation</i>	Boston, MA 2022
Targeting Metabesity 2022, ‘Honorable Mention’ <i>Causal Epigenetic Age Uncouples Damage and Adaptation</i>	Virtual Conference 2022
GSA 2021 Annual Scientific Meeting <i>Genetic and phenotypic evidence for causal relationships between aging and COVID-19</i>	Virtual Conference 2021

INVITED TALKS

St. Jude Children’s Research Hospital , hosted by Dr. Zhaoming Wang <i>MethylGPT and Causality-enriched Epigenetic Clock</i>	Memphis, TN 2025
The Alliance for Longevity Initiatives Scientist Spotlight , <i>Episode 14: Albert Ying</i>	Online Podcast 2024
BioAge Seminar , hosted by Dr. Robert Hughes & Dr. Paul Timmers <i>Ageome: Biological age with higher-dimensionality</i>	Boston, MA 2024
MRC Integrative Epidemiology Unit Seminar <i>Epigenetic Clocks and Mendelian Randomization</i>	Bristol, UK 2024
NIA EL Projects Joint Meeting , National Institute on Aging <i>Aging Clocks</i>	Online Webinar 2024
Biomarkers of Aging Challenge , Foresight Institute <i>Update Webinar with Foresight</i>	Online Webinar 2024

Everything Epigenetics , podcast hosted by Hannah Went <i>Causal Epigenetic Age Uncouples Damage and Adaptation</i>	Online Podcast 2024
Chinese University of Hong Kong , hosted by Dr. Xin Wang <i>Causal Aging Biomarker as a Tool for Systemic Anti-Aging Therapy Screening</i>	Hong Kong, China 2024
Everything Epigenetics , podcast hosted by Hannah Went <i>Causal Epigenetic Age Uncouples Damage and Adaptation</i>	Online Podcast 2023
Chinese University of Hong Kong , hosted by Dr. Xin Wang <i>Causal Aging Biomarker as a Tool for Systemic Anti-Aging Therapy Screening</i>	Hong Kong, China 2023
Peking University , hosted by Dr. Jingdong Han <i>Causal Aging Biomarker and ClockBase</i>	Beijing, China 2023
Chinese Academy of Sciences , hosted by Dr. Xuming Zhou <i>Causal Epigenetic Age Uncouples Damage and Adaptation</i>	Beijing, China 2022
Foresight Institute , hosted by Allison Duettmann <i>Genetic Variation, Aging & Relationship to COVID-19 Joris Deelen, Albert Ying</i>	Online Seminar 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

TEACHING & MENTORING

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

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D.H. Chen Distinguished Professor of Neurology and Neurological Sciences, Stanford University

Dr. David Baker, Postdoctoral Co-Advisor

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Professor of Biochemistry, University of Washington

Dr. Vadim Gladyshev, Dissertation Advisor

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Professor of Genetics, Harvard.

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Dr. Matt Kaeberlein, Advisor
Professor of Pathology, University of Washington