Kejun "Albert" Ying

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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 2019 – Expected May 2025

- Advisor: Dr. Vadim Gladyshev
- 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 2022 – Expected May 2024

- Secondary field during Ph.D. study

University of California, Berkeley Berkeley, CA
Visiting Student, Integrative Biology 2017 – 2018

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%)
- National college admissions exam (Top 0.6%)

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

Goeminne, L. J. E., Eames, A., Tyshkovskiy, A., Argentieri, M. A., **Ying, K.,** Moqri, M., & Gladyshev, V. N. (2024). Plasma-based organ-specific aging and mortality models unveil diseases as accelerated aging of organismal systems. **medRxiv**. https://doi.org/10.1101/2024.04.08.24305469

Moqri, M., Herzog, C., Poganik, J. R., **Ying, K.,** Justice, J. N., Belsky, D. W., Higgins-Chen, A. T., Chen, B. H., Cohen, A. A., Fuellen, G., Hägg, S., Marioni, R. E., Widschwendter, M., Fortney, K., Fedichev, P. O., Zhavoronkov, A., Barzilai, N., Lasky-Su, J., Kiel, D. P., ... Ferrucci, L. (2024). Validation of biomarkers of aging. **Nature Medicine**, 1–13. https://doi.org/10.1038/s41591-023-02784-9

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

Ying, K., Paulson, S., Perez-Guevara, M., Emamifar, M., Martinez, M. C., Kwon, D., Poganik, J. R., Moqri, M., & Gladyshev, V. N. (2023). *Biolearn, an open-source library for biomarkers of aging*. **bioRxiv**. https://doi.org/10.1101/2023.12.02.569722

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

Bitto, A., Grillo, A. S., Ito, T. K., Stanaway, I. B., Nguyen, B. M. G., **Ying, K.,** Tung, H., Smith, K., Tran, N., Velikanje, G., Urfer, S. R., Snyder, J. M., Barton, J., Sharma, A., Kayser, E.-B., Wang, L., Smith, D. L., Thompson, J. W., DuBois, L., … 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

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

Tarkhov, A. E., Lindstrom-Vautrin, T., Zhang, S., **Ying, K.,** Moqri, M., Zhang, B., & Gladyshev, V. N. (2022). *Nature of epigenetic aging from a single-cell perspective*. **bioRxiv**. https://doi.org/10.1101/2022.09.26.509592

Emmrich, S., Trapp, A., Tolibzoda Zakusilo, F., Straight, M. E., **Ying, A. K.,** Tyshkovskiy, A., Mariotti, M., Gray, S., Zhang, Z., Drage, M. G., Takasugi, M., Klusmann, J.-H., Gladyshev, V. N., Seluanov, 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

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

Yang, Z., Macdonald-Dunlop, E., Chen, J., Zhai, R., Li, T., Richmond, A., Klarić, L., Pirastu, N., Ning, Z., Zheng, C., Wang, Y., Huang, T., He, Y., Guo, H., **Ying, K.,** Gustafsson, S., Prins, B., Ramisch, A., Dermitzakis, E. T., … Shen, X. (2022). Genetic Landscape of the ACE2 Coronavirus Receptor. **Circulation**, *145*(18), 1398–1411. https://doi.org/10.1161/CIRCULATIONAHA.121.057888

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**, *1*(1), 35. https://doi.org/10.1038/s43856-021-00033-z

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

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

Bitto, A., Tung, H., **Ying, K.,** Smith, D. L., Kayser, E.-B., Morgan, P. G., Sedensky, M. M., & Kaeberlein, M. (2019). AGING AND MITOCHONDRIAL DISEASE: SHARED MECHANISMS AND THERAPIES? **Innovation in Aging**, *3*(Supplement_1), S395–S395. https://doi.org/10.1093/geroni/igz038.1459

Zhu, J., Xu, M., Liu, Y., Zhuang, L., **Ying, K.,** Liu, F., Liu, D., Ma, W., & 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

Patents

V. N. Gladyshev, **K. Ying**, Mapping CpG sites to quantify aging traits (2024). *WO2024039905A2*

Presentations

Oral Presentations

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 — 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

Poster Presentations

Biomarker of Aging Symposium — Novato, CA
Causal Aging Biomarker as a Tool for Unbiased Anti-Aging Therapy Screening — 2023

Gordon Research Conference, Systems Aging — Maine, MA
Causal Epigenetic Age Uncouples Damage and Adaptation — 2022

Invited Talks

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

Research Experience

Harvard Medical School — Boston, MA
Graduate Researcher, Vadim Gladyshev's Lab — 2020 – Present

Boston Children's Hospital — Boston, MA
Rotation Student, Eric Greer's Lab — 2020

Harvard Medical School — Boston, MA
Rotation Student, David Sinclair's Lab — 2019

Harvard T. H. Chan School of Public Health — Boston, MA
Rotation Student, Brendan Manning's Lab — 2019

Sun Yat-Sen University — Guangzhou, China
Undergraduate Researcher, Zhou Songyang's Lab — 2018 – 2019

University of Edinburgh — Edinburgh, UK
Undergraduate Researcher, Xia Shen's Lab — 2018

University of Washington — Seattle, WA
Undergraduate Researcher, Matt Kaeberlein's Lab — 2018

Buck Institute for Research on Aging — Novato, CA
Undergraduate Researcher, Judith Campisi's Lab — 2018

University of California, Berkeley — Berkeley, CA
Undergraduate Researcher, Danica Chen's Lab — 2017

Sun Yat-Sen University Guangzhou, China
Undergraduate Researcher, Yikang Rong's Lab 2015 – 2017

Honors

Best Poster Award, Inaugural Biomarker of Aging Symposium 2023

Student Spotlight, Harvard Chan School of Public Health 2023

Best Poster Award, Gordon Research Conference, Systems Aging 2022

Hackathon Winner, Longevity Hackathon, VitaDAO 2021

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 – Present

Advisory Committee Member, Massachusetts Community Health & Healthy Aging Funds 2024 – Present

Organizing Committee Member, Biomarker of Aging Symposium 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, Han Weng

Journals Reviewed

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

References

Dr. Vadim Gladyshev, Dissertation Advisor vgladyshev@bwh.harvard.edu
Professor of Medicine, Harvard Medical School

Dr. Steve Horvath, Collaborator shorvath@mednet.ucla.edu
Professor of Human Genetics, UCLA

Dr. David Sinclair, Dissertation Advisory Committee david_sinclair@hms.harvard.edu
Professor of Genetics, Harvard Medical School

Dr. Matt Kaeberlein, Advisor kaeber@uw.edu
Professor of Pathology, University of Washington