

Kejun “Albert” Ying

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, 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

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, *Transition to Aging Research for Predoctoral Students*

2024

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

Publications

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., Galhardo, M., Logarinho, E., Indzhukulian, 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**, in press.

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**, in press.

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>

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., Kotalik, 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>

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>

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>

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>

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>

Preprints

Ying, K., Paulson, S., Eames, A., Tyshkovskiy, A., Li, S., Perez-Guevara, M., Emamifar, M., Martínez, M. C., Kwon, D., Kosheleva, A., Snyder, M. P., Gobel, D., Herzog, C., Poganik, J. R., Biomarker of Aging Consortium, Moqri, M., & Gladyshev, V. N. (2024). *A Unified Framework for Systematic Curation and Evaluation of Aging Biomarkers*. **bioRxiv**. <https://doi.org/10.1101/2023.12.02.569722>

Tyshkovskiy, A., Kholdina, D., **Ying, K.**, Davitadze, M., Molière, A., Tongu, Y., Kasahara, T., Kats, L. M., Vladimirova, A., Moldakozhayev, A., Liu, H., Zhang, B., Khasanova, U., Moqri, M., Van Raamsdonk, J. M., Harrison, D. E., Strong, R., Abe, T., Dmitriev, S. E., & 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., 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>

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>

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., Indzhukulian, 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**, 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

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| 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 |

POSTER PRESENTATIONS

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| Biomarker of Aging Symposium <i>Causal Aging Biomarker as a Tool for Unbiased Anti-Aging Therapy Screening</i> | Novato, CA 2023 |
| Gordon Research Conference, Systems Aging <i>Causal Epigenetic Age Uncouples Damage and Adaptation</i> | Maine, MA 2022 |

INVITED TALKS

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| 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 |

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| 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 |

Research Experience

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| Harvard Medical School, Brigham and Women's Hospital <i>Graduate Researcher, Vadim Gladyshev's Lab</i> | Boston, MA 2020 – Present |
| Harvard Medical School, Boston Children's Hospital <i>Rotation Student, Eric Greer's Lab</i> | Boston, MA 2020 |
| Harvard Medical School <i>Rotation Student, David Sinclair's Lab</i> | Boston, MA 2019 |
| Harvard T. H. Chan School of Public Health <i>Rotation Student, Brendan Manning's Lab</i> | Boston, MA 2019 |
| Sun Yat-Sen University <i>Undergraduate Researcher, Zhou Songyang's Lab</i> | Guangzhou, China 2018 – 2019 |
| University of Edinburgh <i>Undergraduate Researcher, Xia Shen's Lab</i> | Edinburgh, UK 2018 |
| University of Washington <i>Undergraduate Researcher, Matt Kaeberlein's Lab</i> | Seattle, WA 2018 |
| Buck Institute for Research on Aging <i>Undergraduate Researcher, Judith Campisi's Lab</i> | Novato, CA 2018 |
| University of California, Berkeley <i>Undergraduate Researcher, Danica Chen's Lab</i> | Berkeley, CA 2017 |
| Sun Yat-Sen University <i>Undergraduate Researcher, Yikang Rong's Lab</i> | Guangzhou, China 2015 – 2017 |

Honors

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| 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 |

Professional Experience

SERVICE & LEADERSHIP

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| 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

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| 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