

CURRICULUM VITAE

Personal Information:

Founding Principal Investigator
Altos Labs
San Diego Institute
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San Diego, CA
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Adjunct Professor, Yale University

Education:

B.A. University of Southern California 05/2008
Ph.D. University of Southern California 01/2015

Employment:

5/2022 – Founding Principal Investigator, Altos Labs, San Diego Institute
5/2022 – Adjunct Professor of Pathology, Yale School of Medicine, New Haven, CT
9/2017 – 5/2022 Assistant Professor of Pathology, Yale School of Medicine, New Haven, CT
7/2015 – 6/2017 NIH Postdoctoral Fellow, UCLA Department of Human Genetics (PI: Steve Horvath)
7/2011 – 6/2014 NIH Predoctoral Fellow, USC Davis School of Gerontology (PI: Eileen Crimmins)
1/2013 – 6/2013 Teaching Assistant, GERO 640: Data Analysis Strategies
7/2010 – 6/2011 Research Assistant, USC/UCLA Center on Biodemography and Population Health

Professional Honors & Recognition:

2021: The Vincent Cristofalo Rising Star Award in Aging Research
2020: Nathan Shock New Investigator Award
2017: Glenn Award for Research in Biological Mechanisms of Aging
2017: Pepper Scholar Awardee
2015: Leena Peltonen Award in Research Excellence, UCLA
2014: Phi Kappa Phi Honors Society, USC
2014: USC Davis School of Gerontology Teaching Fellowship, USC
2014: Graduate Research Symposium Winner, Health Sciences Section, USC
2014: Scholarship for the Summer Institute in Statistical Genetics, University of Washington
2013: Graduate Research Symposium Winner, STEM Section, USC
2010: Elaine M. Brody Paper Award, Gerontology Society of America

Grant/Clinical Trials History:

Past Grants

1R01AG068285-01 (MPI: Levine, Levine)

07/01/20-05/15/22

NIH/NIA

Amyloidogenic Induction of Cellular Senescence in Alzheimer's Disease

Goals: We hypothesize that soluble amyloids, but not fibrils or plaques, link the induction of cellular senescence in brain cells to neurodegeneration. In order to test this hypothesis, we will utilize a combination of genetic and

Role: Principal Investigator (PD/PI)

R01AG065403-01A1 (MPI: Levine, Gladyshev)

07/01/20-05/15/22

NIA/NIH

Quantitative Assessment of Biological Age and Its Applications

Goals: We propose to develop a series of novel DNA methylation clocks by integrating information on phenotypic and functional aging, investigating links between DNA methylation and aging hallmarks, and evaluating DNA methylation responses to longevity interventions. These clocks will offer a much-needed resource for the Geroscience community.

Role: Principal Investigator (PD/PI)

5R01AG057912-03 (MPI: Levine, Van Dyck, Horvath, Gaiteri)

09/30/17-05/15/22

National Institute on Aging/NIH/DHHS

Molecular Networks Underlying Resilience to Alzheimer's Disease Among APOE E4 Carriers

Goals: To integrate genetic, transcriptomic, epigenomic, and proteomic data to identify multi-scale networks that underlie AD resilience among high risk individuals (ApoE e4 carriers), and to define AD risk prediction methods based on multi-omic composite biomarkers.

Role: Principal Investigator (PD/PI)

Milky Way Research Foundation Grant (PI: Levine)

06/01/21-05/15/22

Mapping the epigenetic landscape in aging, development, and rejuvenation

Goals: Overall, this project will model the reshaping of the epigenetic landscape in aging, reprogramming, and development; identify novel rejuvenation factors, potential barriers, and optimized strategies; and assess our ability for organismal rejuvenation via targeted in vivo epigenetic reprogramming.

Role: Principal Investigator (PD/PI)

ADRC P30 AG066508 (MPI: Van Dyck, Strittmatter)

06/01/20-05/15/22

NIA/NIH

Yale Alzheimer Disease Research Center

Goals: The Biomarker Core as part of the Yale ADRC will manage the Biospecimen Repository and facilitate collection, storage and distribution of biospecimens. This will include brain and biofluid samples that can be utilized by Yale ADRC investigators and the general scientific community to study heterogeneity in AD, biological predictors of AD progression, and model systemic changes involved in pathogenesis of neurodegenerative disease.

Role: Biomarker Core Co-Leader

NIA/NIH 1R01AG060110-01 (PI: Crimmins)

07/01/18-05/15/22

Biological Underpinnings of Socioeconomic Differentials in Health and Mortality

Goals: Assist in identifying CpG sites and develop composite DNA methylation measures that mediate the association between lifecourse social adversity and age-related health disparities. Assist in identifying late-life transcriptional alterations and their consequences, which reflect differences in early life and contemporaneous social status and life experiences.

Role: Subcontract PI

Glenn Foundation for Medical Research (PI: Levine)

09/20/18-09/19/20

Glenn Award for Research in Biological Mechanisms of Aging

The overall aims of the proposed research are to apply advanced computational and statistical methodology to better understand aging-related dynamics in DNAm, attempt to identify the causes of these changes (whether probabilistic or deterministic), and uncover molecular pathways linking them to differential risk of multifactorial aging-related conditions.

Role: PI

1R00AG052604-02 (PI: Levine)

09/15/17-05/31/20

Molecular Mechanisms and Social Constructs: How genes and environment regulate the rate of aging
The goal of this study is to identify genetic, epigenetic, and transcriptomic networks, which contribute to differences in susceptibility for multifactorial outcomes of aging.
Role: PI

K99AG052604-01A1 (PI: Levine)

03/01/17 – 08/31/17

Molecular Mechanisms and Social Constructs: How genes and environment regulate the rate of aging
The goal of this study is to identify new epigenetic biomarkers of aging using phenotypic aging measures.
Role: PI

NIH/NIA 2P30AG02132342-16 (PI: Gill)

07/05/18-06/30/20

Claude D. Pepper Older Americans Independence Center at Yale
Goals: The Yale OAIC will promote the functional independence of older Americans by increasing scientific knowledge related to multifactorial geriatric conditions, by advancing the science of clinical decision making in multimorbid older persons, and by educating and training early-stage investigators in aging research from a multifactorial perspective
Role: Award Recipient Core-003

Publications (Underline denotes First or Senior Author):

1. Kyra L. Thrush, David A. Bennett, Christopher Gaiteri, Steve Horvath, Christopher H. van Dyck⁵, Albert T. Higgins-Chen, **Morgan E. Levine**. Aging the Brain: Multi-Region Methylation Principal Component Based Clock in the Context of Alzheimer's Disease. *Aging. (In Press)*
2. Higgins-Chen A & **Levine ME**. Research Briefing: Principal component analysis improves reliability of epigenetic clocks aging biomarkers. *Nature Aging. (In Press)*
3. Higgins-Chen A, Thrush K, Wang Y, ...**Levine ME**. A computational solution for bolstering reliability of epigenetic clocks: Implications for clinical trials and longitudinal tracking. *Nature Aging. (In Press)*
4. Cohen A, Ferrucci L, Fulop T. A Complex Systems Approach to Aging Biology. *Nature Aging. (In Press)*
5. Pei-Lun Kuo , Dr Jennifer Schrack , **Morgan Levine** , et al. Longitudinal Phenotypic Aging Metrics in the Baltimore Longitudinal Study of Aging. *Nature Aging (In Press)*
6. Mariya Rozenblit, Erin Hofstatter, Zuyun Liu, Tess O'Meara, Anna Maria Storniolo, Disha Dalela, Vineet Singh, Lajos Pusztai, **Morgan Levine**. Evidence of accelerated epigenetic aging of breast tissues in patients with breast cancer is driven by CpGs associated with polycomb-related genes. *Clinical Epigenetics* volume 14, Article number: 30 (2022)
7. Daniel Promislow, Rozalyn M Anderson, Marten Scheffer, Bernard Crespi, James DeGregori, Kelley Harris, B Natterson Horowitz, Morgan E Levine, Maria A Riolo, David S Schneider, Sabrina L Spencer, Dario Riccardo Valenzano, Michael E Hochberg. Resilience integrates concepts in aging research. *iScience*. Volume 25, Issue 5, 20 May 2022, 104199. <https://doi.org/10.1016/j.isci.2022.104199>.
8. Giovanni Fiorito, Sara Pedron, Carolina Ochoa-Rosales, et al. The role of epigenetic clocks in explaining educational inequalities in mortality: a multi-cohort study and meta-analysis. *J Gerontol A Biol Sci Med Sci*. 2022 Feb 17;glac041. doi: 10.1093/gerona/glac041.
9. Csaba Kerepesi, Margarita V Meer, Julia Ablueva, et al. Epigenetic aging of the demographically non-aging naked mole-rat. *Nature Communications* volume 13, Article number: 355 (2022)

10. Canhua Xiao, Jonathan J Beitler, Gang Peng, et al. Epigenetic age acceleration, fatigue, and inflammation in patients undergoing radiation therapy for head and neck cancer: A longitudinal study. *Cancer*. 2021 Sep 15;127(18):3361-3371. doi: 10.1002/cncr.33641.
11. Canhua Xiao, Andrew H Miller, Gang Peng, et al. Association of Epigenetic Age Acceleration With Risk Factors, Survival, and Quality of Life in Patients With Head and Neck Cancer. *Int J Radiat Oncol Biol Phys*. 2021 Sep 1;111(1):157-167. doi: 10.1016/j.ijrobp.2021.04.002.
12. Kuo CL, Pilling LC, Liu Z, Atkins JL, **Levine ME**. Genetic associations for two biological age measures point to distinct aging phenotypes. *Aging Cell*. 2021 Jun;20(6):e13376. doi: 10.1111/accel.13376.
13. Lara Oblak, Jeroen van der Zaag, Albert T. Higgins-Chen, **Morgan E. Levine**, Marco P. Boks. A systematic review of biological, social and environmental factors associated with epigenetic clock acceleration. *Ageing Research Reviews*. 2021; 69. 101348
14. Kuo CL, Pilling LC, Atkins JL, Masoli JA, Delgado J, Tignanelli C, Kuchel GA, Melzer D, Beckman KB, **Levine ME**. Biological Aging Predicts Vulnerability to COVID-19 Severity in UK Biobank Participants" *Journal of Gerontology: Medical Sciences*. 2021 Mar 4;glab060. doi: 10.1093/gerona/glab060.
15. Higgins-Chen AT, Thrush KL, **Levine ME**. Aging biomarkers and the brain. *Semin Cell Dev Biol*. 2021 Jan 25:S1084-9521(21)00009-4. doi: 10.1016/j.semcdb.2021.01.003.
16. Crimmins EM, Thyagarajan B, Levine ME, Weir DR, Faul J. Associations of Age, Sex, Race/Ethnicity and Education with 13 Epigenetic Clocks in a Nationally Representative US Sample: The Health and Retirement Study. *J Gerontol A Biol Sci Med Sci*. 2021 Jan 16;glab016. doi: 10.1093/gerona/glab016.
17. Lu Y, Brommer B, Tian X, et al. Reprogramming to recover youthful epigenetic information and restore vision. *Nature*. 2020; doi:10.1038/s41586-020-2975-4. **Cover Article**
18. **Levine ME**, McDevitt RA, Meer M, et al. A rat epigenetic clock recapitulates phenotypic aging and co-localizes with heterochromatin. *eLife*. 2020 Nov 12;9:e59201. doi: 10.7554/eLife.59201.
19. Liu Z, Leung D, Thrush K, Zhao W, Ratliff S, Tanaka T, Schmitz LL, Smith JA, Ferrucci L, **Levine ME**. Underlying features of epigenetic aging clocks in vivo and in vitro. *Aging Cell*. 2020; doi: 10.1111/accel.13229
20. Haghani A, Cacciottolo M, Doty KR, D'Agostino C, Thorwald M, Safi N, **Levine ME**, Sioutas C, Town TC, Forman HJ, Zhang H, Morgan TE, Finch CE. Mouse brain transcriptome responses to inhaled nanoparticulate matter differed by sex and APOE in Nrf2-Nfkb interactions. *eLife*. 2020; 9: e54822. doi: 10.7554/eLife.54822
21. Kuo PL, Schrack JA, Shardell MD, **Levine ME**, Moore AZ, An Y, Elango P, Karikkineth A, Tanaka T, de Cabo R, Zukley LM, AlGhatrif M, Chia CW, Simonsick EM, Egan JM, Resnick SM, Ferrucci L. A roadmap to build a phenotypic metric of ageing: insights from the Baltimore Longitudinal Study of Aging. *Journal of Internal Medicine*. February 2020
<https://doi.org/10.1111/joim.13024>
22. Thurston RC, Carroll JE, **Levine M**, Chang Y, Crandall C, Manson JE, Pal L, Hou L, Shadyab AH, Horvath S. Vasomotor symptoms and accelerated epigenetic aging in the Women's Health Initiative (WHI). *J Clin Endocrinol Metab*. 2020 Feb 21. pii: dgaa081. doi: 10.1210/clinem/dgaa081.
23. **Levine ME**. Assessment of Epigenetic Clocks as Biomarkers of Aging in Basic and Population Research. *The Journals of Gerontology: Series A*, Volume 75, Issue 3, March 2020, Pages 463–465, <https://doi.org/10.1093/gerona/glaa021>
24. Higgins-Chen AT, Boks MP, Vinkers CH, Kahn RS, **Levine ME**. Schizophrenia and Epigenetic Aging Biomarkers: Increased Mortality, Reduced Cancer Risk, and Unique Clozapine Effects. *Biological Psychiatry*. <https://doi.org/10.1016/j.biopsych.2020.01.025>

25. Crimmins EM, Zhang YS, Kim JK, **Levine ME**. Changing disease prevalence, incidence, and mortality among older cohorts: the Health and Retirement Study. *J Gerontol A Biol Sci Med Sci*. 2019 Nov 13;74. doi: 10.1093/gerona/glz075.
26. Liu Z, Chen X, Gill TM, Ma C, Crimmins EM, **Levine ME**. Associations of genetics, behaviors, and life course circumstances with a novel aging and healthspan measure: Evidence from the Health and Retirement Study. *PLoS Med*. 2019 Jun; 16(6): e1002827.
27. Liu Z, Chen BH, Assimes TL, Ferrucci L, Horvath S, **Levine ME**. The Role of Epigenetic Aging in Education and Racial/Ethnic Mortality Disparities Among Older U.S. Women. *Psychoneuroendocrinology* (Special Issue: Stress and cellular aging-related mechanisms). 2019 Jun;104:18-24. doi: 10.1016/j.psyneuen.2019.01.028. Epub 2019 Feb 6.
28. Crimmins EM, Zhang YS, Kim JK, **Levine ME**. Changing Disease Prevalence, Incidence, and Mortality among Older Cohorts: the Health and Retirement Study. *The Journals of Gerontology: Series A*, Volume 74, Issue Supplement_1, December 2019, Pages S21–S26, <https://doi.org/10.1093/gerona/glz075>
29. Liu Z, Kuo PL, Horvath S, Crimmins E, Ferrucci L, **Levine M**. A new aging measure captures morbidity and mortality risk across diverse subpopulations from NHANES IV: A cohort study. *PLoS Med*. 2018 Dec 31;15(12):e1002718. doi: 10.1371/journal.pmed.1002718. eCollection 2018 Dec.
30. Ferrucci L, **Levine ME**, Kuo PL, Simonsick EM. Time and the Metrics of Aging. *Circ Res*. 2018 Sep 14;123(7):740-744. doi: 10.1161/CIRCRESAHA.118.312816.
31. Yen K, Wan J, Mehta HH, Miller B, Christensen A, **Levine ME**, Salomon MP, Brandhorst S, Xiao J, Kim SJ, Navarrete G, Campo D, Harry GJ, Longo V, Pike CJ, Mack WJ, Hodis HN, Crimmins EM, Cohen P. Humanin Prevents Age-Related Cognitive Decline in Mice and is Associated with Improved Cognitive Age in Humans. *Sci Rep*. 2018 Sep 21;8(1):14212. doi: 10.1038/s41598-018-32616-7.
32. **Levine ME**, Harrati A, Crimmins EM. Predictors and Implications of Accelerated Cognitive Decline. *Biodemography Soc Biol*. 2018; 64(2):83-101.
33. **Levine ME**, et al. An epigenetic clock for aging and life expectancy. *Aging* (Albany NY). 2018 Apr; 10(4): 573–591. Published online 2018 Apr 17. doi: [10.18632/aging.101414]
34. Belsky D, Moffitt TE, Cohen AA, Corcoran DL, Horvath S, **Levine ME**, Prinz J, Schaefer J, Sugden K, Williams B, Poulton R, Caspi A. Eleven telomere, epigenetic clock, and biomarker composite quantifications of biological aging: Do they measure the same thing? *American Journal of Epidemiology*. *Am J Epidemiol*. 2017 Nov 15. doi: 10.1093/aje/kwx346. [Epub ahead of print]
35. Lu AT, Xue L, Salfati EL, Chen BH, Ferrucci L, Levy D, Joehanes R, Murabito JM, Kiel DP, Tsai PC, Yet I, Bell JT, Mangino M, Tanaka T, McRae AF, Marioni RE, Visscher PM, Wray NR, Deary IJ, **Levine ME**, Quach A, Assimes T, Tsao PS, Absher D, Stewart JD, Li Y, Reiner AP, Hou L, Baccarelli AA, Whitsel EA, Aviv A, Cardona A, Day FR, Wareham NJ, Wareham NJ, Perry JRB, Ong KK, Raj K, Lunetta KL, Horvath S. GWAS of epigenetic aging rates in blood reveals a critical role for TERT. *Nat Commun*. 2018 Jan 26;9(1):387. doi: 10.1038/s41467-017-02697-5.
36. Patrick J Brown, Melanie M Wall, Chen Chen, **Levine ME**, Kristine Yaffe, Steven P Roose, Bret R Rutherford. Biological Age, Not Chronological Age, is Associated with Late Life Depression. *The Journals of Gerontology: Series A*, <https://doi.org/10.1093/gerona/glx162>.
37. **Levine ME**, Crimmins EM, Weir DR, Cole SW. Contemporaneous Social Environment and the Architecture of Late-Life Gene Expression Profiles. *American Journal of Epidemiology*, <https://doi.org/10.1093/aje/kwx147>
38. Lu AT, Hannon E, **Levine ME**, et al. Genetic architecture of epigenetic and neuronal aging rates in human brain regions. *Nat Commun*. 2017 May 18;8:15353. doi: 10.1038/ncomms15353.

39. Woodward NC*, **Levine, ME***, Saffari, Haghani A, Morgan TE, Sioutas C, Finch CE. Toll-like Receptor 4 in Glial Inflammatory Responses to Air Pollution in Vitro and in Vivo. J Neuroinflammation.
40. **Levine ME**, Langfelder P, Horvath, S. A Weighted SNP Correlation Network Analysis for the Estimation of Polygenic Risk Scores. *Methods Mol Biol.* 2017; 1613: 277–290. doi: 10.1007/978-1-4939-7027-8_10
41. **Levine ME** & Crimmins EM. Is 60 the New 50? Examining Changes in Biological Age over the Past Two Decades. *Demography.* 2018 Apr; 55(2): 387–402. doi: 10.1007/s13524-017-0644-5
42. Quach A*, **Levine ME***, Tanaka T, et al. Epigenetic clock analysis of diet, exercise, education, and lifestyle factors. *Aging.* 2017 Feb 14;9(2):419-446. doi: 10.18632/aging.101168. * Joint First Author
43. **Levine ME**, Lu A, Chen BH, Hernandez DG, Singleton AB, Ferrucci L, Bandinelli S, Salfati E, Manson J, Quach A, Custers C, Teschendorff AE, Widschwendter M, Ritz BR, Absher D, Assimes T, Horvath S. Menopause Accelerates Biological Aging. *Proc Natl Acad Sci U S A.* 2016 Aug 16;113(33):9327-32. doi: 10.1073/pnas.1604558113. PMID: 27457926
44. Horvath S, Gurven M, **Levine ME**, Trumble BC, Kaplan H, Allayee H, Ritz BR, Chen B, Lu AT, Sun D, Li A, Chen W, Tsao P, Absher D, Assimes T. An epigenetic age analysis of race/ethnicity, sex, and coronary heart disease. *Genome Biology.* 2016. 17(1):171. doi: 10.1186/s13059-016-1030-0.
45. Chen BH, Marioni RE, Colicino E, (... 60 additional authors including **Levine ME...**), Ferrucci L, Horvath S. DNA methylation-based measures of biological age: meta-analysis predicting time to death. *Aging (Albany NY).* 2016 Sep 28;8(9):1844-1865. doi: 10.18632/aging.101020. PubMed PMID: 27690265; PubMed Central PMCID: PMC5076441.
46. Carroll JE, Irwin MR, **Levine ME**, Seeman TE, Absher D, Assimes T, Horvath S. Epigenetic aging and immune senescence in women with insomnia symptoms: Findings from the Women's Health Initiative Study. *Biol Psychiatry.* 2017;81(2):136-144. PMID: 27702440
47. **Levine ME**, Crimmins EM. A Genetic Network Associated With Stress Resistance, Longevity, and Cancer in Humans. *J Gerontol A Biol Sci Med Sci.* 2016 Jun;71(6):703-12. doi: 10.1093/gerona/glv141. Epub 2015 Sep 9. PMID: 26355015
48. Lu AT, Hannon E, **Levine ME**, Ophoff RA, Hao K, Crimmins EM, Lunnon K, Kozlenkov A, Mill J, Dracheva S, Horvath S. Genetic variants near MLST8 and DHX57 affect the epigenetic age of the cerebellum. *Nature Communications.* 2016 Feb 2;7:10561. doi: 10.1038/ncomms10561. PMID: 26830004
49. Arpawong TE, Lee J, Philips DF, Crimmins EM, **Levine ME**, Prescott CA. Effects of recent stress and variation in the serotonin transporter polymorphism (5-HTTLPR) on depressive symptoms: A repeated-measures study of adults age 50 and older. *Behavior Genetics: Special Issue on GxE Interplay in Adulthood.* 2016 Jan;46(1):72-88. doi: 10.1007/s10519-015-9740-8. Epub 2015 Sep 2. PMID: 26330209
50. Mitchell UA, Ailshire J, Brown LL, **Levine ME**, Crimmins EM. Education and Psychosocial Functioning Among Older Adults: 4-Year Change in Sense of Control and Hopelessness. *J Gerontol: Social Sciences.* 2016 Mar 24. pii: gbw031. PMID: 27013537
51. Woodward N & **Levine ME**. Safe Setting Standards to Minimize Air Pollution. *Environmental Science & Policy.* 2016 1;56:49-55.
52. **Levine ME**, Lu AT, Horvath S. Epigenetic age of the pre-frontal cortex is associated with neuritic plaques, amyloid load, and Alzheimer's disease related cognitive functioning. *Aging (Albany NY).* 2015 Dec;7(12):1198-211. PMID: 26684672
53. **Levine ME**, Hosgood DH, Chen B, Absher D, Assimes T, Horvath S. DNA Methylation Age of Blood Predicts Future Onset of Lung Cancer in the Women's Health Initiative. *Aging (Albany NY).* 2015 Sep;7(9):690-700. PMID: 26411804

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 55. Belsky DW, Caspi A, Houts R, ... **Levine ME**, Schaefer JD, Sugden K, Williams B, Yashin AI, Poulton R, Moffitt TE. Quantification of biological aging in young adults. *Proceedings of the National Academy of Sciences of the United States of America*. 2015. <http://dx.doi.org/10.1073/pnas.1506264112>.
 56. Schaefer JD, Caspi A, Belsky DW, Harrington H, Houts R, Israel S, **Levine ME**, Sugden K, Williams B, Poulton R, Moffitt TE. Early-Life Intelligence Predicts Midlife Biological Age. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences* 2015; doi: 10.1093/geronb/gbv035
 57. **Levine ME**, Cole SW, Weir DR, Crimmins EM. The Association between Early Life Stress and Increased Inflammatory Gene Expression in Adulthood. *Social Sci. & Med.* 2015 Apr;130:16-22. doi: 10.1016/j.socscimed.2015.01.030. Epub 2015 Jan 21.
 58. Crimmins EM, **Levine ME**. Current Status of Research on Trends in Morbidity, Healthy Life Expectancy, and the Compression of Morbidity. M. Kaeberlein & G.M. Martin (Eds) *Handbook of the Biology of Aging*, Eighth edition. pp. 489-99. DOI: <http://dx.doi.org/10.1016/B978-0-12-411596-5.00018-6>.
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 60. **Levine ME** & Crimmins EM. Evidence of Accelerated Aging among African Americans and its Implications for Mortality. *Social Science & Medicine*. 2014;118:27-32.
 61. **Levine ME** & Crimmins EM. A comparison of methods for assessing mortality risk. *Am J Hum Biol*. 2014; 26(6):768-76.
 62. **Levine ME** & Crimmins EM. Not All Smokers Die Young: A Model for Hidden Heterogeneity within the Human Population. *PLoS ONE*. 2014;9(2):e87403. doi: 10.1371/journal.pone.0087403.
 63. **Levine ME**, Suarez J, Brandhorst S, Balasubramanian P., Passarino G, Crimmins E, Cohen P, Longo VD. Low protein intake is associated with a major reduction in IGF-1, cancer, and overall mortality in the 65 and younger but not older population. *Cell Metabolism*. 2014;19(3):407-17.
- Cover Article**
64. **Levine ME**. Modeling the Rate of Senescence: Can Estimated Biological Age Predict Mortality More Accurately Than Chronological Age? *J Gerontol A Biol Sci Med Sci*. 2013. 68(6):667-74. PMID:23213031.
 65. **Levine ME**, Crimmins EM. 2013. Evidence of Resilience among long-lived smokers. *Vienna Yearbook of Population Research*; 2013;11:205-218. doi: 10.1553/populationyearbook2013s205
 66. **Levine ME**. Response to Dr. Mitnitski and Dr. Rockwood's Letter to the Editor: Biological Age Revisited. *J Gerontol A Biol Sci Med Sci*. 2014;69(3):297-8. doi: 10.1093/gerona/glt138. Epub 2013 Oct 10.
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 68. **Levine ME**, Crimmins EM. 2012. Sarcopenic Obesity and Cognitive Functioning: The Mediating roles of Insulin Resistance and Inflammation. *Current Gerontology and Geriatrics Research*; 826398. doi: 10.1155/2012/826398. PMCID: PMC3352243
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71. **Canon ME**, Crimmins EM. 2011. Sex Differences in the Association between Muscle Quality, Inflammatory Markers, and Cognitive Decline. *Journal of Nutrition Health and Aging*. 15(8)695-8.

Presentations

Invited Speaking Engagements, Presentations, Symposia & Workshops Not Affiliated With Yale:

- 2022: Annual Harvard/Paul F. Glenn Symposium on Aging
- 2022: Amazon MARS event, Panel Speaker
- 2022: Abundance 360 Summit, Keynote, Longevity Mindset Session
- 2022: Gordon Research Conference: Systems Aging
- 2022: NIH Functional Proteomics of Aging Training Grant Seminar Series, University of Minnesota
- 2022: General Interest Seminar Speaker. Calico. San Francisco, CA
- 2021: Dean's workshop on Center for Genomic Health . Yale University
- 2021: UAB Nathan Shock Center of Excellence in the Basic Biology of Aging Virtual Visit
- 2021: HNRCA Seminar Series. Tufts University
- 2021: NIH 2021 Alzheimer's Research Summit
- 2021: The Future is Now: Innovations in AI and Big Data for Healthspan and Longevity (AFAR)
- 2021: Tufts University HNRCA Seminar Series
- 2021: NIA Workshop on Deeply Phenotyped Longitudinal Studies of Aging
- 2021: Symposium – Aging, Geroscience, Longevity eLife Special Issue
- 2021: NUS Medicine Healthy Longevity
- 2020: Gerontological Society of America Meeting, Nathan Shock Centers workshop on “Biology for Non-Biologists”
- 2020: Gerontological Society of America Meeting, Presidents Symposium.
- 2020: Keynote Speaker at Harvard Medical School conference on Healthy Aging
- 2020: Foresight Health Extension Strategy Group Guest Speaker
- 2020: The Hallmark of Targeting Metabesity
- 2020: Los Altos Hills Conference on Aging and Epigenetic Reprogramming
- 2020: Aspen Brain Institute Expert Series
- 2020: Kinexum Biomarkers of Aging webinar
- 2020: ICCS workshop on Complex Systems Dynamics in Aging Biology
- 2020: NIA Workshop on Heterogeneity and the Rate of Aging.
- 2020: AGE Goes Virtual meeting, Speaker at Trainee Workshop
- 2020: New England Biolabs Seminar Series. Ipswich, MA
- 2020: UCLA Bioinformatics Seminar Series. Los Angeles, CA
- 2019: Joint Seminar The Jackson Laboratory for Genomic Medicine UConn Center on Aging
- 2019: Kogod Center on Aging Speaker. Mayo. Rochester, MN
- 2019: Junior Investigator Session at Fall ADC Directors' Meeting. St Louis, MI
- 2019: M2OVE-AD and Resilience-AD Meeting. Bethesda, MD
- 2019: Biology of Aging Seminar Series. Brown University. Providence, RI
- 2019: Ending Age-Related Diseases Conference. New York, NY
- 2019: University of Michigan Genetics for Social Sciences Summer Workshop
- 2019: American Aging Association Meeting. San Francisco, CA
- 2019: Seminar Speaker Albert Einstein College of Medicine. Bronx, NY
- 2019: Notestein Seminar Speaker at Princeton University. Princeton, NJ
- 2019: Hallmarks of Biological Failure. Santa Fe, NM

- 2019: USC Gerontology Seminar Series. Los Angeles, CA
- 2019: Netflix Docuseries Filming. Los Angeles, CA
- 2019: Life Course Markers of Exceptional Longevity workshop. San Diego, CA
- 2019: Longevity Therapeutics. San Francisco, CA
- 2018: NIA Epigenetic Meeting. Bethesda, MD
- 2018: Enabling Precision Medicine for AD through Open Science. Pre-AAIC symposium, Chicago, IL
- 2018: Population Association of American meeting, Discussant for a session on “Incorporating Biology Into Social Research”
- 2018: Presentation at the National Institute on Aging in Baltimore (Invited by Luigi Ferrucci).
- 2018: Longitudinal Studies Conference, Wellcome Genome Campus, Cambridge, UK
- 2018: Planning meeting on “Using Longitudinal Studies of Younger Cohorts for Aging Research” from the Committee on Population (CPOP) of the National Academies of Sciences.
- 2016: The epigenetics leads to Age-related diseases Network (GIGLA-mesh). Longitudinal studies/mediation analysis in InCHIANTI.
- 2015: NSF Physics of Wear, Tear, and Aging. The Epigenetic Clock.
- 2015: UCLA Neurobehavioral Genetics Retreat. Epigenetic age of the pre-frontal cortex is associated with neuritic plaques, amyloid load, and Alzheimer’s disease related cognitive functioning.
- 2015: UCLA Human Genetic Retreat. DNA Methylation Age of Blood Predicts Future Onset of Lung Cancer in the Women’s Health Initiative.
- 2015: USC Vibrant Living Retreat. Personalized Medicine and Aging.
- 2014: National Academies of Science: Expert Meeting on Assessing and Encouraging Interaction between Genetic and Social-Behavioral Models. Association Studies: Biological Resilience.
- 2014: Harvard Molecular Technology Group Meeting. The whole is greater than the sum of its parts: How complex systems approaches for studying biomarkers and genes can improve our understanding of the aging process.
- 2014: GSA Health and Retirement Workshop. Genetic Analysis Research Example: Cognitive Aging GWAS & Polygenic Risk Score.
- 2014: Duke University, Population Research Institute. Cells to Society: Using Biomarkers to Develop Predictive Measures of Aging & Longevity
- 2014: USC Vibrant Living Retreat. The Longevity Calculator
- 2014: Biomarker Network Meeting. Genetic Networks Associated with Longevity, Stress Resistance and Aging.
- 2014: Biomarker Network Meeting. The Association between Early Life Stress and Increased Inflammatory Gene Expression in Adulthood

Peer-Reviewed Presentations & Symposia Given at Meetings Not Affiliated With Yale:

- 2019: Gerontological Society of America Meeting, “A Functional Epigenetic Clock for Rats”
- 2019: Gerontological Society of America Meeting, “Development of Epigenetic Measures for Geroscience Research”
- 2019: Gerontological Society of America Meeting “Systems-Level Modeling of Biological and Molecular Aging Changes Over Time.”
- 2019: Gerontological Society of America Meeting, “Symposium: DNA Methylation, Cause of Consequence of Aging?”
- 2018: Gerontological Society of America Meeting, “An Epigenetic Clock for Aging and Life Expectancy”
- 2018: Gerontological Society of America Meeting, Chair of Symposium, “Genetic and Epigenetic Contributions to Aging”
- 2018: Gerontological Society of America Meeting, Discussant of Symposium, “Symposium:

Biomarker Data Innovations”

- 2018: Gerontological Society of America Meeting, Chair of Symposium, “Symposium: Advancing Geroscience: New Methods for Genomics of Aging”
- 2017: Gerontological Society of America Meeting, “Epigenetic Age of the Pre-Frontal Cortex & Alzheimer’s Disease Pathology.”
- 2016: Gerontological Society of America Meeting, “Contemporaneous Social Environment and the Architecture of Late-Life Gene Expression Profiles.”
- 2016: Gerontological Society of America Meeting, “Update on the Epigenetic Clock: Lung Cancer and Neurodegeneration.”
- 2016: Biomarker Network Meeting, “A Weighted SNP Correlation Network Analysis for the Estimation of Polygenic Risk Scores.”
- 2014: Gerontological Society of America Meeting, “Human Genetics of Aging and Longevity Symposium.”
- 2014: Gerontological Society of America Meeting, “The Whole Is Greater Than the Sum of Its Parts: Using Network Analysis to Identify Longevity Genes.”
- 2014: Population Association of America Meeting, “Is 60 the New 50? Historical Changes in the Pace of Biological Age.”
- 2013: Population Association of America Meeting, “The Influence of Race and Education on the Rate of Aging.”
- 2013: What’s Hot in Aging Research, “Not All Smokers Die Young: A Model for Hidden Heterogeneity within the Human Population.”
- 2012: APHA Annual Meeting, “The Role of Accelerated Aging in the Association between Mortality and Sociodemographic and Behavioral Characteristics.”
- 2012: Gerontological Society of America Meeting, “Modeling Senescence: Mortality Predictions Using Calculated Rates of Aging.”
- 2012: Gerontological Society of America Meeting, “Predicting Mortality Among the Old and Oldest-Old in the United States.”
- 2012: Conference on Determinants of Unusual and Differential Longevity, Vienna, Austria, “Evidence of Resiliency among long-lived smokers.”
- 2011: Gerontological Society of America Meeting, “Sarcopenic Obesity and Cognitive Decline: Comorbidities Associated with Abnormal Metabolic Processing and Systemic Inflammation.”
- 2011: Gerontological Society of America Meeting, “Be Well: An Exercise and Nutrition Intervention to Improve the Health Status of Chronically Ill Older Adults.”

Supervisory Activities

Zuyun Liu (Former Postdoctoral Researcher)

Role: Primary Mentor 2017-2019

Albert Higgins-Chen (Psychiatry Resident, Physician Scientist Track)

Role: Primary Mentor 2018-Cuurent

Kyra Thrush (PhD Student in Computational Biology and Bioinformatics)

Role: Primary Mentor 2019-Cuurent

Christopher Minter (PhD Student in Experimental Pathology)

Role: Primary Mentor 2019-Cuurent

Johnathan Gonzalez (PhD Student in Experimental Pathology)

Role: Primary Mentor 2019-Cuurent

Yaroslav Markov (PhD Student in Computational Biology and Bioinformatics)

Role: Primary Mentor 2020-Cuurent

Peter Niimi (PhD Student in Experimental Pathology)

Role: Primary Mentor 2020-Cuurent

Margarita Meer (Associate Research Scientist)

Role: PI 2020-Cuurent

Raghav Sahgol (PhD Student in Computational Biology and Bioinformatics)

Role: Primary Mentor 2021-Cuurent

Tom McCabe (PhD Student in Experimental Pathology)

Role: Primary Mentor 2021-Cuurent

Haoming Yu (PhD Student in Genetics)

Role: Committee Member 2020-Cuurent

Matt Murray (PhD Student in Experimental Pathology)

Role: Committee Member 2020-Cuurent

Jiahao Gao (PhD Student in Computational Biology and Bioinformatics)

Role: Committee Member 2020-Cuurent

Alva Sainz (PhD Student in Experimental Pathology)

Role: Committee Member 2018-Cuurent

Public Service:

Study Section

NIA/NIH The Cellular Mechanisms in Aging and Development (CMAD) June 11-12, 2020

NIA/NIH ZAG1 ZIJ-1 (O1) – U19 Special Panel July 8, 2019

NIA/NIH ZAG1 ZIJ-1 (O1) – U19 Special Panel June 30, 2020

Editorial Boards

Member of Editorial Board of the Journals of Gerontology: Biological Sciences

Reviewer

Peer Reviewer for *Lancet Oncology*, *PNAS*, *Nature Communications*, *BMC Medical Informatics and Decision Making*, *eLife*, *Aging Cell*, *Journal of Gerontology Biological Sciences*, *Circulation*, *Trends in Molecular Medicine*, *Aging*, *American Journal of Epidemiology*, *PLoS One*, *Journal of Biodemography and Social Biology*, *Experimental Gerontology*, *Prevention Science*

Yale Committees

CBB/BBS Admissions Committee

MMPP/BBS Admissions Committee

Y-Age Director Search Committee

MD-PhD Admissions Committee

Select Media Coverage:

02/20/20 How Old Are You Really? What New Research Says About Your Biological Age. Good Housekeeping

01/24/20 GoopLab: Netflix Series

12/19/19 New Tests Use Epigenetics to Guess How Fast You're Aging. Wired

11/11/19 This Company Will Tell You How Well You're Aging. Outside

11/27/18 How to calculate your “second age” CNN broadcast

10/19/18 Want to know when you’re going to die? MIT Technology Review

07/09/18 Is the end nigh?: New blood tests can reveal your life expectancy, The Guardian

07/09/18 When will I die? Scientists develop new blood test that could reveal life expectancy, Newsweek

07/26/16 Menopause may speed up aging in women, scientists say, CBS News

07/25/16 Menopause Makes Your Body Age Faster, TIME

07/25/16 Menopause, Sleeplessness Both Make Women Age Faster, Studies Show, Huffington Post

09/10/15 Secrets of longevity may lie in long-lived smokers, The Washington Post

09/10/15 Smoking: Genetics May Play a Role In Survival Of Some Long-Lived Smokers

07/7/15 Age isn’t just a number, Science World Report

07/7/15 Ageing rates vary widely, study says, BBC News

07/6/15 Old before your time? People age at wildly different rates, study confirms, The Guardian

07/6/15 Here’s Why You May Be Aging Faster than Your Friends, TIME

01/1/15 The Papers Most Discussed in 2014, Scientific American

03/4/14 Low Protein Diet May Extend Lifespan, Science

03/4/14 Too much protein could lead to early death, study says, The Washington Post

03/4/14 High-protein diets: Bad for the middle-aged, good for the elderly, Los Angeles Times

03/5/14 Diets high in meat, eggs and dairy could be as harmful to health as smoking, The Guardian

03/4/14 Why High-Protein Diets May Be Linked To Cancer Risk, Forbes

03/4/14 Are Meat and Dairy Really as Bad for You as Smoking, Fitness Magazine

06/22/14 New Evidence that Blacks are Aging Faster than Whites, Pacific Standard

06/22/14 Does your race determine your biological age?, Daily Mail

06/22/14 Not All Races Age Equally, As New Study Finds Blacks Age Faster Than White, Medical Daily