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SUMMARY

An **epidemiologist** and **epigeneticist** with **60+ relevant publications** and **10+ years** of public health research experience in academia, government and international organization. Solid knowledge of analytic epidemiology and bioinformatics. Managed and coordinated multiple epidemiology projects in different countries. Excellent interpersonal and communication skills obtained from working directly with collaborators from diverse backgrounds.

EDUCATION

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| Ph.D. / Epidemiology | Heidelberg University, Heidelberg | Germany | 2014 – 2018 |
| Supervisor: Dr. Hermann Brenner | | | |
| Thesis: “Smoking-related DNA methylation markers: relationship with aging-related health outcomes” | | | |
| Honor: Summa cum laude (the highest honor) | | | |
| M.S. / Epidemiology | Fudan University, Shanghai | China | 2011 – 2014 |
| Supervisor: Dr. Qian Gao | | | |
| Thesis: “Active case-finding of tuberculosis and rapid diagnosis of drug-resistant tuberculosis” | | | |
| Bachelor of Medicine | Fudan University, Shanghai | China | 2006 – 2011 |
| Thesis Advisor: Dr. Biao Xu | | | |
| Major: Preventive Medicine | | | |

PROFESSIONAL EXPERIENCE

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| Assistant Professor (Tenure-Track) | November 2020 – Present |
| Department of Occupational and Environmental Health Sciences, Peking University, Beijing, China | |
| Research interest: Aging, Environmental Health, Molecular Epidemiology | |
| <ul style="list-style-type: none">• Conduct population surveys and cohorts with local and international collaborators to identify the environmental risk factors of human aging• Supervise two Ph.D. candidates and two master students to conduct comprehensive data analyses and to write manuscripts and grant proposals• Lecture undergraduate and graduate courses of environmental health since Spring 2021• Provide professional suggestions on molecular epidemiology and biostatistics to colleagues and stakeholders | |
| Postdoctoral Research Scientist | May 2018 – September 2020 |
| Department of Environmental Health Sciences, Columbia University, New York, USA | |
| Supervisor: Dr. Andrea Baccarelli | |
| <ul style="list-style-type: none">• Collaborated with internal and external partners to design and implement epidemiological projects, investigating the adverse impact of environmental exposures on health in older adults and newborns | |

- **Performed** comprehensive data analyses and **wrote** manuscripts and grant proposals
- **Managed** epidemiological projects, **coordinated** between leadership, lab technician, and other team members
- **Lectured** graduate course “Public Health Epigenetics” (P8326, 3 credits) since Spring 2019
- **Mentored** Ph.D. students and visiting scholars, helping with their epidemiologic analyses
- **Trained** in Environmental Health, Advanced Biostatistics (e.g. statistical machine learning and causal inference), and Computational Methods for multi-omics data
- **Provided** professional suggestions for internal stakeholders on multi-omics data analyses

Junior Epidemiologist

September 2017 – January 2018

German Cancer Research Center (DKFZ), Heidelberg, Germany

Supervisor: Dr. Hermann Brenner

- **Performed** epigenetic epidemiological analyses to investigate the impact of exogenous exposures on aging-related outcomes
- **Interpreted** analysis results and **drafted** manuscripts and grant applications
- **Actively involved** in the management of real-world data and discussion of study design with international experts and key stakeholders

Intern

March 2017 – June 2017

Research for TB Elimination Team, Global TB Programme, World Health Organization, Geneva, Switzerland

Supervisor: Dr. Christian Lienhardt

- **Worked** with the Research For TB Elimination team on the introduction and scaleup of new TB drugs, bedaquiline and delamanid, in 30 high multidrug-resistant TB countries
- **Communicated** on a weekly basis with national healthcare authorities, NGOs, and other stakeholders
- **Developed** data collection scheme, **collected** and **summarized** data on supply chains of new TB drugs, **drafted** reports, and **presented** results to global experts
- **Documented** the implementation status of new TB drugs around the world and **drafted** fact sheets

Research Intern

January 2012 – January 2013

Department of TB Control, Shanghai Municipal Center for Disease Control and Prevention, Shanghai, China

- **Performed** the genotype drug susceptibility test of MDR-TB strains for a project commissioned by the NIH
- **Coordinated** the fieldwork of TB case screening
- **Designed** and **maintained** the database of the epidemic data of MDR-TB in Shanghai
- **Coordinated** the efforts of two undergraduate students who assisted with the project
- **Collaborated** with local and international partners on the data collection and mining
- **Trained** in developing, maintaining, and managing large datasets for easy sharing with collaborators

PUBLICATIONS

First-/Corresponding-authored articles (*corresponding author, # leading shared authorship)

- 1) **Gao X***, Tong G, Jiang M, Huang N, Zheng Y, Belsky D, Huang T. Accelerated biological aging and risk of depression and anxiety: evidence from 424,299 UK Biobank participants. Nature Communications, 2023; 14(1): 2277, doi: 10.1038/s41467-023-38013-7.

- 2) **Gao X***, Tian S, Huang N, Sun G, Huang T. Associations of daily sedentary behavior, physical activity, and sleep with irritable bowel syndrome: a prospective analysis of 362,193 participants. *Journal of Sport and Health Science*, 2023; doi: 10.1016/j.jshs.2023.02.002 (In Press)
- 3) **Gao X***, Jiang M, Huang N, Guo X, Huang T. Long-Term Air Pollution, Genetic Susceptibility, and the Risk of Depression and Anxiety: A Prospective Study in the UK Biobank Cohort. *Environmental Health Perspectives*, 2023;131(1):17002. doi: 10.1289/EHP10391.
- 4) **Gao X***, Huang J#, Cardenas A, Zhao Y, Sun Y, Wang J, Xue L, Baccarelli AA, Guo X, Zhang L, Wu S. Short-Term Exposure of PM_{2.5} and Epigenetic Aging: A Quasi-Experimental Study. *Environmental Science & Technology*, 2022; 56(20):14690-14700. doi: 10.1021/acs.est.2c05534.
- 5) **Gao X***, Huang N, Jiang M, Holleczer B, Schöttker B, Huang T, Brenner H. Mortality and morbidity risk prediction for older former smokers based on a score of smoking history: evidence from UK Biobank and ESTHER cohorts. *Age and Ageing*, 2022, afac154. doi: 10.1093/ageing/afac154.
- 6) **Gao X***, Huang N, Guo X, Huang T. Role of sleep quality in the acceleration of biological aging and its potential for preventive interaction on air pollution insults: Findings from the UK Biobank cohort. *Aging Cell*, 2022, e13610. doi: 10.1111/acer.13610.
- 7) **Gao X***, Koutrakis P, Coull B, Lin X, Vokonas P, Schwartz J, Baccarelli AA. Short-term exposure to PM_{2.5} components and renal health: findings from the Veterans Affairs Normative Aging Study. *Journal of Hazardous Materials*. 2021; 420:126557. doi: 10.1016/j.jhazmat.2021.126557.
- 8) **Gao X***, Coull B, Lin X, Vokonas P, Spiro A III, Hou L, Schwartz J, Baccarelli AA. Short-term air pollution, cognitive performance and nonsteroidal anti-inflammatory drug use in the Veterans Affairs Normative Aging Study. *Nature Aging*. 2021; 1(5):430-437. doi:10.1038/s43587-021-00060-4. **(Coverage of the issue)**
- 9) **Gao X***, Coull B, Lin X, Vokonas P, Sparrow D, Hou L, DeMeo D, Litonjua A, Schwartz J, Baccarelli AA. Association of neutrophil to lymphocyte ratio with reduced pulmonary function in a 30-year longitudinal study of US veterans. *JAMA Network Open*. 2020; 3:e2010350.doi: 10.1001/jamanetworkopen. 2020.10350.
- 10) **Gao X***, Coull B, Lin X, Vokonas P, Schwartz J, Baccarelli AA. Nonsteroidal anti-inflammatory drugs modify the effect of short-term air pollution on lung function. *American Journal of Respiratory and Critical Care Medicine*. 2020; 201(3):374-8. doi: 10.1164/rccm.201905-1003LE.
- 11) **Gao X***, Koutrakis P, Blomberg A, Coull B, Vokonas P, Schwartz J, Baccarelli AA. Short-term ambient particle radioactivity level and renal function in older men: Insight from the Normative Aging Study. *Environment International*. 2019; 131, 105018-25. doi:10.1016/j.envint.2019.105018.
- 12) **Gao X***, Colicino E, Shen J, Just AC, Nwanaji-Enwerem JC, Wang C, Coull B, Lin X, Vokonas P, Zheng Y, Hou L, Schwartz J, Baccarelli AA. Comparative validation of an epigenetic mortality risk score with three aging biomarkers for predicting mortality risks among older adult males. *International Journal of Epidemiology*. 2019; 48, 1958-1971. doi: 10.1093/ije/dyz082.
- 13) **Gao X***, Colicino E, Shen J, Kioumourtzoglou MA, Just AC, Nwanaji-Enwerem JC, Coull B, Lin X, Vokonas P, Zheng Y, Hou L, Schwartz J, Baccarelli AA. Impacts of air pollution, temperature, and relative humidity on leukocyte distribution: An epigenetic perspective. *Environment International*. 2019; 126, 395-405. doi: 10.1016/j.envint.2019.02.053.
- 14) **Gao X***, Gao X, Zhang Y, Holleczer B, Schöttker B, Brenner H. Oxidative stress and epigenetic mortality risk score: associations with all-cause mortality among elderly people. *European Journal of Epidemiology*. 2019; 451-462. doi: 10.1007/s10654-019-00493-7.
- 15) **Gao X***, Colicino E, Shen J, Just AC, Nwanaji-Enwerem JC, Coull B, Lin X, Vokonas P, Zheng Y, Hou L,

- Schwartz J, Baccarelli AA. Accelerated DNA methylation age and the use of antihypertensive medication among older adults. *Aging*. 2018; 10(11), 3210-3228. doi: 10.18632/aging.101626.
- 16) **Gao X**, Zhang Y, Mons U, Brenner H. Leukocyte telomere length and epigenetic-based mortality risk score: associations with all-cause mortality among older adults. *Epigenetics*. 2018; 13(8):846-857. doi: 10.1080/15592294.2018.1514853.
 - 17) **Gao X**, Zhang Y, Schöttker B, Brenner H. Vitamin D status and epigenetic-based mortality risk score: strong independent and joint prediction of all-cause mortality in a population-based cohort study. *Clinical Epigenetics*. 2018; 10(1): 84. doi: 10.1186/s13148-018-0515-y.
 - 18) **Gao X**, Zhang Y, Brenner H. Associations of *Helicobacter pylori* infection and chronic atrophic gastritis with accelerated epigenetic aging in older adults. *British Journal of Cancer*. 2017; 117 (8), 1211. doi: 10.1038/bjc.2017.314.
 - 19) **Gao X[#]**, Thomsen H[#], Zhang Y, Breitling LP, Brenner H. The impact of methylation quantitative trait loci (mQTLs) on active smoking-related DNA methylation changes. *Clinical Epigenetics*. 2017; 9(1): 87. doi: 10.1186/s13148-017-0387-6.
 - 20) **Gao X**, Gao X, Zhang Y, Breitling LP, Schöttker B, Brenner H. Associations of self-reported smoking, cotinine levels and epigenetic smoking indicators with oxidative stress among older adults: a population-based study. *European Journal of Epidemiology*. 2017; 32(5):443-456. doi: 10.1007/ s10654-017-0248-9.
 - 21) **Gao X**, Zhang Y, Saum KU, Schöttker B, Breitling LP, Brenner H. Tobacco smoking and smoking-related DNA methylation are associated with the development of frailty among older adults. *Epigenetics*. 2017; 12(2):149-156. doi: 10.1080/15592294.2016.1271855.
 - 22) **Gao X**, Mons U, Zhang Y, Breitling LP, Brenner H. DNA methylation changes in response to active smoking exposure are associated with leukocyte telomere length among older adults. *European Journal of Epidemiology*. 2016; 31(12):1231-41. doi: 10.1007/s10654-016-0210-2.
 - 23) **Gao X**, Zhang Y, Breitling LP, Brenner H. Tobacco smoking and methylation of genes related to lung cancer development. *Oncotarget*. 2016; 7(37): 59017-59028. doi: 10.18632/oncotarget.10007.
 - 24) **Gao X**, Zhang Y, Breitling LP, Brenner H. Relationship of tobacco smoking and smoking-related DNA methylation with epigenetic age acceleration. *Oncotarget*. 2016; 7(30):46878-46889. doi: 10.18632/oncotarget.9795.
 - 25) **Gao X**, Jia M, Zhang Y, Breitling LP, Brenner H. DNA methylation changes of whole blood cells in response to active smoking exposure in adults: a systematic review of DNA methylation studies. *Clinical Epigenetics*; 2015, 7(1):113. doi: 10.1186/s13148-015-0148-3.
 - 26) **Gao X**, Li J, Liu Q, Shen X, Mei J, Gao Q. [Heteroresistance in *Mycobacteria Tuberculosis* is an important factor for the inconsistency between the results of phenotype and genotype drug susceptibility tests]. *Chinese Journal of tuberculosis and respiratory diseases*. 2014; 4(37):836-842. doi: 10.3760/cma.j.issn.1001-0939.2014.04.007.

Co-first-/corresponding-authored articles (*corresponding author, # non-leading shared authorship)

- 1) Lv Y, Yang Z, Ye L, Jiang M, Zhou J, Guo Y, Qiu Y, Li X, Chen C, Ju A, Wang J, Li C, Li Y, Wang J, Zhang J, Ji J S, Li T, Baccarelli A A, **Gao X^{**}**, Shi X^{**}. Long-term fine particulate exposure and incidence of frailty in older adults: findings from the Chinese Longitudinal Healthy Longevity Survey. *Age and Ageing*, 2023, 52(2): afad009. doi: 10.1093/ageing/afad009.
- 2) Jiang H, Yin J, Liu F, Yao Y, Cai C, Xu J, Zheng L, Zhu C, Jia J, **Gao X^{**}**, Xu W^{**}, Li W^{**}, Zhang G^{**}. Epidemiology of recurrent pulmonary tuberculosis by bacteriological features of 100 million residents in

- China. BMC Infectious Diseases, 22(1), 638. doi: 10.1186/s12879-022-07622-w.
- 3) Tang J, Chen N, Liang H[#], **Gao X^{**}**. The Effect of Built Environment on Physical Health and Mental Health of Adults: A Nationwide Cross-Sectional Study in China. International Journal of Environmental Research and Public Health 2022, 19(11): 6492. doi: 10.3390/ijerph19116492.
 - 4) Shi W, Tang S, Fang J, Cao Y, Chen C, Li T, **Gao X^{**}**, Shi X^{**}. Epigenetic age stratifies the risk of blood pressure elevation related to short-term PM_{2.5} exposure in older adults. Environmental Research 2022, 212: 113507. doi: 10.1016/j.envres.2022.113507.
 - 5) Colicino E[#], Marioni R[#], Ward-Caviness C[#], Gondalia R[#], Guan W[#], Chen B[#], Tsai P[#], Huan T[#], **Gao X[#]**, Agha G, Schwartz J, Vokonas P, Just AC, Starr J, McRae AF, Wray N, Visscher PM, Bressler J, Zhang W, Tanaka T, Moore AZ, Pilling L, Zhang G, Stewart J, Li Y, Hou L, Castillo-Fernandez J, Spector T, Kiel D, Murabito J, Liu C, Mendelson M, Assimes T, Absher D, Tsaho PS, Lu AT, Ferrucci L, Wilson R, Waldenberger M, Prokisch H, Bandinelli S, Bell J, Levy D, Deary I, Horvath S, Pankow J, Peters A, Whitsel E, Baccarelli AA. Blood DNA methylation sites predict death risk in a longitudinal study of 12,300 individuals. Aging. 2020. 12(14):14092-14124. doi: 10.18632/aging.103408.
 - 6) Li J[#], **Gao X[#]**, Luo T, Wu J, Sun G, Liu Q, Jiang Y, Zhang Y, Mei J, Gao Q. Association of gyrA/B mutations and resistance levels to fluoroquinolones in clinical isolates of *Mycobacterium tuberculosis*. Emerging Microbes & Infections, 2014; 3(3): e19. doi: 10.1038/emi.2014.21.

Authored comments/letters

- 1) **Gao X^{*}**, Baccarelli AA. Reply to: Controlled chamber studies showed protective effect of NSAIDs against ozone exposure: the stage was set for broader epidemiologic investigation. American Journal of Respiratory and Critical Care Medicine. 2020; 201(12):1583-1584. doi: 10.1164/rccm.202002-0385LE.

Co-authored

- 1) Sumner JA, **Gao X**, Gambazza S, Dye CK, Colich NL, Baccarelli AA, Uddin M, McLaughlin KA. Stressful life events and accelerated biological aging over time in youths. Psychoneuroendocrinology. 151 (2023): 106058. doi: 10.1016/j.psyneuen.2023.106058.
- 2) Lieberman-Cribbin W, Domingo-Rellosio A, Navas-Acien A, Cole S, Haack K, Umans J, Tellez-Plaza M, Colicino E, Baccarelli AA, **Gao X**, Kupsco A. Epigenetic Biomarkers of Lead Exposure and Cardiovascular Disease: Prospective Evidence in the Strong Heart Study. J Am Heart Assoc 2022, e026934. doi: 10.1161/JAHA.122.026934.
- 3) Shi W, **Gao X**, Cao Y, Chen Y, Cui Q, Deng F, Yang B, Lin E, Fang J, Li T, Tang S, Pollitt K, Shi X. Personal airborne chemical exposure and epigenetic ageing biomarkers in healthy Chinese elderly individuals: evidence from mixture approaches. Environment International, 2022. doi: 10.1016/j.envint.2022.107614.
- 4) Ma Y, Chen N, Chen J, Huang T, Huang N, **Gao X**, Liang H. Genetic modification effects of physical frailty on the morbidity of mental disorders in the UK Biobank. Aging & Mental Health, 2022. doi: 10.1080/13607863.2022.2135682.
- 5) Fang J, Gao Y, Zhang M, Jiang Q, Chen C, **Gao X**, Liu Y, Dong H, Tang S, Li T, Shi X. Personal PM_{2.5} Elemental Components, Decline of Lung Function, and the Role of DNA Methylation on Inflammation-Related Genes in Older Adults: Results and Implications of the BAPE Study. Environmental Science & Technology, 2022. doi: 10.1021/acs.est.2c04972.
- 6) Jiang M, Wang X, **Gao X**, Cardenas A, Baccarelli AA, Guo X, Huang J, Wu S. Association of DNA

- methylation in circulating CD4⁺T cells with short-term PM_{2.5} pollution waves: A quasi-experimental study of healthy young adults. *Ecotoxicology and Environmental Safety* 2022, 239: 113634. doi: 10.1016/j.ecoenv.2022.113634.
- 7) Du Y, **Gao X**, Yan J, Zhang H, Cao X, Feng B, He Y, He Y, Guo T, Xin H, Gao L. Relationship between DNA Methylation Profiles and Active Tuberculosis Development from Latent Infection: a Pilot Study in Nested Case-Control Design. *Microbiol Spectr*, 2022, e0058622. doi: 10.1128/spectrum.00586-22.
 - 8) Sumner JA, Gambazza S, **Gao X**, Baccarelli AA, Uddin M, McLaughlin KA. Epigenetics of early-life adversity in youth: cross-sectional and longitudinal associations. *Clinical Epigenetics*, 2022, 14(1): 48. doi: 10.1186/s13148-022-01269-9.
 - 9) Belsky D W, Caspi A, Corcoran D L, Sugden K, Poulton R, Arseneault L, Baccarelli A, Chamarti K, **Gao X**, Hannon E, Harrington H L, Houts R, Kothari M, Kwon D, Mill J, Schwartz J, Vokonas P, Wang C, Williams B S, Moffitt T E. DunedinPACE, a DNA methylation biomarker of the pace of aging. *Elife*, 2022, 11. doi: 10.7554/eLife.73420.
 - 10) Fang J, Tang S, Deng F, **Gao X**, Chen C, Liu Y, Dong H, Du Y, Li T, Shi X. Associations of carbonaceous compounds and water-soluble inorganic ions in ambient PM_{2.5} with renal function in older individuals: the China BAPE study. *Environmental Science & Technology*, 2022, 56(1): 433-9. doi: 10.1021/acs.est.1c04526.
 - 11) Schlosser P, Tin A, Matias-Garcia P R, Thio C H L, Joeannes R, Liu H, Weihs A, Yu Z, Hoppmann A, Grundner-Culemann F, Min J L, Adeyemo A A, Agyemang C, Arnlov J, Aziz N A, Baccarelli A, Bochud M, Brenner H, Breteler M M B, Carmeli C, Chaker L, Chambers J C, Cole S A, Coresh J, Corre T, Correa A, Cox S R, de Klein N, Delgado G E, Domingo-Relloso A, Eckardt K U, Ekici A B, Endlich K, Evans K L, Floyd J S, Fornage M, Franke L, Fraszczyk E, **Gao X**, Gao X, Ghanbari M, Ghasemi S, Gieger C, Greenland P, Grove M L, Harris S E, Hemani G, Henneman P, Herder C, Horvath S, Hou L, Hurme M A, Hwang S J, Jarvelin M R, Kardia S L R, Kasela S, Kleber M E, Koenig W, Kooner J S, Kramer H, Kronenberg F, Kuhnel B, Lehtimäki T, Lind L, Liu D, Liu Y, Lloyd-Jones D M, Lohman K, Lorkowski S, Lu A T, Marioni R E, Marz W, McCartney D L, Meeks K A C, Milani L, Mishra P P, Nauck M, Navas-Acien A, Nowak C, Peters A, Prokisch H, Psaty B M, Raitakari O T, Ratliff S M, Reiner A P, Rosas S E, Schottker B, Schwartz J, Sedaghat S, Smith J A, Sotoodehnia N, Stocker H R, Stringhini S, Sundstrom J, Swenson B R, Tellez-Plaza M, van Meurs J B J, van Vliet-Ostaptchouk J V, Venema A, Verweij N, Walker R M, Wielscher M, Winkelmann J, Wolffenbutter B H R, Zhao W, Zheng Y, Estonian Biobank Research T, Genetics of DNA M C, Loh M, Snieder H, Levy D, Waldenberger M, Susztak K, Kottgen A, Teumer A. Meta-analyses identify DNA methylation associated with kidney function and damage. *Nature communications*, 2021, 12(1): 7174. doi: 10.1038/s41467-021-27234-3.
 - 12) Tin A, Schlosser P, Matias-Garcia P R, Thio C H L, Joeannes R, Liu H, Yu Z, Weihs A, Hoppmann A, Grundner-Culemann F, Min J L, Kuhns V L H, Adeyemo A A, Agyemang C, Arnlov J, Aziz N A, Baccarelli A, Bochud M, Brenner H, Bressler J, Breteler M M B, Carmeli C, Chaker L, Coresh J, Corre T, Correa A, Cox S R, Delgado G E, Eckardt K U, Ekici A B, Endlich K, Floyd J S, Fraszczyk E, **Gao X**, Gao X, Gelber A C, Ghanbari M, Ghasemi S, Gieger C, Greenland P, Grove M L, Harris S E, Hemani G, Henneman P, Herder C, Horvath S, Hou L, Hurme M A, Hwang S J, Kardia S L R, Kasela S, Kleber M E, Koenig W, Kooner J S, Kronenberg F, Kuhnel B, Ladd-Acosta C, Lehtimäki T, Lind L, Liu D, Lloyd-Jones D M, Lorkowski S, Lu A T, Marioni R E, Marz W, McCartney D L, Meeks K A C, Milani L, Mishra P P, Nauck M, Nowak C, Peters A, Prokisch H, Psaty B M, Raitakari O T, Ratliff S M, Reiner A P, Schottker B, Schwartz J, Sedaghat S, Smith J A, Sotoodehnia N, Stocker H R, Stringhini S, Sundstrom J, Swenson B R, van Meurs J B J, van Vliet-Ostaptchouk J V, Venema A, Volker U, Winkelmann J, Wolffenbutter B H R, Zhao W, Zheng Y, Estonian Biobank Research

- T, Genetics of D N A M C, Loh M, Snieder H, Waldenberger M, Levy D, Akilesh S, Woodward O M, Susztak K, Teumer A, Kottgen A. Epigenome-wide association study of serum urate reveals insights into urate co-regulation and the SLC2A9 locus. *Nature communications*, 2021, 12(1): 7173. doi: 10.1038/s41467-021-27198-4.
- 13) Matias-Garcia PR, Ward-Caviness CK, Raffield LM, **Gao X**, Zhang Y, Gao X, Wilson R, Nano J, Bostom A, Colicino E, Correa A, Coull B, Eaton C, Hou L, Just A C, Kunze S, Lange L, Lange E, Lin X, Liu S, Nwanaji-Enwerem J C, Reiner A, Shen J, Schottker B, Vokonas P, Zheng Y, Young B, Schwartz J, Horvath S, Lu A, Whitsel E A, Koenig W, Adamski J, Winkelmann J, Brenner H, Baccarelli A A, Gieger C, Peters A, Franceschini N, Waldenberger M. DNAm-based signatures of accelerated aging and mortality in blood are associated with low renal function. *Clinical Epigenetics*. 2021;13(1):121. doi:10.1186/s13148-021-01082-w.
- 14) Liu Q, Li H, L Guo, Chen Q, **Gao X**, Li P, Tang N, Guo X, Deng F, Wu S. Effects of short-term personal exposure to air pollution on platelet mitochondrial DNA methylation levels and the potential mitigation by L-Arginine supplementation. *Journal of Hazardous Materials*. 2021. 125963. doi: 10.1016/j.jhazmat.2021.125963.
- 15) Nwanaji-Enwerem JC, Colicino E, **Gao X**, Wang C, Vokonas P, Boyer EW, Baccarelli AA, Schwartz J. Associations of plasma folate and vitamin B6 with blood DNA methylation age: an analysis of one-carbon metabolites in the VA Normative Aging Study. *The Journals of Gerontology: Series A*. 2021. 76(5): 760-769. doi: 10.1093/gerona/glaa257.
- 16) Wang C, Ni W, Yao Y, Heiss J, Wei Y, **Gao X**, Coull B, Kosheleva A, Baccarelli AA, Peters A, Schwartz J. DNA methylation-based biomarkers of age acceleration and all-cause death, myocardial infarction, stroke, and cancer in two cohorts: The NAS, and KORA F4. *EBioMedicine*. 2020. 63: 103151. doi: 10.1016/j.ebiom.2020.103151.
- 17) Breen M, Nwanaji-Enwerem JC, Karrasch S, Flexeder C, Schulz H, Waldenberger M, Kunze S, Ollert M, Weidinger S, Colicino E, **Gao X**, Wang C, Shen J, Just AC, Vokonas P, Sparrow D, Hou L, Schwartz J, Baccarelli AA, Peters A, Ward-Caviness CK. Accelerated epigenetic aging as a risk factor for chronic obstructive pulmonary disease and decreased lung function in two prospective cohort studies. *Aging*. 2020. 12(16): 16539-16554. doi: 10.18632/aging.103784.
- 18) Belsky DWW, Caspi A, Arseneault L, Baccarelli A, Corcoran DL, **Gao X**, Hannon E, Harrington HL, Rasmussen LJH, Houts R, Huffman K, Kraus WE, Kwon D, Mill J, Pieper CF, Prinz JA, Poulton R, Schwartz J, Sugden K, Vokonas P, Williams BS, Moffitt TE. Quantification of the pace of biological aging in humans through a blood test, The DunedinPoAm DNA methylation algorithm. *eLife*, 2020; 9:e54870, doi: 10.7554/eLife.54870.
- 19) Nwanaji-Enwerem JC, Colicino E, Specht AJ, **Gao X**, Wang C, Vokonas P, Weisskopf MG, Boyer EW, Baccarelli AA, Schwartz J. Individual species and cumulative mixture relationships of 24-hour urine metal concentrations with DNA methylation age variables in older men. *Environmental Research*, 2020; 186:109573, doi: 10.1016/j.envres.2020.109573.
- 20) Ochoa-Rosales C, Portilla-Fernandez E, Nano J, Wilson R, Lehne B, Mishra PP, **Gao X**, Ghanbari M, Rueda-Ochoa OL, Juvinao-Quintero D, Loh M, Zhang W, Kooner JS, Grabe HJ, Felix SB, Schöttker B, Zhang Y, Gieger C, Müller-Nurasyid M, Heier M, Peters A, Lehtimäki T, Teumer A, Brenner H, Waldenberger M, Ikram MA, van Meurs JBJ, Franco OH, Voortman T, Chambers J, Stricker BH, Muka T. Epigenetic link between Statin therapy and type 2 diabetes. *Diabetes Care*, 2020; 43(4): 875-884; doi: 10.2337/dc19-1828.
- 21) Wang C, Koutrakis P, **Gao X**, Baccarelli AA, Schwartz J. Associations of annual ambient PM_{2.5} components with DNAm PhenoAge acceleration in elderly men: The Normative Aging Study. *Environmental Pollution*,

- 2019; 258:113690, doi: 10.1016/j.envpol.2019.113690.
- 22) Yang Y, **Gao X**, Just AC, Colicino E, Wang C, Coull BA, Hou L, Zheng Y, Vokonas P, Schwartz J, Baccarelli AA. Smoking-related DNA methylation is associated with DNA methylation Phenotypic Age acceleration: the veterans' affairs Normative Aging Study. *International Journal of Environmental Research and Public Health*, 2019; 16(13):2356, doi: 10.3390/ijerph16132356.
 - 23) Schöttker B, Hagen L, Zhang Y, Gao X, Holleczer B, **Gao X**, Brenner H. Serum 25-hydroxyvitamin D levels as an ageing marker. Strong associations with age and all-cause mortality independent from telomere length, epigenetic age acceleration and 8-isoprostane levels. *Journal of Gerontology: Medical Sciences*. 2019; 74(1), 121-128, doi: 10.1093/gerona/gly253.
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 - 27) Jia M, **Gao X**, Zhang Y, Hoffmeister M, Brenner H. Different definitions of CpG island methylator phenotype and outcomes of colorectal cancer: a systematic review. *Clinical Epigenetics*, 2016; 8(1):25. doi: 10.1186/s13148-016-0191-8.

PROJECTS & FUNDINGS

- 1) China National Key R&D Program (2022YFC022451). Investigation on the life course health effect spectrum of air pollution exposure in Chinese residents. 2022.10-2026.03 Key investigator.
- 2) Open Foundation of China CDC Key Laboratory of Environment and Population Health (2022-CKL-03). Effects of chronic exposure to cadmium and arsenic on frailty and DNA methylation mechanisms in the older adults. 2022.01-2023.12. PI.
- 3) NIH R01 (R01ES025225): Circulating microRNAs in Extracellular Vesicles, Air Particulate Pollution, and Lung Function in an Aging Cohort. 2018-2020 Co-investigator.
- 4) NIH R01 (R01ES027747): Air Particulate, Metals, and Cognitive Performance in an Aging Cohort – Roles of Circulating Extracellular Vesicles and Non-coding RNAs. 2018-2020 Co-investigator.
- 5) Fondazione Cariplo (Bando Ricerca Malattie invecchiamento, #2017-0653): The Trithorax and Polycomb group proteins UTX and Ezh2 in the Frailty Syndrome. 2017-2020. Co-investigator.

TEACHING EXPERIENCE

Graduate Courses

| | | | |
|--|-----------|----------------|--------------------|
| “Epigenetics and Environmental Health” | 1 Credit | 2021 – Present | Primary instructor |
| “Advanced Occupational and Environmental Health” | 3 Credits | 2021 – Present | Joint instructor |
| “Clinical Epidemiology and Study Design” | 2 Credits | 2021 – Present | Joint instructor |
| “Public Health Epigenetics” | 3 Credits | 2019 – 2020 | Co-instructor |

Undergraduate Courses

| | | | |
|---------------------------------------|-----------|----------------|--------------------|
| “Epigenetics and Health” | 1 Credit | 2023 – Present | Primary instructor |
| “Environmental Medicine” | 1 Credit | 2021 – Present | Joint instructor |
| “Environmental Health” | 2 Credits | 2021 – Present | Joint instructor |
| “Experiments of Environmental Health” | 1 Credits | 2021 – Present | Joint instructor |

ADVISING EXPERIENCE

| | |
|--|-----------------------|
| Class advisor of Preventive Medicine Class 2020, Peking University, China | 2021 – Present |
| Teaching assistant of workshop “Machine Learning”, Columbia University, USA | 2019 |
| Teaching assistant of workshop “Mendelian Randomization”, Columbia University, USA | 2018 |
| Teaching assistant of workshop “Epigenetics Boot Camp”, Columbia University, USA | 2018 |
| Volunteer, 2016 Epidemiology Congress of the Americas, Miami, USA | 2016 |
| Teaching assistant of course “Development of Modern Microbiology”, Fudan University, China | 2012 |

CONFERENCES & PRESENTATIONS**[Oral] Epidemiology of air pollution and human aging: preliminary findings**

The 7th Conference on Environmental Health Risks and Prevention and Control of New Environmental Pollutants, Zhengzhou, China May 2023

[Oral] Short-term PM_{2.5} exposure and epigenetic aging: a quasi-experimental study

The 7th Conference on Environmental Health Risks and Prevention and Control of New Environmental Pollutants, Zhengzhou, China May 2023

[Oral] Short-term PM_{2.5} exposure and epigenetic aging: a quasi-experimental study

The 7th Asian Congress on Environmental Mutagens, Qingdao, China March 2023

[Oral] Data processing of cardiometabolic multimorbidity and study findings

The 33rd Great Wall International Congress of Cardiology / Asia Heart Society Congress 2022, Online Virtual October 2022

[Oral] Role of sleep quality in the acceleration of biological aging and its potential for preventive interaction on air pollution insults: Findings from the UK Biobank cohort

International Society of Environmental Epidemiology 2022 Conference, Athens, Greece September 2022

[Oral] Preliminary findings on the associations of air pollution with elderly health and relevant interventions

Environment and Health Academic Conference 2021-2022, Lanzhou, China July 2022

[Oral] Short-term air pollution, cognitive performance and nonsteroidal anti-inflammatory drug use in the Veterans Affairs Normative Aging Study

China 27th Conference on Atmospheric Environment Science and Technology, Online Virtual November 2021

[Keynote speaker & Session Chair] Epidemiological findings on environmental aging

China Conference on Environment and Health 2021, Chengdu, China

October 2021

[Keynote speaker] Short-term PM_{2.5} exposure and epigenetic aging: a quasi-experimental study in young healthy adults

Beijing Conference and Exhibition on Instrumental Analysis, Beijing, China

September 2021

[Session chair] Environmental risk factors for chronic kidney disease

International Society of Environmental Epidemiology 2021 Conference, Online Virtual

August 2021

[Oral] Short-term exposure to PM_{2.5} and epigenetic aging: a quasi-experimental study

International Society of Environmental Epidemiology 2021 Conference, Online Virtual

August 2021

[Oral] Blood-based DNA methylation biomarkers for cumulative lead exposure: associations with cardiovascular disease incidence and mortality in the Strong Heart Study

International Society of Environmental Epidemiology 2020 Conference, Online Virtual

August 2020

[Poster] Epigenetic-based mortality risk score and three aging biomarkers: associations with mortality risks among older adult males

Society for Epidemiologic Research 52nd Annual Meeting, Minneapolis, USA

June 2019

[Oral] Tobacco smoking and smoking-related DNA methylation are associated with the development of frailty among older adults

Guanghua Forum of Fudan University, Shanghai, China

December 2017

[Oral] Tobacco smoking and smoking-related DNA methylation are associated with the development of frailty among older adults

2017 World Congress of Epidemiology, Saitama, Japan

August 2017

[Poster] Relationship of tobacco smoking and smoking-related DNA methylation with epigenetic age acceleration

European Molecular Biology Laboratory (EMBL) - Wellcome Genome Campus Conference Big Data in Biology and Health, Heidelberg, Germany

September 2016

[Poster] DNA methylation changes in response to active smoking exposure are associated with leukocyte telomere length among older adults

Ph.D. retreat of German Cancer Research Center, Heidelberg, Germany

July 2016

[Poster] Tobacco smoking and methylation of genes related to lung cancer development

2016 Epidemiology Congress of the Americas, Miami, USA

June 2016

[Poster] DNA methylation changes in response to active smoking exposure are associated with leukocyte

telomere length among older adults

7th General Meeting of German Cancer Research Center Alumni, Heidelberg, Germany

June 2016

[Poster] A Cross-Sectional Study to Measure the Prevalence of Tuberculosis in Two Counties of Western China

4th Global Forum on TB Vaccines, Shanghai, China

April 2015

HONORS & AWARDS

| | |
|--|-------------|
| Teaching awards of junior teachers competition of Peking University | 2021 |
| Ph.D. degree in Epidemiology with the highest honor (Summa cum laude) of Heidelberg University | 2018 |
| Travel grant (\$1500) for 2017 Guanghua Forum of Fudan University | 2017 |
| Travel grant (\$600) for 2016 Epidemiology Congress of the Americas | 2016 |
| Travel grant (€750) for Karolinska Institutet Scientific Course | 2016 |
| Travel grant (\$1000) of National Institutes of Health for 4th Global Forum on TB Vaccines | 2015 |
| Scholarship of China Scholarship Council for Ph.D. program in Germany (3 years, €45,000) | 2014 |
| Merit graduate student (top 10%) of Fudan University | 2014 |
| Second class academic scholarship (top 10%) of Fudan University | 2013 |
| Third class scholarship for freshman (top 20%) of Fudan University | 2011 |
| Third class academic scholarship (top 20%) of Fudan University | 2010 |

ACADEMIC SERVICE

Peer reviewer for Age and Ageing, Aging, Alzheimer's & Dementia, Atmospheric Environment, BMC Genomics, BMC Medicine, BMC Public Health, Chest, Circulation, Clinical Epigenetics, Clinical Gastroenterology and Hepatology, Ecotoxicology and Environmental Safety, Environmental Health Perspectives, Environmental Pollution, Environmental Research, Environment International, Epidemiology, Epigenomics, European Heart Journal, European Journal of Epidemiology, Exposure and Health, Frontiers in Epidemiology, Frontiers in Nutrition, Frontiers in Public Health, Hypertension, Human Genomics, International Journal of Cancer, International Journal of Molecular Sciences, Journal of Neurology, Neurosurgery, and Psychiatry, Maturitas, National Medical Journal of China, Nature Aging, Nutrients, Science of the Total Environment, Scientific Reports

Member of the International Society for Environmental Epidemiology, Society for Epidemiologic Research, International Epidemiological Association, Cancer Epigenetic Society, Chinese Environmental Mutagen Society, Chinese Society for Environmental Sciences

Editorial members of The Innovation, Current Environmental Health Reports, and Frontiers in Epidemiology

Committee member of the International Society of Environmental Epidemiology (communication committee)

ABILITIES & SKILLS

-
- Profound biostatistical analytical skill for real-world data and multi-omics data, data visualization skill
 - Proficiency in SAS (Officially certified), R, Python, SPSS, STATA, Microsoft Office, Adobe suit

- Familiar with Illumina EPIC/450K methylation array, RT-PCR, Sequencing, VNTR genotyping, GeneXpert, ArcGIS

LANGUAGES

- Mandarin (Native)
- English (Professional proficiency)
- German (Basic)