YIXUAN HE

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- **Research interests:** Leverage statistical and computational methods in diverse multi-omics data to better understand and predict complex human diseases.

ACADEMIC POSITIONS

Tenure-track Assistant Professor — 2025 – present
Human Genetics Center
Department of Epidemiology
University of Texas Health Science Center School of Public Health
Houston, TX

EDUCATION & TRAINING

DARTMOUTH COLLEGE, Hanover, NH — 2014 - 2018
Bachelor of Arts: *magna cum laude* — Mathematics
Advisor: Dorothy Wallace, Ph.D. — Biology, with high honors

HARVARD MEDICAL SCHOOL, Boston, MA — 2018 – 2022
Doctor of Philosophy — Bioinformatics and Integrative Genomics
Advisor: Chirag Patel, Ph.D.

BROAD INSTITUTE, Cambridge, MA — 2022 – 2024
Research Fellow, Massachusetts General Hospital
Analytical and Translational Genetics Unit
Primary advisor: Alicia Martin, Ph.D.
Secondary advisor: Alexander Gusev, Ph.D.

MASSACHUSETTS GENERAL HOSPITAL, Boston, MA — 2023 – 2024
NIH Precision and Genomic Medicine T32 Fellow
Center for Genomic Medicine
Directors: Jordan Smoller, MD, ScD, Heidi Rehm, PhD, FACMG

AWARDS

ASHG Trainee Research Excellence Awards (Semi-finalist), American Society of Human Genetics — 2024
Early Career Investigator Program (ECIP) Award, World Congress of Psychiatric Genetics — 2024
Eliana Hechter Memorial Prize, The Broad Institute — 2023
"Reviewers' Choice" Award (Top 10%), American Society of Human Genetics — 2023
Early Career Researcher Award, Cohorts for Heart and Aging Research in Genomic Epidemiology (CHARGE) Consortium — 2022
Early Career Researcher Scholarship, International Conference in Quantitative Genomics — 2020
"Reviewers' Choice" Award (Top 10%), American Society of Human Genetics — 2020
Epstein Award (Semi-finalist), American Society of Human Genetics — 2020

UK Biobank Early-Career Researcher of the Year (Semi-finalist), UK Biobank 2019

Program in Quantitative Genomics (PQG) Student/Postdoc Travel Fund, Harvard School of Public Health 2019

Travel Fund, Harvard Medical School 2018

Christopher G. Reed Biologist Award, Dartmouth College Biology Department 2018

MAA Outstanding Presentation Award (Top 5%), Mathematical Association of America Mathfest 2017

Rufus Choate Scholar (Top 5% GPA), Dartmouth College 2017

First Place AWM Essay Contest, American Women in Mathematics Association, Math for America 2017

Mathematics Department Poster Award (1st place), Dartmouth College. 2016

Wetterhahn Library Research Award, Dartmouth College 2016

James O. Freedman Presidential Scholar, Dartmouth College 2016

GRANTS |

Mass General Brigham (MGB) Precision and Genomic Medicine Training Grant $56,880 2023–24
T32; 5T32HG010464, PI: Jordan Smoller, Heidi Rehm

NSF Graduate Research Fellowship Program $102,000 2020–22

NHGRI Institutional National Training Grant $73,464 2018–20
T32; 5T32HG002295-17, PI: Peter Park

AWS Cloud Credits, Amazon Web Services Research Grants $2000 2018
Support for research through AWS promotional credits applicable to AWS services

Student Experiential Learning Fund, Center for Professional Development and the Dartmouth Center for the Advancement of Learning $5000 2017
Fund to support "students' skill, confidence, and capacity building through unpaid or low-paid, intentional experiences"

Hellman Family Foundation Research Grant, Dartmouth College $5,200 2017
Support for full-time leave term research given to "projects in which students are intellectually engaged and playing a key role in the project"

Neukom Travel Grant, William H. Neukom Institute for Computational Science $1,000 2017
Awarded to "excellent and deserving proposals" to students who presenting their research at conferences, workshops, or symposia

Rockefeller Mini Grant, Nelson A. Rockefeller Center for Public Policy and the Social Sciences $300 2017

PUBLICATIONS |

**Denotes co-primary authorship*

He Y, Lu W, Jee YH, Wang Y, Tsuo K, Qian DC, Diao JA, Huang H, Patel CJ, Byun J, Pasaniuc B, Atkinson EG, Amos, CI, Moll M, Cho MH, Martin "Multi-trait and multi-ancestry genetic analysis of comorbid lung diseases and traits improves genetic discovery and polygenic risk prediction". *Nature Genetics* (under revisions). DOI: 10.1101/2024.08.25.24312558

He Y*, Groha S*, Taraszka K*, Lakhani CM, Braunstein L, Foulkes W, Polak P, King D, Tell R, White K, Zaitlen N, Patel CJ, Gusev A. "Genetic Ancestry and Population Differences in Somatic Alterations and Clinical Outcomes for Five Common Cancers". *Nature Genetics*. (under revision)

Choi KW*, Tubbs J*, Lee H, **He Y**, Tsuo K, Yohannes M, Madsen E, Ghimire D, Hermosilla S, Ge T, Martin AR, Axinn W, Smoller JW. "Genetic Architecture and Socio-Environmental Risk Factors for Major Depressive Disorder in Nepal". *Psychological Medicine* (2024) DOI: 10.1017/S0033291724001284

Diao JA, **He Y**, Khazanchi R, Tiako MJN, Witonsky JI, Pierson E, Rajpurkar P, Elhawary JR, Melas-Kyriazi L, Yen A, Martin AR, Levy S, Patel CJ, Farhat M, Borrell LN, Cho M, Silverman EK, Burchard EG, Manrai AK. "Implications of

Race Adjustment in Lung Function Equations". *New England Journal of Medicine* (2024) DOI: 10.1056/NEJMsa2311809

Wang Y*, **He Y***, Shi Y, Qian DC, Gray KJ, Winn R, Martin AR "Boldly aspiring towards equitable benefits from genomic advances to individuals of ancestrally diverse backgrounds". *The American Journal of Human Genetics* (2024) DOI: 10.1016/j.ajhg.2024.04.002

Ciobanu O, **He Y**, Martin AR, Remick JS, Shelton JW, Eng TY, Qian CQ. "Patterns of under- and over-treatment in adjuvant radiotherapy for early-stage endometrial cancer based on molecular classification". *JAMA Oncology* (2024) DOI:10.1001/jamaoncol.2024.0104.

He Y, Martin AR. "We need more-diverse biobanks to improve behavioural genetics". *Nature Human Behavior* (2023). DOI: https://doi.org/10.1038/s41562-0D23-01795-3

He Y, Qian DC, Diao JA, Cho MH, Silverman EK, Gusev A, Manrai AK, Martin AR, Patel CJ "Prediction and stratification of longitudinal risk for chronic obstructive pulmonary disease across smoking behaviors". *Nature Communications* (2023). DOI: 10.1038/s41467-023-44047-8

He Y, Patel CJ. "Software Application Profile: PXStools -- an R package of tools for conducting exposure-wide analysis and deriving polyexposure risk scores". *International Journal of Epidemiology* (2022). DOI: 10.1093/ije/dyac216

He Y, Patel CJ. "Polygenic and polyexposure risks of type 2 diabetes predict chronic conditions in participants of the UK Biobank". *Acta Diabetologica* (2022). DOI: 10.1007/s00592-022-01864-5

He Y, Lakhani CM, Rasooly D, Manrai AK, Tzoulaki I, Patel CJ. "Comparisons of Polyexposure, Polygenic, and Clinical Risk Scores in Risk Prediction of Type 2 Diabetes". *Diabetes Care* (2020) DOI: 10.2337/dc20-2049

Tierney BT, **He Y**, Church GM, Segal E, Kostic AD, Patel CJ. "The Predictive Power of the Microbiome Exceeds That of Genome-Wide Association Studies in the Discrimination of Complex Human Disease". *bioRxiv* (2020). DOI: 10.1101/2019.12.31.891978

He Y, Kodali A, Wallace DI. "Predictive Modeling of Neuroblastoma Growth Dynamics in Xenograft Model after Anti-VEGF Therapy". *Bulletin of Mathematical Biology* (2018). DOI: 10.1007/s11538-018-0441-3

Qian DC, Jin JL, Titus AJ, **He Y**, Vaissié M, Li Y, Molfese DL, Salas R, Amos CI. "Genome-wide imaging association study implicates functional activity and glial homeostasis of the caudate in smoking addiction". *BMC Genomics* (2017). DOI: 10.1186/s12864-017-4124-5

PRESENTATIONS

INVITED TALKS

Festival of Genomics & Biodata; Boston, MA 06/2024
"Integration of polygenic risk scores with social health for precision medicine"

Feigin Rising Stars Symposium, Baylor College of Medicine; Houston, TX 01/2024
"Big data for precision medicine: an integrative gene & environment approach in global biobanks"

Center for Genomic Medicine Seminar Series, Massachusetts General Hospital; Boston, MA 11/2023
"Comprehensive analyses of genetic and environmental factors in global biobanks"

Faculty Retirement Conference, Dartmouth College; Hanover, NH 06/2023
"Prediction and stratification of disease risk through integrative multi-omics analysis of global biobanks"

SELECTED PLATFORM SPEAKER

ASHG Annual Meeting, Denver, CO 11/2024
"Multi-trait and multi-ancestry genetic analysis of comorbid lung diseases and traits improves genetic discovery and polygenic risk prediction"
He Y, Lu W, Jee YH, Wang Y, Tsuo K, Moll M, Cho MH, Martin AR

7th International Conference of Quantitative Genomics (ICQG7) 07/2024

"Multi-trait and multi-ancestry polygenic risk score approach improves genetic discovery and risk prediction of respiratory diseases"

He Y, Lu W, Jee YH, Wang Y, Tsuo K, Moll M, Cho MH, Martin AR

STATGEN 2024: Conference on Statistics in Genomics and Genetics; Pittsburgh, PA 05/2024

"Multi-trait and multi-ancestry prediction of respiratory diseases".

He Y, Wang Y, Jee YH, Y Matthew M, Tsuo K, Cho MH, Martin AR

IGES Annual Meeting; Paris, France 08/2022

"Polyexposure risk score offers greater predictive performance for COPD than polygenic score or smoking"

He Y, Patel CJ

ASHG Annual Meeting, Virtual 10/2020

"Comparisons of Polyexposure, Polygenic, and Clinical Risk Scores in Risk Prediction of Type 2 Diabetes"

He Y, Lakhani CM, Rasooly D, Manrai AK, Tzoulaki I, Patel CJ

UK Biobank Annual Meeting; London, UK 07/2019

"Poly-Exposure Scores for Disease Prediction"

He Y, Lakhani CM, Manrai AK, Patel CJ

NHGRI Research Training and Career Development Meeting; St. Louis, MO 04/2019

"Poly-Exposure Scores for Disease Prediction"

He Y, Lakhani CM, Manrai AK, Patel CJ

Society for Industrial and Applied Mathematics (SIAM) Annual Meeting; Pittsburgh, PA 06/2017

"Mathematical Model of Tumor Growth *In Vivo*"

He Y, Kodali A, Wallace, DI

POSTER PRESENTATIONS

Symposium in Artificial Intelligence for Learning Health Systems; Puerto Rico. 05/2024

"SBG-LUNG: Integrating raw spirogram, blood markers, and genetic data in a hybrid learning model for lung cancer prediction"

He Y, Diao JA, Martin AR, Manrai AK, Qian DC, Patel CJ

American Human Genetics Conference; Washington, D.C. 11/2023

"Comprehensive polygenic prediction of respiratory diseases: a cross biobank multi-trait and multi-ancestry approach"

He Y, Wang Y, Tsuo K, Martin AR

European Human Genetics Conference; Glasgow, Scotland, UK 06/2023

"Socioeconomic and environmental risk assessment of chronic obstructive pulmonary disease across smoking behaviors and populations"

He Y, Martin AR, Patel CJ

CHARGE Annual Meeting; Philadelphia, PA 04/2022

"PXStools: an R package for conducting exposure-wide analysis and deriving polyexposure risk scores"

He Y, Patel CJ

American Society of Human Genetics Annual Meeting; Houston, TX 10/2018

"Genetic Ancestry Differences in Oncogenic Mutations and Driver Genes"

He Y, Gusev A

TEACHING

COURSE DEVELOPMENT

Curriculum that I have designed (lectures, problems sets, etc.) and taught

Global Initiative for Neuropsychiatric Genetics Education in Research (GINGER) 2023

Member of the core teaching team at GINGER which aims to build neuropsychiatric genetics research capacity in low and middle- income countries. Designed and recorded lectures on fundamental of genome wide association studies and polygenic risk scores.

Topics in Translational Biomedical Informatics (BMI 722) Tutorials 2019 F, 2020 F

Harvard Medical School

Designed and led introductory sessions for using R and Python to supplement students taking BMI 722. Constructed and graded homework for coding tutorials.

GUEST LECTURES

Invited lecturer

BMI 704: Data Science for Medical Decision Making, Harvard Medical School 2021

Lecture on the principals of constructing environmental risk score for disease prediction.

BMI 722: Topics in Translational Biomedical Informatics, Harvard Medical School 2020

Introductory lecture on how to conduct genetic-enviroment interaction studies.

Medlytics: Data Science for Health and Medicine, MIT Beaverworks Summer Institute 2019

Overview of current research in biomedical data science, especially research applications in healthcare.

TEACHING SUPPORT

Designed / graded problem sets, led office hours and discussion sections

BMI 704: Data Science for Medical Decision Making, Harvard Medical School 2020 S, 2021 S

Head TA for 2021: managed team of 3 teaching fellows

BMI 722: Topics in Translational Biomedical Informatics, Harvard Medical School 2019 – 2021 F

Head TA for 2020, 2021: managed team of 3-4 teaching fellows

BMI 706: Data Visualization, Harvard Medical School 2021 S

High Impact Cancer Research Postgraduate Certificate Program, Harvard Medical School 2019 – 2020

Member of the teaching support team for a year-long program on cancer research for >50 students across the world

Biology 2: Human Biology, Dartmouth College 2017 F

Biology 13: Genetics, Dartmouth College 2016 F

Learning fellow: received extensive training in teaching, learning, and pedagogy as well as strategies for assisting with cooperative learning in the classroom

TUTORING

Peer Tutor, Tutor Clearinghouse, Dartmouth College 2014 – 2017

Provided one-on-one peer tutoring for over 15 students in: Multivariable Calculus, Genetics, General Chemistry, Mathematical Biology

RESEARCH

Natalia Morado-Mata (current undergraduate student at The University of Texas at San Antonio)

Aashna Shah (current PhD student at Harvard University)

Faith Adams (current PhD student at Icahn School of Medicine)

Pauline Gabrieli, while as a master's student at Harvard University (current medical student at Harvard Medical School)

MENTORSHIP

Lily Wang, while as an PhD student at Harvard University (through DBMI) 2021

Andrea Liu, while as an undergraduate student at Harvard University (through WiSTEM) 2020

Jena Lorman, while as an undergraduate student at Harvard University (through WiSTEM) 2019

Theia Qu, while as an undergraduate4 student at Dartmouth College (through WISP) 2017-2018

Paula Mendoza, while as an undergraduate student at Dartmouth College (through WISP) 2016-2018

SERVICE |

***Ad-Hoc* Reviewer** *Genome Biology* 2025

***Ad-Hoc* Reviewer**	*New England Journal of Medicine AI*	2024
***Ad-Hoc* Reviewer**	*Journal of Translational Medicine*	2023
***Ad-Hoc* Reviewer**	*Diabetes Care*	2022
***Ad-Hoc* Reviewer**	*Acta Diabetologica*	2021
***Ad-Hoc* Reviewer**	*Diabetologia*	2021
***Ad-Hoc* Reviewer**	*European Heart Journal*	2021
Panelist	Harvard DBMI SIBMI Trainee Workshop	2020, 2021
Program Representative	Harvard Medical School and Harvard Medical Visiting Committee	2021
Program Representative	Harvard Integrative Life Sciences welcome event	2020
Co-Chair	Harvard Graduate Women in Science (HGWISE) mentoring program	2019 – 2021
Organizer	Monthly Research Seminar, Program in Bioinformatics and Integrative Genomics, Harvard Medical School	2019 – 2020
Planning Committee	Annual Retreat, Program in Bioinformatics and Integrative Genomics, Harvard Medical School	2019
Invited Panelist	Graduate Student Panel, Program in Bioinformatics and Integrative Genomics, Harvard Medical School	2019
Planning Committee	PhD Student Admissions Events, Program in Bioinformatics and Integrative Genomics, Harvard Medical School	2018 – 2019

AFFILIATIONS

Associate, Program in Quantitative Genomics	2018 – 2022
Member, Landry Cancer Biology Consortium	2018 – 2022
Member, Association for Women in Mathematics	2016 – 2018
Member, Gamma Sigma Alpha National Academic Greek Honor Society	2016 – 2018