Heather M. Highland, Ph.D.

EDUCATION

2015	Ph.D., Human and Molecular Genetics, The University of Texas MD Anderson Cancer Center, UTHealth Houston Graduate School of Biomedical Sciences. Advisor: Craig L. Hanis
2007	B.S., Biology, Trinity University, Graduated *Cum Laude*

PROFESSIONAL EXPERIENCE

2025-present	Research Assistant Professor, UTHealth Houston School of Public Health - Brownsville campus.
2025-present	Adjunct Faculty, Professor, University of North Carolina, Department of Epidemiology
2020-2025	Research Assistant Professor, University of North Carolina, Department of Epidemiology
2019-present	Statistical Editor, American Heart Association, *Circulation Research*
2015-2020	Postdoctoral Fellow, University of North Carolina, Department of Epidemiology
2007-2015	Graduate Research Assistant, Human Genetics Center, School of Public Health, University of Texas Health Science Center at Houston.
2006	Undergraduate Research Fellow, Trinity University
2004-2007	Teaching assistant for introductory biology labs, Trinity University
2005	Undergraduate Research Fellow, Institute of Biotechnology, University of Texas Health Science Center San Antonio

HONORS

American Diabetes Association Postdoctoral Fellowship, 2019-2020
NHLBI Genetic Epidemiology of Heart, Lung, and Blood Traits training grant, 2018
Top 10% of accepted abstracts, American Society of Human Genetics, 2017, 2018
Top 10% of accepted abstracts, American Heart Association EPI/Lifestyle, 2016
Semifinalist for Charles J. Epstein Trainee Award for Excellence in Human Genetics Research, American Society of Human Genetics, 2015
NHLBI Cardiovascular Disease Training Grant, 2015-2018
Burroughs Wellcome Training Program in Gene-Environment Interaction, 2010-2012
Outstanding Poster, Annual Human and Molecular Genetics Symposium University of Texas Health Science Center Houston, 2011, 2012, 2013
Outstanding Poster, 32nd West Coast Biological Sciences Undergraduate Research Conference, 2007
Jacob Uhrich departmental merit scholarship, Trinity University Department of Biology, 2006-2007

MEMBERSHIPS

American Society of Human Genetics
American Heart Association
American Diabetes Association
American Society of Nephrology
International Genetic Epidemiology Society

BIBLIOGRAPHY AND PRODUCTS OF SCHOLARSHIP

REFEREED PAPERS/ARTICLES (SHOW AUTHOR ORDER AND INCLUDE PAGES FOR ALL PUBLISHED, IN PRESS, SUBMITTED, ETC.)

* indicates authors contributed equally to this work
^ indicated trainee mentored for this work
107 publications, 7 other scholarly products

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3. Krishnan M^, Rushing BR, Howard AG, **Highland HM**, Buchanan VL^, Okello S, Tu Y, Liu S, Du X, McRitchie SL, Fornage M, Lewis CE, Reis JP, Sumner SJ, Avery CL, Gordon-Larsen P, Graff M, North KE. Integration of metabolomic and genetic data reveals novel variants underpinning the human metabolome: the Coronary Artery Risk Development in Young Adults (CARDIA) study. *medRxiv*. 2026; *Jan 30. doi: 10.64898/2026.01.28.26344965
4. Shrestha P, Graff M, Gu Y, Wang Y, Ahn HS, Nguyen KN, Khanna A, Avery CL, **Highland HM**, Ginnis J, Simancas-Pallares MA, Ferreira Zandona AG, Alotaibi RN, Lin DY, Preisser JS, Slade GD, Marazita ML, North KE, Divaris K. Genomic basis of developmental defects of enamel and sex-specific effects. *medRxiv*. 2026; Jul 10. doi: 10.64898/2026.07.06.26355672, under review
5. Wang H, Nagarajan P, Miller CL, Bentley AR, Noordam R, Westerman KE, Brown MR, Kraja AT, O'Connell JR, Schwander K, Li C, Sanghvi MM, Song Y, Bartz TM, Braunack-Mayer V, Chen L, Du J, Dunca D, Feitosa MF, Gudmundsdottir V, Guo X, Harris SE,

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106. Shalev SA, Tenenbaum-Rakover Y, Horovitz Y, Paz VP, Ye H, Carmody D, **Highland HM**, Boerwinkle E, Hanis CL, Muzny DM, Gibbs RA, Bell GI, Philipson LH, Greeley SA. Microcephaly, epilepsy, and neonatal diabetes due to compound heterozygous mutations in IER3IP1: insights into the natural history of a rare disorder. *Pediatr Diabetes*. 2014; May; 15:252-256. doi: 10.1111/pedi.12086
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Refereed Other Products of Scholarship

1. **Highland HM,** Sanchez-Roige S, Im HK. Invited session co-chair. “Cross-ancestry genomic research: Time to bridge the gap” American Society of Human Genetics, 2021 October; virtual.
2. **Highland HM**, Wessel J and Manning A. 30-OR: Whole Genome Sequence Analysis of Type 2 Diabetes Risk in 44,713 Humans of Diverse Ancestry in the TOPMed Study. *Diabetes*. 2019;68:30-OR. https://diabetes.diabetesjournals.org/content/68/Supplement_1/30-OR
3. **Highland HM**. Invited Session Chair. “Diversity Matters: Scientific and Ethical Strategies for Achieving Representation in Genomics.” American Society of Human Genetics; 2017 October; Orlando, FL.
4. **Highland HM**, Stitlani CM, Seyerle AA, Gondalia R, Graff M, Avery CL and North KE. Pleiotropic effects on BMI, WHR, fasting glucose, and fasting insulin levels. Paper presented at: American Society of Human Genetics; 2016. https://www.ashg.org/wp-content/uploads/2019/10/2016-plenary_platform_abstracts.pdf
5. **Highland HM**, Turcot V, Lu Y, Young KL, Wang J, Lenzini P, Graff M, Cupples AL, Frayling TM, Hirschhorn J, Lettre G, North KE, Borecki IB and Loos RJF. ExomeChip meta-analysis of

526,508 individuals from five ancestries identifies novel coding variation associated with body mass index. Paper presented at: American Society of Human Genetics; 2015; Baltimore, MD. https://www.ashg.org/wp-content/uploads/2019/10/2015-platform-abstracts-min.pdf

6. **Highland HM**, Manning AK, Sim X, Im HK, Mahajan A, Rivas MA, Locke AE, Grarup N, Ng HJ, Fontanillas P, Morris AP, Tesolvich TM, Flannick JA, Fuchsberger C, Gaulton KJ, Kang HM, Gloyn AL, Meigs JB, Lindgren CM, Consortium TDG and Go TDC. Exome Sequencing and Exome Chip Genotyping to Understand the Role of Coding Variation in Glycemic Trait. Paper presented at: American Diabetes Association; 2014; San Francisco, CA. https://diabetes.diabetesjournals.org/content/63/Supplement_1
7. **Highland HM**, Sim X, Manning A, Rivas MA, Atzmon G, Choi S, Cornes BK, Dupuis J, Florez JC, Fontanillas P, Frayling TM, Gamazon ER, Huh IS, Im HK, Kim J, Kim YJ, Lindgren CM, Locke A, Meigs JB, Morris AP, Palmer N, Prokopenko I, Teslovich TM and Consortium TD-G. The impact of genetic variation on diabetes-related quantitative traits from whole exome sequences: The T2D-GENES Consortium. Paper presented at: American Society of Human Genetics; 2012; San Francisco, CA. https://www.ashg.org/wp-content/uploads/2019/10/2012-platform-abstracts.pdf

Other Invited Talks

1. **Highland HM**, Graff M, Below JE. Education Workshop: Multi-omics Data Integration. International Genetic Epidemiology Society Meeting. November 5, 2023.
2. **Highland HM**. A multi-omics approach to understanding the role of APOL1 in CKD amongst African Ancestry individuals. University of Tennessee Health Science Center, Department of Biostatistics. October 17, 2022.

Digital and Other Novel Forms of Scholarship

1. **Highland HM**. Importance of Diversity in Science. ASHG TV Interview. October 20, 2018. https://www.youtube.com/watch?v=UTcq6e_UaPU
2. **Highland HM**, Nickerson ML. Leveraging NGS Data to Unlock the Biological Mysteries in Cancer and Diabetes. The Scientist, webinar: April 25, 2013.

Thesis/Dissertation

1. **Highland HM**. Genetics of Obesity in Starr County, Texas Mexican Americans. *Human and Molecular Genetics*. 2015;Ph.D.

Teaching Activities

University of North Carolina

- Course designer and co-primary lecturer, EPID 889 “Topics in Epidemiology”, Fall 2021, Spring 2022, Spring 2023, Spring 2024

    - This course teaches hands on genetic data analysis methodologies providing examples and troubleshooting advice
- Lecturer, lecture on transcriptomic imputation, EPID 889 “Topics in Epidemiology”, 2020
- Lecturer, two to three lectures, EPID 743 “Genetic Epidemiology”, 2016-present
- Lecturer, one lecture on 1000 Genomes and TOPMed projects, BCB 723, “Topics in Statistical Genetics and Genomics”, 2018-present

UTHealth Houston

- Lecturer, a lecture on obesity genetics, Genetic Epidemiology of Chronic Diseases, 2010-2015

Student Mentoring

2025-present Deep Shah. UTHealth Houston, Ph.D. student in Epidemiology. I am on his committee and mentor him with Kari North.

2025-present Ramiro Garza. UTHealth Houston, MPH. student in Epidemiology. I am on his committee and meet with him weekly.

2025-present Harinee Yerra. UTHealth Houston, MPH. student in Epidemiology. I am on her committee and meet with her weekly.

2025-present Yukun Yang. UTHealth Houston, Ph.D. student in Biostatistics.

2024-present Rashedeh Roshani. Vanderbilt University, Ph.D. student in Human Genetics. I serve on her dissertation committee and have mentored her in analyses and writing.

2023-present Elizabeth Frankel. Vanderbilt University, Ph.D. student in Human Genetics. I mentor her on analytical methods, biological contextualization, writing, and soft skills of collaborative science. I am co-senior author on her dissertation papers.

2024 Ballard, Christine. University of North Carolina, Ph.D. Student in Epidemiology. I am supervised a practicum, analyzing metabolic traits in pediatric samples from Cameron County, TX.

2023-2025 Qi, Baiyu. University of North Carolina, Ph.D. Student in Epidemiology. I am a dissertation committee member and oversee her genetic analyses.

2022-2023 Okello, Samson. University of North Carolina, Ph.D. Student in Epidemiology. I oversaw a practicum, doing quality control analyses of a genetic dataset.

2022-2023 Pleasants, Hannah. Elon University, undergraduate in public health. I am co-mentoring Hannah on a project looking at the social determinants of health on diabetes in Mexican Americans from Cameron County, Texas.

2021-2025 Yang, Peter. University of North Carolina, Ph.D. Student in Epidemiology. I am co-mentoring a new Ph.D. student. As PAGE diabetes working group co-chair I am fostering his involvement in the development of a type 1 diabetes project that extends his prior work to new scientific questions in additional datasets.

2021-2022 Memili, Aylin. University of North Carolina, M.S. Student in Nutrition. I mentor this student, helping with analytical challenges, life balance, and preparing her for a platform presentation at a national meeting.

2021-2023 Li, Yilun. University of North Carolina, Ph.D. Student in Biostatistics. I helped with teaching investigation and accounting for the biological implications of his analyses. I was a member of his dissertation committee.

2021-2024 Krishnan, Mohanraj. University of North Carolina, postdoctoral fellow in Epidemiology. I meet weekly with this trainee to assess his progress and foster development of his projects integrating genomics and untargeted metabolomics.

2021-2025 Zhang, Xinruo "Alice". University of North Carolina, Ph.D. Student in Epidemiology. I supervise Alice's involvement with many collaborative projects in the PAGE and TOPMed consortium. I am a member of her dissertation committee.

2020-2023 Buchanan, Victoria. University of North Carolina, Ph.D. Student in Epidemiology. I've long held a working relationship with Victoria. She often seeks my advice of analytical challenges. I am a member of her dissertation committee.

2019-2023 Baldassari, Antione. University of North Carolina, Ph.D. Student in Epidemiology. I meet with this student weekly to ensure progress in his dissertation proposal.

2019-2023 Downie, Carolina. University of North Carolina, Ph.D. Student in Epidemiology. I co-mentor Miss Downie with her primary mentor Dr. Christy Avery. I co-authored a paper with Miss Downie on the genetics of glycemic traits in ancestrally diverse populations.

2019-2021 Dimos, Sofia University of North Carolina, undergraduate in computer science. With my oversight, Sofia has set up an analytical pipeline for genetic analysis using SUGEN. Miss Dimos developed the ability translate ideas into analytical tools.

2016-2019 Lin, Bridget. University of North Carolina, Ph.D. Student in Biostatistics. With my oversight, an analytical pipeline using GENESIS was set up for analysis of the HCHS/SOL genetic data.

2015-present I am available to all trainees in the CVD Epidemiology group for mentorship, analytical troubleshooting, and time/life management. As co-leader of the instructional modules with Dr. Mariaelisa Graff, students become comfortable reaching out to me for hands on help. Outside of standing meetings, I generally have several emails and have at least one Zoom session per week to help students with analytical challenges.

GRANTS

Project# 1R01-DE034410 Shaffer NIDCR 08/14/2025-05/31/2028
Title: Advancing the Genomics Knowledge Base for Oral Diseases
Description: To identify the genetic underpinnings of periodontal and related oral diseases.
Total costs: $308,852 Role: Co-I

Project# 1U54AG089326 NIH 02/01/2025-01/01/2030
Title: The Vanderbilt-coordinated human Virome Collaborative Center (V2C2)
Description: Total costs: Role: Co-I

Project# 1R01EY036258 Padovani-Claudio NIH 09/01/2024-04/01/2029
Title: Integrative multi-omics for discovery of molecular pathways associated with diabetic retinopathy
Description: Total costs: Role: Co-I

Project# 5U01CA288325 McCormick NCI/NHGRI 09/01/2023-08/31/2028
Title: Multi-omics for obesity-associated liver disease in a high-risk population cohort
Description: Total costs: Role: Co-I

Project # R01-DK116028 Sotres-Alvarez NIDDK 07/01/2023-06/30/2024
Title: Preconceptional health of Latinas and its association with child adiposity
Description: Total costs $ Role: Co-I

Project # 0001164014 Kooperberg NHGRI 08/01/2022-07/31/2023
Title: Polygenic Risk Scores for Diverse Populations Bridging Research and Clinical Care
Description: In this third phase of the PAGE study, we will continue to focus on improving improve the performance of polygenic risk scores for ancestrally diverse populations. Total costs (UNC-subaward) $ Role: Co-I

Project # R01HG010297 Matise NHGRI 06/15/2019-03/31/2024
Title: PAGE III: Population Architecture using Genomics and Epidemiology
Description: In this third phase of the PAGE study, we will continue to focus on improving our understanding of the genetic underpinnings of common complex diseases in ancestrally diverse populations. Total costs (UNC-subaward) $900,238 Role: Co-I

Project # R01HL143885 Gordon-Larsen NHLBI 04/01/2010-03/31/2025
Title : Leveraging multi-omics approaches to examine metabolic challenges of obesity in relation to cardiovascular diseases
Description: This project will assess the role of metabolomics as both a cause and consequence of CVD risk factors within the CARDIA study. Total costs: $8,894,348 Role: Co-I

Project # R01HL147853 Avery NHLBI 01/01/2020-12/31/2024
Title: Inflammatory mediators of cardiometabolic risk in Latinos
Description: This grant will measure eicosanoid metabolites in HCHS/SOL participants and examine their association with diabetes and cardiometabolic risk factors. Total costs: $3,875,000. Role: Co-I

Project # R01HL142825 Avery NHLBI 02/10/2019-01/31/2025
Title: Characterizing pleiotropy in cardiometabolic phenotypes among diverse populations

Description: This study will examine the role of shared genetic effects in the etiology of cardiometabolic traits that span blood pressure, glucose, obesity, electrocardiographic, and lipid measurements. Role: Co-I

Project #1-19-PDF-045 Highland ADA 01/01/2019-12/31/2020
Title: Identification of pleiotropic loci affecting type 2 diabetes, adiposity, and renal disease
Description: This study will examine the role of shared genetic effects in the etiology of diabetes related traits including glycemic, adiposity, and kidney function traits. Role: PI

NIH Loan Repayment Program Highland NHGRI 07/01/2017-06/30/2021
Title: Characterizing pleiotropy in cardiometabolic phenotypes among diverse populations
Description: This grant pays back my student loans while I continue to conduct qualifying research at nonprofit or of US government entity. Role: PI

Project #: 2R01HD057194-06 Gordon-Larsen, North NICHD 01/1/2008-06/30/2019
Title: Exome Variants Underlying Weight Gain from Adolescence to Adulthood
Description: This project will examine gene-by-environment interactions on trajectories of weight gain from adolescence to young adulthood. Role: Analyst

SERVICE

Department

2026-	IT Committee, UTHealth SPH
2018-2019	Peer Led Organizer, Cardiovascular Epidemiology group, University of North Carolina
2016-2018	Journal Club Organizer, Genetic Epidemiology Journal Club, University of North Carolina
2020-present	Organize and lead hands on instructional modules training students and postdoctoral fellows in using field specific analytical software
2023-2024	Organize and lead cardiovascular disease journal club.

School

2012-2014	Member of Recruitment Council, University of Texas Health Science Center at Houston, Graduate School of Biomedical Sciences

Professional Service

2026	Grant reviewer for Singapore's Research Grants
2022	Grant reviewer for Vanderbilt Diabetes Research and Training Center (DRTC) Discovery Pilot and Feasibility Project
2022	American Society of Human Genetics meeting abstract reviewer

2022 Grant Peer Reviewer Medical Research Council UKRI
2022 American Diabetes Association meeting abstract reviewer
2019-present Statistical Editor for *Circulation Research*
2016 Participant in American Society of Human Genetics public policy focus group

I have served as a peer reviewer for numerous journals including:

- Nature Communications
- Circulation
- Cell Genomics
- Genes & Genomics
- Scientific Reports
- European Journal of Human Genetics
- American Journal of Human Genetics
- Nature Genetics
- Human Genetics
- Proceedings of the National Academy of Sciences
- Genetic Epidemiology
- GENE
- G3-Genes Genomes Genetics
- Diabetologia
- Annals of Human Biology
- EBioMedicine