

Kenneth Westerman, Ph.D.

Curriculum Vitae

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EDUCATION

Tufts Friedman School of Nutrition Science and Policy, Boston, MA

Sep 2014 - Aug 2019

Ph.D. in Biochemical & Molecular Nutrition

Tufts Friedman School of Nutrition Science and Policy, Boston, MA (2014 - 2016)

Sep 2014 - May 2016

M.S. in Biochemical & Molecular Nutrition, with concentration in Systems Genomics

Tufts University, Medford, MA (2010 - 2014)

Sep 2010 - May 2014

B.S. in Chemical Engineering – *Magna cum laude*

RESEARCH EXPERIENCE

Postdoctoral Fellow

Massachusetts General Hospital and Harvard Medical School, Boston, MA

Broad Institute, Cambridge, MA

Sep 2019 - present

Advisor: Alisa K. Manning

Develop and test methods for gene-environment interaction testing in large-scale datasets. Investigate gene-diet interactions in large consortia and biobanks including TOPMed and the UK Biobank.

Doctoral Thesis

JM-USDA Human Nutrition Research Center on Aging at Tufts University, Boston, MA

Oct 2016 - Aug 2019

Thesis: Integration of genomics, epigenomics, and diet for cardiovascular risk prediction

Advisor: José M. Ordovás

Carried out a module-based epigenome-wide association study of DNA methylation and incident cardiovascular disease, and extended this work to assemble multi-cohort predictive models for cardiovascular risk. Evaluated dietary fat response prediction based on genome-wide gene-diet interactions impacting cardiometabolic risk factors.

Graduate Directed Study

JM-USDA HNRCA at Tufts University, Boston, MA

Jan 2015 - Dec 2018

Developed a cheminformatic workflow based on quantitative structure-activity relationship machine learning models to discover targeted uses of food compounds.

Graduate Practicum

JM-USDA HNRCA at Tufts University, Boston, MA

Sep 2014 - Jan 2015

Analyzed 16S metagenomic data to uncover dietary effects on murine microbiome patterns.

GRANTS, HONORS, AND AWARDS

Early Career Educational Travel Award – American Society for Nutrition (2021)

Semifinalist, Charles J. Epstein Trainee Award – American Society for Human Genetics (2021)

Emerging Leaders in Nutrition Science Award – American Society for Nutrition (2021)

Finalist, Postgraduate Research Award Competition – American Society for Nutrition (2021)

T32 Training Program in Endocrinology – NIDDK (2016 - 2019)
BioData Catalyst Fellowship – NHLBI (2020 - 2021)
Gerald Cassidy Student Research Award – JM-USDA HNRCA at Tufts University (2018)
IMPACT Fellowship – MIT IMPACT program (2018)
T32 Training Program in Nutrition and Cardiometabolic Disorders – NHLBI (2016 - 2019)
Honos Civicus Society – Tufts University civic honor society (2015)

PROFESSIONAL EXPERIENCE

InsideTracker, Cambridge, MA – Data Scientist
Jan 2016 - Dec 2019

Analyzed large behavior and blood biomarker datasets from a commercial personalized nutrition platform. Led the statistical modeling and manuscript preparation for the company's first peer-reviewed publication, and developed a tool for automated analysis and visualization of biomarker data that is now consistently used across the company.

Tufts Medical Center, Boston, MA – Bioinformaticist
Jun 2019 - Aug 2019

Consulted on the content of reports for a machine learning-based biological analytics platform being developed within the Tufts Clinical and Translational Science Institute.

Harvard Medical School, Boston, MA – Technical Outreach Coordinator
Jun 2015 - May 2016

Worked with biological research groups to find gaps in computational workflows and identified relevant resources within the IT department; projects ranged from RNA-Seq analysis in R to system administration.

PUBLICATIONS

Published

Westerman KE*, Lin J*, Sevilla-Gonzalez M, Tadess B, Marchek C, Manning AK. Gene-environment interaction analysis incorporating sex, cardiometabolic diseases, and multiple deprivation index reveals novel genetic associations with COVID-19 severity. *Front. Genet.* 2022; 12:782172.

Westerman KE, Miao J, Chasman DI, Florez JC, Chen H, Manning AK, Cole JB. Genome-wide gene-diet interaction analysis in the UK Biobank identifies novel effects on hemoglobin A1c. *Hum. Mol. Genet.* 2021; 30(18):1773-1783.

Westerman KE, Pham DT, Hong L, Chen Y, Sevilla-González M, Sung YJ, Sun YV, Morrison AC, Chen H, Manning AK. GEM: scalable and flexible gene-environment interaction analysis in millions of samples. *Bioinformatics.* 2021; 37(20):3514-3520.

Christensen JJ, Ulven SM, Thoresen M, **Westerman K** et al. Associations between dietary patterns and gene expression pattern in peripheral blood mononuclear cells: A cross-sectional study. *Nutr. Metab. Cardiovas. Dis.* 2020; 30(11):2111-2122.

Liu Y, Shen Y, Guo T, Parnell LD, **Westerman KE**, Smith CE, Ordovás JM, Lai C-Q. Statin use associates with risk of type 2 diabetes via epigenetic patterns at *ABCG1*. *Front. Genet.* 2020; 11:622.

Westerman K, Liu Q, Liu S, Parnell LD, Sebastiani P, Jacques P, DeMeo DL, Ordovás JM. A gene-diet interaction-based score predicts response to dietary fat in the Women's Health Initiative. *Am. J. Clin. Nutr.* 2020; 111(4):893-902.

Westerman KE, Harrington S, Ordovás JM, Parnell LD. PhyteByte: Identification of foods containing compounds with specific pharmacological properties. *BMC Bioinformatics.* 2020; 21:238.

Westerman K, Fernández-Sanlés A, Patil P, Sebastiani P, Jacques P, Starr JM, Deary IJ, Liu Q, Liu S, Elosua R, DeMeo DL, Ordovás JM. Epigenomic assessment of cardiovascular disease risk and interactions with traditional risk metrics. *J. Am. Heart Assoc.* 2020; 9(8):e015299.

Westerman K*, Kelly J* et al. Epigenome-wide association study reveals a molecular signature of response to phyloquinone (vitamin K1) supplementation. *Epigenetics.* 2020; 15(8):859-870.

Westerman K, Sebastiani P, Jacques P, Liu S, DeMeo DL, Ordovás JM. DNA methylation modules associate with incident cardiovascular disease and cumulative risk factor exposure. *Clin. Epigenetics.* 2019; 11:142.

Reaver A, Hewlings S, **Westerman K**, Blander G, Schmeller T, Heer M, Rein D. A Randomized, Placebo-Controlled, Double-Blind Crossover Study to Assess a Unique Phytosterol Ester Formulation in Lowering LDL Cholesterol Utilizing a Novel Virtual Tracking Tool. *Nutrients*. 2019; 11(9):2108.

Westerman K, Reaver A, Roy C, Ploch M, Sharoni E, Nogal B, Sinclair DA, Katz DL, Blumberg JG, Blander G. Longitudinal analysis of biomarker data from a personalized nutrition platform in healthy subjects. *Sci. Rep.* 2018; 8(1):14685.

Horowitz AI, **Westerman K**, and MJ Panzer. Formulation influence on the sol–gel formation of silica-supported ionogels. *J. Sol-Gel Sci. Technol.* 2016; **78**, (2016).

Koh YW, **Westerman K**, and Manzhos S. A computational study of adsorption and vibrations of UF6 on graphene derivatives: Conditions for 2D enrichment. *Carbon*. 2015; **81**, (2015).

Submitted

Westerman KE, Majarian TD, Giulianini F, Jang DK, Florez JC, Chen H, Chasman DI, Udler MS, Manning AK, Cole JB. Variance-quantitative trait loci enable systematic discovery of gene-environment interactions for cardiometabolic serum biomarkers. *medRxiv* (2021). *Under review*.

PRESENTATIONS

Oral

Westerman K. “Creating a research portal for vQTL and gene-by-environment associations”. Cardiometabolic Disease Knowledge Portal Network Webinar (2021).

Westerman K. “Systematic discovery of gene-environment interactions for metabolic serum biomarkers”. American Society for Human Genetics Virtual Conference (2021).

Westerman K. “Identification of gene-diet interactions impacting glycemic biomarkers in the multi-ethnic TOPMed cohorts”. 2nd International Conference on Precision Nutrition and Metabolism in Public Health and Medicine, Rhodes, Greece (2021).

Westerman K. “Identification of genetic loci impacting COVID-19 severity via gene-environment interaction analysis incorporating known risk factors”. International Genetic Epidemiology Society Virtual Conference, Lightning Talk (2021).

Westerman K. “Identification of gene-diet interactions impacting glycemic biomarkers in the multi-ethnic TOPMed cohorts”. American Society for Nutrition Virtual Conference (2021).

Westerman K. “Systematic discovery of gene-environment interactions for cardiometabolic serum biomarkers”. CHARGE Consortium Virtual Meeting (2021).

Westerman K * and Kelly J*. “Epigenome-wide association study of plasma phylloquinone response to phylloquinone supplementation”. American Society for Nutrition Conference, Baltimore, MD (2019).

Westerman K. “DNA methylation-based cardiovascular risk assessment”. Nutritional Genomics Organization Conference, Varna, Bulgaria (2017).

Westerman K. “A chemogenomics approach defines novel food, chemical and genetic mediators of triglyceride homeostasis”. Nutritional Genomics Organization Conference, Barcelona, Spain (2015).

Poster

CHARGE Meeting, Virtual (2021)

American Heart Association Epi|Lifestyle Virtual Conference (2021)

American Society for Human Genetics Virtual Conference (2020)

American Society for Nutrition Virtual Conference (2020)

CHARGE Meeting, Houston, TX (2020)

American Society of Human Genetics Conference, Houston, TX (2019)

American Society for Nutrition Conference, Baltimore, MD (2019)

RECOMB Conference, Washington, DC (2019)

Experimental Biology Conference, San Diego, CA (2018)

Tufts Data Intensive Studies Center Symposium, Medford, MA (2017)

PATENTS

LD Parnell, MS Obin, and **KE Westerman**. “Methods of Identifying and Formulating Food Compounds That Modulate Phenotype-Related Targets.” US Provisional Patent Pending (2016).

TEACHING EXPERIENCE

Teaching Assistant at Friedman School of Nutrition, Boston, MA

2015 & 2016

Course: Graduate biochemistry (BCHM 0223), A. Bohm instructor

MENTORSHIP

Joanna Lin, Undergraduate, Bowdoin College

2020 – 2021

Resulted in our co-first author publication exploring gene-environment interactions for COVID-19 severity.

UNIVERSITY SERVICE

Co-founder and Coordinator of “NewTriton” at the Friedman School, Boston, MA

2015 – 2018

Organized, spoke at, and secured a continuing budget for a series of TED-like events focusing on food and nutrition.

Research Working Group, Friedman School Strategic Plan, Boston, MA

2015

Collected and synthesized input from internal and external stakeholders as student and laboratory science representative to the working group.

Research Committee, Friedman School Student Research Conference, Boston, MA

2014 - 2017

Worked with a team to evaluate and select winning abstracts from original student research to be presented at the annual Friedman School event.

PEER REVIEW

Genes and Nutrition

Clinical Epigenetics

Journal of Nutrition

Diabetologia

Scientific Reports

Frontiers in Genetics

Arteriosclerosis, Thrombosis, and Vascular Biology