

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors.
Follow this format for each person. **DO NOT EXCEED FIVE PAGES.**

NAME: Penny Gordon-Larsen

eRA COMMONS USER NAME (credential, e.g., agency login): PGORDONLARSEN

POSITION TITLE: Carla Smith Chamblee Distinguished Professor of Global Nutrition; Vice Chancellor for Research, UNC-Chapel Hill

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE (if applicable)	Completion Date MM/YYYY	FIELD OF STUDY
Tulane University, New Orleans, LA	B.A.	05/1989	Anthropology & Experimental Psychology
University of Pennsylvania, Philadelphia, PA	M.S.	05/1992	Human Biology
University of Pennsylvania, Philadelphia, PA	Ph.D.	05/1997	Human Biology
University of North Carolina, Chapel Hill, NC	Post-Doc	1998-2000	Nutritional Epidemiology

A. Personal Statement

Gordon-Larsen has more than 20 years of experience leading a large research program that integrates biology, behavior, and environment to understand, prevent, and treat obesity and cardiovascular disease. As PI or co-Investigator on many NIH-funded grants Gordon-Larsen has experience in working with multi-omics and metabolome, genetic, weight, diet, biomarker, and environment data using multilevel modeling and pathway-based microbiome, analyses, with a focus on race/ethnic disparities and heterogeneity in disease. She has led many R01 grants on topics ranging from molecular and genomic markers of cardiometabolic disease to community and environment determinants of cardiometabolic disease. She has added biological and omics data to several population-based cohorts and has been working with multi-ethnic populations throughout her career. She is engaged in several leadership activities that connect her to a range of scholars from around the world. In 2010, she received the Lilly Scientific Achievement Award and in 2020 the George A. Bray Founders Award from The Obesity Society. She has served as Chair of the Kidney, Nutrition, Obesity & Diabetes NIH study section, National Diabetes and Digestive and Kidney Diseases (NIDDK) Advisory Council, and as a member of the Nutrition Research Thought Leaders Panel, which advised the NIH Nutrition Research Task Force designed to develop the NIH-Wide Strategic Plan on Nutrition Research. She is a Past-President of The Obesity Society and served on leadership council of the Lifestyle and Cardiometabolic Health Council of the AHA. At UNC she is the Vice Chancellor for Research. As a leader in her institution, she has developed structures to engage, recruit, and retain those from underrepresented groups, in biomedical sciences (e.g., web-based tools for NIH diversity supplement applications; training and workshops designed for mentorship of diverse faculty and advanced students; and tools for documenting the Gillings School health equity and social determinants of health research portfolio). In addition, as a member of NIDDK Advisory Council she advocated for resources and structures to increase participation of individuals from diverse backgrounds in biomedical sciences, including serving on several subcommittees to advance this goal (e.g., NIDDK's Strategic Plan Dissemination and Implementation Research; NIH's Behavioral and Social Sciences Research (BSSR) Integration Working Group). She was among the first investigators to investigate trajectories of weight gain leading to complex, common severe obesity in population cohort data, which she published in *JAMA* in 2010.

Pre-prints, publications, and research projects that I would like to highlight include:

R01 HL143885

04/01/20-03/31/23

Gordon-Larsen (MPI)

Metabolic Pathways to Cardiovascular Disease: A Multi-omics Approach

T32 HL160524-06

09/01/21-08/31/26

Gordon-Larsen (MPI)

Global Cardiometabolic Disease Training

B. Positions, Scientific Appointments, and Honors

Positions and Scientific Appointments

2023- Vice Chancellor for Research, UNC-CH

2021- Carla Smith Chamblee Distinguished Professor of Global Nutrition

2022-23 Interim Vice Chancellor for Research, UNC-CH

2018-22 Associate Dean for Research, Gillings School of Global Public Health, UNC-CH

2013-21 Professor, Department of Nutrition, UNC-CH

2013-18 Associate Chair for Research, Department of Nutrition, UNC-CH

2008-13 Associate Professor, Department of Nutrition, UNC-CH

2002-08 Assistant Professor, Department of Nutrition, UNC-CH

2000-02 Research Assistant Professor, Department of Nutrition, UNC-CH

1998-00 Dannon Institute Postdoctoral Fellow, University of North Carolina at Chapel Hill (UNC-CH)

1996-98 Academic and Administrative Coordinator, W.K. Kellogg Foundation Program to Link Intellectual Resources and Community Needs, University of Pennsylvania

Other Experience and Professional Memberships

2022- Board of Governors of the Research Triangle Institute International, compensated

2022- Board Member, North Carolina Biotechnology Center

2022- Board Member, Triangle Universities Center for Advanced Studies Inc.

2022- Board Member, Microelectronics Center of North Carolina

2022- Board Member, Rapidly Emerging Antiviral Drug Development Initiative

2019-23 Advisory Council Member, National Institute of Diabetes & Digestive & Kidney Diseases

2019-20 Member, NIDDK Clinical Obesity Research Panel (CORP)

2016-19 Chair, Kidney, Nutrition, Obesity & Diabetes (KNOD) study section

2014- Fellow of the American Heart Association (FAHA)

2011-16 Member, Kidney, Nutrition, Obesity & Diabetes (KNOD) study section

2002- Member, American Society for Nutrition

1998- Member, Population Association of America

1998- Fellow, The Obesity Society [Fellow of The Obesity Society (FTOS), 2013]

1998- Reviewer for Science, JAMA, New England Journal of Medicine (among others)

Select National and Elected Offices

2023 Executive Committee, Council on Research, Association of Public and Land-Grant Universities

2022- Nominating Committee, The Obesity Society

2016-20 Member of the Obesity Committee: Lifestyle Council of the American Heart Association

2015-16 President, The Obesity Society

2013-17 Executive Committee, The Obesity Society

2012-14 Member-At-Large of the Lifestyle and Cardiometabolic Health Leadership Committee: Council of the American Heart Association

2008-09 Chair, Pediatric Obesity Section, The Obesity Society

2005-08 Scientific Council, The Obesity Society

Editorial Board Membership

2011- Associate Editor, Pediatric Obesity

2010-16 Editorial Board Member, Nutrition and Diabetes
 2010-14 Associate Editor, Health and Place
 2008-14 Editorial Board Member, Annals of Human Biology
 2007-10 Editorial Board Member, Annals of Behavioral Medicine
 2003-13 Editorial Board, Obesity (formerly Obesity Research)

Honors

2020 George A. Bray Founders Award, The Obesity Society
 2010 Lilly Scientific Achievement, The Obesity Society
 2010 Obesity, Top Reviewer Award
 2005 Obesity Research, Editor's Choice Reviewer Award
 2005 Delta Omega Society (Honorary Public Health Society)
 2002 William T. Grant Scholars Award (National Competition, one of 10 finalists)

C. Contributions to Science

†Denotes a predoctoral trainee who is independently supported by Gordon-Larsen.

*Denotes a postdoctoral trainee/early career scientist independently supported by Gordon-Larsen.

1. Obesity: My work on obesity has focused on heterogeneity of obesity and understanding differential susceptibility to weight gain, with the aim of developing treatment approaches that go far beyond the “one-size-fits-all” approach that is so common. The unique contribution of my work in this area relates to the development of complex methods to address differential susceptibilities and pathways to risk. For example, a large part of my work has involved the use of innovative latent class trajectory methods to characterize the patterns of weight change across 20 years to understand how the tempo and timing of weight gain influences cardiometabolic disease risk. In addition, I am using structural equation modeling strategies to capture rapid social, economic, and environmental changes that accompany urbanization in China to identify the multiple pathways through which such changes influence weight, central adiposity, and cardiometabolic risk across the lifecycle.

- a. **Gordon-Larsen P**, Heymsfield SB. Obesity as a Disease, Not a Behavior. *Circulation*. 2018 37(15):1543-1545. DOI: 10.1161/CIRCULATIONAHA.118.032780
- b. **Gordon-Larsen P**, Wang H, Popkin BM. Overweight dynamics in Chinese children and adults. *Obes Rev*. 2014;15(Suppl 1):37-48. PMCID: PMC3951516.
- c. **Gordon-Larsen P**, Jones-Smith J. Challenges in ameliorating hunger while preventing obesity. *Lancet*. 2012;380(9844):787-9. DOI: 10.1016/S0140-6736(12)60909-X
- d. †The NS, Suchindran CM, North KE, Popkin BM, **Gordon-Larsen P**. Association of adolescent obesity with risk of severe obesity in adulthood. *JAMA*. 2010;304(18): 2042-7. PMCID: PMC3076068.

2. Multiomics data: My work in this area relates to the molecular signals linking diet with obesity and cardiometabolic diseases. A key interest is in examining the well-known demands of obesity on metabolism, thereby affecting cardiometabolic diseases. We are studying the microbiome and metabolome in the China Health and Nutrition Survey (CHNS). In the Coronary Artery Risk Development in Young Adults (CARDIA) study, we are using longitudinal metabolomics data to ask questions about metabolic disturbances in relation to cardiometabolic diseases. We are particularly interested in the evolution of cardiovascular disease in the context of unremitting metabolic stress induced by obesity and cardiovascular disease risk factors. In the National Longitudinal Study of Adolescent to Adult Health (Add Health) we are examining exome data to identify variants that underlie weight gain in the transition to obesity and we are interested in the interplay between genetics and environmental factors and the impacts on future disease risk.

- a. Winglee K, Howard AG, Sha W, Gharaibeh RZ, Liu J, Jin D, Fodor AF, **Gordon-Larsen P**. Recent urbanization in China is correlated with a Westernized microbiome encoding increased virulence and antibiotic resistance genes. *Microbiome*. 2017 Sept 15;5(1):121. PMCID: PMC5603068
- b. **Gordon-Larsen P**, French JE, Moustaid-Moussa N, Voruganti VS, Mayer-Davis EJ, Bizon CA, Cheng Z, Stewart DA, Easterbrook JW, Shaikh SR. Synergizing mouse and human studies to understand the heterogeneity of obesity. *Adv Nutr*. 2021. doi: 10.1093/advances/nmab040.
- c. †Wang Y, Wang H, Howard AG, Meyer KA, Tsilimigras MCB, Avery CL, Sha W, Sun S, Zhang J, Su C, Wang Z, Zhang B, Fodor AA, **Gordon-Larsen P**. Circulating Short-Chain Fatty Acids Are Positively Associated with Adiposity Measures in Chinese Adults. *Nutrients*. 2020;12(7):2127. PMCID: PMC7400849.

- d. †Wang Y, Wang H, Howard AG, Tsilimigras MCB, Avery CL, Meyer KA, Sha W, Sun S, Zhang J, Su C, Wang Z, Fodor AA, Zhang B, **Gordon-Larsen P**. Gut Microbiota and Host Plasma Metabolites in Association with Blood Pressure in Chinese Adults. *Hypertension*. 2021 Feb;77(2):706-717. PMID: PMC7856046.

3. Cardiovascular Diseases: My work in this area has focused on novel determinants of cardiometabolic and cardiovascular disease risk factors, including environmental and -omics research. These studies emphasize contextual and biological factors in the etiology of cardiovascular disease to understand the most efficacious factors and strategies for reducing risk. I am particularly interested in heterogeneity in risk and understanding why some individuals who are overweight do not have diabetes, dyslipidemia, or hypertension, while some normal weight individuals do. In addition, my work involves using sophisticated statistical models for pathway-based analyses, addressing each piece of the complex system to investigate links between environments, behavior, and weight with cardiovascular disease risk over time.

- a. Powell-Wiley TM, Poirier P, Burke LE, Després JP, **Gordon-Larsen P**, Lavie CJ, Lear SA, Ndumele CE, Neeland IJ, Sanders P, St-Onge MP; American Heart Association Council on Lifestyle and Cardiometabolic Health; Council on Cardiovascular and Stroke Nursing; Council on Clinical Cardiology; Council on Epidemiology and Prevention; and Stroke Council. Obesity and Cardiovascular Disease: A Scientific Statement from the American Heart Association. *Circulation*. 2021 May 25;143(21):e984-e1010; PMID: PMC8493650.
- b. Meyer KA, Benton TZ, Bennett BJ, Jacobs DR Jr, Lloyd-Jones DM, Gross MD, Carr JJ, **Gordon-Larsen P**, Zeisel SH. Microbiota-Dependent Metabolite Trimethylamine N-Oxide and Coronary Artery Calcium in the Coronary Artery Risk Development in Young Adults Study (CARDIA). *J Am Heart Assoc*. 2016 Oct 21;5(10). pii: e003970. PMID: PMC5121500
- c. Avery CL, Howard AG, Ballou AF, Buchanan VL, Collins JM, Downie CG, Engel SM, Graff M, Highland HM, Lee MP, Lilly AG, Lu K, Rager JE, Staley BS, North KE, **Gordon-Larsen P**. Strengthening Causal Inference in Exposomics Research: Application of Genetic Data and Methods. *Environ Health Perspect*. 2022 May;130(5):55001. PMID: 35533073
- d. †Wang Y, Howard AG, Adair LS, Wang H, Avery CL, **Gordon-Larsen P**. Waist circumference change is associated with blood pressure change independent of BMI change. *Obesity* (Silver Spring, Md). 2020;28(1):146-153. doi: 10.1002/oby.22638. PMID: PMC6925347.

4. Health Equity and Environmental Factors Shaping Access to Resources to Support Healthy Lifestyles:

Very early in my career, I became interested in how physical and social environments influence the development of obesity. I found that the early work in this area was restricted to small geographic areas and ignored fundamental issues of reverse causality related to residential selection. My early work in this area has been widely cited as we were the first team to develop a fine-grained geographic information system database at the individual-level spanning the entire U.S. and including longitudinal data. My team's work developing methodological approaches to handle residential selectivity bias, the biggest threat to causal inference in this research area, has pushed the field forward methodologically.

- a. **Gordon-Larsen P**. Food availability/convenience and obesity. *Adv Nutr*. 2014;5(6):809-17. PMID: PMC4224220.
- b. Meyer KA, Guilkey DK, Tien HC, Kiefe CI, Popkin BM, **Gordon-Larsen P**. Instrumental-Variables Simultaneous Equations Model of Physical Activity and Body Mass Index: The Coronary Artery Risk Development in Young Adults (CARDIA) Study. *Am J Epidemiol*. 2016 Sep 15;184(6):465-76. doi: 10.1093/aje/kww010. Epub 2016 Sep 9. PMID: PMC5023789
- c. †Richardson AS, *Meyer KA, *Howard AG, *Boone-Heinonen J, Popkin BM, Evenson KR, Kiefe CI, Lewis CE, **Gordon-Larsen P**. Neighborhood socioeconomic status and food environment: a 20-year longitudinal latent class analysis among CARDIA participants. *Health & Place*. 2014;30:145-53. PMID: PMC4252601.
- d. Howard AG, Attard SM†, Herring AH, Wang H, Du S, **Gordon-Larsen P**. Socioeconomic gradients in the Westernization of diet in China over 20 years. *SSM Popul Health*. 2021 Oct 15;16:100943. doi: 10.1016/j.ssmph.2021.100943. PMID: 34703875; PMID: PMC8526760.

5. Genetics: My initial genetics-related R01 (R01-HD057194) was the first gene-environment study in a racially/ethnically diverse longitudinal cohort that spanned the transition from adolescence to young adulthood. Specifically, I am investigating how genetic variation influences weight-related traits during the transition from adolescence to adulthood – a critical risk period for weight gain. The continuation of this grant focuses on exome variants and their role in obesity and cardiometabolic disease (MPI: Gordon-Larsen and North). Specifically, this

work is aimed at assessing the association between weight-related traits and coding variants across a 15-year lifecycle period of dramatic weight gain between adolescence and adulthood. Another aspect of this work is contributing to several ongoing genetic consortia, most notably Cohorts for Heart and Aging Research in Genomic Epidemiology (CHARGE) and the Genetic Investigation of ANthropometric Traits (GIANT) consortia.

- a. Spracklen CN, Horikoshi M, Kim YJ, Lin K, Bragg F, Moon S.. **Gordon-Larsen P**... Kim BJ, Mohlke KL, Sim X. Identification of type 2 diabetes loci in 433,540 East Asian individuals. *Nature*. 2020 Jun;582(7811):240-245. PMID: PMC7292783.
- b. Graham SE, Clarke SL, Wu KH, Kanoni S, Zajac GJM, Ramdas S,... **Gordon-Larsen P**... Morris AP, Assimes TL, Deloukas P, Sun YV, Willer CJ. The power of genetic diversity in genome-wide association studies of lipids. *Nature*. 2021 Dec;600(7890):675-679. doi: 10.1038/s41586-021-04064-3. Epub 2021 Dec 9. PMID: 34887591; PMCID: PMC8730582.
- c. *Graff M, **Gordon-Larsen P**, Lim U, Fowke JH, Love S-A, Fesinmeyer M, Wilkens LR, Vertilus S, Ritchie MD, Prentice RL, Pankow J, Monroe K, Manson JE, Le Marchand L, Kuller LH, Kolonel LN, Hong CP, Henderson BE, Haessler J, Gross MD, Goodloe R, Franceschini N, Carlson CS, Buyske S, Buzkova P, Hindorff LA, Matise TC, Crawford DC, Haiman CA, Peters U, North KE. The influence of obesity-related single nucleotide polymorphisms on BMI across the life course: the PAGE study. *Diabetes*. 2013;62(5):1763-7. PMID: PMC3636619.
- d. *Graff M, Ngwa JS, Workalemahu T, Homuth G, Shipf S, Teumer A, Volzke H, Wallaschofski H, Abecasis GR, Edward L, Francesco C, Sanna S, Scheet P, Schlessinger D, Sidore C, Xiao X, Wang Z, Chanock SJ, Jacobs KB, Hayes RB, Hu F, Van Dam RM, Consortium TG, Crout RJ, Marazita ML, Shaffer JR, Atwood LD, Fox CS, Heard-Costa NL, White C, Choh AC, Czerwinski SA, Demerath EW, Dyer TD, Towne B, Amin N, Oostra BA, van Duijn CM, Zillikens MC, Esko T, Nelis M, Nikopensius T, Metspalu A, Strachan DP, Monda KL, Qi L, North KE, Cupples LA, **Gordon-Larsen P**, Berndt SI. Genome-wide analysis of BMI in adolescents and young adults reveals additional insight into the effects of genetic loci over the life course. *Hum Mol Genet*. 2013;22(17):3597-607. PMID: PMC3736869.

Complete List of Publications: [http://www.ncbi.nlm.nih.gov/pubmed/?term=Gordon-Larsen+P+\[Author\]](http://www.ncbi.nlm.nih.gov/pubmed/?term=Gordon-Larsen+P+[Author])