

Ellen C. Francis, PhD

EDUCATION

Ph.D. Applied Health Research and Evaluation

Clemson University, Clemson SC

2019

B.A. Psychology

Honors: Summa Cum Laude

University of Southern Maine, Portland ME

2012

CERTIFICATES

Personalized and Genomic Medicine Graduate Certificate Program

University of Colorado – Anschutz medical campus

2023

Diversity, Equity, and Inclusion Certificate Program

University of Colorado – Anschutz medical campus

2022

POSTGRADUATE TRAINING

Postdoctoral research fellow

Lifecourse Epidemiology of Diabetes & Adiposity (LEAD) Center

Colorado School of Public Health | Department of Epidemiology

University of Colorado Anschutz Medical Campus

2019 – 2023

ACADEMIC APPOINTMENTS, FELLOWSHIPS, PROFESSIONAL EXPERIENCE

Predocctoral Research Fellow

Epidemiology Branch of the Division of Intramural Population Health Research at the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development, Bethesda MD

2017 – 2019

Graduate Research Assistant

Clemson University, Clemson SC

2016 – 2019

Research Associate/Data Analyst

Spurwink Services, Portland ME

2011 – 2016

Research Assistant

University of Southern Maine, Portland, ME

2011

MEMBERSHIP

American Diabetes Association: Precision Medicine in Diabetes Initiative – GDM working group

- Invited member

2020 – present

Perinatal Research Society

- Invited member

2021 – present

Society for Perinatal and Pediatric Epidemiologic Research

- Member

2017 – present

HONORS AND AWARDS

PRIDE Scholarship (Program to Increase Diversity Among Individuals Engaged in Health-Related Research)

2022 – present

- National Heart, Lung, Blood, and Sleep Institute. National Institutes of Health

NIH Mead-Johnson Nutrition Young Investigator Grant Writing Fellowship	2021
<ul style="list-style-type: none"> • Perinatal Research Society 	
Post-doctoral Fellow of the Month	2021
<ul style="list-style-type: none"> • University of Colorado Anschutz Medical Campus 	
Fellows Award for Research Excellence	2019
<ul style="list-style-type: none"> • National Institutes of Health 	
Emerging Leader in Nutrition Science	2019
<ul style="list-style-type: none"> • American Society for Nutrition 	
Emerging Leader in Nutrition Science (Poster Competition Finalist)	2018
<ul style="list-style-type: none"> • American Society for Nutrition 	
Outstanding Master's Student Research Assistant (Finalist)	2018
<ul style="list-style-type: none"> • Clemson University 	

SERVICE ON NATIONAL GRANT REVIEW PANELS, STUDY SECTIONS, COMMITTEES

American Diabetes Association- Precision Medicine & Diabetes	
<ul style="list-style-type: none"> • Grant Reviewer 	2022

SERVICE ON MAJOR COMMITTEES

International & National

- American Diabetes Association & European Association for the Study of Diabetes
 - Precision Medicine in Diabetes Initiative: *nominated member, 2021 - present*

University

- University of Colorado
 - DOHaD Chat: *nominated organizer, 2019 – 2022*
 - Postdoctoral Association: *finance committee member, 2019 – 2020*

Department

- Health Equity Council, Department of Epidemiology, University of Colorado: *member, 2019 – 2023*

Editorial Boards

- Annals of Epidemiology: *associate editor, 2023 – present*
- Metabolites: *invited guest editor (Determinants, Mechanisms, and Consequences of Childhood Obesity), 2020 - 2023*

AdHoc Reviewer

- Diabetes Care (2022 – present)
- Diabetologia (2019 – present)
- BMC pregnancy (2019 – present)
- BMC Medicine (2022 – present)
- Epidemiology (2022 – present)
- Nutrition & Diabetes (2021 - present)
- Nutrients (2021 – present)
- Pediatric Obesity (2020 – present)

TEACHING/GUEST LECTURES

Teaching Assistant

Colorado School of Public Health

University of Colorado Anschutz Medical Campus Aurora, CO

Graduate students. Department of Epidemiology *Teaching Assistant* EPID 7632: Advanced Epidemiology 2020
 Description: Bi-weekly doctoral-level course that focuses on select theoretical and methodological issues related to the analysis of epidemiologic data with the purpose of drawing causal inference and preparing PhD/DrPH students for their preliminary examinations.

Guest Lectures

Division of Pulmonary Sciences and Critical Care Medicine University of Colorado Anschutz Medical Campus Aurora, CO

Undergraduate and health professional students. Course: Graduate Experience for Multicultural Students (GEMS). The overarching goal of the GEMS program is to support the development of future biomedical scientists by providing undergraduate students with research opportunities and exposure to the realistic lifestyle of biomedical research. 2020 - 2023

Colorado School of Public Health University of Colorado Anschutz Medical Campus Aurora, CO

Graduate students. Course: Advanced Epidemiology; Lecture: Methodological challenges in perinatal epidemiology – reverse causation due to proximity of exposure and outcome 2020

Department of Public Health Sciences Clemson University, Clemson SC

Undergraduate students. Course: Introduction to Epidemiology; Lecture: Nested study designs in epidemiology 2018

Graduate students. Course: Analytical Epidemiology; Lecture: Analysis of data from complex survey design 2018

Seminars

Department of Public Health Sciences Clemson University, Clemson SC 2019

Graduate student seminar on career and fellowship funding

GRANT SUPPORT

Principal Investigator

NIH/NHLBI R25HL146166-05
Small Research Project: Leveraging metabolomics to generate an early pregnancy metabolite signature of placental inflammation 2022 - 2023
\$30,000

NIH/NICHD K99108272-02
Characterizing metabolic variability during pregnancy to understand pathways of in-utero overnutrition: an integrative analysis of metabolomics and lifestyle data 2022 – 2027
\$930,000

Pending

CO-I
NIH/NICHD R01112375-01 2024 – 2029
Placental function and cardiometabolic outcomes in children \$3,787,370.00

Fellowships

NIH/NICHD: T32HD007186-39 (PI: Rozance) 2020 – 2022

NIH/NICHD Office of Intramural Training & Education (Mentor: Zhang) 2018 – 2019

NIH/NICHD Intramural Research Training Award/Graduate Partnership Program (Mentor: Zhang) 2017

PUBLICATIONS

Refereed Original Article in Journal

Francis, EC, Powe, C, Lowe Jr. W, White, S, Scholtens, D. M, Yang, J, Zhu, Y, Zhang, C, Hivert, MF, Kwak, SH. Sweeting, A, ADA/EASD PMDI. Refining the diagnosis of Gestational Diabetes Mellitus: A systematic review to inform efforts in precision medicine. *Nature Communications Medicine*. Under Review 05/12/2023

Tobias, D. K.*, Merino, J.*, Ahmad, A.*, Aiken, C.*, Benham, J. L.*, Dhanasekaran, B.*, Clark, A. L., Colclough, K.*, Corcoy, R., Cromer, S. J.*, Duan, D.*, Felton, J. L.*, **Francis**, EC.*, et al. 2nd International Consensus Report on Gaps & Opportunities for the Clinical Translation of Precision Diabetes Medicine. *Nature Medicine*. Accepted 07/20/2023

Francis EC., Kechris, K., Jansson, T., Dabelea, D., Perng, W. Novel metabolic subtypes in pregnant women and risk of early childhood obesity in offspring: The Healthy Start Study. *JAMA Open Network*. 2023;6(4):e237030. doi:10.1001/jamanetworkopen.2023.7030

Francis EC., Oken, E., Hivert, MF., Rifas-Shiman, SL., Chavarro, JE., Perng W. (2022). Anti-Mullerian Hormone and adiposity across mid-life among women in Project Viva. *Menopause*. ePub ahead of print 01/04/2023

Francis, EC., Kechris, K., Cohen, CC., Dabelea, D., & Perng, E. Metabolomic profiles in childhood and adolescence are associated with fetal overnutrition. *Metabolites* 2022, 12(3), 265

Francis EC, Dabelea D, Boyle KE, Jansson T, Perng W. Maternal Diet Quality Is Associated with Placental Proteins in the Placental Insulin/Growth Factor, Environmental Stress, Inflammation, and mTOR Signaling Pathways: The Healthy Start ECHO Cohort. *J Nutr*. 2022 Mar 03; 152(3):816-825. PMID: 34850052

Cohen, CC., **Francis**, EC., Perng, W., Sauder, KA., Scherzinger, A., Sundaram, SS., Shankar, K., Dabelea, D. Exposure to maternal fuels during pregnancy and offspring hepatic fat in early childhood: The Healthy Start Study. *Pediatr Obes*. 2022 Feb 05; e12902. PMID: 35122420.

Francis, EC., Hinkle, S., Li, M., Cao, Y., Chen, J., Wu, J., Zhu, Y., Haiming, C., Tsai, M., Chen, L., & Zhang, C. Longitudinal Measurement of Maternal Proinflammatory Adipokines Throughout Pregnancy and Associations with Multiple Measures of Neonatal Size and Body Composition. *Current Developments in Nutrition*; 2021,5: nzab113.

Francis EC., Dabelea D, Shankar K, Perng W. Maternal diet quality during pregnancy is associated with biomarkers of metabolic risk among male offspring. *Diabetologia*. 2021 Aug 9. doi: 10.1007/s00125-021-05533-0. Epub ahead of print

Perng, W., **Francis**, EC., Barbosa, G., Schuldt, C., Dabelea, D., & Sauder, K.A. Pre- and perinatal correlates of ideal cardiovascular health during early childhood: A prospective analysis in the Healthy Start Study. *J Pediatr*. 2021 Mar 16;. doi: 10.1016/j.jpeds.2021.03.014

Francis, EC., Charron, E., Li, M., Chen, L., Mayo, R., Butler, L., & Rennert, L. (2020). Third trimester maternal vitamin D and early childhood socioemotional development. *Paediatric and Perinatal Epidemiology*. PMID: 33295049

Francis EC, Dabelea D, Perng W. Impact of maternal HbA1c on offspring glucose at 4-7 years of age: role of childhood adiposity and other potential confounders. Reply to Periyathambi N, Sukumar N, Weldeselassie Y, Saravanan P [letter]. *Diabetologia*. 2021 Jun;64(6):1449-1450. PMID: 33765182;

Francis, EC., Dabelea D, Ringham BM, Sauder KA, Perng W. Maternal blood glucose level and offspring glucose-insulin homeostasis: what is the role of offspring adiposity? *Diabetologia*. 2020 Oct 06. PMID: 33021691. [Up front study](#)

Perng W, **Francis** EC., Smith HA, Carey J, Wang D, Kechris KM, Dabelea D. Sex-Specific Metabolite Biomarkers of NAFLD in Youth: A Prospective Study in the EPOCH Cohort. *J Clin Endocrinol Metab*. 2020 Sep 01; 105(9). PMID: 32687159.

Francis EC., Li M, Hinkle SN, Cao Y, Chen J, Wu J, Zhu Y, Cao H, Kemper K, Rennert L, Williams J, Tsai MY, Chen L, Zhang C. (2020). Adipokines in Early and Mid-Pregnancy and Subsequent Risk of Gestational Diabetes: A longitudinal study in a multi-racial cohort. *BMJ Open Diabetes Research and Care* 10.1136/bmjdr-2020-001333.

Zhang, Y., **Francis**, EC., Xia, T., Kemper, K., Williams, J., & Chen, L. (2020). Adherence to DASH dietary pattern is inversely associated with osteoarthritis in Americans. *Int J Food Sci Nutr*, 1-7. doi:10.1080

Ajjarapu, A. S., Hinkle, S. N., Wu, J., Li, M., Rawal, S., **Francis**, EC., Chen, L., Pitsava, G., Bjerregaard, A. A., Grunnet, L. G., Vaag, A., Zhu, Y., Ma, R. C. W., Damm, P., Mills, J. L., Olsen, S. F. and Zhang, C. (2020). Nut Consumption and Renal Function Among Women with a History of Gestational Diabetes. *J Ren Nutr*. doi:10.1053

Ajjarapu, A., Hinkle, S., Li, M., **Francis**, EC., & Zhang, C. (2019) Dietary patterns and renal health outcomes in the general population: a review focusing on prospective studies. *Nutrients*. Nutrients, 11(8).

Francis, EC, Witrick, B., Zhang, L. & Chen, L. (2019). Adherence to healthy behaviors in American pregnant women: NHANES 2007-2014. *Journal of Public Health*.

Li, M., Francis, EC., Hinkle, S., Ajjarapu, A., & Zhang, C. (2019). Preconception and prenatal nutrition and neurodevelopmental disorders. *Nutrients* 11 (7)

Francis, EC., Johnstone, M., B., Covington-Kolb, S., Witrick, B., Griffin, S., Sun, X., Crockett, A., & Chen, L. (2018). Group Prenatal Care Attendance and Women's Characteristics Associated with Low Attendance: Results from Centering and Racial Disparities (CRADLE Study). *Maternal and Child Health Journal*

Shi, Lu., Francis, EC., Feng, C., Pan, X. & Truong, K. (2019). Association between Prior Insurance and Healthcare Utilization Among the Long-Term Uninsured. *Health Equity* 3(1):409-416.

Charron, E., Francis, E. C., Heavner, S., & Truong, K. Disparities in Access to Mental Health Services Among Patients Hospitalized for Deliberate Drug Overdose (2019). *Psychiatric Services* 70(9):758-764.

Donnelly, S. R., Hinkle, S. N., Rawal, S., Grunnet, L. G., Vaag, A., Chavarro, J., Vaag, A., Wu, J., Damm, P., Mills, J. L., Li, M., Bjerregaard, A. A., Thusen, A. C., Langton, R. G., Francis, EC., Ley, S., Hu, F. B., Tsai, M., Olsen, S. F., & Zhang, C. (2019). Prospective study of gestational diabetes and fatty liver scores 9 to 16 years after pregnancy. *Journal of Diabetes* 1–11

Francis, EC., Hinkle, S. H., Rawal, S., Song, Y., Rawal, S., Donnelly, S. R., Liu, D., Tsai, M., Chen, L. & Zhang, C. (2018). Longitudinal Associations of Vitamin D Concentrations During Pregnancy and Neonate Body Composition. *Nutrients* 10(11), 1631

Chen, Q., Francis, EC., Hu, G. & Chen, L. (2018). Metabolomic Profiling of Women with Gestational Diabetes Mellitus and Their Offspring: Review of Metabolomics Studies. *Journal of Diabetes and its Complications*, 32(5):512-523.

Book chapters

Francis EC, Perng W. Metabolomic Biomarkers, Metabolite Patterns, and Gestational Diabetes Mellitus. In: Patel V, Preedy V, editors. Biomarkers in Diabetes. Biomarkers in Disease: Methods, Discoveries and Applications Cham, Switzerland: Springer International Publishing; 2023. p.1033-1052.

Butler, L. S., and Francis, E. (2014). Resiliency Differences Between Youth in Community-Based and Residential Treatment Programs: An Exploratory Analysis. In S. Prince-Embury (Ed.), Resilience Interventions in Diverse Populations (1st) New York, NY: Springer.

PRESENTATIONS (presenter)

Francis, EC., Johnson, R K., Cohen, C. C., Dabelea, D., Perng, W. (2023) Metabolites of diacylglyceride and unsaturated fatty acid synthesis improves prediction of gestational diabetes. European Association for the Study of Diabetes. Hamburg, Germany

Francis, EC., Kechris, K., Jansson, T., Dabelea, D., Perng, W. (2023) Biomarker Clustering Identifies Metabolic Profiles in Pregnant Women More Strongly Associated with Offspring Adiposity Than Conventional Childhood Obesity Risk Factors. Society for Reproductive Investigation. Brisbane, Australia

Francis, EC. (2022). Associations of Healthy Eating During Pregnancy: Sex as a Modifier of Placental Function and Child Cardiometabolic Traits. Invited presentation. National Conference for Women's Health and Sex Differences Research. Colorado Springs, CO

Francis EC. (2022). Characterizing maternal fuels in pregnancy: implications for fetal overnutrition. Invited presentation. Perinatal-Neonatal Research Conference. University of Colorado School of Medicine, Department of Pediatrics, Section of Neonatology. Aurora, CO

Francis EC., Oken, E., Hivert, MF., Chavarro, JE., Perng W. (2022). Anti-Mullerian Hormone and long-term body composition among women in Project Viva'. Society for Pediatric and Perinatal Epidemiological Research. Chicago, IL

Francis EC., Dabelea, D., Boyle, KE., Jansson, T., Perng W. (2022). Maternal diet quality is associated with placental proteins in the placental insulin/ growth factor, environmental stress, inflammation, and mTOR signaling pathways: The Healthy Start ECHO Cohort. Society for Reproductive Investigation. Denver, CO

Francis, EC., Dabelea, D., Shankar, K., Perng., (2021). Maternal diet quality during pregnancy is associated with biomarkers of metabolic risk among male offspring. Society for Pediatric and Perinatal Epidemiological Research. Virtual

- Francis, EC., Hinkle, S., Li, M., Chen, J., Chen, L., & Zhang, C. (2019).** A Longitudinal Study of a Panel of Adipokines and Gestational Diabetes Risk. American Society for Nutrition. Baltimore, MD
- Butler, L. S., **Francis, E., & Bunce, D. (2015).** Reducing Restraints of Youth with Autism Spectrum Disorder in Residential Treatment. American Association of Children's Residential Centers. Savannah, GA
- Butler, L. S. & **Francis, E. (2014).** Youth Functioning Post-Residential Treatment: Conceptualization & Calculation of Well-Being. American Association of Children's Residential Centers. San Francisco, CA
- Francis, E., McConnell, E. & Butler, L. (2013).** Helping Resettled, Traumatized Somali Refugees Access Mental Health Services: The Introduction and Impact of Project SHIFA (Supporting the Health of Immigrant Families and Adolescents). Child Welfare League of America. Washington, D.C.

CONFERENCE ABSTRACTS

- Francis EC., Kechris K, Rahman ML, Dabelea D, Perng W (2021).** Differences in metabolite levels across adolescence underlie in utero exposure to maternal obesity or Gestational Diabetes Mellitus: A prospective study in the EPOCH cohort. Precision Diabetes Medicine Conference – The American Diabetes Association. Virtual.
- Francis EC., Dabelea D, Ringham B, Glueck D, Perng W (2020).** Maternal HbA1c is related to childhood fat mass and only partially mediated by neonatal fat mass. American Diabetes Association. Chicago, IL
- Francis EC., Dabelea D, Ringham B, Perng W (2020).** Early childhood glucose metabolism and adiposity in association with maternal glycemia in mid- to late-pregnancy and prepregnancy obesity: findings from the prospective health start study. Society for Epidemiologic Research. Boston, MA.
- Francis, EC., Charron, E., Witrick, B., Chen, L., Mayo, R., Butler, L., Rennert, L. (2019).** Maternal Vitamin D and Associations with Offspring Behavior and Socioemotional Development. 32nd Society for Pediatric and Perinatal Epidemiological Research, Minneapolis, MN
- Francis, EC., Kemper, K., Williams, J., & Chen, L. (2019)** Adherence to DASH Dietary Pattern is Inversely Associated with Osteoarthritis in Americans. American Society for Nutrition, Baltimore, MD
- Francis, EC., Rolke, R., Charron, E., Karim, S., Mayo, R., Griffin, S., Risinger, J., Liu, J., Kelly, D., & Chen, L. (2018).** Gestational Diabetes and Risk of Developmental Disabilities in Early Childhood. 146th American Public Health Association. San Diego, CA
- Lu, S., **Francis, EC., Feng, C., Pan, X. & Truong, K. (2018).** Association between Prior Insurance and Healthcare Utilization among the Long-Term Uninsured. Academy Health Annual Research Meeting 2018. Seattle, WA
- Donnelly, S. R., Olsen, S. F., Hinkle, S. N., Rawal, S., Grunnet, L. G., Vaag, A., Chavarro, J., Wu, J., Li, M., Damm, P., Mills, J. L., Bjerregaard, A. A., Thusen, A. C., Langton, R. G., **Francis, EC., Ley, S., Hu, F. B., Tsai, M. & Zhang, C. (2018).** Gestational Diabetes and Subsequent Liver Function 9 to 15 Years Postpartum. American Diabetes Association. Orlando, FL
- Francis, EC., Hinkle, S. H., Rawal, S., Song, Y., Rawal, S., Donnelly, S. R., Liu, D., Tsai, M., Chen, L. & Zhang, C. (2018).** Longitudinal Associations of Vitamin D Concentrations During Pregnancy and Neonate Body Composition. 31st Society for Pediatric and Perinatal Epidemiological Research, Baltimore MD
- Francis, EC., Zhang, L. & Chen, L. (2017).** Adherence to healthy behaviors in American pregnant women: NHANES 2007-2014. 145th American Association of Public Health. Atlanta, GA
- Francis, EC., Crockett, A., Zhang, L., Sun, X., Covington-Kolb., S. & Chen, L. (2017).** A randomized controlled trial on reducing disparities in preterm birth through group prenatal care: implementation and interim results from Centering and Racial Disparities (CRADLE) Study. 30th Pediatric and Perinatal Epidemiology Research. Seattle, WA.
- Groom, S., **Francis (Bean), E. C., Vella, E. & Thornton, B. (2012).** Hostility, Social Support, & Attachment Style: Psychosocial Correlates of Hypercompetitiveness. 83rd Eastern Psychological Association. Pittsburgh, PA.