BIOGRAPHICAL SKETCH

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NAME: Dominick Lemas, Ph.D.

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

POSITION TITLE: Assistant Professor

| INSTITUTION AND LOCATION | DEGREE | MM/YYYY | FIELD OF STUDY |
| --- | --- | --- | --- |
| University of Vermont, Burlington, VT | B.S. | 05/2006 | Molecular Biology |
| University of Alaska Fairbanks, Fairbanks, AK | Ph.D. | 12/2012 | Molecular Epidemiology |
| University of Colorado Denver, Aurora, CO | Postdoctoral | 07/2015 | Computational Biology |

# A. Personal Statement

I am an Assistant Professor in the College of Medicine at the University of Florida and a member of the OneFlorida Clinical Research Consortium. My research leverages precision health tools to characterize how early life breastfeeding impacts maternal and child health outcomes such as obesity. My NIDDK K01 (K01-DK115632) is centrally focused on un-targeted metabolomics to identify human milk compounds that stabilize a healthy infant microbiome and are associated with infant growth. My recent UF/CTSI pilot award is devoted to using natural language processing (NLP) and electronic health records (EHR) to characterize geospatial clustering of breastfeeding disparities that can directly inform community stakeholders for precision public health interventions (e.g., telehealth lactation consultation). Accordingly, the long-term focus of my research at UF is to develop low-cost behavioral interventions for pregnant and breastfeeding mothers that target bioactive compounds in human milk with therapeutic potential to attenuate the transmission of disease risk from mother to child. I believe the proposed aims focused on understanding changes in microbiome count and diversity during pregnancy and their effects on maternal metabolic health, assessed by insulin sensitivity and β-cell responsivity will be of fundamental interest to the NDC. My role on this project will be to provide expertise in maternal-infant microbiome and serve as advisor for the microbiome portion of the study that includes data collection, analysis and interpretation of results and dissemination of findings.

1. **Lemas DJ**, Young BE, Baker PR, Tomczik A, Soderborg T, Hernandez T, De la Houssaye B, Robertson CE, Rudolph M, Ir D, Patinkin Z, Krebs NJ, Santorico SA, Weir T, Barbour LA, Frank DN, Friedman JE. Alterations in in human milk leptin and insulin are associated with early changes in the infant intestinal microbiome. *American Journal of Clinical Nutrition*. 2016. 103 (3):1291-1300. PMID: 27140533
2. **Lemas DJ**, Yee Shanique, Cacho N, Miller D, Cardel M, Gurka M, Janicke D, Shenkman E. Exploring the contribution of maternal antibiotics and breastfeeding to the development of the infant microbiome and pediatric obesity. *Seminars in Fetal and Neonatal Medicine*. 2016. PMID 27424917
3. **Lemas DJ**, Cardel M, Filipp SL, Hall J, Essner RZ, Smith SR, Nadglowski J, Donahoo WT, Cooper-DeHoff RM, Nelson DR, Hogan WR, Shenkman EA, Gurka MJ, Janicke DM. Objectively measured pediatric obesity prevalence using the OneFlorida Clinical Research Consortium. *Obesity Research and Clinical Practice*. 2019. PMID: 30391132
4. **Lemas DJ**, Wright L, Flood-Grady E, Francois M, Chen L, Hentschel A, Du X, Hsiao CJ, Chen H, Neu J, Theis RP, Shenkman E, Krieger J. Perspectives of pregnant and breastfeeding women on longitudinal clinical studies that require non-invasive biospecimen collection- a qualitative study. *BMC Pregnancy and Childbirth*. 2021. PMID: 33472584

# B. Positions and Honors

**Positions and employment**

2003-2006 Undergraduate Research Assistant, University of Vermont, Burlington, VT

2006-2007 Professional Research Assistant, Alaska Native Tribal Health Consortium, Anchorage, AK

2007-2012 Graduate Research Assistant, University of Alaska Fairbanks, Fairbanks, AK

2012-2015 Postdoctoral Fellow, University of Colorado Anschutz Medical Campus, Aurora, CO

2015- Assistant Professor, University of Florida, Gainesville, FL

**Other Experience and Professional Membership**

2009- Member, Society for Advancement of Chicanos and Native Americans in Science (SACNAS)

2012- Member, American Society for Biochemistry and Molecular Biology (ASBMB)

2013- Member, American Diabetes Association (ADA)

2013- Member, The Obesity Society (TOS)

2016- Member, American Society for Nutrition (ASN)

## Positions & Honors

2002-2006 Scholarship, Indian Health Service Health Professions Scholarship

2007-2010 Scholarship, Alaska Native Tribal Health Consortium Scholarship

2008-2012 Scholarship, Citizen Potawatomi Nation Scholarship

2012 Travel Award, IDeA Symposium for Biomedical Research

2013 Travel Award, American Society for Biochemistry and Molecular Biology

2014 Travel Award, Keystone Symposium on the Human Microbiome

2014 Travel Award, NIDDK Microbiome-Host Interactions Workshop

2015 Travel Award, Keystone Symposia on the Human Microbiome

2015 Awardee, ASN Emerging Leader in Nutrition Science Lactation RIS

2015 Travel Award, UAB 3rd Metabolomics Workshop

2015 Travel Award, American Diabetes Association National Meeting

2015 Participant, National Research Mentoring Network Grant Writing Workshop

2016-2018 Fellow, Keystone Symposia

2016 Reviewer, NIH Mechanistic Insights into Birth Cohorts Study Section

2016-2018 Reviewer, NIH Kidney, Nutrition, Obesity and Diabetes (KNOD) study section

2019 Ad hoc Reviewer, NIH Infectious, Reproductive Health, Asthma and Pulmonary Conditions (IRAP) Study Section

# C. Contribution to Science

1. My publications related to my doctoral training at the University of Alaska Fairbanks (UAF) were focused on gene-by-diet interactions and “healthy obesity” in Alaskan Native communities. Specifically, my dissertation research examined whether an individual’s genetic risk of developing obesity was modified by consumption of n-3 polyunsaturated fatty acids (n-3 PUFAs) in a cross-sectional cohort of Yup’ik people living in Southwest Alaska. These studies demonstrate that large-scale genomic surveys, such as linkage analyses and GWAS, have identified genetic variants that interact with dietary n-3 PUFA and partially account for the “missing heritability” attributed to obesity and may contribute to “heathy obesity”. Importantly, this research was supported by several research fellowships that translated into two first-author publication and a second author publication.
   1. **Lemas DJ**, Wiener HW, O’Brien DM, Hopkins S, Stanhope KL, Havel PJ, et al. Genetic polymorphisms in *carnitine palmitoyltransferase 1A* gene are associated with variation in body composition and fasting lipid traits in Yup’ik Eskimos. *Journal of Lipid Research*. 2012. 53(1):175–184. PMID: 22045927
   2. **Lemas DJ**, Klimentidis YC, Wiener HW, O’Brien DM, Hopkins S, Allison DB, Fernandez JR, Tiwari HK, Boyer BB. Obesity polymorphisms identified in genome-wide association studies interact with n-3 polyunsaturated fatty acids and modify genetic associations with adiposity phenotypes in Yup’ik people. *Genes & Nutrition.* 2013. 8(5):495-505. PMID: 23526194
   3. Klimentidis YC, **Lemas DJ**, Wiener HW, O’Brien DM, Hopkins S, Allison DB, Fernandez JR, Tiwari HK, Boyer BB. CDKAL1 and HHEX are associated with type-2 diabetes-related traits among Yup'ik people. *Journal of Diabetes.* 2014. 6(3):251-259. PMID: 24112421
   4. **Lemas DJ**, Klimentidis YC, Aslibekyan S, Wiener HW, O’Brien DM, Hopkins SE, Stanhope KL, Havel PJ, Allison DB, Fernandez JR, Tiwari HK, Boyer BB. Polymorphisms in *stearoyl CoA desaturase* and *sterol regulatory element binding protein* interact with n-3 polyunsaturated fatty acid intake and modify genetic associations with obesity-related anthropometric and metabolic phenotypes in Yup’ik people. *Molecular Nutrition and Food Research*. 2016. PMID 27467133
2. In addition to my work that examines gene-by-environment interactions and obesity, I have several publications focused on understanding the dietary and environmental factors that contribute to pediatric obesity. Specifically, these studies demonstrate consumption of n-3 and n-6 PUFAs are associated with protection from pediatric obesity and that maternal obesity and gestational weight gain during pregnancy are associated with neonatal cardio-metabolic risk factors at delivery.
   1. **Lemas DJ**, Brinton JT, Shapiro, ALB, Friedman JE, Glueck DH, Dabelea D. Associations of maternal weight status prior and during pregnancy with neonatal cardio-metabolic markers at birth: The Healthy Start Study. *International Journal of Obesity.* 2015. 39(10):1437-1442 PMID: 26055075
   2. Cardel M, **Lemas DJ**, Friedman JE, Fernandez JR. Higher Intake of PUFAs is associated with Lower Total Adiposity and Higher Lean Mass in a Racially Diverse Sample of Children. *Journal of Nutrition*. 2015. 145 (9):2146-2152 PMID: 26269238
   3. Rudolph MC, Young BE, **Lemas DJ**, Palmer CE, Hernandez T, Barbour LA, Friedman JE, Krebs NS, MacLean PS. Early infant adiposity deposition is positively associated with n-6 to n-3 fatty acid ratio in human milk independent of maternal BMI. *International Journal of Obesity*. 2016. PMID 27876761
3. During my post-doctoral training, I expanded my expertise to include the fetal origins of obesity with an emphasis on the development of the microbiome. The overall objective of my F32 project was to test how maternal obesity impact the infant’s microbiome, resulting in functional elements of the infant microbiome that will be associated with differences in adiposity during the first 4 months of life. Our first observations demonstrate that maternal obesity results in elevated fasting human milk (HM) insulin and leptin are associated with features of the infant microbiome that contribute to gut development and inflammation. Moreover, we have recently been asked to contribute to an invited review that will present an expanded view of the hypothesis that maternal obesity contributes directly to the function and structure of the maternal-infant microbiome, resulting in greater risk of pediatric obesity during early life.
   1. **Lemas DJ**, Young BE, Baker PR, Tomczik A, Soderborg T, Hernandez T, De la Houssaye B, Robertson CE, Rudolph M, Ir D, Patinkin Z, Krebs NJ, Santorico SA, Weir T, Barbour LA, Frank DN, Friedman JE. Alterations in in human milk leptin and insulin are associated with early changes in the infant intestinal microbiome. *American Journal of Clinical Nutrition*. 2016. 103 (3):1291-1300. PMID: 27140533
   2. **Lemas DJ**, Yee Shanique, Cacho N, Miller D, Cardel M, Gurka M, Janicke D, Shenkman E. Exploring the contribution of maternal antibiotics and breastfeeding to the development of the infant microbiome and pediatric obesity. *Seminars in Fetal and Neonatal Medicine*. 2016. PMID 27424917

## Complete List of Published Work in MyBibliography:

<http://www.ncbi.nlm.nih.gov/sites/myncbi/dominick.lemas.1/bibliography/43358594/public/?sort=date&direction=descending>

# D. Research Support

**Ongoing Research Support**

UF Clinical and Translational Research Institute Grant ($50K) PI (Lemas) 07/01/20-06/30/21

*Title: Estimating patterns of geographic variation and the social determinants of health that impact breastfeeding outcomes using natural language processing and electronic health records*

The objective of this study is to leverage mom-baby linked electronic health records and biomedical informatics to estimate geospatial patterns in breastfeeding and characterize the social determinants of health that impact breastfeeding outcomes in vulnerable and hard-to-reach populations.

Role: Assistant Professor, Principal Investigator

K01-DK115632

Research Scientist Development Award ($755) PI (Lemas) 01/17/19-11/30/23

*Title: Human milk metabolomics and microbe-host interactions associated with pediatric obesity*

The goal of this proposal is to leverage untargeted metabolomics to investigate how human milk impacts the infant gut microbiome during the first 12-months of life and identify the microbe-host interactions that mediate the protective role of breastfeeding on infant adiposity.

Role: Assistant Professor, Principal Investigator

**Completed Research Support**

Southeast Center for Integrated Metabolomics Pilot & Feasibility ($16K) PI (Lemas) 07/01/18-07/01/19

*Title: Human milk metabolomics and pediatric obesity*

The objective of this study is to investigate how the human milk metabolome (HMO’s, hormones, metabolites) differs according to maternal obesity and mode of delivery and identify HM metabolites that mediate the anti-obesity effects of breastfeeding.

Role: Assistant Professor, Principal Investigator

UF Clinical and Translational Research Institute Grant ($7K) PI (Lemas) 03/14/16-09/13/17

*Title: Recruitment and retention of pregnant women for longitudinal clinical microbiome studies*

The objective of this study is to optimize recruitment and retention of obese and normal weight pregnant women committed to exclusive breast-feeding into longitudinal clinical studies devoted to characterizing the link between the microbiome and pediatric obesity.

Role: Assistant Professor, Principal Investigator

UF Clinical and Translational Research Institute Grant ($28K) PI (Cardel) 03/14/16-09/13/17

*Title: The Effects of Experimentally Manipulated Social Status on Energy Balance in Youth*

The objective of this randomized controlled trial is to evaluate the effects of experimentally manipulated social status on eating behavior, physical activity, and energy balance in Hispanic adolescents.

Role: Assistant Professor, Co-Investigator

The Robin Hood Foundation Grant ($20K) 11/1/15-01/31/16

*Title: Assessing the Evidence for the Microbiome as a Potential Path for Reducing C-sections and Improving Child Health Outcomes in New York City*

The goal of this project is to provide a systematic review that will provide a comprehensive narrative summarizing the current evidence on the incidence of C-sections, related health implications, possible interventions to decrease unnecessary C-sections, and the role of perinatal microbiotic relationships on child health outcomes.

Role: Assistant Professor, Principal Investigator

UCD/Nutrition Obesity Research Center Pilot Grant ($20K) 08/01/14-07/31/15

*Title: The Effects of Maternal Obesity on the Function of the Infant Gut Microbiome*

The goal of this pilot project was to evaluate how maternal obesity contributes to the function of the infant microbiome by fecal short chain fatty acids and bile acids.

Role: Postdoctoral Fellow, Principal Investigator

F32-DK101179 04/01/14-07/31/15

NIH/NIDDK: Ruth L. Kirschstein National Research Service Award

*Title: Impact of Maternal Obesity on the Development of the Microbiome and Infant Adiposity*

The goal of this project was to determine how maternal obesity impacts the development of the maternal-fetal microbiome as a precursor to infant adiposity.

Role: Postdoctoral Fellow, Principal Investigator