

# Lifecourse Epidemiology of Adiposity & Diabetes (LEAD) Center

colorado school of public health



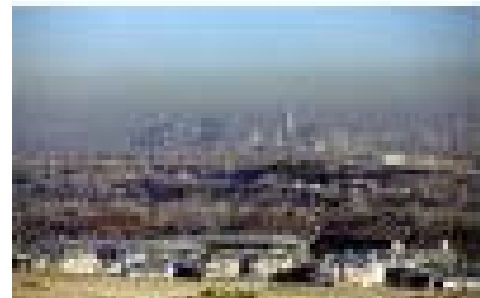
## Trainee Profile: Anne Starling, PhD (2013)

Dr. Starling received her BS from Duke University, an MPhil from Cambridge, University, UK, and her PhD from the Gillings School of Public Health at the University of North Carolina at Chapel Hill in 2013. She completed her postdoctoral training at the LEAD Center in 2017. She was recently funded for a mechanistic study of prenatal air pollution exposure through mapping and offspring obesity risk, an NIH K99/00 award funded as a Healthy Start ancillary study. She has also been exploring the role of endocrine disrupting chemicals that may have hormonal or direct toxic effects to increase obesity.

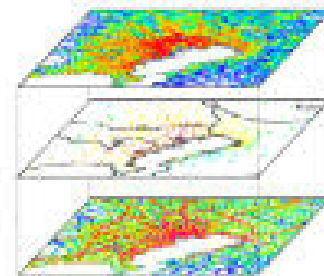
The prevention of childhood obesity is an urgent public health priority. The Centers for Disease Control and Prevention reported that 17% of children and adolescents in the US had obesity in 2012, and children with obesity may experience higher lifetime risks of age-specific morbidity and mortality. Environmental exposures in early life may promote the development of obesity and related adverse cardio-metabolic outcomes in children. Specifically, maternal exposure to particulate and gaseous air pollutants during pregnancy may lead to programming of offspring adiposity and altered postnatal growth trajectories.

Previous epidemiologic studies have identified associations between air pollution exposure and childhood overweight or obesity, but have rarely looked at exposures in the prenatal period, or measured biological factors in the mother or infant that could mediate the observed relationship.

The proposed research is an in-depth evaluation of the role that prenatal exposure to traffic-related air pollution may play in offspring adiposity and early childhood overweight and obesity, considering as mediators both inflammatory markers in maternal and umbilical cord blood, and epigenetic markers of DNA methylation in umbilical cord blood. We will use spatial modeling methods to estimate residential exposure to traffic-related air pollution during pregnancy in an existing longitudinal pre-birth cohort study focused on the developmental origins of obesity and related cardio-metabolic disorders. Stored maternal and umbilical cord serum samples will be analyzed for markers of systemic inflammation, which may be



Denver, Colorado air pollution in the 1970's



linked to traffic-related air pollution exposure and to offspring risk for overweight and obesity. Maternal and fetal systemic inflammation and offspring DNA methylation in umbilical cord blood will be investigated as possible mediators of the association. The project will make a substantial contribution to the field of air pollution epidemiology and the early-life environmental factors that influence childhood obesity risk.

### **Published Research**

Starling, A.P., J.T. Brinton, D.H. Glueck, A.L. Shapiro, C.S. Harrod, A.M. Lynch, A.M. Siega-Riz, D. Dabelea. Associations of maternal BMI and gestational weight gain with neonatal adiposity in the Healthy Start Study. *American Journal of Clinical Nutrition*, 2015; 101(2):302-9.

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Starling, A.P., A.L. Shapiro, K.A. Sauder, J.L. Kaar, B.M. Ringham, D.H. Glueck, H.L. Galan, D. Dabelea. Blood pressure during pregnancy, neonatal size and altered body composition: the Healthy Start Study. *Journal of Perinatology*, 2017; 37(5):502-506.

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Starling, A.P., J.L. Adgate, R.F. Hamman, K. Kechris, A.M. Calafat, X. Ye, D. Dabelea. Perfluoroalkyl substances during pregnancy and offspring weight and adiposity at birth: examining mediation by maternal fasting glucose in the Healthy Start Study. *Environmental Health Perspectives*, 2017; 125(6):067016.

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Starling, A.P., K.A. Sauder, J.L. Kaar, A.L.B. Shapiro, A. Siega-Riz, D. Dabelea. Maternal dietary patterns during pregnancy are associated with newborn body composition. *Journal of Nutrition*, 2017; 147(7):1334-1339.

### **Contact us about training opportunities:**

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