

## **Research Opportunities** **Dawn Misra Research Group**

I am a PhD epidemiologist (MHS in Maternal and Child Health, Johns Hopkins University; PhD in Epidemiology, Columbia University). I have, however, had wonderful past experiences with postdoctoral fellows, one a fellow from the MSU T32 (Jaime Slaughter-Acey) and a second fellow supported on my grants (Jennifer Straughen) and a third who (Shawnita Sealy-Jefferson) who successfully obtained an NIH F32 postdoctoral fellowship. I am proud to say that all three are now in faculty positions!

My research interests and goals closely parallel the mission of the National Institute for Child Health and Human Development. A central goal of the Institute is to assure that every child is born healthy and that no mothers experience adverse consequences of pregnancy. Through my work on adverse pregnancy outcomes and pregnancy complications, I am seeking to contribute to a fuller understanding of the pathways which lead to optimal perinatal health. Although my doctorate is in Epidemiology, my approach to the study of perinatal health has been broad and has included qualitative and health policy methodologies. I am passionate about this area of research and am continually exploring new methods that may move my work forward, whether they are innovative statistical analyses, measures of constructs borrowed from fields such as sociology, or identification of genetic factors that may amplify the adverse effects of environmental factors.

In 2003, I published a paper describing a contemporary perinatal health framework rooted in a life course perspective (Misra, DP, Guyer, B, Allston, A. (2003). Integrated perinatal health framework: A multiple determinants model with a lifespan approach. *American Journal of Preventive Medicine*. 25: 65-75). This work sought to integrate a seemingly disparate set of factors into a life course and multiple determinants model. The lifespan perspective focuses attention toward the preconceptional and interconceptional periods as targets for intervention in improving perinatal health. This framework has been the basis for my work going forward, in direct and indirect ways.

There are several projects where we have data available and I would welcome collaborations by a student or postdoctoral fellow. Data collection is complete in most of these studies but there may be opportunities for additional assays of biobanked specimens if good ideas are proposed.

Two of our NIH studies that are ongoing and could adopt new protocols.

### **Biosocial Impacts on Black Births (BIBB) (2017 – 2023).**

BIBB is a prospective longitudinal study of Black women that focuses on how social (at the individual and neighborhood levels) relate to risk of preterm birth. We are recruiting Black women in early to mid pregnancy with data collected at 2 to 3 prenatal time points (depending on entry into the study). Data include self administered questionnaires (social and behavioral factors, including life course measures), blood (to measure the lipidome and cytokines, with banked extra specimens), saliva (to measure telomere length), and medical record abstraction (maternal health, birth outcomes). For a subset of women, we have collected postpartum questionnaires to assess prenatal care quality and a few additional measures. We are currently recruiting women at 2 prenatal care sites: St. John Hospital, Detroit MI; Ohio State University Health System, Columbus OH. Data collection will continue through December 2021. As of March 1 2020, we have enrolled about 650 pregnant women and had 400 deliveries.

Students interested in participating at any level should contact me.

### **Fathers Matter (2018 – 2022)**

Fathers Matter is recruiting the father of the baby (fetus) of women enrolled in the BIBB study (see above). Most fathers are recruited during the pregnancy and complete a prenatal and postpartum questionnaire as well as providing a saliva sample (telomere length). We are also recruiting fathers only at delivery. As of March 1 2020, we have enrolled about 115 fathers.

Students interested in participating at any level should contact me.

## **Baltimore Preterm Birth Study (Grant Title: How Social Factors Influence the Risk of Preterm Delivery)**

This was an NIH R01 study funded from 2000 through 2006. We collected data on 842 women, African-American Baltimore City residents seeking care either at a Johns Hopkins prenatal clinic or delivering at Johns Hopkins Hospital. Approximately half of the cohort was recruited prenatally and half recruited at delivery. A wide range of social and psychosocial factors were examined. The prenatally recruited cohort was also enrolled in collection of vaginal smear slides and limited saliva measures for cortisol assessment. Current residential address data was also collected. This design was intended to capture women receiving late or no prenatal care who would be missed by longitudinal (prenatal) designs. Consistent with the high risk study population, our preterm birth rate was approximately 17 percent. We have published several manuscripts but there are still many excellent questions that remain to be examined with these data.

### Publications to date

1. Slaughter-Acey JC, Talley LM, Stevenson HC, Misra DP. (2018.) Personal versus group experiences of racism and risk of delivering a small-for-gestational age infant in African American women, a life course perspective. *Journal of Urban Health*. July 19.
2. \*Sealy-Jefferson, S, \*Hegner, K, Helmkamp, L, Straughen, J, Misra, DP (2014) Linking Non-traditional Physical Activity and Preterm Delivery in Urban African American Women. *Women's Health Issues*. 24(4):e389-95.
3. \*Straughen, JK, Caldwell, CH, Young, AA, Misra DP. (2013). Partner support in a cohort of African American families and its influence on pregnancy outcomes and prenatal health behaviors. *BMC Pregnancy and Childbirth*. 13: 187
4. \*Slaughter-Acey, JC, Caldwell, C, Misra, DP. (2013). The Influence of Personal and Group Racism on Entry into Prenatal Care among African American Women. *Women's Health Issues*. 23(6):e381-7.
5. Srinivasan, U, Ponnaluri, S, Villareal, L, Gillespie, B, Wen, A, Miles, A, Bucholz, B, Marrs, CF, Iyer, RK, Misra, D, Foxman, B. (2012). Gram stains: a resource for retrospective analysis of bacterial pathogens in clinical studies. *PLoS One*. 7(10):e42898.
6. Misra, DP, Strobino, D, \*Trabert, B. (2010) Effects of social and psychosocial factors on risk of preterm birth in Black women. *Paediatric and Perinatal Epidemiology*. 24(6):546-54.
7. \*Trabert, B, Misra, DP. (2007). Risk factors for bacterial vaginosis during pregnancy among African American women. *American Journal of Obstetrics and Gynecology*. 197(5): 477.e1-e8.
8. Misra, DP, \*Trabert, B. (2007). Protective effects of vaginal douching on risk of preterm birth. *American Journal Obstetrics and Gynecology*. 196(2): 140.e1-140.e8.
9. Misra, DP, \*Trabert, B, \*Atherly-Trim, S. (2006). Variation and predictors of vaginal douching practices. *Women's Health Issues*. 16: 275-282.
10. \*Boskey, ER, \*Atherly-Trim, SA, O'Campo, PJ, Strobino, DM, Misra, DP. (2004). Acceptability of a self-sampling technique to collect vaginal smears for Gram stain diagnosis of bacterial vaginosis. *Women's Health Issues*. 14: 14-18.

## **LIFE Study (Grant Title: Impact of Racism on Risk of Preterm Birth in Black Women)**

This is an NIH R01 study funded from 2008 through 2014. We collected data on 1410 African-American women delivering at Providence Hospital in Southfield Michigan. Our preterm birth rate was approximately 15 percent. This grant collected information on a wide range of social and psychosocial factors as well as measures of women's exposures and experiences over the life course. It included interviews with approximately half of the mothers of women in the study to better examine life course measures. Addresses, both current and childhood, have been geocoded. We have published a few manuscripts with several out for review and in development. Again, the data set is very rich and many opportunities remain.

### Publications to date:

1. Sealy-Jefferson, S, Butler, B, Price-Spratlen, T, Dailey, RK, Misra, D. (2020). Neighborhood-level mass incarceration and future preterm birth risk among African American women. *J Urban Health*. <https://doi.org/10.1007/s11524-020-00426-w>

2. Nowak, AL, Giurgescu, C, Templin, TN, Dailey, RK, Misra, DP. (2020). How depressive symptoms among African American women relate to measures of social disorder in her childhood and pregnancy neighborhood. *Journal of Urban Health*.
3. Slaughter-Acey JC, Sneed D, Parker L, Keith VM, Lee NL, Misra DP. (2019). Skin Tone Matters: Racial Microaggressions and Delayed Prenatal Care. *Am J Prev Med*.
4. Sealy-Jefferson, S, Misra, DP. (2019). Neighborhood Tax Foreclosures, Educational Attainment, and Preterm Birth among Urban African American Women. *International Journal of Environmental Research and Public Health*.
5. Sealy-Jefferson, S, Mustafaa, F, Misra, DP. (2019). Early-life Neighborhood Context, Perceived Stress, and Preterm Birth in African American Women. *Social Science in Medicine – Population Health*.
6. Giurgescu C, Caldwell C, Misra DP, Rogers W, Young A. (2018) Interpersonal Relationships and Depressive Symptoms during Pregnancy among Black Couples. *American Journal of Maternal Child Nursing*
7. Straughen, J, Sealy-Jefferson S, Bazydlo M, Helmkamp L, Misra, DP. (2018) Physical activity and risk of preterm birth in a cohort of African American women. *Women's Health Issues*.
8. Giurgescu C, Fahmy L, Slaughter-Acey J, Nowak A, Caldwell C, Misra DP. (2018). Can support from the father of the baby buffer the adverse effects of depressive symptoms on risk of preterm birth in Black families? *AIMS Public Health*.
9. Nutor, J, Slaughter-Acey, J, Giurgescu, C, Misra, DP. Relationship between Symptoms of Depression and Preterm Birth among Black Women. *American Journal of Maternal Child Nursing*.
10. Eboh, R, Giurgescu, C, Misra, DP. (2018). Relationship with the father of the baby and perceived stress among Black women. *American Journal of Maternal Child Nursing*.
11. Straughen JK, Bazydlo M, Havstad S, Shafie-Khorassani, F, Misra DP. (2017) Maternal body weight trajectories across the life course and risk of preterm delivery. *Journal of Developmental Origins of Health and Disease*. Sept 7: 1-8.
12. Giurgescu, C, Slaughter-Acey, J, Templin, T, Misra, D. (2017). The impact of symptoms of depression and walking on gestational age at birth in African-American women. *Women's Health Issues*. 27(2): 181-7.
13. Sealy-Jefferson, J, Messer, L, Slaughter-Acey, J, Misra, D. (2017) Inter-relationships between objective and subjective measures of the residential environment among urban African American women. *Annals of Epidemiology*. 27(3): 164-8
14. Sealy-Jefferson, SJ, Slaughter-Acey, J, Caldwell, C, Kwarteng, J, Misra, DP. (2016). Neighborhood Disadvantage and Preterm Delivery in Urban African Americans: The Moderating Role of Religious Coping. *Social Science in Medicine – Population Health*.
15. Sealy-Jefferson, SJ, Giurgescu, C, Slaughter-Acey, J, Caldwell, C, Misra, DP. (2016). Neighborhood Context and Preterm Delivery among African American Women: The Mediating Role of Psychosocial Factors. *Journal of Urban Health*.
16. Osypuk, T, Slaughter-Acey, J, Kehm, R, Misra, DP. (2016). Life course social mobility reduces risk of adverse birth outcomes. (2016). *American Journal of Preventive Medicine*.
17. Slaughter-Acey, JC, Sealy-Jefferson, S, Helmkamp, L, Caldwell, CH, Osypuk, TL, Platt, RW, Straughen, JK, Dailey-Okezie, RK, Abeysekara, P, Misra, DP. (2016). [Racism in the form of micro aggressions and the risk of preterm birth among black women](#). *Annals of Epidemiology*. 26(1): 7-13.
18. Sealy-Jefferson, J, Giurgescu, C, Helmkamp, L, Misra, DP, Osypuk, TL. (2015). Perceived Physical and Social Residential Environment and Preterm Delivery in African American Women. *American Journal of Epidemiology*.
19. Osypuk, TL, Kehm, R, Misra, DP. (2015) Where we used to live: Validating retrospective measures of childhood neighborhood context for life course epidemiologic studies. *PLOS One*.
20. Giurgescu, C, Misra, DP, Sealy-Jefferson, S, Caldwell, CH, Templin, TN, Slaughter, JC, Osypuk, TL. (2015) The impact of neighborhood quality, perceived stress, and social support on depressive symptoms during pregnancy in African American women. *Social Science in Medicine*
21. Straughen, JK, Caldwell, CH, Osypuk, TL, Helmkamp, L, Misra, DP. (2013). Direct and Proxy Recall of Childhood Socio-Economic Position and Health. *Paediatric and Perinatal Epidemiology*. 27(3): 294-302.
22. Osypuk, TL, Caldwell, CH, Platt, R, Misra, D. (2012). The Consequences of Foreclosure for Depressive Symptomatology. *Annals of Epidemiology*. 22(6): 379-387.

## **GROW Study (Grant Title: Gestational Regulators of Weight)**

The PI for this study is Vinod Misra (my spouse and collaborator). One of my past postdocs and I have continued to collaborate on this avenue of research. The research was undertaken at the University of Michigan where Vinod used his K award coupled with a Doris Duke Clinical Foundation Award he obtained to examine how maternal overweight and obesity influenced pregnancy. This was a longitudinal study of pregnant women who presented for early prenatal care at the University of Michigan Health System. Women were enrolled between 6 and 10 weeks gestation. Women were eligible for inclusion if they were between 18 and 45 years of age, had a singleton pregnancy, and intended to deliver at the study hospital. Participants were seen for four additional study visits at 10-14, 16-20, 22-26, and 32-36 weeks gestation. At each of the five study visits, questionnaire data, anthropometric measurements (maternal weight and fetal ultrasound, including measures of maternal and fetal fat on half the sample), and biological samples were collected. Baseline maternal characteristics were obtained by questionnaire and medical record review. Data were collected, over two phases, on 286 pregnancies. The sample was well educated, relatively high income, and primarily of white ethnicity. However, there was heterogeneity with regard to weight with approximately half of the cohort classified as normal weight and half as overweight/obese. We have published several manuscripts with more in development. Again, the data set is very rich and there are many opportunities that remain.

### Publications to date:

1. \*Straughen, JK, Misra, DP, Helmkamp, L, Misra, VK. (2017). Preterm delivery as a unique pathophysiologic state characterized by maternal soluble FMS-like tyrosine kinase 1 and uterine artery resistance during pregnancy: a longitudinal cohort study. *Reproductive Sciences*.
2. \*Straughen, JK, Misra, D, Kumar, P, Misra, VK. (2013). The influence of overweight and obesity on maternal soluble fms-like tyrosine kinase 1 and its relationship to leptin during pregnancy. *Reproductive Sciences*. 20(3): 269-275. Online August 7, 2012.
3. \*Straughen, J., Kumar, P., & Misra, V. K. (2012) The Effect of Maternal Soluble FMS-like Tyrosine Kinase 1 during Pregnancy on Risk of Preterm Delivery, *Journal of Maternal-Fetal & Neonatal Medicine* 25: 1879-83.
4. Misra, V. K., Straughen, J., & Trudeau, S. (2012) Maternal Serum Leptin During Pregnancy and Infant Birth Weight: the Influence of Maternal Overweight and Obesity, *Obesity*, in press.
5. Misra, V.K., Trudeau, S and \*Perni, U (2011) Maternal Serum Lipids During Pregnancy and Infant Birth Weight: The Influence of Prepregnancy BMI. *Obesity*, 19: 1476-1481.
6. Misra V.K., Trudeau S. (2011) The influence of overweight and obesity on longitudinal trends in maternal serum leptin levels during pregnancy, *Obesity (Silver Spring)*, 19: 416-421.
7. Straughen, JK, Trudeau, S, Misra, VK (In press.) Changes in Adipose Tissue Distribution during Pregnancy in Overweight and Obese Compared to Normal Weight Women. *Nutrition and Diabetes*.
8. Vahratian A, Misra, VK, Trudeau, S, Misra, DP. (2010). Pre-pregnancy body mass index and time-dependent changes in lipid levels during pregnancy. *Obstetrics & Gynecology*. 116(1):107-113.

## **Placenta Research**

I collaborate with a placental pathologist on a number of studies concerning the placenta and its relationship to birth outcomes as well as later childhood outcomes. Most recently we are involved in research on the placenta as a screening tool to identify infants likely to develop autism spectrum disorders. We have an ongoing community cohort on autism and the placenta capitalizing on the universal placenta collection of a large New York city hospital.

### *General*

1. Salafia CM, Shah RG, Misra, DP, Straughen JK, Roberts DJ, Troxler L, Morgan SP, Eucker B, Thorp JM. (2017). Chorionic vascular 'fit' in the human placenta: Relationship to birth weight and gestational age. *Placenta*. 59: 13-18.
2. Salafia, C, Dygulska, B, Perez-Avilan, G, Roberts, DJ, Ma, X, Misra, DP, Dunn, AD, Ngu, S, Inany, H, Khawar, N, Shah, G, Narula, P, Lederman, S. (2017). The relationship between birth and placental weights changes with placental size. *Early Human Development*. 111:56-59.
3. Straughen, JK, Misra, DP, Ernst, LM, Charles, AK, VanHorn, S, Ghosh, S, Buhimschi, I, Buhimschi, C, Divine, G, Salafia, CM. (2017) Methods to decrease variability in histologic scoring in placentas from a cohort of preterm infants. *BMJ Open*. 7(3):E013877.

4. Yampolsky, M, Salafia, CM, Misra, DP, Shlakhter, O, Gill, JS. (2013). Is the placental disk really an ellipse? *Placenta*. 34(4):391-3.
5. Yampolsky, M, Salafia, C, Shlakhter, O, Misra, D, Haas, D, Eucker, B, Thorp, J. (2011). Variable placental thickness affects placental functional efficiency independent of other placental shape abnormalities. *Journal of the Developmental Origins of Health and Disease*. 2(4): 205-211.
6. Salafia, C, Yampolsky, M, Misra, D, Shlakhter, O, Haas, D, Eucker, B, Thorp, J. (2010) Placental surface shape, function, and effects of maternal and fetal vascular pathology. *Placenta*. 31(11): 958-962.
7. Misra, DP, Salafia, CM, Miller, RK,, and Charles, AK. (2009) Non-linear and gender-specific relationships for placental growth measurers with birth weight and the fetoplacental weight ratio. *Placenta*. 30: 1052-1057.
8. Salafia CM, Misra DP, Miles, J. (2009.) Methodologic issues in the study of the relationship between infection and preterm birth. *Placenta*. 30(12): 988-993.
9. Salafia, CM, Misra, DP, Yampolsky, M, Charles, AK, Miller, RK. (2009.) Allosteric metabolic scaling and fetal and placental weight. *Placenta*. 30(4): 355-360.  
*Under development*
10. Validity and reliability of measurement of placental infarcts (NCPD study, US)

#### *Developmental Origins Health and Disease*

1. Misra, DP, Salafia, CM, Charles, AK, Miller, RK. (2012). Placental measurements associated with IQ at age 7 years. *Journal of the Developmental Origins of Health and Disease*. 3(3): 190-197.
2. Misra, DP, Salafia, CM, Chadha, K, Charles, AK, Miller, RK (2010). Birthweights smaller or larger than the placenta predict BMI and blood pressure at age 7 years. *Journal of the Developmental Origins of Health and Disease*. 1(2): 123-130.

#### *Prenatal Origins of Autism: Placental Predictors*

1. Straughen, JK, Misra, DP, Divine, G, Shah, R, Perez, G, VanHorn, S, Dubrey, V, Dygulska, B, Schmit, R, Lederman, S, Narula, P, Salafia CM. (2017) The association between placental histopathology and autism spectrum disorders. *Placenta*. 57: 183-188.
2. Park BY, Misra DP, Moye J, Miller RK, Croen L, Fallin DM, Walker C, Newschaffer CJ, Salafia CM. (2018). Placental gross shape differences in a high autism risk cohort and the general population. *PLOS One*. 13(8).
3. Placental vasculature differences in a high autism risk cohort and the general population.
4. Relationships between autism risk and placental size, shape, and vasculature in a low risk population based cohort (ALSPAC, UK).