The NEST Stork: Delivering News to You!

Spring 2015 Volume 4

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Spring Forward with NEST!

Welcome to Spring! Thank you for your continued participation in NEST! Your involvement is what makes NEST a success!

The Newborn Epigenetic Study (NEST) seeks to improve our understanding of how environmental exposures during pregnancy and in the first few years of life influence our children's future risk of chronic diseases and conditions such as obesity, diabetes, cancer, neurodevelopmental disorders (including ADHD and autism), and heart disease (ex: coronary heart disease). We do this by studying the genes that are believed to play a role in these conditions.

NEST Quick Facts:

- More than 2,000 women and their children participate
- The children are now ages 3 – 10 years
- NEST is a springboard for ideas! We are learning about how the body switches genes on and off. This information is used to explore ways of reducing disease.
- We had twins! Two new studies have hatched over the past year (NICHES & TESIE) and we are nurturing additional eggs.

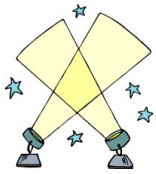
As we look for new ways to explore child development we are growing and changing with you. We are launching new studies which will allow a detailed look at specific areas. These studies will build on the wealth of information collected as part of NEST to focus on specific areas of child development. To learn more about these studies, please see the articles on page 3 of this issue. We are also in the process of developing a web platform to allow new ways to communicate.

DukeMedicine

Duke Child and Family Study Center

Pavilion East 2608 Erwin Road, Suite 300 Durham, NC 27705

NEST Mom in the Spotlight



In 2010 I became a NEST participant when I was pregnant with my second child, Olivia, who is now almost four years old. As a scientist and a mom I was excited to become a part of a new research study examining lifestyle and environmental factors affecting our children's health. Today, I'm not only a NEST participant, but a scientist working with the NEST and NICHES research team to understand if and how chemicals present in our home also affect children's health. These types of research questions cannot be answered through laboratory experiments. Only by working with families side by side can we understand what factors are contributing to chronic illnesses in children, and identify ways to lead healthier lives. I am proud to be a NEST participant and a scientist at Duke, because there is nothing more important than protecting the health of our children.

Heather Stapleton, PhD is an Associate Professor at Duke University and the Principal Investigator for the TESIE study.

We want to hear your story! If you would like to be a featured "NEST Mom" contact Rachel Maguire at **Rachel.Maguire@duke.edu** or **(919)-613-6469.**

NEST in the News

Your participation in NEST has led to some exciting findings! These discoveries will move science forward for the next 10 years.

- We were recently featured on NPR and Duke Research profiles. To read more, search for "How a Pregnant Woman's Choices Could Shape a Child's Health" and "Environmental Influences on Health, Starting Before Birth".[1, 2]
- High stress during pregnancy resulted in abnormal levels of chemicals that control children's genes (epigenetics). Reducing stress during pregnancy could be helpful in decreasing levels of these chemicals.[3]
- Antibiotic use during pregnancy was associated with lower birth weight.[4]
- Recommended levels of folate intake during pregnancy have a positive impact on birth weight. Folate rich foods include spinach, black-eyed peas, asparagus, romaine lettuce, avocado, and beef liver.[5, 6]
- Higher intake of folate and iron was associated with lower levels of toxic metals in the body. A healthy diet may decrease the impact of toxic metals in the body.[7]
- Fathers can also influence a child's health. We found babies whose fathers were obese had less of a chemical that turns a gene in the body on and off. [8, 9]

1. http://research.duke.edu/stories/duke-team-looks-environmental-influences-health-starting-birth; **2.** http://www.npr.org/blogs/health/2013/09/23/224387744/how-a-pregnant-womans-choices-could-shape-a-childs-health; **3.** Vidal A et al., Maternal stress, preterm birth, and DNA methylation at imprint regulatory sequences in humans; Genetics & Epigenetics, 2014; **4.** Vidal A et al., Associations between antibiotic exposure during pregnancy, birth weight and aberrant methylation at imprinted genes among offspring. International Journal of Obesity, 2013; **5.** Hoyo C et al., Erythrocyte folate concentrations, CpG methylation at genomically imprinted domains, and birth weight in a multiethnic newborn cohort. Epigenetics, 2014; **6.** http://ods.od.nih.gov/factsheets/Folate-HealthProfessional/; **7.** Luo Y et al.., Associations between Circulating Levels of Nutrients and Toxic Metals in Pregnant Women. Pediatric Academic Societies Annual Meeting Abstract, 2015 ; **8.** Soubry A et al., Paternal obesity is associated with IGF2 hypomethylation in newborns: results from a Newborn Epigenetics Study (NEST) cohort. BMC Medicine, 2013; **9.** Soubry A et al., Newborns of obese parents have altered DNA methylation patterns at imprinted genes; International Journal of Obesity, 2013

Meet Our Twins!

The NICHES study is lead by Dr. Bernard Fuemmeler, a Duke child psychologist. NICHES is part of a national network of children's environmental health research centers. NICHES focuses on how the environment influences children's cognitive and behavioral health and what causes differences in children's development and ability to learn. Some children may learn differently than others. In some instances, it can lead to a diagnosis of Attention Deficit Hyperactivity Disorder (ADHD).

The NICHES Team

One of NICHES's focus areas is on secondhand smoke and how this may affect children's cognitive development. The NICHES study is interested in finding out if biological factors such as epigenetics may play a role in these processes. Epigenetics is an exciting, new area of research that explains how genetic changes are influenced by things in the environment like smoking.

Your family has already contributed a lot to research and we are thankful for your time and efforts. As a NEST participant, you have provided a wealth of information about your pregnancy and your child's early development. This information is invaluable. As your child grows, we are able to better understand his/her cognitive development. We hope you will remain with us so that we can continue to learn more about epigenetics and child cognitive development.

Special thanks to the 121 families already enrolled in the NICHES study! NICHES study participants complete computerized assessments and are compensated $100 cash for their time and travel. If you are interested in learning more about NICHES please contact us at **(919) 681-2353** or by email at **NICHESproject1@duke.edu.**

The NEST family is pleased to welcome Professor Heather Stapleton and her staff to our team! With funding provided by the National Institutes of Environmental Health Science and the Environmental Protection Agency, Professor Stapleton's team is currently conducting a research study to determine how young children's behavior affects their exposure to chemicals found in their home environment.

Home sampling

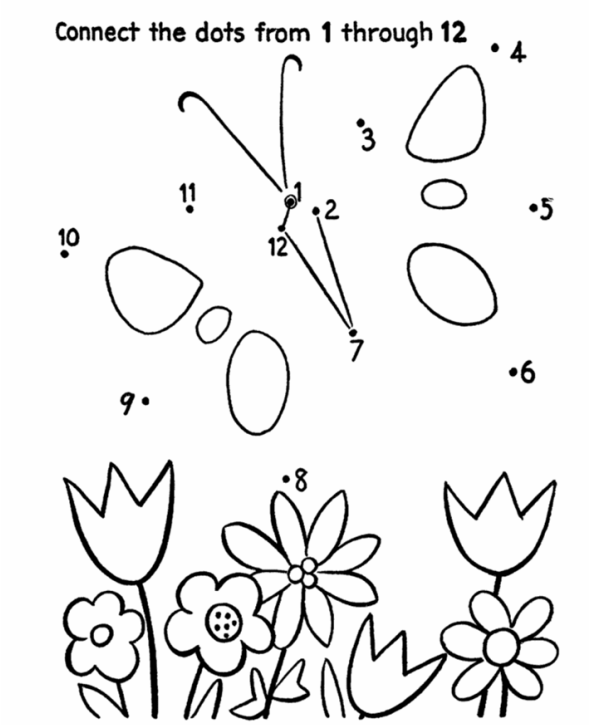
Professor Stapleton's team visits homes of NEST children to collect samples from the child, dust and foam samples, and detailed information about the home environment. Using this new information and information participants have already provided through the NEST study, Professor Stapleton's team will look for a connection between chemical exposure in the home environment and development. Study participants receive $30 as compensation for their time and will receive information about the levels of chemicals in their homes and children's bodies.

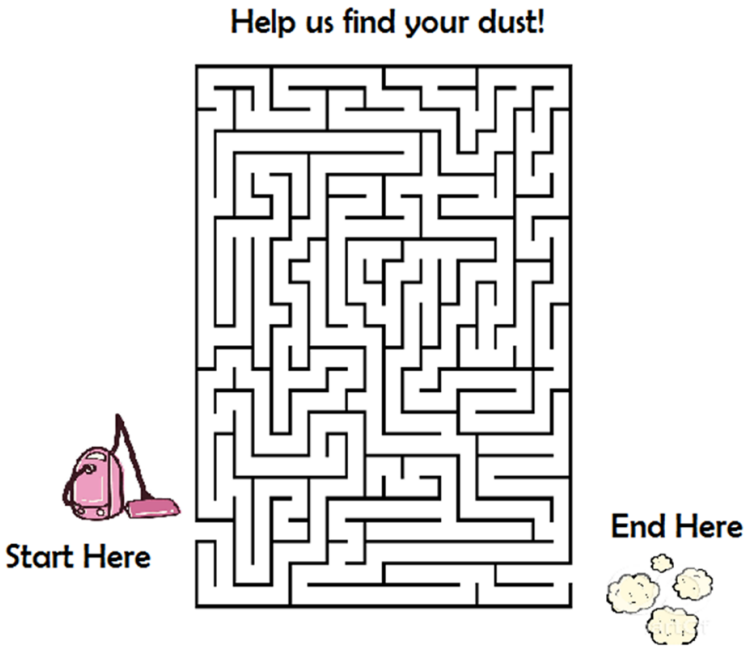
The TESIE Team

If this study sounds like something you'd like to learn more about or participate in, please contact Kate Hoffman at **(919) 684-6952** or by email at **SVOC@duke.edu**.

A special thank you to the 60 families who have already enrolled in the TESIE project! The team hopes to recruit an additional 140 families over the next year. Would you like to help us build our knowledge of children's chemical exposures?

Kids' Corner





If you would like your child's drawing featured in our newsletter please contact Rachel Maguire at **Rachel.Maguire@duke.edu** or **(919)-613-6469**.

2608 Erwin Rd., Suite 300 Durham, NC 27705

NEST
Newborn Epigenetics Study

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