EXPERTISE
Effects of nutrition on typical and atypical brain development and function across the lifespan with an emphasis on cognitive development

UNC NUTRITION RESEARCH INSTITUTE
Studies individual differences in requirements and responses to diet and the effects on individual nutritional needs, human development, and the mitigation of chronic diseases for the advancement of precision nutrition

DISCOVERIES
» Docosahexaenoic acid (DHMA) and choline work synergistically to support cognitive abilities
» Balance between omega-6 and omega-3 fatty acid intake is important for optimal cognitive development
» Consumption of wild blueberries improves speed of processing and general cognitive abilities in those experiencing mild cognitive decline
» Maternal genetics are related to the fatty acid quantity in breast milk, impacting infant brain development and cognitive function

RESEARCHING
» Effects of maternal nutrition on fetal and infant brain development
» Impact of nutrition on brain function across the lifespan
» Influence of specific nutrients on atypical brain development and function such as seen in fetal alcohol spectrum disorders
**CASE STUDY**

Mother’s Ability to Produce Fatty Acids Linked to Infant Cognition

**Challenge:** Ten years before anyone else in her field, Carol L. Cheatham, PhD, was researching how the genetics of a mother and baby interact in utero and through breast feeding to support or derail cognitive function.

**Research:** She found that mothers with certain single nucleotide polymorphisms (SNPs) on the FADS2 gene have lower levels of fatty acids in their milk and may confer lower levels of fatty acids during gestation. The SNPs are thought to be markers for lower levels of a fatty acid desaturase critical for fatty acid metabolism. By using an event-related potential (ERP) system to record the brain activity of exclusively breastfed 6-month-old infants, Dr. Cheatham determined that infants of the mothers with the SNP could not differentiate between familiar and unfamiliar pictures. The infants of the mothers without the SNP could.

**Importance:** The findings indicate that cognitive abilities are related to the amount of fatty acids the mother delivers through gestation and lactation. Identifying mothers with this SNP allows for dietary counseling to ensure they optimize their diet and improve the cognitive abilities of their children.


*Nutrition Research*: Genetic and epigenetic transgenerational implications related to omega-3 fatty acids, Part II: maternal FADS2 rs174575 genotype and DNA methylation predict cognitive performance. 2015.


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About The North Carolina Research Campus

The North Carolina Research Campus, located in Kannapolis, NC, near Charlotte, is a scientific community of eight universities, the David H. Murdock Research Institute, global companies and entrepreneurs. Research and development focus on safer, more nutritious crops, healthier foods and precision nutrition.

Learn more at www.NCResearchCampus.net.