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Dr. Steve Zeisel (second from right) meets with colleagues at the Nutrition Research Institute.

Preventing health problems and birth defects, courtesy of genetics

The nutrient choline is essential for normal brain development in babies, and adults need it for normal liver and muscle function. Now UNC public health researchers find that some people need more of this nutrient than others, and a specific gene, called PEMT, may determine that need. Dr. Steven Zeisel led the UNC team that discovered this connection.

Most of the choline needed by the body must be consumed in the diet through eggs, meats, grains and similar foods. Under best circumstances, the body can make about 30 percent of the choline it requires.

“The PEMT gene is the only mechanism the body has to make choline. The more estrogen one has, the more the gene can be

upregulated to tell one’s body to make choline, if you are not eating enough,” says Dr. Kerry-Ann da Costa. Therefore, people with lower estrogen, such as men and postmenopausal women, would have greater need for dietary choline.

Dr. da Costa and colleagues found that women with a variation in the PEMT gene

do not upregulate the gene to make more choline, so they need more of it in their diets to prevent liver or muscle dysfunction than do those who did not have the variant. She suspects the same would be true for pregnant women, to help prevent birth defects in their babies.



Dr. Kerry-Ann da Costa

These discoveries have importance beyond choline. Zeisel and da Costa envision being able to analyze a person’s genetic profile, then design a diet for them to prevent specific health problems, such as birth defects.

—Angela Spivey

Researchers featured in this article include:

- Steven Zeisel, MD, PhD, Kenan Distinguished Professor of nutrition at UNC’s public health school and director of the Nutrition Research Institute, in Kannapolis, N.C.
- Kerry-Ann da Costa, PhD, research assistant professor of nutrition