

THE HARTWELL FOUNDATION

2007 Individual Biomedical Research Award

Kenneth Lyons Jones, MD

**Professor
Department of Pediatrics**

University of California, San Diego



Maternal Dietary Fat Intake as a Potentially Preventable Cause of Gastroschisis

During fetal development, if the abdominal wall fails to close properly, the baby will deliver with its intestines outside the body, creating a condition known as gastroschisis. It occurs in approximately one out of every 5,000 births, with approximately 10% of affected babies stillborn, 20-30 % with gastrointestinal abnormalities, and 75% classified as growth-restricted. A baby with gastroschisis will require surgical intervention soon after birth and frequently more than one surgery. The cause of gastroschisis is unknown, but it is associated with younger maternal age, low socioeconomic status, and poor maternal diet. It is usually not associated with a chromosome disorder. There is some evidence to suggest that environmental factors may be important in its etiology, since the increased incidence of gastroschisis in the U.S. parallels the introduction or escalation of particular environmental factors. Given the limited information available about the disorder, it is only indirectly preventable. However, based on recent detailed observations made by Dr. Jones, it appears an unusually strong correlation exists between the existence of fat deposits in the placental membranes and the appearance of the disease. In this regard, he proposes to profile the lipid deposits in the membranes of mothers with affected babies and relate the information to maternal diet and infant lipid tissue stores. In order to identify possible metabolic mechanisms underlying this birth defect, he intends to compare the nutritional status of mothers and their infants with gastroschisis to unaffected mother/child pairs. His plan is to deploy biochemical, physiological and computational methods to evaluate micronutrients in the placenta, blood, and serum, by taking advantage of cutting-edge technologies several orders of magnitude more sensitive than conventional methods. If Dr. Jones is successful, the pattern of results will generate diagnostic paradigms appropriate for detection of preclinical gastroschisis, leading to intervention or prevention of this dreadful birth defect.