Children's Nutrition Research Center at Baylor College of Medicine

Studying Nutrition Today for the Health of Future Generations

Mission

The Children's Nutrition Research Center (CNRC) is dedicated to defining the nutrient needs of children from conception through adolescence, pregnant women, and nursing mothers. Since 1978, CNRC research has helped form the foundation of national nutrition policies and clinical nutrition practices that have improved the health mothers and children of all ages.

Research

The CNRC is the largest federally funded research center of its kind, with 65 full-time faculty members and approximately 350 technical and support personnel. One of six USDA Human Nutrition Research Centers, the CNRC is operated by Baylor College of Medicine in cooperation with the USDA's Agricultural Research Service and the Texas Children's Hospital. This unique public/private partnership gives Center scientists access to the resources of the USDA, two of the nation's leading pediatric research institutions and the world's largest medical center.

Led by Center Director Dr. Dennis Bier, the CNRC takes an interdisciplinary team approach to nutrition research, with scientists trained in disciplines ranging from biochemistry, cellular and molecular biology, human genetics, physiology, nutrition, plant biology, animal science, physics, statistics, epidemiology, urban economics, behavioral science, and psychology working closely with physicians trained in a variety of pediatric subspecialties. This scientific synergy has fostered research collaborations across disciplines and at all scientific levels, from plant and animal studies at the molecular/cellular level to human nutrition studies at the clinical level, with the single goal of improving the nutritional well being of children.

The 11-story CNRC houses an Energy Metabolism and Exercise Laboratory with indirect room calorimetry, an advanced Body Composition Laboratory, a Behavioral Studies Unit and Children's Eating Laboratory, a Research Greenhouse, and both small and large animal facilities. These facilities enable Center scientists to conduct some of the world's most advanced nutritional studies, which have earned the CNRC an international reputation for research excellence.

Education and Training

The CNRC offers a post-doctoral research training program designed to prepare individuals with an M.D. or a Ph.D. degree for active research careers in maternal, infant and/or childhood nutrition.

Current Research Projects

Nutritional Regulation of Cell Growth, Differentiation and Development: One of the overarching and interdisciplinary themes of CNRC research is to describe how dietary components help determine organ growth, development and function throughout fetal life, infancy, childhood, and adolescence.

Nutritional Programming During Critical Periods of Development: These studies focus on how an inadequate intake of nutrients like folic acid, Vitamin A, protein, and cholesterol during critical periods of development can have long lasting effects on childhood development and impact health in adult life.

Nutrient-gene Interactions: This research examines how genes affect the absorption and utilization of nutrients, which in turn affects nutrient requirements, and how nutrients themselves alter gene expression, which is a crucial "personal" link in the development of nutrition-related diseases like obesity, diabetes, heart disease and cancer.

Nutrition of Mother and Child During Pregnancy and Lactation: This research has defined the optimal dietary energy, protein, and mineral requirements for optimal maternal health during pregnancy and lactation.

Absorption and Metabolism of Essential Mineral Nutrients: These studies investigate the metabolic, hormonal and dietary factors that affect the absorption and utilization of essential mineral nutrients, especially calcium and zinc, in children.

Regulation of Energy Balance and Body Composition: This research involves the genetic, physiological and environmental factors that influence the amounts of lean tissue, body fat and bone minerals that children gain during normal development and assesses the changes in the development of obesity.

Determinants of Childhood Eating/Physical Activity Behaviors: These studies identify the behavioral factors influencing the development of children's eating and physical activity habits and explore how to best help children adopt healthier habits.

Phytonutrient Biochemistry, Physiology and Transport: This research explores how plants regulate the absorption and accumulation of minerals like calcium, iron, and zinc, which could lead to improvements in the essential-mineral content of plants and the bioavailability of these minerals from plant foods.

Research Highlights

- Developed national reference data for body composition, bone density, energy intake and expenditure for pre-term infants and children of all ages and major U.S. ethnic groups.
- Proved that human infants can synthesize DHA, a long-chain polyunsaturated fatty acid needed for neurodevelopment, from the essential fatty acid alpha-linolenic acid. This finding has important implications for infant feeding and the care of premature infants.
- Showed that bone deposition and calcium absorption peak during early puberty, a finding that influenced recent increases in calcium recommendations for children 9 to 18 years of age.
- Developed an early feeding strategy using human milk that reduced post-delivery hospitalization of premature infants by an average of three days.
- Developed the doubly labeled water method, which is now the gold standard for determining energy expenditure in the free-living environment.
- Developed safe, non-invasive methods for measuring body composition in children.

Outreach

The CNRC produces *Nutrition & Your Child*, an award-winning quarterly consumer-oriented newsletter, and a web site that has earned an “Among the Best” rating from Tufts University’s Nutrition Navigator. A Cooperative State Research, Education and Extension Service (CSREES) National Program Leader for Maternal and Child Health stationed at CNRC provides linkages to Extension activities across the nation. In addition, CNRC scientists serve as a valuable source of science-based nutrition information for parents, health professionals, and local and national media.

Contact Information

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