Department of Nutritional Sciences

Faculty and Staff Research and Teaching Information
Karen E. Peterson, Professor & Chair, Department of Nutritional Sciences
Research Professor, Center for Human Growth and Development

- **Research themes**
  - Biosocial and environmental influences on physical growth and cardio-metabolic risk
  - Design and evaluation of interventions to improve weight status and health behaviors
  - Diet and activity assessment in youth and multi-ethnic populations

- **Center affiliations**
  - Michigan Nutrition & Obesity Research Center
  - Children’s Environmental Health & Disease Prevention Research Center: *Lifecourse Exposures & Diet: Epigenetics, Maturation & Metabolic Syndrome*
  - Momentum Center (www.momentumcenter.org)

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**M**

NUTRITIONAL SCIENCES

UNIVERSITY OF MICHIGAN
• **NUTR 677: Physical Growth and Development**
  - Reference growth curves; population trends; growth monitoring; environmental influences on growth & maturation.
  - Gain expertise in analysis and interpretation of growth data from population studies.

• **NUTR 869: Innovations in Nutrition Research**
  - PhD, MS, and MPH students focusing on nutrition: critical review of study design, frameworks, tailoring methods to study questions, interpretation of results; significance
  - Highly interactive, journal club format: Communicate research ideas through formal presentation and informal discussions.
Research: Impact of obesity on systemic and pulmonary inflammation during infection and chronic disease

- Impact of obesity on susceptibility to respiratory tract infections
- Role of lipid mediators in lung disease and bacterial pneumonia
- Adipokines as biomarkers of chronic diseases associated with obesity in population studies
NUTR 639: Pathophysiology of Obesity (Fall)
Framework for understanding the etiology, pathophysiology, and treatment of obesity. Emphasis is on the influence of physiologic factors that contribute to overconsumption of food, the pathophysiologic consequences of obesity, and current methods of treatment.

NUTR 688: Research Seminar in Nutritional Sciences (Fall and Winter)
Introduction to important and current topics in nutritional science research.

Epigenetics involves stable changes in gene activity that don't involve changes in DNA.

We focus on epigenetics as a mechanism of the Developmental Origins of Health and Disease (DOHaD).

Our research incorporates diet-toxicant interactions (e.g. methyl donors, antioxidants, high fat diet, bisphenol A, lead, phthalates).

Our approach includes animal models, human clinical samples, and human population studies.

Our endpoints of interest are metabolic syndrome risk, obesity, and neuropathology.
• **EHS 601**: Foundations of Environmental Health Sciences (Fall): *Introduction to the environmental health (toxicology, exposure analysis) and nutritional sciences by addressing key concepts, including the ability to assess environmental and occupational exposures to chemical, nutritional, and physical agents* (Possible BIC Class for NUTR students)

• **EHS/NUTR 801**: Research and Communication (Fall): *For Doctoral Students in their 1st/2nd year; the goal of this course is to develop research and communication skills essential to graduate school success and to prepare students for a professional career in the environmental health and nutritional sciences.*

• **EHS/NUTR 660**: Environmental Epigenetics and Public Health (Winter): *Examines the principles and applications of epigenetics and epigenomics as they relate to human nutrition, toxicology, and disease etiology.*
Intersection of Weight-Related Disorders

- Causes and consequences of binge eating disorder
- Unintended consequences of obesity prevention programs and policies
- Primary and secondary prevention of eating disorders in schools and clinical settings
- Clinical and public health implications of weight overvaluation, body dissatisfaction, and weight misperception
Teaching

Kendrin R. Sonneville, ScD, RD, Assistant Professor, Department of Nutritional Sciences

NUTR 646: Approaches in Nutrition Counseling (Winter)
• Introduction to nutrition counseling including skills and tools used in patient interviewing, patient education, and practical aspects of implementing counseling for dietary change
• Strong emphasis on working with diverse patient populations, cultural competence, and health literacy

NUTR 621: Eating Disorders Prevention and Treatment

NUTR 802: Professional Development and Technical Writing
Research: Food systems for improved nutrition in global contexts

Andrew Jones, Assistant Professor, Department of Nutritional Sciences

- Assessing impacts of agriculture and food systems on maternal and child nutrition across urban-rural gradients in low-and middle-income countries (LMICs)

- Determinants and nutritional consequences of food insecurity in LMICs

- Spatial and sociodemographic determinants of the nutritional “double burden” in LMICs

- Peri-conceptional influences of maternal obesity on birth outcomes and neonatal iron status

- Peri-conceptional and antenatal intervention approaches to improving birth outcomes and infant iron status
Teaching

Andrew Jones, Assistant Professor, Department of Nutritional Sciences

- **NUTR 555**: Foundations of Sustainable Food Systems (Fall): provides an interdisciplinary introduction to the sustainability of food systems from agroecological principles, to policy, nutrition, and health concerns

- **NUTR 633**: Evaluation of Global Nutrition Programs (Winter): introduces principles of program evaluation with an emphasis on global nutrition programs implemented in the Global South

- **NUTR 622**: Food Systems and Human Nutrition (Winter): explores current research examining the intersection of food systems and nutrition in global contexts
Research

Katherine W. Bauer, PhD, Assistant Professor, Department of Nutritional Sciences

Social and Behavioral Determinants of Childhood Obesity

- Nutrition, physical activity, and other obesogenic behavior among older children and adolescents
- Familial influences on nutrition and weight
- Socio-economic stressors on families and their impact on weight-related family environments
- Community-based obesity prevention interventions
NUTR 650: Child and Adolescent Nutrition (winter)

• This course will take a socio-ecological perspective to identify key issues in and influences on nutrition, eating behavior, and energy balance among children (6-12) and adolescents (13-21).

• Specific topics include:
  • School food programs
  • Peer, family, and neighborhood influences
  • Food marketing
  • Disordered eating
  • Obesity prevention and treatment
  • Emerging adulthood

Teaching

Katherine W. Bauer, PhD, Assistant Professor, Department of Nutritional Sciences
Research: Determinants of excess adiposity and metabolic risk during childhood

Wei Perng, Research Assistant Professor, Department of Nutritional Sciences

- **Research themes**
  - Developmental origins of health & disease: Identifying early risk factors of childhood obesity and obesity-related sequelae
    - Perinatal characteristics
    - Dietary & nutritional factors
  - Women’s health: Associations of maternal condition during the peripartum period with postpartum cardiovascular and metabolic health
    - Pre-pregnancy BMI & gestational weight gain
    - Pregnancy disorders
  - Metabolomics as a tool to understand relevant biological pathways

- **Blog**: www.weighinginblog.org
Research: Food systems for improved nutrition in global contexts

Olivia Anderson, Clinical Assistant Professor, Department of Nutritional Sciences

- Development and implementation of novel pedagogy to enhance student engagement in the classroom
- Development of assessment and evaluation techniques at the classroom and program level
- Early-life environmental exposures and the impact they have on metabolism and the epigenome
Teaching

Olivia Anderson, Clinical Assistant Professor, Department of Nutritional Sciences

- **NUTR 600**: Professional Development and Capstone (Fall): examines the evolution of personal and professional goals within the field of nutrition. Provide you with skills and knowledge to establish a career that sustains learning as a lifelong process and the opportunity to form relationships with peers and professionals in the field.

- **NUTR 630**: Principles of Nutrition (Fall): foundational course of nutritional sciences in respect to the metabolism of macronutrients. Covers digestion, absorption, transport, and storage of macronutrients in humans. Discusses the metabolism of macronutrients and their contribution to whole body energy homeostasis.

- **PUBHLTH 310/NUTR 510**: Nutrition in the Life Cycle (Winter): Examines nutrition during critical stages of the life cycle from the time individuals are in the womb during pregnancy to when they become older adults. Discusses nutritional needs for normal growth and development and the consequences of under- or over-nutrition at critical life stages.
Teaching

Suzanne M. Cole, Lecturer & Research Investigator, Department of Nutritional Sciences

• **NUTR 540**: Maternal and Child Nutrition (winter): *introduces* nutritional requirements of pregnancy, lactation, infancy, childhood, and adolescence by examining topics such as physiologic and metabolic adaptations of pregnancy and lactation, composition of human milk and formula, and the feeding practices of infants and children.

• **NUTR 631**: Metabolism of Vitamins and Minerals (winter): *an in-depth introduction to vitamin and mineral metabolism with emphasis on nutrient bioavailability, absorption, transport and tissue accumulation, regulation of nutrient metabolism, and nutrient function.*

• **NUTR 640**: Nutrition Assessment (fall): *provides a comprehensive introduction to the methods and approaches for conducting nutrition assessment of individuals and populations throughout the lifecycle.*

• **NUTR 642**: Community Nutrition (fall): *introduces the principles and programs developed to improve the dietary intake and the nutritional status of individuals and groups within a community.*
Teaching

Susan Aaronson, MA, RD, Program Manager, DPD Director, Lecturer, Department of Nutritional Sciences

NUTR 547: Food Science (Fall)

• This course examines food composition and the chemical and physical changes that result from food processing, preparation and cooking. Exploration of sensory analysis and food safety.
• Didactic and lab/demonstration based learning activities teaching the principles of food science, food processing and preservation, and the application of these principles to specific food commodities such as meat, fish, poultry, dairy, fruits and vegetables, cereals and grains, eggs and others.
Dietetic Internship Director

Theresa Han-Markey, Lecturer, Department of Nutritional Sciences

- Supervise and direct the U-M SPH Dietetic Internship Program
- The U-M SPH DI Program is 1200 supervised practice hours completed after graduating from the U-M graduate program
- Internship placement sites include: UMHS, Ann Arbor WIC, St. Joseph The Farm, Glacier Hills Senior Living Community, Ann Arbor VA Hospital and U-M Athletics Department
- Teach Medical Nutrition Therapy I and II classes (NUTR 636 and NUTR 637)

U-M SPH DI Class of 2015
Teaching

- Manage the Nutrition Obesity Research Center nutrition and dietary services for clinical investigation at the Michigan Clinical Research Unit
- Assist investigators in study design and implementation of protocols
- Provide dietary counseling for various nutrition therapies including:
  - DASH Diet
  - Low FODMAP
  - Fatigue Reduction Diet (FRD) in Breast Cancer Survivors

Paige Kyle, U-M SPH MPH graduate and dietetic intern making muffins highlighting FRD ingredients
Ana Baylin

Associate Professor, Departments of Epidemiology and Nutritional Sciences

Nutrition and Cardiometabolic Risk:
- Dietary patterns
- Fatty acids
- Prevention interventions at the worksite level
Courses

**EPID602: EPID Methods II: Applied Epidemiologic Data.** A practicum in epidemiologic data analysis designed to integrate and apply concepts learned in previous biostatistics and epidemiologic methods courses.

**EPID625: Controversial topics in the role of nutrition on chronic disease.** This public health-oriented course will provide students the opportunity to advance their knowledge in nutrition and chronic disease research from a population perspective and help them to better interpret epidemiologic studies on nutrition and chronic disease.

**EPID806: History of Epidemiology.** This is a methodology course which focuses on the historical evolution of methods (e.g., study designs) and concepts (e.g., confounding, bias, interaction and causal inference) that constitute today's epidemiology.
Research: Use of ‘omics technologies to understand the development and treatment of obesity and obesity-related diseases

Charles Burant, MD, PhD, Robert C. and Veronica Atkins Professor of Metabolism, Department of Internal Medicine and Nutritional Sciences Director, University Of Michigan Nutrition Obesity Research Center

- We use targeted and untargeted metabolomic profiling, integrated with other ‘omics technologies (genomics, epigenomics, transcriptomics and proteomics) and clinical data, to understand emergent phenotypes in obesity-related metabolic dysfunction in both man and in animal models.
- The lab is working to understand the molecular basis of the associations between maximal exercise capacity and how it accurately predicts risk of metabolic disease and longevity in animals and man.
- Other projects relate to how an insulin resistant/hyperglycemic, hyperlipidemic environment alters the function of cellular metabolic pathways in pancreatic β-cells and in inflammatory cells.
Research: The role of nutrition in pathogenesis & treatment of GI Diseases

William D. Chey, MD, Timothy T. Nostrand Professor, Departments of Medicine & Nutritional Sciences, Director – GI Nutrition & Behavioral Wellness Program, Division of Gastroenterology

• Understand how food causes symptoms in patients with common GI disorders like irritable bowel syndrome

• Develop novel diagnostic strategies to identify patients with food sensitivities

• Perform food analysis to understand the content of FODMAPs in the US diet

• Rigorously test dietary interventions in patients with upper and lower GI symptoms.

• Utilize technology to create novel virtual platforms to deliver evidence-based diet interventions

“What’s the big deal with gluten?”
Research: Environmental factors in carcinogenesis and cancer prevention

Justin Colacino, Research Assistant Professor, Department of Environmental Health Sciences

- Effects of environmental and nutritional exposures on normal breast stem cells
- Characterizing molecular mechanisms by which cancer preventive compounds target stem cells
- Nutritional and environmental influences on epigenetic regulation in cancer
- Interactions between toxicant exposures and dietary intake in chronic inflammation
- Modification of the effects of toxicant exposures by body composition in the etiology of chronic diseases

Curcumin
Research: Dietary interventions for cancer prevention

Zora Djuric, Research Professor, Department of Nutritional Sciences and Department of Family Medicine

• Effects of Mediterranean eating patterns on biomarkers of cancer risk.

• Optimizing omega-3 fatty acid supplementation to reduce pro-inflammatory states in obesity.

• Curcumin in clinical trials for breast cancer prevention using stem cell endpoints.

• Establishing new analytical approaches to uncover the etiology of the pro-inflammatory state

• Developing coaching methods for attaining healthy lifestyles in primary care.
Craig Harris, Ph.D.
NSF International Chair of Environmental Health Sciences
Professor of Toxicology
Professor of Nutritional Sciences

**TEACHING**

- **EHS 602 - Essentials of Toxicology**
  - Biotransformation
  - Hepatotoxicity
  - Nephrotoxicity
  - Cell Death
  - Developmental Toxicology

- **EHS 612 - Biochemical and Molecular Toxicology**
  - Structure
  - Function
  - Regulation
  - Toxicity

- **EHS 622 - Mechanisms of Developmental Toxicology**
  - Chemical Teratogenicity
  - Embryonic Nutrition
  - Redox Signaling

- **EHS 796 - Phytochemical Toxicity and Nutrition**
  - Reactive Oxygen
  - Antioxidant and Antioxidant Response
  - Phytochemicals
Craig Harris, Ph.D.
NSF International Chair of Environmental Health Sciences
Professor of Toxicology
Professor of Nutritional Sciences

Developmental Toxicity/Teratology
Birth Defects Research
Redox Signaling and Control
Developmental Nutrition
Environmental Effects on Developmental Signaling and Control
Research: Pediatric obesity disparities

Rebecca Hasson, Assistant Professor of Kinesiology (Joint appointment: Department of Nutritional Sciences)

- Identifying the causes and consequences of pediatric obesity
- Examining the environmental determinants that contribute to racial/ethnic disparities in obesity-related metabolic risk factors
- Developing behavioral interventions and to inform health policies designed to reduce obesity in pediatric populations

“Improving the health and well-being of children and their families”

www.cdrl.kines.umich.edu
Teaching

Rebecca Hasson, Assistant Professor of Kinesiology (Joint appointment: Department of Nutritional Sciences)

- **HF 446 (KIN 511):** The Role of Social Factors in Shaping Physical Activity Behavior (Winter):
  - *Using the Social Ecological Model, this course discusses the social determinants of health and their impact on physical activity behaviors.*

- **HF 448 (KIN 511):** Physical Activity Across the Lifespan (Fall):
  - *Using the Human Capital Model, this course discusses the factors that shape age-related trends and patterns in physical activity behavior and provide an overview of different approaches designed to help individuals across the lifespan become more physically active.*
Joyce Lee, MD, MPH, Pediatric Endocrinology, Dept of Pediatrics/Nutritional Sciences

- Clinical/health outcomes research in pediatric obesity and diabetes (secondary database analysis as well as clinical research)
  - NIH RO1 focused on studying conventional and metabolomic biomarkers for diabetes in overweight and obese children
- Using social media to understand and measure health, and to conduct research with online patient communities (type 1 diabetes in particular)
- Using patient-centered participatory design and the maker movement to promote innovations in health

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https://twitter.com/joyclee
http://joyceisplayingontheinternet.net/
Research: Parenting, psychosocial stress, and childhood obesity

Julie Lumeng, Associate Professor, Departments of Pediatrics and Nutritional Sciences

- Cortisol as a mediator of links between psychosocial stress and obesity among low-income children
- Head Start as a venue for obesity prevention
- Emotional and behavioral self-regulation and obesity risk in young children
- Maternal feeding beliefs and practices as contributors to obesity risk
- Randomized controlled trials in communities
- Qualitative and observational behavioral studies
Amy Rothberg, Assistant Professor, Department of Internal Medicine

- Determining factors that predict successful and cost-effective long-term weight loss
- Assessing the neurobiopsychosocial adaptations that occur with weight loss
- Evaluating implementation of a model of intensive behavioral therapy from subspeciality care into primary care
- Impact of Weight Loss on Health Related Quality of Life
- Effects of intensive lifestyle intervention on reproductive, maternal and fetal outcomes
Delivered in the clinical setting:
• Pathogenesis of obesity
• Weight regulation
• Interventions in the management of obesity, particularly intensive behavioral therapy
• Pharmacotherapy for weight management
• Behavioral economics
Research: The role of the gut-brain axis in regulating glucose and lipid metabolism

• Mechanisms for weight-loss independent mechanisms for improvements in glucose and lipid metabolism after bariatric surgery

• Understanding sexual dimorphic response to weight loss after bariatric surgery

• Understanding the neurophysiology and pharmacology of a GI peptide, GLP-1, in regulating glucose homeostasis

Darleen Sandoval, PhD, Assistant Professor, Department of Surgery and Nutritional Sciences
Research: Nutritional and hormonal signals to the CNS that regulate body weight and metabolism

Randy J. Seeley, H.K. Ransom Professor, Department of Surgery, Internal Medicine and Nutritional Sciences

- **Research themes**
  - Neuroendocrine regulation of food intake and body weight
  - CNS regulation of peripheral metabolism
  - GI tract signals that regulate food intake
  - Development of new treatment strategies for obesity and diabetes

- **Center affiliations**
  - Michigan Nutrition & Obesity Research Center
  - Michigan Diabetes Research & Training Center
  - Neuroscience Graduate Program

NUTRITIONAL SCIENCES
UNIVERSITY OF MICHIGAN
Research: Integrative oncology with a focus on whole food diets and cancer

Suzanna Zick, Research Associate Professor, Department of Nutritional Sciences, Department of Family Medicine

- Examining the impact of a whole food diet on persistent fatigue in breast cancer survivors
- Determining the role of nutrients on symptom clusters in cancer survivors including pain, depression, sleep quality and fatigue
- Exploring mechanisms of whole food diet and nutrients on impacting changes in brain neurotransmitters and connectivity.
- Other interest include:
  - nutrition and pre-autoimmunity
  - The role of diet quality and chronic pain