

2018
DOCTORAL STUDENT (Ph.D.)
OPPORTUNITIES

at UNC Chapel Hill Department of Nutrition



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

UNC Department of Nutrition

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THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

INTRODUCTION

Doctoral Student (Ph.D.) Opportunities at UNC Chapel Hill Department of Nutrition
For doctoral students entering in Fall of 2018

We are delighted that you have expressed an interest in doctoral studies in the Department of Nutrition at The University of North Carolina at Chapel Hill. This brochure identifies faculty members in the department who are interested in mentoring an outstanding doctoral student.

For doctoral students entering in Fall of 2018, individualized programs of study will be developed through a mentored process and will ensure strong, interdisciplinary training with a focus on critical thinking across the full spectrum of nutrition science. Areas of focus will include nutritional biochemistry or metabolism, nutrition epidemiology, nutrition policy, clinical nutrition, community or behavioral interventions and global nutrition; plus in-depth training in a chosen area of specialty.

As you can see, our department is composed of faculty members with a tremendous breadth of expertise. There is no better place to train in the world, and the most recent rankings of Nutrition Departments by the US National Science Foundation recognize this.



The Department of Nutrition at UNC Chapel Hill ranked at the top among U.S. Nutrition Departments in the National Academies' National Research Council (NRC) report. This was the first such ranking of doctoral training programs in Departments of Nutrition. A program summary score was based on characteristics such as publications, grants, financial support for students, graduation rates, breadth of faculty backgrounds, student activities and diversity.



We live in a time in which nutrition is a pivotal factor in changing the trajectory of public health around the globe. Critical public health issues—from food insecurity to obesity, cardiovascular disease, diabetes, and cancer—can be touched by nutrition research, from the cellular level to epidemiology, interventions, and public policy. Our ultimate goal is to find solutions and produce research and intervention techniques that improve the health of people everywhere.

Our faculty train students in nutritional sciences, clinical nutrition, and public health to become global leaders in their fields. Students participate in a

broad range of research in the physiological, biochemical, and behavioral aspects of nutrition and their respective practical applications. Our areas of focus are balanced by a commitment to research that improves the health of under-represented and underserved global populations.

Our research strengths include:

- Obesity and related conditions including diabetes, heart disease and some cancers
- Role of nutrition and physical activity in preventing and treating disease in diverse populations
- Nutrigenetics and personalized nutrition
- Population trends in diet
- Influence of nutrients on the immune response to infectious disease, including gene-nutrient interactions and the development of cancer
- Nutrition and brain development
- Relationships between obesity, environment, infection, and diabetes
- Cardiovascular disease and metabolic syndrome
- Nutrition in the first 1,000 days of life and optimal development
- Role of agriculture and food systems in increasing food access, improving dietary intake and promoting economic development
- Nutrition policy

THE UNC GILLINGS SCHOOL OF GLOBAL PUBLIC HEALTH DEPARTMENT OF NUTRITION IS CURRENTLY RECOGNIZED AS A GLOBAL LEADER IN RESEARCH AND TRAINING. IT IS THE ONLY DEPARTMENT OF ITS KIND IN THE U.S. THAT IS SITUATED IN BOTH A SCHOOL OF PUBLIC HEALTH AND A SCHOOL OF MEDICINE.

APPLICATION PROCESS

Here are several things you should know as a prospective Ph.D. student:

- Your combined verbal and quantitative GRE score should be higher than the 50th percentile; most admitted students score near or above the 90th percentile. We also expect good grades and strong letters of reference.
- Students considering bench science should have lab experience.
- Every doctoral student is funded by their faculty mentor (there are a few training grants and University awards that also provide financial support).
- Every student admitted to the program has been selected by a faculty mentor who makes a commitment to fund them and to help them succeed. We admit no students without such a match. After beginning the Ph.D. program, students may choose to switch faculty mentors for their dissertation work.
- Admission decisions are made relatively early, starting in February, with a rolling admissions process that continues through the Fall. Some University scholarship nominations must be made by early January, therefore it is recommended that you apply and make your faculty match prior to December 1.
- Our doctoral students train in two locations, depending on where their mentor's research program is located: Chapel Hill and Kannapolis (2 hour drive from Chapel Hill). Please carefully read the information regarding the NRI in Kannapolis (page 22).
- For other questions please contact Steve Zeisel (Chair of the Doctoral Committee, steven_zeisel@unc.edu) or our Registrar, Jonathan Earnest (phone: 919-966-7212, or email: earnestj@unc.edu).

Ready to Apply? Be sure to do the following:

- Contact the faculty members that you are interested in and discuss the opportunities available in their research program; copy Steve Zeisel (steven_zeisel@unc.edu) and Jonathan Earnest (earnestj@email.unc.edu).
- Apply to the program online (<https://applynow.unc.edu/apply>) and ensure all materials are complete.
- Once you have decided which faculty might be a good fit to supervise your research interest, contact the faculty member to express your interest and discuss whether they are ready to tell the department's doctoral admissions committee that they are interested in sponsoring you for admission.

THE MATCH BETWEEN APPLICANTS AND FUTURE RESEARCH MENTORS IS ONE OF THE MOST IMPORTANT FACTORS IN THE ADMISSIONS PROCESS.

IT IS CRITICAL THAT APPLICANTS BEGIN COMMUNICATING WITH FACULTY MEMBERS AS EARLY AS POSSIBLE.

More information about the doctoral program is available at www.sph.unc.edu/unc-nutrition

FACULTY MEMBERS

SEEKING NUTRITION DOCTORAL STUDENTS ENTERING 2018

Please email faculty members directly to discuss your interest.

These faculty members are ready to accept and mentor a new doctoral student and will provide funding through stipend, in-state tuition, reimbursement, and costs associated with research expenses and the dissertation project.

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Linda Adair, PhD

Professor of Nutrition

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CHAPEL HILL, NC

Linda Adair's research is focused on nutrition and health of women and children, in particular, the determinants and consequences of infant and early childhood growth patterns, the developmental origins of chronic disease risk and the role of HIV in maternal nutritional status, pregnancy and birth outcomes, and infant nutrition (South Africa, Rwanda, and Malawi). A

second line of work is on multiple dimensions of health in older women, including the intersection of nutrition with physical health, cognitive functioning, and mental health in women in the Philippines who have been followed in a health and nutrition survey for more than 30 years. Her methodological focus is on the design and implementation of population-based health/demographic/nutrition surveys and the application of longitudinal epidemiologic and structural models to health outcome research.



Sandra Albrecht, PhD, MPH

Assistant Professor of Nutrition

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CHAPEL HILL, NC

Dr. Albrecht's research is focused on understanding variability in obesity and diabetes outcomes among immigrants and key Hispanic/Latino subpopulations. To this end, her research aims to characterize the social, environmental, and clinical determinants of obesity and diabetes in these populations to inform more tailored prevention and treatment strategies.

Dr. Albrecht is primarily working with data from the Multi-Ethnic Study of Atherosclerosis (MESA), the National Longitudinal Study of Adolescent Health (Add Health), and the Hispanic Community Health Survey/Study of Latinos (HCHS/SOL), a large national cohort of Hispanic/Latinos living in the U.S. She also has a separate line of research using health informatics techniques to analyze data from electronic health records. Dr. Albrecht is especially interested in understanding why certain Hispanic/Latino subpopulations bear a disproportionate burden of diabetes regardless of obesity status. Furthermore, she is also interested in uncovering why glucose control is so poor among diabetic Hispanic/Latinos, even when access to healthcare is available.



Alice Ammerman, PhD

Professor of Nutrition

Director, Center for Health Promotion and Disease

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CHAPEL HILL, NC

Dr. Ammerman is interested in design and testing of innovative clinical and community-based nutrition and physical activity intervention approaches for chronic disease risk reduction in primarily low income and minority populations. Dr. Ammerman has strong research and

practice collaborations across the state addressing childhood obesity and was appointed by the Lieutenant Governor to serve on the Childhood Obesity Study Committee, charged with recommending legislative action around childhood obesity. She is also PI of the Center of Excellence for Training and Research Translation, charged with identification, translation, and dissemination of evidence-based interventions for obesity and cardiovascular disease control and prevention. More recent research interests focus on school nutrition policy associated with childhood obesity, sustainable agriculture as it relates to improved nutrition, and social entrepreneurship as a sustainable approach to addressing public health concerns.



Penny Gordon-Larsen, PhD

Professor of Nutrition and Associate Chair of Research

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CHAPEL HILL, NC

The Gordon-Larsen lab is focused on obesity and its cardiometabolic disease complications, spanning genetics and the gut microbiome to behavior to environmental research. At the core of this work is the focus on the interplay between environment, biology, behavior and disease in the US and China. The work in China is focused on the effects of urbanization on the human microbiome and metabolome and on complex pathways from urbanization to cardiometabolic disease. The work in the US is focused on gene-environment interactions in relation to obesity and cardiometabolic disease using data from a nationally representative cohort followed from adolescence into adulthood. The central goal of the Gordon-Larsen lab is finding modifiable factors that can be used in efforts to prevent, reduce, and treat obesity and its complications.



Natalia Krupenko, PhD

Assistant Professor of Nutrition

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KANNAPOLIS, NC

Dr. Krupenko joined the UNC Nutrition Research Institute in 2014 as Assistant Professor of Nutrition. Her research focuses on the role of folate (vitamin B9) in promoting health and preventing disease in humans. Folate deficiency has been connected with increased risk for neural tube defects, cardiovascular disease and cancer. Recently, however, concerns have been raised regarding the adverse effects of over-supplementation with the vitamin. Dr. Krupenko's goal is to determine the best ways to utilize health-protective properties of folate and prevent the possibility of its adverse effects in humans. Dr. Krupenko's work is covered in 35 peer-reviewed publications in high impact journals and numerous presentations at national and international conferences and meetings. Dr. Krupenko earned her doctorate degree in bioorganic chemistry from the Institute of Bioorganic Chemistry, Byelorussian Academy of Sciences, in Minsk, Belarus. She was a recipient of the Rockefeller Foundation Fellowship in Population Sciences and served on the faculty of the Medical University of South Carolina. Currently, in addition to her role at the NRI, Dr. Krupenko holds her appointment as an Assistant Professor with the Department of Nutrition at the Gillings School of Global Public Health, UNC-Chapel Hill.



Sergey A. Krupenko, PhD

Professor of Nutrition

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KANNAPOLIS, NC

Dr. Krupenko joined the UNC Nutrition Research Institute in 2014 as Professor of Nutrition. His research focuses on vitamin folate and its role in liver function and cancer disease. His goal is to understand how we can fight cancer by controlling the diet and nutrient supplements. "There are molecular strings in the human organism, which can be pulled by right combinations of nutrients to activate resistance to tumor formation or to slow down cancer development. We have to identify these links and make them work," he said. Dr. Krupenko received his Bachelor's Degree in Biochemistry from Byelorussian State University and Ph.D. in Biochemistry at the Byelorussian Academy of Sciences. Before joining the NRI, he was a faculty member in the Department of Biochemistry at the Vanderbilt University School of Medicine, and in the Department of Biochemistry and Molecular Biology at the Medical University of South Carolina. He has a joint appointment as a Professor of Nutrition at the Gillings School of Global Public Health, UNC-Chapel Hill.



Stephanie Martin, PhD

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CHAPEL HILL, NC

Stephanie Martin has more than 15 years of experience designing and implementing behavioral interventions in low-income countries. Through her research, Dr. Martin provides evidence to improve the quality and impact of maternal and child nutrition programs. Dr. Martin's research focuses on: 1) the design and evaluation of behavioral interventions to improve maternal and child nutrition, 2) implementation research to facilitate the translation of global recommendations into effective programs, and 3) mixed-methods research to examine barriers and facilitators to recommended infant and young child care and feeding practices. She is particularly interested in behavioral interventions to increase social support and is currently examining family members' experiences supporting women for improved maternal and child nutrition in Kenya and Tanzania. As a global health practitioner, Dr. Martin designed and implemented policy-, facility-, and community-level programs, and developed dozens of training and communication materials to promote optimal nutrition; maternal, child, and adolescent health; and HIV prevention, care, and treatment.



Philip May, PhD

Professor of Nutrition

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KANNAPOLIS, NC

Dr. May, Ph.D., joined the UNC Nutrition Research Institute in 2011 as Research Professor. He is an expert in the field of Fetal Alcohol Spectrum Disorders (FASD) and the epidemiology of a number of health-related behaviors. He has conducted extensive research on the epidemiology and risk factors for FASD, including maternal and paternal alcohol use and abuse, childbearing variables, and maternal health factors such as socioeconomic status and dietary intake in various populations. He has received funding from the National Institutes of Health (NIH), specifically the National Institute on Alcohol Abuse and Alcoholism (NIAAA), over the past 20 years. Dr. May was formally trained in demography, social epidemiology, and population studies and focuses much of his research on the epidemiologic discovery of etiology, targeted opportunities for community-wide prevention, and programs of intervention.



Elizabeth Mayer-Davis, PhD

Chair, Department of Nutrition

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CHAPEL HILL, NC

Elizabeth Mayer-Davis, PhD, is the Cary C. Boshamer Distinguished Professor of Nutrition and Medicine, and Chair of the Department of Nutrition, at the University of North Carolina at Chapel Hill. She has focused her career on diabetes, including the epidemiology and natural history of type 1 and type 2 diabetes in children and adults. Her research addresses the many ways in which nutrition can impact the risk for development of diabetes, and the risk of complications of either type 1 or type 2 diabetes. Studies have typically included culturally and regionally diverse populations. Dr. Mayer-Davis' primary focus now is on type 1 diabetes in youth and young adults. She is Principal Investigator for the Carolina site of the SEARCH for Diabetes in Youth study, and she serves as the national co-chairperson for this large multi-center study. Recently funded studies address nutritional factors that may improve prognosis for adolescents with type 1 diabetes (the SEARCH Nutrition Ancillary Study), and behavioral strategies to help youth with type 1 diabetes better manage their disease (the FLEX Study). Newly funded work (ACT1ON) focuses on metabolic, clinical and behavioral challenges in weight management for individuals with type 1 diabetes. Intervention strategies are patient-centered, using problem solving skills training and motivational interviewing that incorporates communication technologies as desired by the patient. Studies include large epidemiological studies as well as clinical trials, including adaptive interventions and adaptive designs. Dr. Mayer-Davis is very active in the American Diabetes Association and was the 2011 President for Health Care and Education for the Association. She also served as an appointee of President Obama on the Advisory Group on Prevention, Health Promotion and Integrative and Public Health. Recently, she was awarded the Excellence in Nutrition Education award from the American Society for Nutrition (ASN) and was profiled in the Lancet.



Katie Meyer, ScD

Assistant Professor of Nutrition

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KANNAPOLIS, NC

Dr. Meyer is a nutritional and cardiovascular disease epidemiologist. Her research focuses on diet-related health behaviors and nutritional risk factors for cardiometabolic disease. She is a recent recipient of a Research Scientist Development Award from the National Heart, Lung, and Blood Institute to study the gut microbiome, nutrient metabolites, and cardiovascular disease in the Coronary Artery Risk Development in Young Adults Study.



Shu Wen Ng, PhD

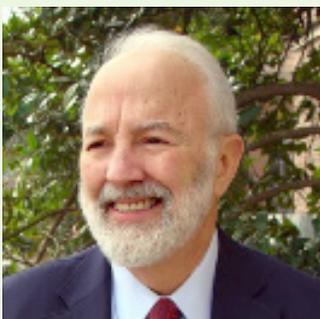
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CHAPEL HILL, NC

Shu Wen Ng is a health economist whose main scholarly objective is to further understanding of individual and household-level decisions about dietary and activity behaviors and their health impact. Her research acknowledges that such decisions are constrained by monetary, time and biological factors, and are made within a broader environmental or policy context. To consider such behaviors, decisions

and outcomes, Dr. Ng relies on tools and approaches from economics, epidemiology, sociology and public policy, and collaborates with others who have expertise in these disciplines. Dr. Ng's research to date primarily involves innovations in: a) combining large secondary data sources to identify potential macro-level levers (e.g., policy, industry pledges); b) creating new metrics by which to measure shifts in the culture of eating and moving, and; c) analyzing the circumstances under which these shifts occur, so as to identify areas for effective and sustainable changes in individuals' or households' (micro-level) health behaviors, especially among the most vulnerable.

Dr. Ng has been co-Investigator on several foundation and NIH studies that use 'big-data' on commercial store sales, household purchase, and nutrition label data at the barcode level (scanner data), alongside dietary intake and nutrition databases. Analyzing such data, she has studied how policies such as taxation or quotas affect consumer purchases, diet, nutrition, and health outcomes across many settings. In addition, Dr. Ng has analyzed historical time-use data from a range of countries to estimate activity levels across domains of daily living and to identify trends and patterns by subpopulations.



Barry M. Popkin, PhD

Professor of Nutrition

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CHAPEL HILL, NC

Barry M. Popkin, PhD, is the W. R. Kenan, Jr. distinguished professor of nutrition at the University of North Carolina at Chapel Hill (UNC). His research program focuses globally (both the US and low and middle income countries on understanding the shifts in stages of the transition and programs and policies to improve the population health linked with this transition (see www.nutrans.org; <http://globalfoodresearchprogram.web.unc.edu/>). His current work is focused solely on studying diet and food purchase behavior and linking this with policy-related research on an array of global and US food and nutrition programs and regulatory actions. His group is involved in policy design and evaluation side at the national level, including collaborative SSB/junk food tax evaluation research in Mexico (with the National Institute of Public Health) in evaluating the impact of the Mexican SSB and nonessential food taxes and similar work with the Institute of Nutrition and Food Technology, University of Chile in evaluating an SSB tax and marketing/FOP controls and research to create future regulations/taxes. He is working with Brazil, South Africa, Colombia and a number of Asian countries on similar research. The research is large-scale statistically oriented work, all focused on diet and food purchase dynamics. All his US and global research focuses very much on causes of disparities in diet and obesity prevention. The US research includes dietary and food purchase data, WIC and SNAP-related studies, tax evaluation work, work in designing future taxes, and consumer behavior.



S. Raza Shaikh, PhD
Associate Professor of Nutrition
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CHAPEL HILL, NC

Research in the Shaikh lab is broadly focused on understanding how dietary fatty acids regulate immunological and metabolic outcomes in obesity, type 2 diabetes, and cardiovascular diseases.

The lab vertically integrates differing model systems including biomimetic membranes, cell culture, transgenic/knockout mice, and human subjects. The lab uniquely fuses techniques from lipid biochemistry, membrane biophysics, and nutritional immunology to address questions related to two major projects in the lab.

The first project aims to understand how omega-3 polyunsaturated fatty acids, which are generally deficient in obese subjects, can be used therapeutically to boost humoral immunity upon viral infection in pre-clinical and clinical models. We are focusing on mechanisms by which polyunsaturated fatty acids target plasma membrane molecular organization and downstream enzymes to improve immunological responses mediated by B cells.

The second project in the lab is addressing how mitochondrial inner membrane structure-function is impaired in response to modifications to the mitochondrial-specific phospholipid known as cardiolipin. We are investigating how remodeling of cardiolipin fatty acyl chains, as observed in type II diabetes and cardiovascular diseases, impairs oxidative phosphorylation enzyme activity and formation of mitochondrial structures known as supercomplexes.



Susan Smith, PhD

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KANNAPOLIS, NC

Prenatal alcohol exposure (fetal alcohol spectrum disorder) causes permanent neurodevelopmental disability in 2.5% - 4.6% of school-aged children. Our research reveals that both genetic and nutritional factors affect alcohol's damage to brain structure and function. Unfortunately, global alcohol consumption is rising in women. Our research goal is to understand how alcohol damages the developing brain, and then leverage that knowledge into strategies that improve infant outcomes for at-risk pregnancies. We use integrative models from the cellular to clinical level to identify gene-nutrient

interactions that affect fetal vulnerability to alcohol. Students in our lab acquire skills in interdisciplinary approaches to address questions of nutritional relevance. Our research goal is to use this integrative approach, from genes to cells to people, to develop biomarkers that identify at-risk pregnancies, and then design dietary interventions that mitigate alcohol's damage for these affected families.



Susan Sumner, PhD

Professor of Nutrition

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KANNAPOLIS, NC

Susan Sumner, Ph.D. joined the UNC Nutrition Research Institute on December 1, 2016, as a Professor of Nutrition. Dr. Sumner is working to make personalized medicine a reality through metabolomics, the science of measuring thousands of chemicals in a small sample of a person's blood. Metabolomic analyses provide a more comprehensive view of a patient's metabolism than the limited measurements of glucose and cholesterol that doctors employ today. Using metabolomics, Dr. Sumner assesses differences in the metabolic profile of individuals that correlate with states of wellness or disease. She is identifying responses to treatment in areas such as obesity, drug-induced liver injury, infectious disease, and reproductive and developmental biology.

For the past 12 years, Dr. Sumner has worked at the Research Triangle Institute as Director of the NIH Eastern Regional Comprehensive Metabolomics Resource Core, and as a Senior Research Scientist in the Center for Estimating Human Health Risks from Exposure to Nanoparticles. Her research activities span several domain areas in Personalized Medicine, Metabolomics and Biomarkers Research, Obesity, and NanoHealth. She has led projects designed to identify biomarkers for the early detection of disease, to monitor disease progression or therapeutic intervention, and to gain insights into mechanisms of response. Dr. Sumner has served as the PI of a grant funded through the National Institute of General Medical Sciences to use metabolomics to reveal noninvasive markers of drug-induced liver injury. She also leads several research efforts that involve using metabolomics to reveal mechanistic insights related to the impact of environmental exposure in utero or early in life on reproductive and developmental outcomes.



Carmina G. Valle, PhD, MPH

Research Professor of Nutrition

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CHAPEL HILL, NC

Carmina Valle, PhD, MPH joins the Department of Nutrition in 2017 as an Assistant Professor of Nutrition with over 15 years of experience in the field of cancer prevention and control. She is a behavioral scientist and member of the UNC Lineberger Comprehensive Cancer Center and UNC Weight Research Program. Her research focuses on developing and evaluating behavior change interventions to eliminate disparities in cancer. Dr. Valle's research addresses: (1) novel strategies to improve nutrition, physical activity, and weight control in cancer survivors, with a particular emphasis on young adults and minority populations; (2) implementing behavioral interventions related to cancer prevention and control with potential for scalability and dissemination through the use of technology; and (3) optimizing tailored health communications to improve cancer prevention behaviors. She has conducted physical activity and weight control interventions for cancer survivors using Facebook, wearable activity trackers, and digital smart scales. Other recently completed projects include an evaluation of the effects of tailored health messages on intentions to engage in cancer prevention behaviors and a cultural adaptation of a tailored health assessment tool for Latino cancer survivors.

Dr. Valle is currently Principal Investigator of a grant funded through the National Cancer Institute to evaluate the efficacy of a theory-based, mobile- and Facebook-delivered physical activity intervention for young adult cancer survivors. In addition, she is Co-Principal Investigator on a Gillings Innovation Lab, focused on developing just-in-time adaptive interventions (JITAs) around wearable and connected health devices, and on a study testing a mobile health intervention to promote physical activity in adolescent and young adult cancer survivors.



Saroja Voruganti, PhD
Assistant Professor of Nutrition
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KANNAPOLIS, NC

Dr. Voruganti joined the UNC Nutrition Research Institute in 2013 as Assistant Professor of Nutrition. Her research investigates how genetic and environmental (particularly diet and nutrients) factors impact hyperuricemia, gout, kidney and cardiovascular disease, with the goal of finding new treatment options. The Voruganti lab studies the effects of gene-nutrient interactions on hyper- and hypouricemia and related cardiovascular, renal and neurological diseases. Specifically, we investigate how each individual

is different in regulation of serum uric acid concentrations based on their nutrient intake, genotypes and ethnic background.

Dr. Voruganti earned her B.Sc. degree with honors in Foods and Nutrition at The University of Delhi, India, and a post-graduate diploma in Dietetics and Hospital Food Service. She received a Ph.D. in Nutritional Sciences from the University of Texas at Austin, and did post-doctoral work in Genetic Epidemiology at the Texas Biomedical Research Institute.

She has conducted several studies involving minority populations such as Mexican Americans, American Indians, Western Alaska Natives and Hispanic children. Her focus in all these studies is to understand genetic and environmental influences on renal-cardiovascular disease risk.

Dr. Voruganti has published or has in press more than 75 scholarly papers and has authored chapters in two books: Handbook of Anthropometry: Physical Measures of Human Form in Health and Disease and Human Variation: From the Laboratory to the Field.



Dianne S. Ward, EdD
Professor of Nutrition
Director, Children's Healthy Weight Research Group
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CHAPEL HILL, NC

The purpose of the Children's Healthy Weight Research Group is to create and test programs and policies that improve the health and well-being of children and their families through healthy nutrition and physical activity. A major focus of our group's research is the design and testing of interventions to

prevent obesity in children, families, and other caregivers using multi-level approaches that are theory-based and use well-defined behavior change techniques. Because of the need to translate research into practice, our research group has recently begun designing and testing strategies for dissemination and implementation of research-based interventions into practice. In addition to our intervention research, our group is active in creating and testing organizational assessments for use in interventions, including homes, child care, and community settings and in identifying important determinants of physical activity and nutrition behavior.

FACULTY MEMBERS

WHO ENRICH YOUR EXPERIENCE

The following faculty members are not seeking students in 2018, but add to the intellectual environment.

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Faculty highlighted in BLUE are located in Kannapolis, NC.

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Melinda Beck, PhD

Professor of Nutrition

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CHAPEL HILL, NC

The Beck lab studies the effects of obesity on the immune response to infection and vaccination. We have demonstrated that, compared to lean mice, influenza infected diet-induced obese mice have a higher mortality rate and greater lung inflammation and damage. Both T and B cell responses are impaired in the obese animal. Secondary influenza immune

responses are also impaired by obesity. Directly translating these results into humans, we find that obese adults have an impaired T cell response to influenza vaccination and are 2X more likely to develop influenza or influenza-like illness, despite vaccination. Our lab is actively pursuing a mechanistic explanation for these findings, including obesity-induced alterations in immune cell metabolism, leptin resistance, and/or accelerated immunosenescence.



Margaret Bentley, PhD

Professor of Nutrition

Associate Dean for Global Health

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CHAPEL HILL, NC

Dr. Bentley's research focuses on women and infant's nutrition, infant and young child feeding, behavioral research on HIV and nutrition, and community-based interventions for nutrition and health. She has worked both globally and locally, particularly on infant and young child

feeding research. She has particular expertise in ethnographic, qualitative, and mixed-methods research methods and the application of these for program development and evaluation. She led a National Institutes of Health (NIH) funded intervention to improve child growth and development in Andhra Pradesh, India and currently leads an NIH-funded behavioral intervention trial in North Carolina for prevention of obesity among infants and toddlers. She was Principal Investigator of a Bill and Melinda Gates Foundation grant for analyses of nutrition data from the Breastfeeding, Antiretroviral and Nutrition (BAN) study, which supported the health and nutrition of HIV+ mothers and their infants in Lilongwe, Malawi. She received the Kellogg International Nutrition Prize Award Lecture in 2016 and in 2017 was named the Global Health Champion by the Triangle Global Health Consortium



Cynthia Bulik, PhD, FAED

Professor of Nutrition

Founding Director, UNC Center of Excellence for Eating Disorders

Co-Director, UNC Center for Psychiatric Genomics

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CHAPEL HILL, NC

Dr. Bulik research includes treatment, laboratory, epidemiological, twin and molecular genetic studies of eating disorders and weight regulation. She has written more than 500 scientific

papers and chapters on eating disorders and is the author of *Crave: Why You Binge Eat and How to Stop*, *The Woman in the Mirror*, *Midlife Eating Disorders: Your Journey to Recovery*, and *Binge Control: A Compact Recovery Guide*. She is a recipient of the Eating Disorders Coalition Research Award, the Academy for Eating Disorders' Leadership Award for Research, the Price Family National Eating Disorders Association Research Award and the Women's Leadership Council Faculty-to-Faculty Mentorship Award. Dr. Bulik is past president of the Academy for Eating Disorders, past vice-president of the Eating Disorders Coalition and past Associate Editor of the *International Journal of Eating Disorders*. She holds the first endowed professorship in eating disorders in the United States.



Kyle Burger, PhD
 Assistant Professor of Nutrition
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CHAPEL HILL, NC

The research interests of Neuropsychology of Ingestive Behavior Laboratory (NIBL) are centered on examining the underpinnings of consummatory behavior to better understand eating behavior and weight regulation to inform health interventions and food policy. To accomplish this, we take a multidisciplinary approach grounded in nutrition, psychology, neuroscience,

and physiology. We use a variety of approaches in humans including direct measures of food intake, behavioral and self-report assessments, and functional neuroimaging techniques to study the brain's response to food stimuli. We also are actively involved in using our lab-based techniques in conjunction with highly controlled animal experiments, as well as large-scale population-based research to increase the understanding and generalizability of our findings.



Rosalind Coleman, MD
 Professor of Nutrition and Pediatrics
 rcoleman@unc.edu

CHAPEL HILL, NC

Dr. Coleman's studies investigate lipid metabolism, particularly triacylglycerol biosynthesis and its critical regulated pathways in liver, muscle, heart, and adipocytes. She is particularly interested in understanding the controls on triacylglycerol synthesis and acyl-CoA partitioning. Using recombinant enzyme isoforms, knockout mice and cell culture models, members of her

lab are identifying the regulatory controls on enzymes that commit acyl-CoAs to either beta-oxidation or to storage as complex lipids. These studies will enable us to understand and treat disorders that involve disturbed lipid metabolism, including obesity, diabetes, and heart disease. Dr. Coleman's recently published studies of knockout mice have provided strong evidence that hepatic insulin resistance is caused by intermediates in the synthesis of triacylglycerol that impair insulin signaling. These studies directly link insulin resistance to the increased synthesis and accumulation of triacylglycerol in liver and muscle. Dr. Coleman was awarded the Osbourne and Mendel Award for her work on the synthesis and metabolism of triacylglycerol, and five of her recent doctoral students have won national awards for their research.



Stephen D. Hursting, PhD, MPH
 Professor of Nutrition
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LAB LOCATIONS IN BOTH CHAPEL HILL AND KANNAPOLIS, NC

Epidemiologic and experimental studies have established that obesity is an important risk and/or prognostic factor for most cancer types, but the mechanisms underlying the obesity-cancer link have not been clearly elucidated. This knowledge gap is hampering efforts to develop mechanism-based strategies to more precisely intervene to prevent and control obesity-related

cancers. Given the rising rates of obesity and cancer worldwide, and the challenges for many people to lose excess weight, we are taking an integrated multilevel approach to address four critical questions that will lead to new, effective mechanism-based interventions to offset obesity-associated increases in cancer burden: i) Does moderate weight loss alone, or in combination with other mechanism-based interventions, reverse the pro-cancer effects of obesity? ii) What are the mechanisms of (and solutions to) obesity-induced chemotherapeutic resistance? iii) What are the targets and strategies for offsetting the pro-metastatic effects of obesity? iv) What new targets for offsetting the effects of obesity can be identified by deconvoluting (and ultimately disrupting) the reciprocal crosstalk between adipocytes, macrophages and epithelial cells? The overarching goal is to capitalize on our expertise in energy balance and cancer research (including well-characterized preclinical models of breast, colon and pancreatic cancer and well-established collaborations spanning molecular/cellular biologic approaches to clinical trials and epidemiologic studies) to elucidate mechanistic targets, identify new biomarkers that can be used in parallel human and animal studies, and develop effective interventions to break obesity-cancer links and reduce the burden of cancer in obese people.



Folami Ideraabdullah, PhD
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CHAPEL HILL, NC

Dr. Ideraabdullah investigates which genetic differences between individuals determine how the cells of our body respond to changes in diet and, not only how these cellular responses may increase the risk of disease in the individual, but also how such responses may be inherited by their children. She also studies how dietary nutrients can be used to decrease the risk of disease

associated with exposures to harmful environmental factors such as pesticides.

The overall goal of this research is to identify genetic factors that contribute to diet-related disease susceptibility, which can then be used to screen individuals to determine their disease risk or outcome and ultimately allow for more effective treatment and preventative care.

Dr. Ideraabdullah earned her B.S. in Biology at the Pennsylvania State University and her Ph.D. in Genetics and Molecular Biology at UNC-Chapel Hill. She continued her training in epigenetics as a postdoc at the University of Pennsylvania where she was awarded a Ruth L. Kirschstein National Research Service Award from the National Institute of General Medical Sciences.



Martin Kohlmeier, MD, PhD
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KANNAPOLIS, NC

Martin Kohlmeier's expertise is in laboratory diagnostics, nutritional genetics and the use of computers for professional and lay nutrition education, with doctorates in medicine, biochemistry and clinical biochemistry from the universities of Heidelberg and Berlin. He is director of the Nutrition in Medicine project, which provides comprehensive online nutrition education to medical students, physicians and other healthcare providers worldwide. Dr. Kohlmeier searches for small

genetic differences that change how much of a nutrient people need for optimal health. He is developing online computer programs that use genetic and other personal information to guide individual food choices in a safe and effective way. He expects that personalized nutrition can make a major impact on the big killer diseases, such as reducing breast cancer risk by a third or more.

AREAS OF RESEARCH INTEREST

nutrigenomics, assessing dietary intake, nutrigenetics, epigenetics, nutrition education, nutrition in medicine



Nobuyo Maeda, PhD
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CHAPEL HILL, NC

Dr. Maeda's research projects are focused on understanding gene-gene and gene-environment interactions in complex human diseases, such as atherosclerosis, hypertension and diabetes. To better understand the involvement of hypercholesterolemia in atherogenesis, she has been generating mice carrying mutations in the genes involved in lipid metabolism using homologous recombination in embryonic stem cells. These mutations include polymorphic variations in the human genome that may have only small effects by themselves, but have large impacts on vascular diseases when combined with other risk factors. One of the mutant strains generated by Dr. Maeda in 1992, apoE-deficient mice, develops very high cholesterol and atherosclerotic lesions like those found in humans. Using the apoE-deficient mice, her laboratory has been studying how genetic factors (such as those involved in blood pressure regulations, inflammations and glucose metabolism) and dietary factors (such as fat and antioxidant vitamins) influence the progression of atherosclerotic lesion development. Dr. Maeda was the recipient of the prestigious Method to Extend Research in Time (MERIT) Award from the National Heart, Lung and Blood Institute in 1998.

Dr. Maeda's research projects are focused on understanding gene-gene and gene-environment interactions in complex human diseases, such as atherosclerosis, hypertension, diabetes and complications of diabetes. Experiments were carried out using mice with polymorphic variations present in the human genome that may have only small effects by themselves, but have large impacts on vascular diseases when combined with other risk factors. One of the mutant strains generated by Dr. Maeda in 1992, apoE-deficient mice, develops very high cholesterol and atherosclerotic lesions like those found in humans. The apoE-deficient mice have provided a wealth of information how genetic factors (such as those involved in blood pressure regulations, inflammations and glucose metabolism) and dietary factors (such as fat and antioxidant vitamins) influence the progression of atherosclerotic lesion development. Her laboratory is currently investigating the mechanisms by which simple vitamins could prevent/treat cardiomyopathy that is prevalent in patients with diabetes.



June Stevens, PhD
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CHAPEL HILL, NC

Dr. June Stevens is an obesity epidemiologist with a large research program focusing on the causes, consequences, and prevention of obesity in different populations. She is currently principal investigator of the Coordinating Center for the Childhood Obesity Prevention and Treatment Research (COPTR) Consortium. COPTR studies develop and test methods for preventing and treating overweight and obesity in young children and adolescents using multi-level approaches. Dr. Stevens also conducts research that examines questions related to obesity using data from observational cohort studies. Recent projects have focused on body composition, glycemic index, metabolomics, the home food environment and cardio-metabolic risk in Asians and African Americans. Dr. Stevens has served as an obesity expert for the National Institutes of Health, the Centers for Disease Control, the Institute of Medicine and the World Health Organization.



Mirek Styblo, PhD

Professor of Nutrition

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CHAPEL HILL, NC

Dr. Styblo is a biochemist with background in nutritional biochemistry, biochemical toxicology, and environmental health. His research focuses on topics that require expertise in both nutrition and toxicology and typically involve a translational or interdisciplinary approach. In other words, his work includes both laboratory studies, using in vitro, tissue culture and animal models, and population-based studies, involving human subjects and populations in risk of diseases associated with specific environmental exposures.

His research topics include: (1) metabolic interactions between essential and toxic trace elements found in drinking water, in the food chain or in the environment, (2) environmentally-induced diseases and the role of diet or specific nutrients in prevention of these diseases, (3) modulation of the therapeutic efficacy or toxic side effects of anticancer drugs by diet or specific nutrients, and (4) development of analytical techniques for identification of biomarkers of health effects of the essential and toxic trace elements. The current research projects are focusing on diabetes associated with exposure to arsenic in drinking water and on molecular and cellular mechanisms underlying the diabetogenic effects of arsenic. The ultimate goal of his work is to characterize the role of essential and toxic trace elements in etiology of common human diseases and to identify molecular, metabolic and genetic markers that would facilitate risk assessment, prevention or treatment of these diseases.

INTEREST AREAS

- Environmental carcinogens, obesogens and diabetogens – exposures and modes of action
- Interactions of the environmental obesogens and diabetogens with diet and nutrients
- Genetic polymorphism and susceptibility to environmentally induced disease
- Epigenetic mechanisms of environmentally induced disease
- Methods for speciation analysis of metals and metalloids in biological matrices



Deborah Tate, PhD

Professor of Nutrition

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CHAPEL HILL, NC

The UNC Health-e Weight Research Program conducts research on obesity prevention and treatment interventions in diverse populations from childhood to adulthood, and special populations including young adults, parents of young children, and cancer survivors. In addition to lifestyle interventions delivered in person, the Program has a major focus on using new technologies to deliver interventions aimed at helping individuals and families to make changes to their lifestyles in order to achieve and maintain a healthy weight. Technologies such as internet, mobile devices and applications, wearable devices, smart scales and automated counseling help to reach a broader and more diverse audience.

Our team includes students, post-doctoral fellows, faculty and staff with backgrounds in Nutrition and Dietetics, Clinical Psychology, Exercise Physiology and Health Behavior as well as expertise in using technology in health interventions. The Health-e Weight Research Program is led by Dr. Deborah Tate, PhD, Professor of Health Behavior and Nutrition and a leading expert in adapting technology for obesity prevention and treatment. Dr. Tate is also the Director of the CHAI Core, a service core of the Nutrition Obesity Research Center and the Lineberger Comprehensive Cancer Center, which works with investigators to use state-of-the-art technologies to facilitate the translation of traditional evidence-based behavioral interventions into effective web- and mobile-based interventions in fields such as obesity and cancer prevention. Ongoing studies include interventions to prevent weight gain in young adults, an internet and face to face intervention to reduce post-partum weight in low income women, and a physician referred internet+mobile+text weight loss program in primary care.

In addition, there are opportunities to conduct secondary analyses on recently completed studies including a weight gain prevention intervention, a community based weight control intervention conducted in Kannapolis NC, a Stepped Care approach to behavioral weight loss, a family-based weight loss program to reduce obesity in children through parent weight loss or parenting skills for healthy weight, and multiple interventions to reduce weight in teens.



Steven H. Zeisel, MD, PhD

Professor of Nutrition and Pediatrics
Director, UNC Nutrition Research Institute

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KANNAPOLIS, NC

Dr. Zeisel and his research team focus on the essential nutrient choline and why there are individual differences in nutrient metabolism, using new approaches in nutrigenomics and in metabolomics. The team works with humans, mice and cell culture model systems. Using our human studies we discovered that there are very common single nucleotide polymorphisms (SNPs; gene misspellings) that make humans require more dietary choline and that one of these is in the gene PEMT and prevents estrogen from inducing the gene. We are collaborating in a number of epidemiology studies that examine the relationship between diet, these gene SNPs, and risk for disease. After identifying a SNP of interest in humans we make a mouse model and now have three such knockouts. One of them develops mitochondrial abnormalities and has immotile sperm. We are conducting studies in humans on this SNP. In another study, we examine choline's role in brain development and discovered that choline is critical for cortical and hippocampal development. We study mouse models and neural progenitor cells in culture to identify the molecular mechanism for choline's effect on brain.

UNC NUTRITION RESEARCH INSTITUTE

KANNAPOLIS, NC

Several faculty members in the Department of Nutrition are located in the Nutrition Research Institute in Kannapolis, NC and are looking to accept and mentor a new doctoral student next year. This is an exceptional opportunity to work at the cutting edge of science in an amazing new facility.

The UNC System General Administration has located research programs from seven Universities on a new 350-acre campus in Kannapolis, NC (2 hours from Chapel Hill and 30 minutes from Charlotte). The Nutrition Research

Institute is Chapel Hill's component of this science campus.

The UNC Nutrition Research Institute (NRI), established in 2008, is leading the development of "individualized nutrition" – understanding why people's metabolism and nutrition requirements differ from one another– by providing sound science supporting the understanding of genetic, epigenetic and other mechanisms that cause individual variations in metabolism.

MISSION

The NRI's mission is to become the world leader in defining optimal nutrition requirements. By using the most up-to-date research knowledge and technologies, the NRI will contribute significantly to the discovery of the health benefits of nutrition, and will apply this knowledge to define and implement optimal nutrition based on individual biological characteristics.

NORTH CAROLINA RESEARCH CAMPUS



The Nutrition Research Institute is proud to be part of the North Carolina Research Campus in Kannapolis, a 350-acre research center located just north of Charlotte, NC. Here, universities and leading industry partners have forged a public-private partnership, bringing the brightest minds from across the globe to transform science at the intersection of human health, nutrition and agriculture.

Research and product development are collaborative and multi-disciplinary. Focus areas are as varied as phytochemicals in fruits, vegetables, grains and herbs; exercise physiology; post-harvest physiology; population-based genetic studies; and personalized nutrition.

Research is supported by the UNC Charlotte

Bioinformatics Services Division and the David H. Murdock Research Institute (DHMRI), which houses one of the most advanced collections of scientific instrumentation in genomics, proteomics, metabolomics, microscopy and nuclear magnetic resonance (NMR) spectrometer.

Novel approaches to prevent and treat disease are emanating from the research centers at the NC Research Campus. The growing base of scientific knowledge combines new understandings of how nutrients, plant phytochemicals, the environment and lifestyle choices impact brain and fetal development, cancer, diabetes, obesity, heart disease, fatty liver and other metabolic diseases.

RESEARCH AT THE NRI

CREATING A HEALTHIER TOMORROW

The NRI studies nutritional individuality using new “omic” methods such as nutrigenomics, epigenetics and metabolomics. Nutrigenomics is the study of the interaction between genes and nutrition, and how together they affect human health. Epigenetics is the study of chemical marks on genes that turn them on or off, and are often affected by nutrition in early life. Metabolomics is the simultaneous measurement of thousands of molecules — in blood, urine or tissues — that are generated as a result of an individual’s metabolism.

Because most traditional approaches to nutrition only consider the “average person,” there is a lot of unexplained “noise” in experimental data. This noise occurs because we mix responders with non-responders in nutrition studies. By understanding why people have different nutrient requirements (e.g. identify responders from non-responders), we are able to replace a one-size-fits-all nutritional approach with one that considers individual differences in people’s metabolism.

The NRI is equipped with state-of-the-art research laboratories, a whole room calorimeter (capable of measuring calories burned to within 75kCal/d), a fully-equipped metabolic kitchen, an outpatient clinical examination

suite, a behavioral testing suite equipped with sophisticated instrumentation for the study of brain function, mass spectrometers and state-of-the-art genetics equipment.

FUNDED RESEARCH

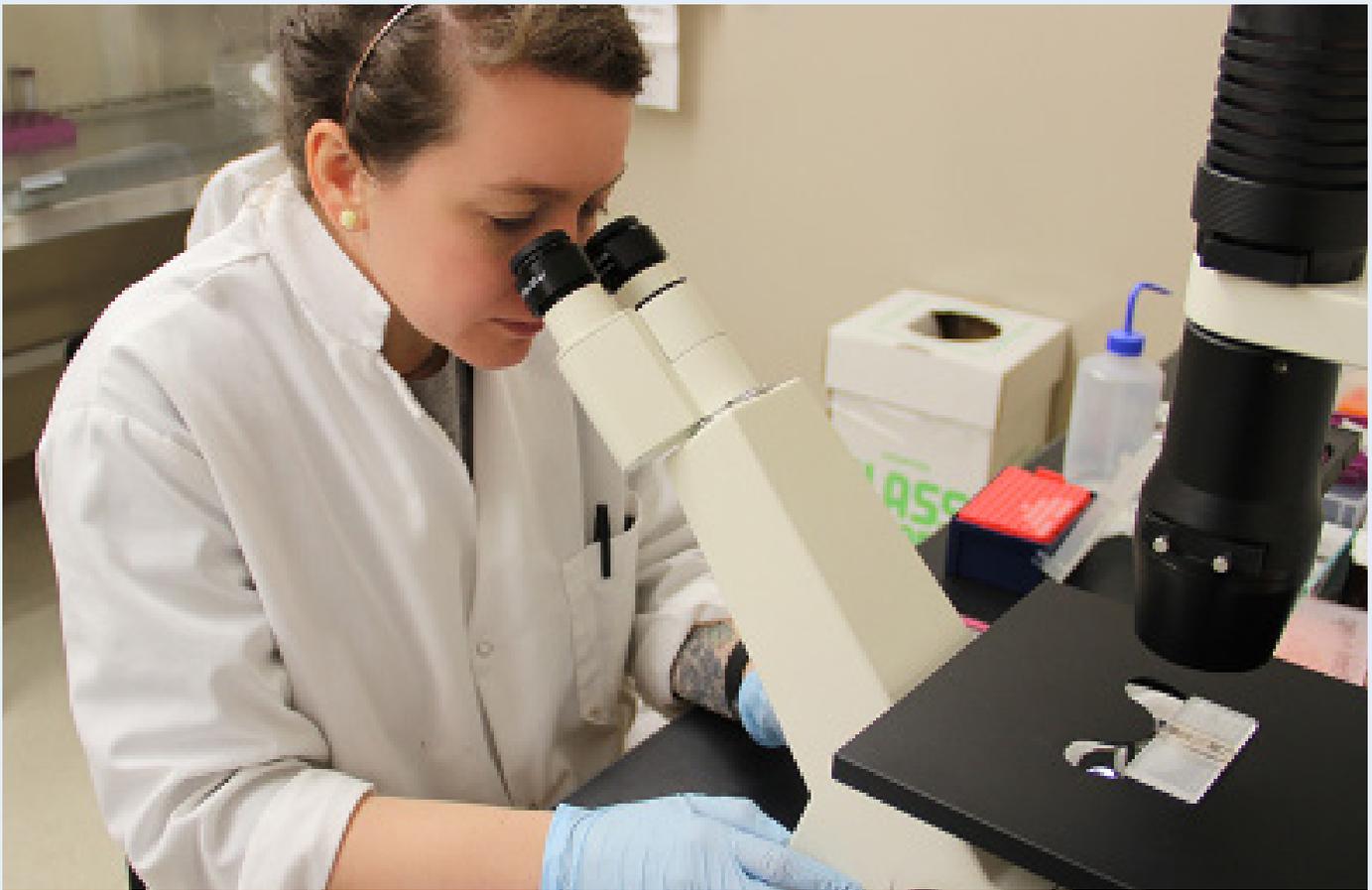
Since its inception in 2008, NRI scientists have been awarded \$36,075,042 in grants and



contracts from not only the NIH and USDA, but also from other prestigious sources, including The Bill & Melinda Gates Foundation and industry partners with interests in nutrition. Our faculty are recognized by their presence on international review panels (e.g. NIH, MRC, BBSRC, etc.), as journal reviewers, as members of journal editorial boards, and as invited speakers at national and international conferences.

NRI researchers possess the broad range of expertise necessary for successfully competing for funding in the era of systems biology, including: metabolomics, transcriptomics, genomics, epigenomics, behavior and cognition, energy metabolism, gut metabolism, brain development, epidemiological and intervention research (including international locations such as the South African Republic, The Gambia, and Romania). This expertise is complemented by collaborations with other universities with a local presence (e.g. NC State, Appalachian, NCCU), and by collaborations within the main UNC CH campus and with universities around the world.





BEING A STUDENT AT THE NRI

Students based at the NRI take the same courses and meet the same requirements as do nutrition students in Chapel Hill. Students live and work in Kannapolis and attend required classes using high-speed videoconferencing equipment. The Department of Nutrition offers all of its classes in this way. Some students choose to live in Chapel Hill during some part of their first year to take specific classes from other departments that are not offered by videoconference. After the first year students are expected to work in labs

at the NRI in Kannapolis.

The drive to Chapel Hill is almost all on major highways, with little traffic, and takes about 2 hours. Kannapolis is a small town that is friendly and safe. Parking is free and housing prices are lower than in Chapel Hill. The public high school is nationally recognized for its science programs. Next door, Concord has NASCAR, a wide variety of restaurants, a world-class discount mall and amusement parks. The nightlife, professional sports arenas, and museums of Charlotte are only about a 30 minute drive away.

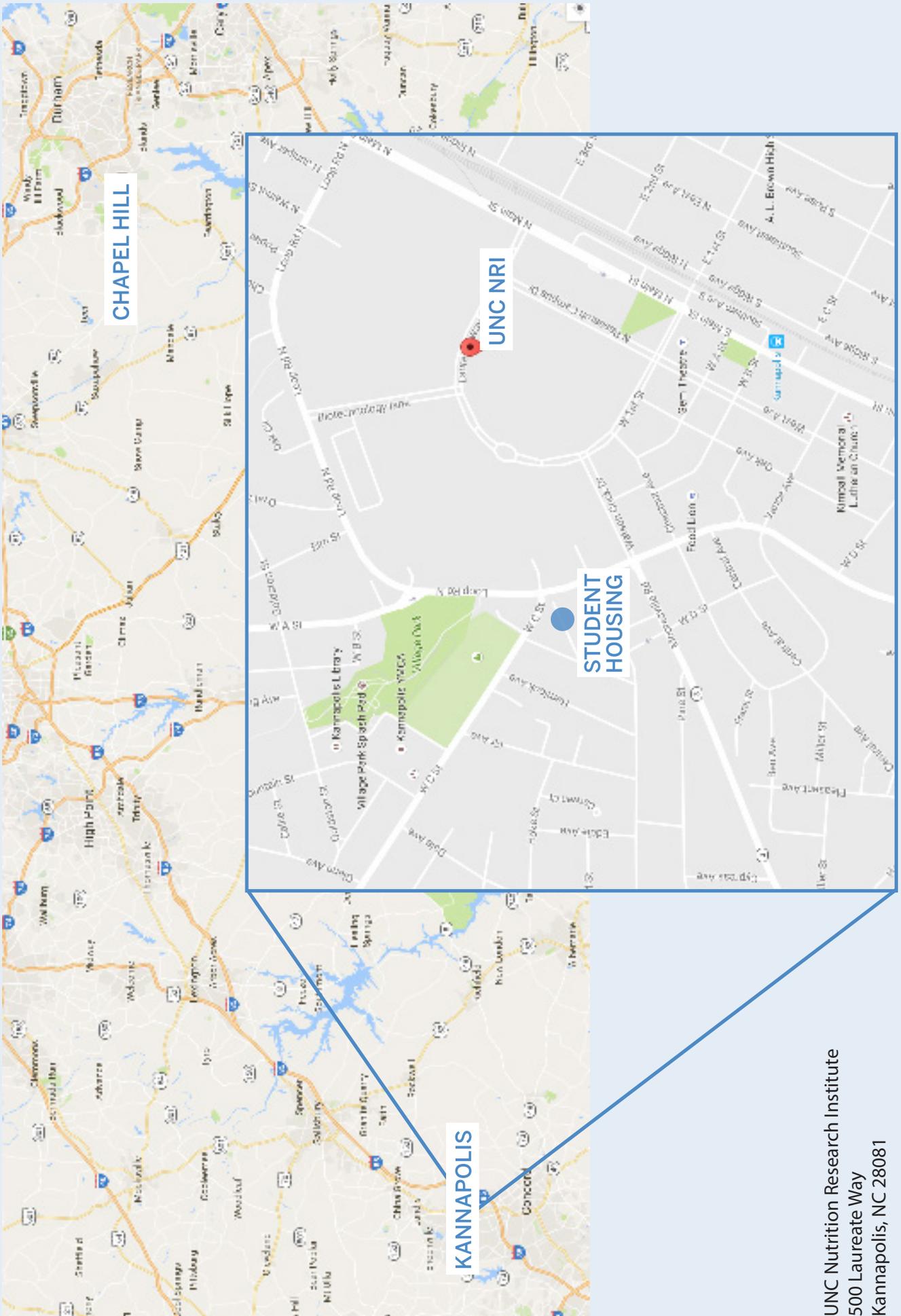
STUDENT HOUSING

We have a limited number of subsidized student housing at the NRI. These 2 bedroom houses are walking distance to campus and are newly renovated. A student can apply for one of these bedrooms. Costs are approximately half of market rates.

SHUTTLE BUS

A free shuttle bus makes two round trips per day from the NRI to the UNC Chapel Hill campus.

UNC NUTRITION RESEARCH INSTITUTE



UNC Nutrition Research Institute
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Kannapolis, NC 28081