



2017
DOCTORAL STUDENT (Ph.D.)
OPPORTUNITIES

at UNC Chapel Hill Nutrition Department



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

UNC Department of Nutrition

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INTRODUCTION

Doctoral Student (Ph.D.) Opportunities at UNC Chapel Hill Department of Nutrition For doctoral students entering in Fall of 2017

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 2017, 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, including 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 recognized this.



The Nutrition Department 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 faculty train students in nutritional sciences, clinical nutrition, and public health to become global leaders in their fields. Our areas of focus are balanced by a commitment to research that improves the health of minority and underserved global populations.

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 and policy makers in their fields. They 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 minority 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 1000 days of life and optimal development; and
- Role of agriculture and food systems in increasing food access, improving dietary intake and promoting economic development.
- Nutrition Policy

THE DEPARTMENT OF NUTRITION IS CURRENTLY RECOGNIZED AS A GLOBAL LEADER IN RESEARCH AND TRAINING, AND IS UNIQUE IN THAT IT IS THE ONLY ONE IN THE U.S. THAT IS SITUATED IN BOTH A SCHOOL OF PUBLIC HEALTH AND THE SCHOOL OF MEDICINE.

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

- We expect that combined verbal and quantitative GRE score is higher than the 50th percentile; most of our admitted students are near or above the 90th percentile. We 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 can help).
- Every student that is 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, a number of students choose to switch faculty mentors for their dissertation work; you are free to do this.
- We make admission decisions relatively early, starting in October with a rolling admissions process that continues through the Fall. Some University scholarship nominations must be made by early January. It is important that you apply and make your faculty match as soon as you can.
- 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). Read the information that follows on Kannapolis carefully (page 20).
- For other questions please contact Steve Zeisel (chair of the doctoral committee, steven_zeisel@unc.edu) or our registrar, Mrs. Joanne Lee (phone: 919-966-7212, or email: joanne_lee@unc.edu).

Things you need to do:

- Contact the faculty members that you are interested in and discuss the opportunity they offer in their research program; copy Steve Zeisel (steven_zeisel@unc.edu) and Joanne Lee (joanne_lee@unc.edu).
- Apply to the program online (<https://applynow.unc.edu/apply>) and make sure all of your materials are complete.
- When you decide who you want to work with, talk to (or email) the faculty member and tell them of 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 YOU AND YOUR FUTURE RESEARCH MENTOR IS ONE OF THE MOST IMPORTANT FACTORS IN DECIDING WHICH OF THE OUTSTANDING APPLICANTS GET ADMITTED.

IT IS SO IMPORTANT THAT YOU BEGIN COMMUNICATING WITH THE FACULTY MEMBERS YOU ARE INTERESTED IN AS SOON AS YOU CAN, AND THAT YOU HAVE DETAILED DISCUSSIONS ABOUT WHAT WORKING TOGETHER WOULD BE LIKE.

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

FACULTY MEMBERS

LOOKING FOR NUTRITION DOCTORAL STUDENTS ENTERING IN 2017

Please email faculty members directly to discuss the opportunity.

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

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Faculty highlighted in GREEN are located in Chapel Hill, NC.

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Faculty in BLACK have labs in both locations.

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LINDA ADAIR, PH.D.

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.

Potential thesis project areas for a new doctoral student:

1. How early life nutrition and growth relate to adult health (with a focus on emergence of obesity and cardiometabolic disease risk) and well-being in the Philippines
2. Factors related to infant feeding choices and their consequences for health among HIV-infected women
3. How Filipino women's reproductive and work histories affect their health and well-being as they age. This work would take advantage of 30 years of longitudinal data on adult women who are participants in the Cebu Longitudinal Health and Nutrition Survey



SANDRA ALBRECHT, PH.D., M.P.H.

Assistant Professor of Nutrition

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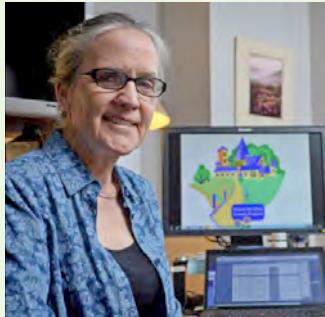
CHAPEL HILL, NC

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.

Potential thesis project areas for a new doctoral student:

1. Understanding why Hispanic/Latinos bear a disproportionate burden of diabetes even at normal BMI levels; identifying which subpopulations are at greatest risk for glucose dysregulation at normal BMI and identifying potential social, environmental and clinical determinants.
2. Merging social data with clinical data from electronic health records to determine what the social barriers are to achieving adequate glucose control among Hispanic/Latino diabetic patients.
3. Use of longitudinal modeling techniques to determine whether longer time in the US among immigrants is associated with declining diet quality and/or with change in activity patterns; identifying potentially modifiable social and environmental factors that aid in preventing the health deterioration that appears to occur in immigrants the longer they live in the U.S.



ALICE AMMERMAN, DrPH

**Professor of Nutrition
Director, Center for Health Promotion and Disease Prevention**

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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.

Potential thesis project areas for a new doctoral student:

1. Developing and testing innovative interventions in diverse populations to:
 - A. Improve school lunch participation and quality
 - B. Increase access to and affordability of locally grown food
 - C. Increase economic opportunities within local food systems
 - D. Prevent and control childhood obesity and type 2 diabetes
 - E. Use social ventures as an approach to health promotion
 - F. Improve nutrition behavior using behavioral economics
2. Determining the impact of food-related policies on:
 - A. Chronic disease risk reduction
 - B. Economic opportunities in the food system
 - C. Participation rates in federal nutrition programs
3. Developing and testing interventions to reduce chronic disease health disparities
4. The impact of policy on food environment and dietary behaviors



MELINDA BECK, PH.D.

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, PH.D.

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.

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.



PENNY GORDON-LARSEN, PH.D.

Professor & Associate Chair of Research, Nutrition

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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.

Potential thesis project areas for a new doctoral student:

1. How do environmental and genetic changes affect cardiometabolic health? Do environmental factors modify genetic effects? What are the ethnic disparities in these associations? The doctoral student would use epidemiological methods to examine the interactive effects of environment, behaviors and genet variants in relation to obesity and cardiometabolic health outcomes.
2. What are the pathways from urbanization to obesity and cardiometabolic risk factors? Which plays a comparatively stronger role, diet or physical activity? Which segments of the urbanizing population are most at risk? The doctoral student would use structural equation modeling or other complex statistical and epidemiological methods to examine pathways from urbanization to obesity and cardiometabolic health outcomes through lifestyle behaviors.
3. How does Westernization of diet affect gut microbial composition and microbial-related plasma metabolites? Do microbiome and metabolome differences translate to differences in health outcomes? How different are patterns of microbes and metabolites in rural versus urban environments? The doctoral student would collaborate with bioinformatics faculty to examine the role of microbes and metabolites in obesity and cardiometabolic health outcomes.



STEPHEN D. HURSTING, PH.D., M.P.H.

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.

Potential thesis project areas for a new doctoral student:

1. Starving cancer from the outside and inside: Combining nutrient stress (calorie restriction, folate restriction, methionine restriction, leucine restriction) with autophagy inhibition in cell culture models and animal models of breast, colon and pancreatic cancer.
2. Eavesdropping on the crosstalk between adipocytes, macrophages and cancer cells in cell culture models and animal models of breast, colon and pancreatic cancer.



NATALIA KRUPENKO, PH.D.

Assistant Professor of Nutrition

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KANNAPOLIS, NC

Dr. Krupenko's laboratory investigates the role of an important nutrient folate and related metabolic pathways in methyl group metabolism and their involvement in pathogenesis and etiology of diseases. Epidemiological studies have found numerous associations between the genetic variations in specific folate enzymes and human diseases, but little is known about how

these variations lead to the disease and whether dietary changes can prevent or exacerbate the disease. Our goal is to decipher the mechanisms by which dietary folate and human genetics affect health.

Potential thesis project areas for a new doctoral student:

1. We have recently discovered a novel function for a folate-binding methyltransferase GNMT in the regulation of cellular proliferation. Doctoral student will focus on the question "how does this enzyme work to control proliferation and whether genetic variations in the enzyme affect the function"? The project will involve identification of metabolic changes caused by the enzyme knockout and use of dietary alterations preventing these metabolic changes with a goal of averting development of liver carcinomas in the GNMT deficient animals.
2. Investigation into whether modulation of sphingolipid signaling could be used to mitigate the negative effects of folate stress. Our lab has recently established that disruption of folate metabolism (folate stress) activates signaling by specific sphingolipids (ceramide) in cultured human cells. The project will include characterizing sphingolipid responses to dietary folate changes in mice. Additionally, the student will investigate whether targeting ceramide signaling with specific drugs can be used to counteract negative effects of folate depletion as well as to increase the activity of antifolate cancer therapeutics.



SERGEY A. KRUPENKO, PH.D.

Professor of Nutrition

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KANNAPOLIS, NC

Dr. Krupenko's research is directed toward understanding mechanisms of regulation of cellular homeostasis by folate pathways, and how folate-related nutritional stress is involved in cell death, survival, and tumorigenesis.

Potential thesis project areas for a new doctoral student:

1. ALDH1L1 is a major cytosolic folate enzyme with a regulatory function. This enzyme is expressed at a high level in numerous tissues but ubiquitously silenced in cancers through the promoter methylation. Doctoral student will use cell culture and mouse models to understand how the loss of ALDH1L1 provides the survival advantage to malignant tumors and whether the protein can serve as a marker of tumorigenesis.
2. Mitochondrial folate enzyme ALDH1L2 is not a well-studied target but it has been proposed as a regulator of oxidative stress and metastasis promoting protein. The project will investigate metabolic role of this enzyme and its function in health and diseases.



ELIZABETH MAYER-DAVIS, PH.D.

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 on the risk for development of diabetes, and on 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, and behavioral strategies to help youth with type 1 diabetes better manage their disease. New work 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 serves as an appointee of President Obama on the Advisory Group on Prevention, Health Promotion and Integrative and Public Health.

Potential thesis project areas for a new doctoral student:

1. FL3X: An Adaptive Intervention to Improve Outcomes for Youth with Type 1 Diabetes. This is a randomized clinical trial funded by NIH.
2. SEARCH for Diabetes in Youth: a large epidemiological study of childhood diabetes including type 1 and type 2 diabetes and incorporating a registry for trends in incidence and prevalence of diabetes and a follow up cohort for study of emergence of complications and relevant behaviors, clinical, sociodemographic contributors to health and quality of life. Funded by NIH and CDC
3. SEARCH Nutrition Ancillary Study: study of nutritional determinants of early complications of diabetes in youth and young adults with type 1 or type 2 diabetes. Funded by NIH



MICHELLE MENDEZ, PH.D.

Assistant Professor of Nutrition

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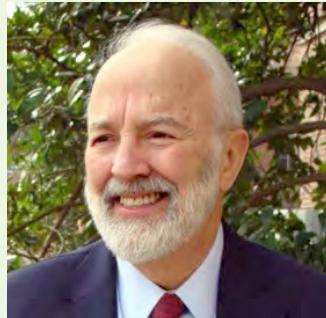
CHAPEL HILL, NC

Dr. Mendez is a nutritional epidemiologist whose research focuses on the role of both contaminants and dietary exposures on health outcomes that include as obesity and related cardio-metabolic disorders, neurodevelopment, and cancer. Her research examines food-borne contaminants, food groups and diet patterns, in an effort to better understand synergies among

these factors, and pathways through which beneficial dietary components may help to modify health risks of contaminant exposures. She has a particular interest in methodological strategies for improving the measurement and analysis of dietary factors, including approaches to reduce error and bias.

Potential thesis project areas for a new doctoral student:

1. Using data from Mexico and China exploring topics such as: What is the role of contaminants in poor cardio-metabolic health among normal weight as well as obese individuals?
2. Using data from Mexico and China exploring topics such as: How do inequalities in dietary and contaminant exposures contribute to disparities in cardio-metabolic health?



BARRY M. POPKIN, PH.D.

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

Potential thesis project areas for a new doctoral student:

1. Broad areas of the dissertation can relate to US food and beverage programs or US policies and how they affect food purchasing patterns; global diet and food purchase issues related to the set of countries in which I work.



SUSAN SMITH, PH.D.
Research Professor, Nutrition
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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.

Potential thesis project areas for a new doctoral student:

1. How does the mTOR signaling pathway remodel cellular nutrition to prevent the apoptotic death of neurons? What gene targets in that pathway modify vulnerability to alcohol? We use zebrafish and chick embryo models to manipulate gene expression and sequence cellular transcriptomes to identify gene candidates that modify cellular responses to alcohol.
2. What are the mechanisms and signals by which alcohol disrupts maternal-fetal iron metabolism to cause fetal anemia and brain iron deficiency? We manipulate rodent models using genetics and diet interventions to investigate underlying mechanisms and the consequences to behavioral and physiological outcomes.
3. How does prenatal alcohol reprogram fetal epigenetics to increase a person's risk for metabolic syndrome and obesity in later life? We assess metabolism, eating behaviors, and cardiovascular function in adult mice and characterize changes in their epigenetic program invoked by alcohol. We test these hypotheses in clinical cohorts that experienced prenatal alcohol exposure.



DEBORAH TATE, PH.D.
Professor of Nutrition
Director, Communication for Health Applications and Interventions Core

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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.



SAROJA VORUGANTI, PH.D.

Assistant Professor of Nutrition

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KANNAPOLIS, NC

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.

Potential thesis project areas for a new doctoral student:

1. What is the role of nutrients in regulating serum uric acid concentrations? How do they interact with genetic variants in affecting uric acid metabolism?
2. Why are the loci that interact with nutrient intake to affect serum uric acid concentrations different by ethnicities? How do these differences affect their future disease (cardiovascular, renal or neurological) risk?
3. What is the role of other environmental factors (physical activity, smoking, exposure to pollutants, etc) in uric acid metabolism? How do they interact with genetic variants to affect serum uric acid concentrations and related disease risk?



DIANNE S. WARD, ED.D.

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.

Potential thesis project areas for a new doctoral student:

1. What are the critical organizational characteristics associated with successful adoption and implementation of interventions within early care and education programs? How does organizational readiness relate to intervention success? Since parents are important conduits to healthy behaviors in young children, what are the important channels that early care and education programs use to transmit health promotion messages to families?
2. Social marketing approaches have been found to create changes in health behavior among adults. How do the various components of a quality social marketing approach (i.e., product, promotion, price, place) combine to create changes in adult and/or children's health behavior? How do organizational characteristics of early care and education programs moderate in intervention outcomes?
3. What is the relationship between physical activity and other health behaviors such as diet, sleep, stress, smoking, and tobacco use? Can physical activity behavior change serve as a "gateway" activity to additional health behavior change? How do adult health behaviors (e.g., parents and child care staff) impact child health behaviors?

FACULTY MEMBERS

THAT ENRICH YOUR EXPERIENCE

The following faculty members **are not taking students in 2017**, but add to the intellectual environment.

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Faculty highlighted in **BLUE** are located in Kannapolis, NC.

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RAMON BATALLER, PH.D.

Associate Professor of Nutrition

Associate Professor, Division of Gastroenterology, UNC School of Medicine

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CHAPEL HILL, NC

alcoholic liver disease.

Bataller's expertise focuses on developing novel targeted therapies for alcoholic liver disease that will improve the outcome of this severe medical condition.

As a staff member of the Hospital Clinic in Barcelona, Spain, Dr. Bataller was responsible for both creating and implementing strategies for the management of patients with advanced alcoholic liver disease. He has developed prognostic scoring systems for patients with alcoholic hepatitis and has identified novel targets for therapy.

Dr. Bataller is a native of Valencia, Spain and is the overall PI of the NIH-funded consortium InTeam.



CYNTHIA BULIK, PH.D., 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, PH.D.

Assistant Professor of Nutrition

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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, M.D. Professor of Nutrition and Pediatrics

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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.



FOLAMI IDERAABDULLAH, PH.D. Assistant Professor of Genetics and Nutrition

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KANNAPOLIS, NC

Folami Iderabdullah, Ph.D., joined the UNC Nutrition Research Institute (NRI) in 2013 as assistant professor of genetics in the UNC-Chapel Hill School of Medicine.

Dr. Iderabdullah joined the NRI to expand her research program in genetics to study the role of dietary nutrients such as folate, choline, betaine, and Vitamin B12 in determining disease susceptibility. She 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. Iderabdullah 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.



NOBUYO MAEDA, PH.D. Professor of Nutrition

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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

NOBUYO MAEDA, PH.D.

Professor of Nutrition

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.



LIZA MAKOWSKI, PH.D.

Assistant Professor of Nutrition

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The Makowski lab studies mechanisms underlying metabolic reprogramming of immune cells in obesity and cancer. Our primary interest is to investigate how macrophage biology is influenced by fuel sources, such as glucose or fatty acids. We have focused on the following themes to build our program: 1) diet exposure and effects on inflammation; 2) manipulating fuel metabolism in immune cells; 3) examining supporting cells in the microenvironment, called the stroma, in cancer risk and progression; and 4) using metabolomics to understand how metabolism may influence cell biology. Findings from these studies will provide targeted strategies through dietary interventions or pharmacologic therapies to translate into novel avenues of prevention and treatment. The list of chronic diseases addressed by our research includes obesity, diabetes, atherosclerosis, and obesity-driven cancers.



JUNE STEVENS, M.S., PH.D.

Professor of Nutrition and Epidemiology

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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, PH.D.

Associate Professor of Nutrition Director, Nutrition BSPH Program

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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.

MIREK STYBLO, PH.D.
Associate Professor of Nutrition
Director, Nutrition BSPH Program

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



STEVEN H. ZEISEL, M.D., PH.D.
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 Nutrition Research Institute (NRI), established in 2008, located in Kannapolis, NC and part of the University of North Carolina at Chapel Hill, 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.

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

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 NMR.

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. If we could better understand why people have different nutrient requirements (e.g. identify responders from non-responders), we could replace a one-size-fits-all nutritional approach with one that considers individual differences in people’s metabolism.

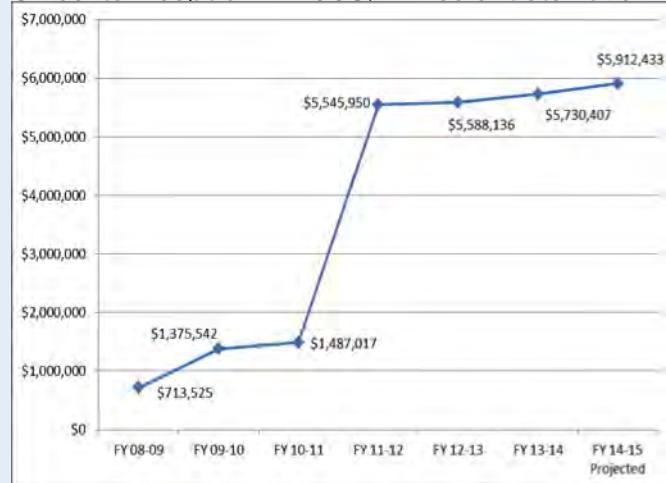
The NRI is equipped with state-of-the-art research laboratories, a whole room calorimeter (capable of measuring calories burned to within 75kCal/d), a fully-equipped metabolic kitchen, an outpatient clinical examination suite, a behavioral testing suite equipped with sophisticated instrumentation for



the study of brain function, mass spectrometers and state-of-the-art genetics equipment.

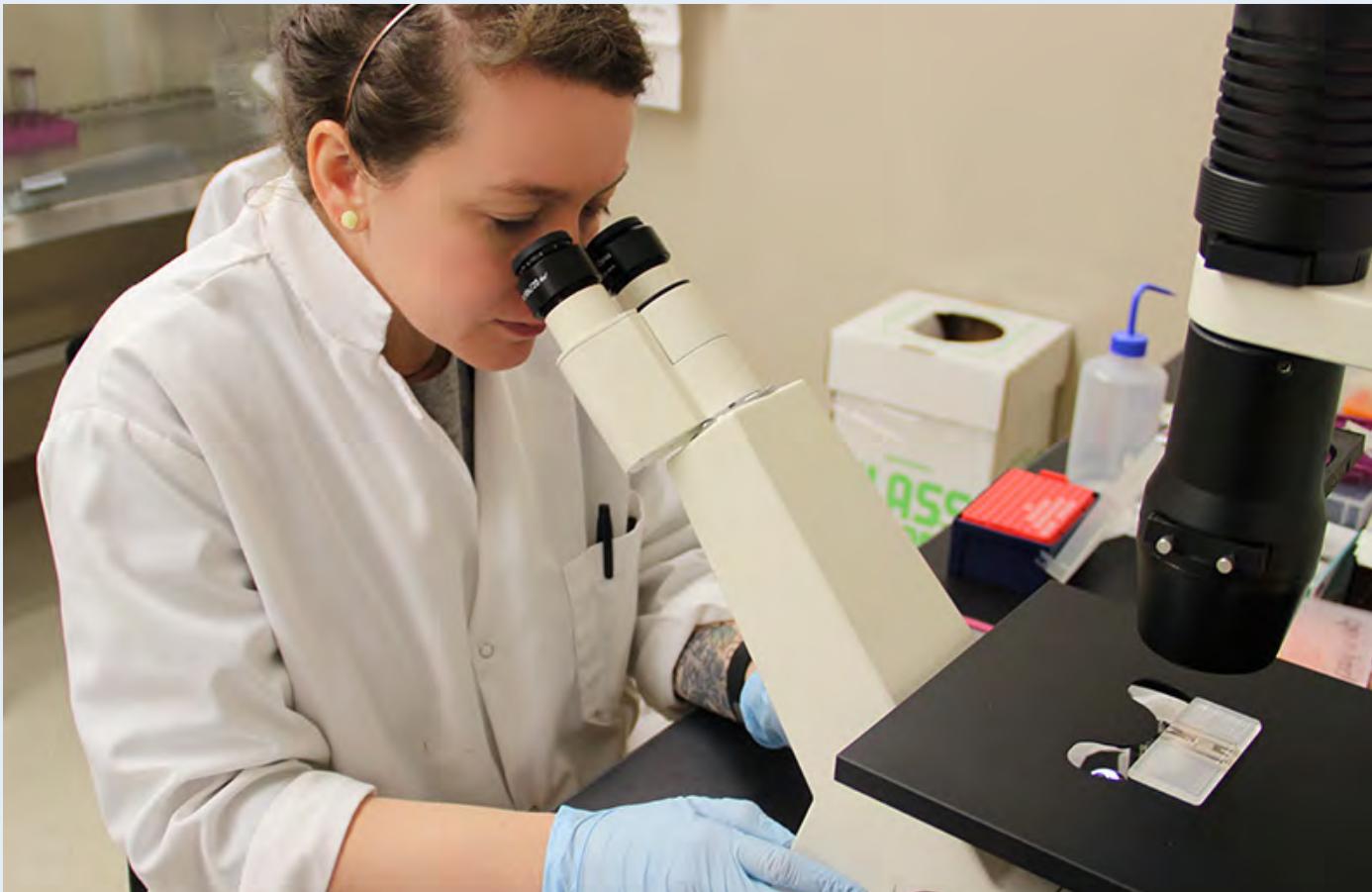
FUNDED RESEARCH

Since its inception in 2008, NRI scientists have



been awarded \$28,472,588 in grants and contracts from not only the NIH and USDA, but also from other prestigious sources (e.g. 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.), by their presence as journal reviewers and as members of journal editorial boards, and by their presence at national and international conferences as invited speakers.

NRI researchers possess the broad range of expertise necessary for successfully competing for funding in the era of systems biology: 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 IN KANNAPOLIS

Students take the same courses and meet the same requirements as do nutrition students working with faculty members 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 chose 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 spend their time in labs 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, great restaurants, a world-class discount mall and amusement parks. The nightlife, professional sports arenas, and museums of Charlotte are about a 30 minute drive away by highway.

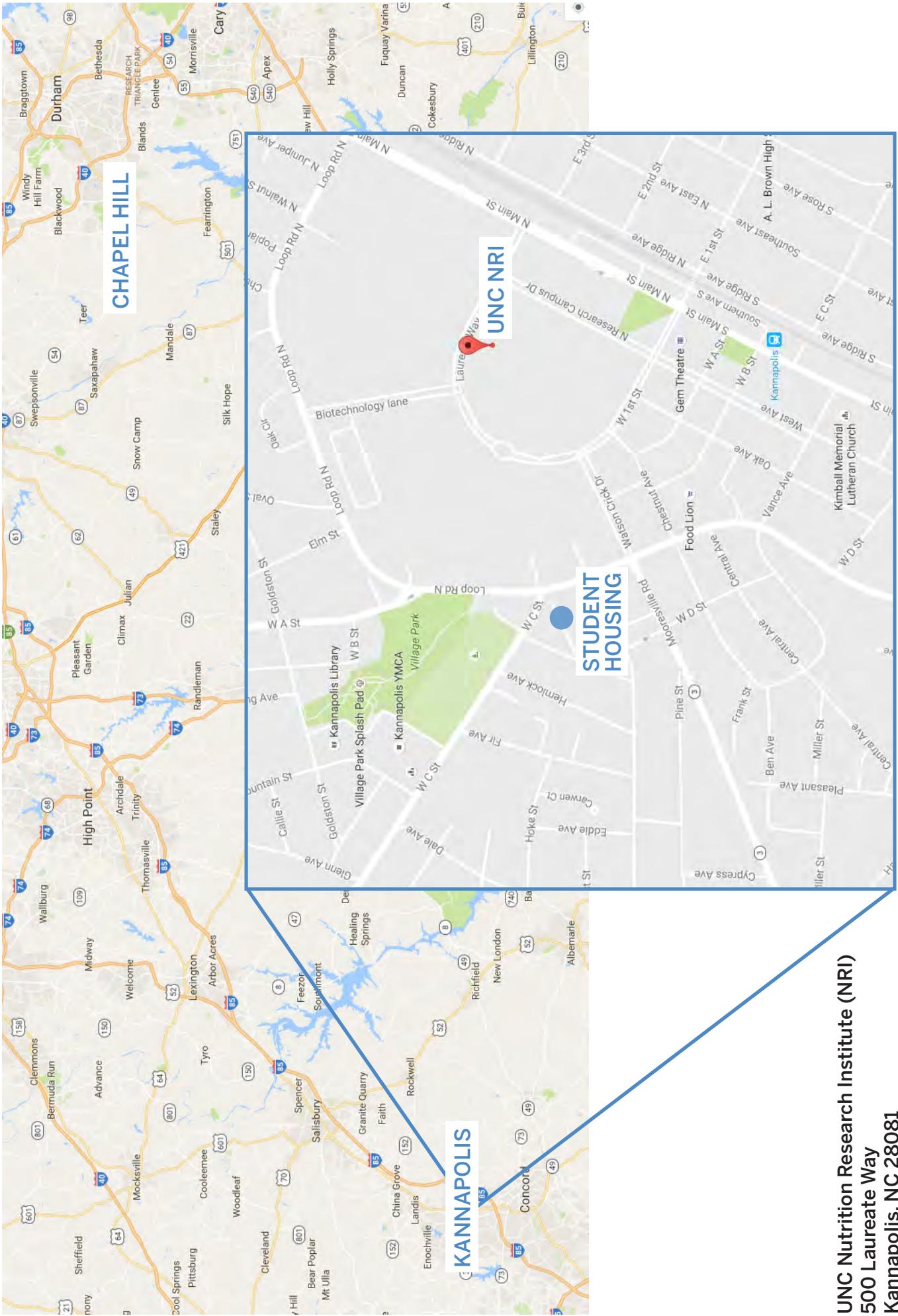
STUDENT HOUSING

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

There is a free shuttle bus making two round trips per day from the NRI to the UNC Chapel Hill campus.

UNC NUTRITION RESEARCH INSTITUTE



UNC Nutrition Research Institute (NRI)
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