

Impact Report FY23

Impact Report

Reflecting the outcome of your financial support of our
Personalized Nutrition Research

#EatUniquely

FY23

July 2022 - June 2023

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Our research is changing how the world looks at nutrition in personalized health and healthcare. Thank you for your investment.



**NUTRITION RESEARCH
INSTITUTE**

About

Vision: To use scientific discovery to ensure optimal health through individualized nutrition.

Nutritional recommendations

Tailored for you

A year of robust research

UNC NRI

FY2023

FROM BENCH TO BETTER HEALTH

Mission

To understand how nutrition affects individual health through our leadership in precision nutrition research, establishing how differences in our genes, bacteria, metabolism, and environment shape our individual disease risk.

Guiding Scientific Premise

Each of us is metabolically unique. The UNC Nutrition Research Institute is dedicated to finding out how these differences affect an individual's health so that current one-size-fits-all dietary guidelines can be replaced with customized nutritional recommendations and actions to improve an individual's health and quality of life.

Administrative Staff

24

Advancement, Facilities, Finance, Human Resources, Information Technology, Research Services

Faculty

20

Departments of Nutrition, Psychology and Neuroscience, Pediatrics, Pharmacology, and Psychiatry and the School of Social Work

Research Staff

63

Research: Assistant, Associate, Specialist, Technician, Scientist; Bioinformatician; Dental Hygienist; Lab Manager; Project Manager; Study Coordinator

Postdoctoral Fellows

13

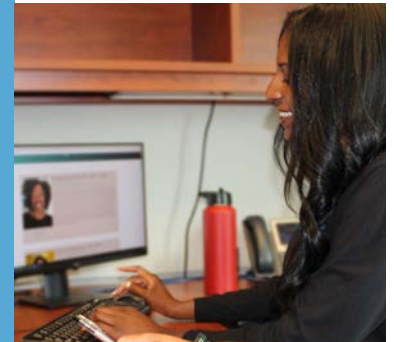
Students

31

Interns

15

Our research contributes to the prevention and mitigation of chronic disease across the lifespan from periconception through aging. The science is complex, but the purpose is simple: We do it for you.



“
Dear Friends,

I'm pleased to share with you in this report the discoveries and successes achieved by the innovative scientists at the UNC Nutrition Research Institute in FY23 (7/1/22 – 6/30/23).

Our faculty and their research teams continued this year to lead the field of precision nutrition research, as evidenced by our high impact, peer-reviewed publications (57), invited presentations nationally or internationally (48), leadership roles in scientific societies (including chairing 7 major conferences), and success in obtaining highly competitive federal grants. Findings from the work at the NRI are contributing to the guidance healthcare professionals need to help you, their patients, promote good metabolic health and prevent disease. Importantly, NRI faculty are also training the next generation of physicians and scientists, as 31 undergraduates and graduate students have been mentored this year in NRI laboratories. Moreover, we have heard from many of our past trainees who have

now completed medical school, graduate school, or veterinary school and are rising stars in their chosen areas.

NRI scientists continue to be well-supported by our stellar administrative team. This includes our Advancement office, which disseminated our scientific advances through various media, free public programs, and community collaborations. I hope you stayed current with us, and we loved seeing you at our in-person events.

I'm proud of these accomplishments, which were made possible, in part, thanks to your generosity. On behalf of the faculty and staff of the NRI, I send gratitude for the confidence you have placed in us and demonstrated through your thoughtful gifts and other forms of support.

Stephen D. Hursting

Stephen D. Hursting, PhD, MPH
Director, Nutrition Research Institute
AICR/WCRF Distinguished Professor,
Department of Nutrition
Member, Lineberger Comprehensive Cancer Center
The University of North Carolina at Chapel Hill



Faculty

NRI principal investigators hold faculty appointments in an array of departments at the University of North Carolina at Chapel Hill. They each approach their nutrition research at the NRI through questions addressing cancer, brain health, and cardiometabolic disease. In addition to running active bench and/or clinical laboratories, our faculty may teach undergraduate classes, mentor graduate students, manage core services for other researchers, speak at professional meetings, or serve as experts for the media.

Deborah Tate, PhD



Deborah Tate joined the Nutrition Research Institute as a professor in July 2022. Tate is a behavioral scientist, having received her PhD in Clinical Psychology. She focuses her research on strategies for improving both short- and long-term body weight regulation to reduce disease risks and on developing and translating alternative programs to clinical-based care. Specifically, Tate conducts studies to determine which digital technologies contribute to efficacy in behavioral treatments for obesity, including wearable devices.

Ximena Bustamante-Marin, PhD
Assistant Professor of Nutrition

Carol L. Cheatham, PhD
Associate Professor of Psychology
and Neuroscience

John E. French, PhD
Professor of Nutrition

Rachel W. Goode, PhD, MPH, LCSW
Assistant Professor of Social Work
and Psychiatry

Stephen D. Hursting, PhD, MPH
Director, NRI
Professor of Nutrition

Martin Kohlmeier, MD, PhD
Professor of Nutrition
Director, Nutrigenetics Laboratory

Natalia I. Krupenko, PhD
Associate Professor of Nutrition

Sergey A. Krupenko, PhD
Professor of Nutrition

Philip A. May, PhD
Professor of Nutrition

Katie Meyer, ScD
Assistant Professor of Nutrition

Sandra Mooney, PhD
Associate Professor of Nutrition

Wilmal Pathmasiri, PhD
Assistant Professor of Nutrition

Blake Rushing, PhD
Assistant Professor of Nutrition

Susan M. Smith, PhD
Deputy Director, NRI
Professor of Nutrition

Delisha Stewart, PhD
Assistant Professor of Nutrition

Susan Sumner, PhD
Professor of Nutrition and
Pharmacology
Director, Metabolomics and
Exposome Laboratory (MEL)

Deborah Tate, PhD
Professor of Nutrition and
Health Behavior

Isis Trujillo-González, PhD
Assistant Professor of Nutrition

Saroja Voruganti, PhD
Associate Professor of Nutrition
Associate Director, NRI Clinical
Research Services

Steven H. Zeisel, MD, PhD
Professor of Nutrition and Pediatrics
Founding Director, NRI

“At the NRI, we want to understand the optimal level of nutrients an individual needs, and that may depend on the person’s genetics, metabolism of nutrients, and lifestyle factors.”

*Susan Sumner, PhD
Professor of Nutrition*



Board members gathered for an in-person meeting in April 2023.

Fred T. Brown
Charlotte, NC

Byron Bullard*
(1927-2021)
Charlotte, NC

Margaret K. Dees
Salisbury, NC

John Fennebresque, Jr.
Charlotte, NC

J. Steven Fisher
Salisbury, NC

Erika G. Gantt
Charlotte, NC

Melissa Harman
Portsmouth, NH

Jason C. Holt
Davidson, NC

Kathleen Kaney
Charlotte, NC

Farzaneh Keshmiri-
Sanchez
Kannapolis, NC

Kevin W. Lobdell
Charlotte, NC

Monique May
Charlotte, NC

Jeffrey Petry
Davidson, NC

Almer Reddick
Zebulon, NC

Craig Richardville
Broomfield, CO

Rina K. Shah (Chair)
Durham, NC

Samuel L. Taggard
West Simsbury, CT

Richard Vinroot
Charlotte, NC

Jason Walser
Salisbury, NC

Mary Jo Walter
Lumberton, NC

Amanda G. Watlington
Durham, NC

Douglas Weed
Wilmington, NC

*Emeritus

The board of advisors is a select group of individuals with vision and experience in a broad range of areas to help elevate the NRI to world-class stature. The board comprises leaders in their respective fields who can position the institute for continued growth and achievement. They are individuals who are personally committed to the NRI's mission.

Our volunteer board of advisors helps enhance the NRI's local, national, and global presence through advocacy and by fostering both public and private collaborations. They identify and help secure financial and other resources and help guide the NRI to be relevant to the needs of our community, nation, and world.



Tom E. Smith
1941-2023

We were deeply saddened by the passing of the immediate past chair of our advisory board, Tom E. Smith. Tom served on the board since the NRI's inception, assuming the chairmanship in 2017 and stepping down in 2021. He led with a steady hand, drawing on his expertise as former Food Lion CEO and as a benevolent member of his community to offer thoughtful guidance to NRI leadership and fellow members. Tom was foremost a kind and caring friend and a philanthropist, having given the NRI a major gift to support the development of upcoming scientists. We will always be grateful and are heartened that his legacy will live on at the NRI.

Image Source: Legacy.com

Publications

- Ximena Bustamante-Marin ◦ ————— • **Bustamante-Marin, XM** and Capel, B (2023). "Oxygen availability influences the incidence of testicular teratoma in Dnd1Ter/+ mice." *Front Genet* **14**: 1179256.
- Carol Cheatham ◦ ————— • **Cheatham, CL**, Canipe, LG, 3rd, Millsap, G, Stegall, JM, Chai, SC, Sheppard, KW and Lila, MA (2022). "Six-month intervention with wild blueberries improved speed of processing in mild cognitive decline: a double-blind, placebo-controlled, randomized clinical trial." *Nutr Neurosci* **26**: 1019-1033.
- Natalia Krupenko ◦ ————— • **Rushing, BR**, Fogle, HM, Sharma, J, You, M, McCormac, JP, Molina, S, **Sumner, S**, **Krupenko, NI** and **Krupenko, SA** (2022). "Exploratory Metabolomics Underscores the Folate Enzyme ALDH1L1 as a Regulator of Glycine and Methylation Reactions." *Molecules* **27**: 8394.
- Sergey Krupenko ◦ —————
- Blake Rushing ◦ —————
- Susan Sumner ◦ —————
- Wimal Pathmasiri ◦ ————— • Wishart, DS, Cheng, LL, Copie, V, Edison, AS, Eghbalnia, HR, Hoch, JC, Gouveia, GI, **Pathmasiri, W**, Powers, R, Schock, TB, Sumner, LW and Uchimiya, M (2022). "NMR and Metabolomics-A Roadmap for the Future." *Metabolites* **12**: 678.
- Delisha Stewart ◦ ————— • Peng, J, Madduri, S, Clontz, AD and **Stewart, DA** (2023). "Clinical trial-identified inflammatory biomarkers in breast and pancreatic cancers." *Front Endocrinol (Lausanne)* **14**: 1106520.
- Deborah Tate ◦ ————— • **Tate, DF**, Lutes, LD, Bryant, M, Truesdale, KP, Hatley, KE, Griffiths, Z, Tang, TS, Padgett, LD, Pinto, AM, Stevens, J and Foster, GD (2022). "Efficacy of a Commercial Weight Management Program Compared With a Do-It-Yourself Approach: A Randomized Clinical Trial." *JAMA Netw Open* **5**: e2226561.
- Isis Trujillo-Gonzalez ◦ ————— • Warriar, M, Paules, EM, Silva-Gomez, J, Friday, WB, Bramlett, F, Kim, H, Zhang, K and **Trujillo-Gonzalez, I** (2023). "Homocysteine-induced endoplasmic reticulum stress activates FGF21 and is associated with browning and atrophy of white adipose tissue in Bhmt knockout mice." *Heliyon* **9**: e13216.
- Saroja Voruganti ◦ ————— • **Voruganti, VS** (2023). "Precision Nutrition: Recent Advances in Obesity." *Physiology (Bethesda)* **38**: 0.
- Steven Zeisel ◦ ————— • Gimbel, BA, Anthony, ME, Ernst, AM, Roediger, DJ, de Water, E, Eckerle, JK, Boys, CJ, Radke, JP, Mueller, BA, Fuglestad, AJ, **Zeisel, SH**, Georgieff, MK and Wozniak, JR (2022). "Long-term follow-up of a randomized controlled trial of choline for neurodevelopment in fetal alcohol spectrum disorder: corpus callosum white matter microstructure and neurocognitive outcomes." *J Neurodev Disord* **14**: 59.

Presentations

- Carol Cheatham ◦ ————— • *Understanding How Nutrigenetics and Nutrition Shape Cognitive Development*. Department of Nutrition, University of North Carolina at Greensboro, Greensboro, NC. Fall 2022.
- Steve Hursting ◦ ————— • Keynote *New Strategies for Breaking the Obesity-Breast Cancer Link*. Gordon Ginder Innovations in Cancer Symposium, Massey Cancer Center, Virginia Commonwealth University, Richmond, VA. March 2023.
- Martin Kohlmeier ◦ ————— • Keynote *Making precision nutrition work in practice*. George M. Briggs Nutrition Science Symposium, Society for Nutrition Education and Behavior, Atlanta, GA. July 2022.
- Natalia Krupenko ◦ ————— • *Restriction of dietary methionine prevents metabolic reprogramming in GNMT KO mice*. Department of Pharmaceutical & Biomedical Sciences, College of Pharmacy, University of Georgia, Athens, GA. November 2022.
- Philip A. May ◦ ————— • *Fetal Alcohol Spectrum Disorders: Initiating New Energy for, and Attention to, FASD in Louisiana*. Keynote at Louisiana FASD Summit, Human Development Center, Louisiana State University Health, New Orleans, LA. June 2023.
- Katie Meyer ◦ ————— • *Dietary Patterns, Weight and Inflammatory Markers Across Adulthood*. UNC Interdisciplinary Nutrition Sciences Symposium, Chapel Hill, NC. July 2022.
- Sandra Mooney ◦ ————— • *A Relationship between Cognitive Deficits and Metabolic Dysfunction in PAE*. Research Society on Alcohol annual conference, Bellevue WA (w/Susan Smith). June 2023.
- Susan Smith ◦ ————— • *How Nutrigenetics Informs Outcomes in FASD: the Lesson of Choline Metabolism*. CIFASD Research Update Symposium, Research Society on Alcohol annual conference, Bellevue WA. June 2023.
- Deborah Tate ◦ ————— • *Moving towards Precision Behavioral Weight Loss Interventions using Digital Approaches*. UAB Nutrition Obesity Research Center seminar, Birmingham, AL. February 2023.
- Saroja Voruganti ◦ ————— • *Genetics of metabolic disease risk in Parsi Zoroastrian families – The Parsi Family Study*. World Zoroastrian Congress, New York City, NY. July 2022.

Clinical Research on Wheels



The NRI added a mobile clinical unit to our facilities this year. This custom-designed vehicle operates completely independently—it does not rely on having an external power source or water hookup. It will greatly enhance availability of our clinical studies to people in rural, suburban, and urban communities in our region by allowing us to come to them.



The mobile clinical unit contains all the equipment necessary for measuring, collecting samples, and processing and storing those for safe transport back to the NRI.

Now, those who have had transportation and other obstacles to clinical study participation can be a part of NRI science.

Studies

CHEATHAM LAB

Infant Cognition and Nutrition Study

Purpose: To show how nutrition helps babies grow and learn.

GOODE LAB

The HONOR Study

Purpose: To examine the factors that affect eating behaviors of African American adults with Type 2 diabetes.

VORUGANTI LAB

Children's Health Study

Purpose: To identify genes and lifestyle factors that affect children's health status and overall well-being.

Fructose Liver-Fat Study

Purpose: To identify genetic and dietary factors that affect the risk for non-alcoholic fatty liver disease.

ADDITIONAL STUDIES

Colgate Study

Purpose: To evaluate the impact of regular, professional, non-surgical intensive periodontal therapy to find out whether the effects of oral health are associated with corresponding changes in general health.

Nutrition for Precision Health

The goal of the NIH Common Fund's Nutrition for Precision Health, powered by the All of Us Research Program, is to develop algorithms that predict individual responses to food and dietary patterns.

Soy Milk Study

Purpose: To determine if soy milk polyphenols offer resilience against reactive carbonyl species-induced stress in humans.

Key Findings



What the Research Shows

Evidence-based

Advances in Nutrition Knowledge

Employing advanced approaches to the science

Total Publications **57**

EAT UNIQUELY

Gut Microbiome

The analysis found that physical activity was associated with gut microbiome composition.

Triple-Negative Breast Cancer

Research from the NRI seeks to understand TNBC mechanisms with the goal of directing development of treatments.

Alcohol-exposed Pregnancies

Maternal alcohol consumption puts metabolic stressors on the mother that can negatively impact the developing fetus.

Pandemic and Eating Disorders

Persons with eating disorders constitute a higher risk group in the context of public health crises.

Ground-breaking research from:

Meyer, Hursting, Sumner, Rushing, Goode, May, Mooney, Smith



“Our lab’s research focuses on obesity and how it can drive cancer. We seek to identify therapies that can improve cancer treatments.

Evan Paules
Postdoctoral Research Fellow, Hursting Lab

Physical activity and gut microbiome

The gut microbiome is an intermediary in many health outcomes. This is important because our microbiome can be modified by our behavior. NRI faculty Meyer (Memili et al., 2023) recently published a study looking at whether physical activity and diet could impact the gut microbiome using data from the Coronary Artery Risk Development in Young Adults (CARDIA) Study. CARDIA is a long-running study that has followed the health of over 5,000 individuals since 1985. The analysis found that physical activity was associated with gut microbiome composition. While this study did not look at causality, the results are consistent with the hypothesis that physical activity could influence the microbiome in ways that are beneficial to health.

Memili, A, **Lulla, A**, Liu, H, Shikany, JM, Jacobs, DR, Jr., Langsetmo, L, North, KE, Jones, C, Launer, LJ and **Meyer, KA** (2023). “Physical activity and diet associations with the gut microbiota in the Coronary Artery Risk Development in Young Adults (CARDIA) study.” *J Nutr* **153**: 552-561.

Breast cancer risks and new treatment options

The combination of few treatment options and the aggressive nature of triple-negative breast cancer (TNBC) results in a higher recurrence and mortality rate. Research from the NRI seeks to understand TNBC mechanisms with the goal of directing development of treatments.

Aging and obesity are associated with increased risk of TNBC. The Hursting laboratory (Smith et al., 2022) showed that both risk factors act through convergent inflammatory and immune-related responses. These results suggest potential targets for future chemotherapeutic development and highlight the need to account for age and/or obesity when treating TNBC.

The high-dose chemotherapy used to treat TNBC carries extreme side effects. Polyphenols and omega-3 polyunsaturated fatty acids (PUFAs) have shown promise as chemosensitizers in TNBC treatment. The Rushing and Sumner laboratories (Rushing et al., 2023) used a metabolomics approach to identify cellular pathways through which polyphenols and PUFAs impact chemosensitivity. The results could facilitate development of new treatment options for TNBC.

Smith, LA, Craven, DM, Rainey, MA, Cozzo, AJ, Carson, MS, Glenny, EM, Sheth, N, McDonell, SB, **Rezeli, ET**, Montgomery, SA, Bowers, LW, **Coleman, MF** and **Hursting, SD** (2022). “Separate and combined effects of advanced age and obesity on mammary adipose inflammation, immunosuppression and tumor progression in mouse models of triple negative breast cancer.” *Front Oncol* **12**: 1031174.

Rushing, BR, Wiggs, A, Molina, S, Schroder, M and **Sumner, S** (2023). “Metabolomics Analysis Reveals Novel Targets of Chemosensitizing Polyphenols and Omega-3 Polyunsaturated Fatty Acids in Triple Negative Breast Cancer Cells.” *Int J Mol Sci* **24**: 4406

Developments in addressing alcohol-exposed pregnancies

Drinking alcohol during pregnancy has negative health effects on the developing fetus, but exactly how alcohol exerts these effects is less clear. In a collaborative effort of the May, Mooney, and Smith laboratories, Hasken et al. (2022) analyzed how alcohol consumption-associated maternal metabolites related to certain alcohol-affected birth outcomes. They found that a metabolomic signature consistent with increased maternal amino and fatty acid metabolism correlated with decreased infant weight, length, and head circumference, consistent with the hypothesis that maternal alcohol consumption puts metabolic stressors on the mother that can negatively impact the developing fetus.

Limiting alcohol consumption during pregnancy remains the most effective method of preventing fetal alcohol spectrum disorders (FASD). NRI faculty May (May et al., 2023) analyzed the effect of an 18-month intervention method known as multifaceted case management (MCM) on birth/development outcomes through age 5 in a population at high-risk for alcohol consumption during pregnancy. As applied here, MCM combines the traditional interventions of Motivational Interviewing, which helps the individual learn coping skills and behavioral changes, the Community Reinforcement Approach, which helps develop a more supportive family/social environment, and nutritional supplementation for women with low BMI. Overall, children of mothers who received MCM vs non-MCM control had significantly fewer markers of FASD, indicating that the MCM approach substantially reducing drinking in pregnant women.

Hasken, JM, de Vries, MM, Marais, AS, May, PA, Parry, CDH, Seedat, S, Mooney, SM and Smith, SM (2022). "Untargeted Metabolome Analysis of Alcohol-Exposed Pregnancies Reveals Metabolite Differences That Are Associated with Infant Birth Outcomes." *Nutrients* **14**: 5367

May, PA, Marais, AS, Kalberg, WO, de Vries, MM, Buckley, D, Hasken, JM, Snell, CL, Barnard Rohrs, R, Hedrick, DM, Bezuidenhout, H, Anthonissen, L, Brocker, E, Robinson, LK, Manning, MA, Hoyne, HE, Seedat, S and Parry, CDH (2023). "Multifaceted case management during pregnancy is associated with better child outcomes and less fetal alcohol syndrome." *Ann Med* **55**: 926-945.

Pandemic affects eating disorders

The impact of the COVID-19 pandemic was widely felt across the globe, especially by persons with other ongoing medical conditions. In a series of studies, new NRI faculty Goode specifically assessed how the pandemic impacted people with eating disorders. These studies spanned populations in the US, Sweden, and the Netherlands. The pandemic exacerbated stressors and individuals' responses (e.g., eating in response to stress) and limited access to support and treatment; these effects persisted through at least the first year of the pandemic. Overall, persons with eating disorders constitute a higher risk group in the context of large scale public health crises.

Goode, RW, Godoy, SM, Olson, K, Berg, S, Agbozo, B, Gwira, R, Xu, Y, Wolfe, H, Bhutani, J and Alexander, R (2023). "If I start panicking over having enough, then I start eating too much": Understanding the eating behaviors of SNAP recipients in larger bodies during COVID-19." *Eat Behav* **49**: 101741.

Goode, RW, Godoy, SM, Wolfe, H, Olson, K, Agbozo, B, Mueller, A, Noem, T, Malian, H, Peat, CM, Watson, H, Thornton, LM, Gwira, R and Bulik, CM (2023). "Perceptions and experiences with eating disorder treatment in the first year of COVID-19: A longitudinal qualitative analysis." *Int J Eat Disord* **56**: 247-256.

Thompson, KA, Hedlund, EL, Sun, Q, Peat, CM, Goode, RW, Termorshuizen, JD, Thornton, LM, Borg, S, van Furth, EF, Birgegard, A, Bulik, CM and Watson, HJ (2023). "Course and predictors of eating disorder symptoms, anxiety symptoms, and pandemic-related eating disorder concerns among adults with eating disorders during the first year of the COVID-19 pandemic." *Int J Eat Disord* **56**: 151-168.

Termorshuizen, JD, Sun, Q, Borg, S, Mantilla, EF, Goode, RW, Peat, CM, Thornton, LM, Watson, H, van Furth, EF, Birgegard, A and Bulik, CM (2023). "Longer-term impact of COVID-19 among individuals with self-reported eating disorders in the United States, the Netherlands, and Sweden." *Int J Eat Disord* **56**: 80-90.

Goode, RW, Malian, H, Samuel-Hodge, C, Noem, T, Coan, D, Takgabjouah, M, Bahena, L and Bulik, CM (2022). "The impact of COVID-19 on Black women who binge-eat: a qualitative study." *Eat Weight Disord* **27**: 3399-3407.



Photos: (left to right)

Blake Rushing, assistant professor of Nutrition; Steve Hursting (L), institute director, and Evan Paules (R), postdoctoral research fellow; Yanping Huang, postdoctoral research associate.

Awards and Honors



Ximena Bustamante-Marin

Pilot & Feasibility Program Award, Nutrition Obesity Research Center, University of North Carolina at Chapel Hill

Selected participant, Scholars Program, SPLENDOR-NC: Supporting, Promoting, and Launching the Expansion of Nutrition, Diabetes, and Obesity Researchers in North Carolina (U24DK132715)

Rachel W. Goode

Deborah Padgett Early Career Award, Society of Social Work and Research

Stephen D. Hursting

Elected co-chair, 2024 American Association for Cancer Research Annual Meeting

Member, Metabolic Dysregulation and Cancer Risk Program Advisory Board, National Cancer Institute

Member, UNC Gillings School of Global Public Research Strategic Plan Taskforce

Martin Kohlmeier

Nutrition Advisory Team member, Ahara Corporation

*Core Title in Nutrition awarded to his book *Principles of Nutrigenetics and Nutrigenomics: Fundamentals of Individualized Nutrition* by Doody's Core Titles in the Health Sciences*

Organizing Committee member, NNEdPro Summit (virtual)

Editor-in-Chief, BMJ Nutrition, Prevention & Health

Natalia Krupenko

Elected co-chair, 2024 and elected chair, 2026 of FASEB SRC on B vitamins and One Carbon Metabolism in Health and Disease

Susan Smith

Session organizer and co-chair, "New Advances in Nutrient-Alcohol Interactions in FASD: from Preclinical Models to Clinical Translation," Research Society on Alcohol annual conference

Susan Sumner

Chair, Diet and Nutrition Session, 19th Annual Conference of the Metabolomics Society

Vice chair, 2023 Gordon Conference on Metabolomics and Human Health. "Examining the Intersection Between Systemic and Cellular Metabolism and Lifestyle Factors to Understand Health and Disease"

Member, UNC Lineberger Comprehensive Cancer Center, Cancer Epidemiology Program

Isis Trujillo-Gonzalez

Guest review editor, Frontiers in Nutrition research topic: Leveraging Multi-omics Approaches to Confront Gastrointestinal and Hepatic Diseases

Saroja Voruganti

CLIA certification of Voruganti Laboratory for nucleic acid extraction and genotyping services

Associate Editor, Genes and Nutrition, Official Journal of the European Nutrigenomics Organization (NuGO)

Associate Director for Clinical Research Services, Nutrition Research Institute

Panelist, women's heritage month, Lake Normal Charter School, Huntersville, NC



Photos: (top to bottom)

Ximena Bustamante-Marin (L), assistant professor of Nutrition, and student (R); Rachel Goode, assistant professor of Social Work and Psychiatry; Natalia Krupenko (L), associate professor of Nutrition and Madeline Hall (R), graduate research assistant.

Once NRI investigators publish their findings (pg 8-10), we translate and disseminate the information to fellow scientists, health practitioners and the public through programs, events, collaborations, and trainings. We appreciate our friends and colleagues who joined us this past year to learn from and engage with our experts.

Appetite for Life

Appetite for Life is a series of free educational and interactive events to translate nutrition-related research into clear and helpful information for the public. This year we continued to offer in-person, evening programs in various locations around Kannapolis as well as virtual lunchtime presentations. Topics ranged from nutrition's role in cancer prevention to how

epidemiology tells the story of a disease.

NRI advisory board member Monique May, MD, the Physician in the Kitchen™, spoke about her journey through plant-based eating and how it can be incorporated into a personalized diet. In an introduction, Kendra Nelson, MPH, RD, presented NRI's approach to precision nutrition research.

We welcomed 2023 by asking: What's the difference

between a vitamin and a mineral? and: Which fruits are high in anthocyanins and good for your brain? To test our audience on these and other questions, we gathered at Gaelic Alley Irish Pub in downtown Kannapolis for Nutrition Trivia Night. Fun and informative, Trivia Night showcased NRI science and supported local small businesses. NRI emcees were Angela Clontz, MS; Kendra Nelson, MPH, RD; and Evan Paules, PhD.

In February we offered Speed Dating with the NRI. The audience heard from eight NRI scientists who explained what they are investigating and why it's important—in just 3 minutes each! Principal investigators, postdocs, PhD students, and research specialists took the mic to reveal the ideas and concepts

that underlie their exacting work in the laboratory and clinic. These 3-minute presentations were designed to effectively explain complex scientific research in down-to-earth language for nonscientists. Presenters: Walter Friday; Lydia Dooley, RD; Violet Kiesel, PhD; Martin Kohlmeier, MD, PhD; Nipun Saini, PhD; Jorge Silva, PhD; Julie Stegall, MSW; Yuan Li, PhD

In the spring our guest speaker was NRI advisory board member Katie Kaney, DrPH, FACHE, author of *Both/And: Medicine & Public Health Together*. She shared that health is driven by four factors: clinical (10%), social (20%), genetics (30%), and behavior (40%). And yet, more than 80% of our current health spending is on clinical services. The result is a declining life span and the highest cost per capita in the world. Kaney discussed her book with NRI's Martin Kohlmeier, MD, PhD to explore how we can have better health outcomes, at a lower cost, now and for the future.

Local Participation

Throughout the year NRI scientists and representatives participate in various events in and around our community to support our neighbors, help build awareness of our research, and encourage people to consider joining a research study. This past year, we were represented at several health and wellness expos, Jackson Park Elementary School's STEM Night, and Kannapolis's signature barbecue festival Jiggy with the Piggy.

Collaborations

We partnered with these organizations and businesses to provide our various Appetite for Life programs:

- Food Lion
- Gaelic Alley Irish Pub
- Nostalgia Hollow Co.
- Rowan Cabarrus Community College



Engagement and Education

Everyone benefits from personalized nutrition

Community events

NRI programming

By the Numbers

FY23

	Audience
Appetite for Life	477
Community Event Attendees	1,154
VIP High School Students	21
Undergraduate Students	15
Faculty Seminar Attendees	290
Total	1,957

Learn more about our engagement and education opportunities on our website: uncnri.org

Virtual Internship Program

The NRI held its fourth annual Virtual Internship Program (VIP) this year with 21 high school students from around the country who were selected from among 102 through a competitive application process. This 4-week, online-only program provided students the opportunity to learn from NRI principal investigators and other research staff, participate in group mentoring sessions, and complete an independent nutrition research project and presentation. To complete the program, students presented their papers to their peers as well as NRI scientists and staff. Their papers have been compiled in a VIP Student Journal available at uncnri.org/VIP.

Undergraduate Scholars

The NRI is helping prepare undergraduate scholars to enter the workforce through career opportunities in science. Our researchers are highly qualified to train, mentor, and provide hands-on experiences to emerging scientists. This year, the NRI offered unique opportunities to 15 student interns to strengthen their education with hands-on research experiences.

Student Housing

For 100 years, Kannapolis was home to Cannon Mills. Mill workers lived in company-built and -owned houses. With a \$125,000 grant from the Cannon Foundation, and support from UNC General Administration and the state of North Carolina, we purchased and renovated one of these historic properties, converting it to another—this is our sixth—graduate student house adjacent to the North Carolina Research Campus.



Faculty Seminar Series

Like Carolina's students, our faculty are always learning. To stay current with developments in science related to their work, the faculty invited five esteemed scientists to present on topics around NRI researchers' work in nutrition, metabolism, microbiome and disease. Guest speakers were from the University of Colorado Anschutz Medical Campus, Lewis Katz School of Medicine of Temple University, Wake Forest University School of Medicine and the NRI itself.

I have benefited greatly from each [session] and learned so much new information. The past few weeks have allowed me to recognize that nutrition is a field that I would love to pursue, and that I perhaps would enjoy the research side of things as well.

Sumayyah Elkhoully
2023 VIP Student

Carol L. Cheatham

Blueberries really ARE a superfood! Study finds eating the fruit every day can reverse cognitive decline in elderly people
by Mansur Shaheen
DailyMail.com | September 21, 2022

Deborah Tate

The science-backed strategies that will actually help you eat better
by Andrea Petersen
Wall Street Journal | September 28, 2022

Saroja Voruganti

Her childhood in India – and parenthood – changed this nutrition expert's eating habits
By Michael Merschel
American Heart Association News Series
May 23, 2023

“Maine wild blueberries are delicious, and new research confirms their health benefits as well! Seniors who added this superfood to their diets demonstrated increased mental processing speeds. This is just one more reason to enjoy Maine wild blueberries.

Senator Susan Collins, Maine
Twitter | @SenatorCollins

Rachel W. Goode

The most common eating disorder in the U.S. is also the least understood
by Dani Blum
The New York Times | May 31, 2023

Study finds pandemic pressures put SNAP recipients at risk for eating disorders
88.5 WFDD, Public Radio for the Piedmont and WFDD.org
June 12, 2023

9 investigates diabetes and its connection to eating disorders in Black women
by Deneige Broom
WSOC-TV and wsoc.com | November 2, 2022

Eating disorders in the Black community are more common than you think
by Anissa Durham
The Seattle Times | October 28, 2022

Natalia Krupenko

The ABCs of Vitamin B: What you need to know about the eight different types of this essential nutrient
by Constance Sommer
AARP.org | July 21, 2022

Susan Sumner

Precision nutrition improves health at individual level, expert says
by Rich Woychick
Environmental Health Factor | February 2023

Her childhood in India – and parenthood – changed this nutrition expert's eating habits

By Michael Merschel, American Heart Association News



Saroja Voruganti is an associate professor of nutrition at the University of North Carolina at Chapel Hill. (Photo courtesy of Alyssa LaFaro, UNC Research)

These days, Saroja Voruganti, an associate professor of nutrition at the University of North Carolina at Chapel Hill, prefers a balanced diet that emphasizes "whole" foods and steers clear of processed ones.

That wasn't always the case.

"My dietary patterns were very different when I was younger," said Voruganti, who is also associate director for clinical research services at UNC's Nutrition Research Institute. "I did not pay much attention to the foods I was eating."

What changed? Voruganti explained for "The Experts Say," an American Heart Association News series where specialists discuss how they apply what they've learned to their own lives.

Is there a guiding principle behind what you eat?

The most important principle I follow is that every nutrient has a purpose and should not be vilified. However, each nutrient has to be taken in moderation and proportional to its role.

I don't believe in cutting off carbohydrates or fats or proteins completely. I try to maintain a balance between all the nutrients, including macronutrients (carbohydrates, proteins and fats) and micronutrients (vitamins and minerals). Also, I don't believe in skipping meals. I eat small portions rather than skip a meal.

Did you always have such a mindset?

I have been following this pattern for many years, but I can't say I always ate this way.



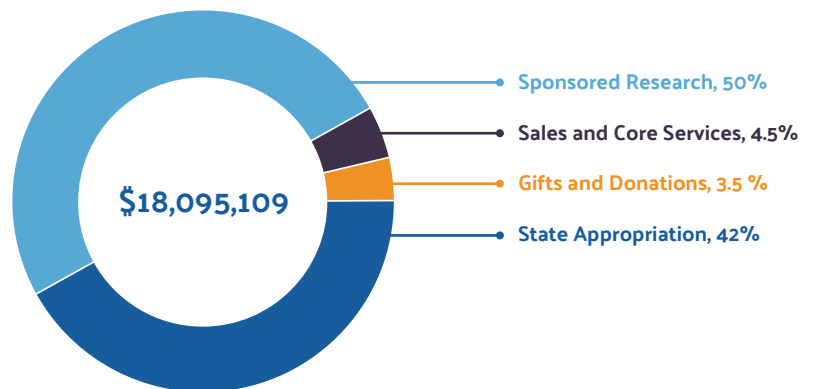
Photos: (left to right)

Isis Trujillo (L), assistant professor of Nutrition, Rina Shah, Chair, Board of Advisors, Suzanne Dane (R), Director, Institutional Advancement; UNC Nutrition Research Institute building on the North Carolina Research Campus; Tyisha Harper (L), project coordinator, Goode Lab and Carsyn Patton (R), study participant.

With Gratitude

Because you recognize the value of scientific research, we can support our faculty, their staffs, and the administration and operation of our institute. Gifts to the NRI from individuals, foundations, and businesses provide crucial funds that help us recruit the world's best nutrition scientists, forge new paths of inquiry and discovery in precision nutrition, and provide hands-on education and mentoring to students. We are inspired everyday by your commitment to our institute.

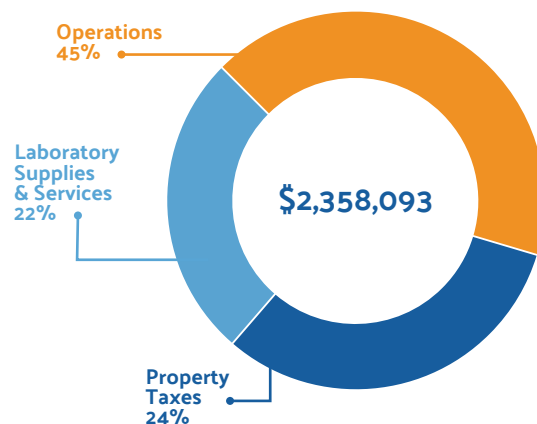
FUNDING

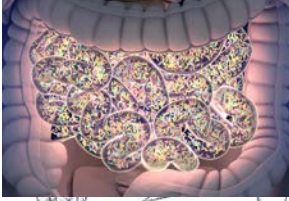


Our Community

As a proud member of the North Carolina Research Campus in Kannapolis, the NRI is pleased that our participation in the local business community contributes to the economic development of our hometown. Along with our fellow institutions and private industry, we have attracted many new residents to Rowan, Cabarrus, and surrounding counties, all of whom shop locally and contribute to the revitalization of our beautiful community.

LOCAL EXPENDITURES





TRIVIA NIGHT!



SPEED DATING WITH THE NRI: 3-MINUTE NUTRITION THEORIES
NRI scientists share their research in 180 seconds.
FEBRUARY 15, 6 PM
Bowen Cabarrus Community College
399 Hatterasway Lane
Kannapolis, NC 28081



WHEN MOM DRINKS, BABY DRINKS
Research by Nipun Saini, PhD



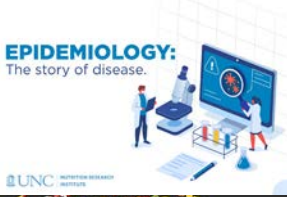
2023/24 Pilot and Feasibility Award Winners



NEW OPTIMISM FOR BREAKING THE OBESITY-CANCER LINK
Violet Kristel, PhD



HELP MAKE PEOPLE healthier THROUGH SCIENCE



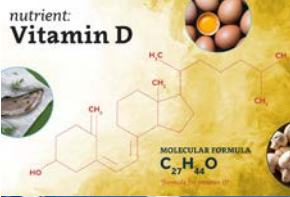
ARE YOU A SUPER-TASTER?



NEW STUDY: Understanding the eating behaviors of SNAP recipients in larger bodies during COVID-19



WHEN MOM DRINKS, BABY DRINKS
Research by Nipun Saini, PhD



help CHILDREN



The UNC Nutrition Research Institute's goal is to replace general dietary guidance with more customized nutrition recommendations, encouraging us all to #eatuniquely.



UNC | NUTRITION RESEARCH INSTITUTE

uncnri.org

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Kannapolis, NC 28081

