

Tufts
UNIVERSITY

Jean Mayer USDA
Human Nutrition
Research Center on Aging

Healthy & Active Aging Through Research

ANNUAL REPORT 2012



HNRCA'S TOP STORIES OF 2011-2012

The Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University (HNRCA) is the largest research center in the world dedicated to the study of nutrition and healthy & active aging. In 2011-2012, our scientists in 19 individual laboratories made groundbreaking discoveries impacting nutritional research and clinical practice, and influencing guidelines for adult nutrition around the world.

Strength Training Prevents and Reverses Muscle Loss in Seniors



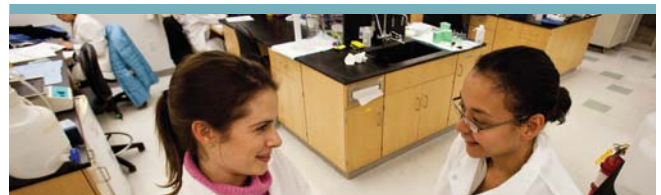
HNRCA researchers led by Dr. Roger Fielding in the Nutrition, Exercise, Physiology and Sarcopenia Laboratory confirm that middle age adults should lift weights at least twice a week to retain muscle and consume protein to manufacture the lean tissue. The loss of muscle, known as sarcopenia, a term coined at the HNRCA by Dr. Irwin Rosenberg, slows the body's resting metabolic rate, causing weight gain as well as difficulty in performing basic tasks like carrying groceries. Weight training that targets specific muscle groups can slow and even reverse this loss of function. Related findings were published in the *Journal of the American Medical Directors Association* in 2011.

MyPlate for Older Adults



MyPlate for Older Adults is a new tool to guide seniors in meeting their daily nutrient, fluid and physical activity needs. Created by Dr. Alice Lichtenstein, Director of the Cardiovascular Nutrition Lab, with support from her team, the symbol is an excellent guide for healthy, older adults who are living independently and looking for examples of good food choices and guidance in terms of fluid intake and physical activities.

New Research Clusters



Four new Research Clusters were established in 2012 for the purpose of enhancing collaboration within the HNRCA, throughout the University, and eventually, across institutions. The Clusters address: Cancer; Cardiovascular Disease; Inflammation, Immunity and Infectious Diseases; and Obesity. The Clusters are advancing their scientific agendas and building multi-lab teams.

Their work is leading to new research ideas, plans for pilot studies, cross-disciplinary collaboration, and key milestones.

Vitamin D Improves Glucose Tolerance in Adults at Risk for Type 2 Diabetes



Adults with lower blood levels of vitamin D are thought to be at increased risk of developing type 2 diabetes. HNRCA researchers in the Bone Metabolism Laboratory, in collaboration with scientists at Tufts Medical Center, conducted a study to examine the effect of 2000 IU of vitamin D per day compared with placebo on insulin secretion sensitivity in adults at high risk for developing type 2 diabetes. Supplementation significantly improved glucose tolerance, mainly by increasing insulin secretion. This study suggests a favorable effect of vitamin D on glucose handling. Results were published in the *American Journal of Clinical Nutrition* in 2011.

Focus on Epigenetics



The HNRCA is a world leader in the study of gene-diet interaction. The Center's Nutritional Genomics Laboratory, led by Dr. Jose Ordovas, utilizes both genetic epidemiology approaches and controlled dietary intervention studies. In 2012, the HNRCA established a Functional Genomics Core Scientific Service, headed by Dr. Ordovas, to enable more researchers to incorporate this growing area of study into their investigations. Dr. Ordovas was honored by the 2012 Francisco Grande Covian award and was named 2011 winner of the Grand Prix de la Science de l'Alimentation de L'Académie Internationale de la Gastronomie for his pioneering work in the field.

Mother's Diet of Folate and B Vitamins Protects Offspring from Tumors



Mice born to mothers fed a diet supplemented with B vitamins, including folate, are less likely to develop intestinal tumors, according to research published by Dr. Joel Mason, Director of the HNRCA's Vitamin Carcinogenesis Laboratory, and colleagues. Mothers were fed supplemented diets prior to conception through weaning. Fewer incidences of tumors were associated with fewer disruptions in the gene signaling pathway which is altered in colorectal cancer cases. Researchers attribute these differences in gene expression to epigenetics, modifications of DNA which are sensitive to environmental factors such as diet, and concluded that changing maternal B vitamin intake had lasting epigenetic effects in offspring. These observations were published in the December 2011 issue of *GUT*.

TO OUR SUPPORTERS

Never before has healthy aging been more important. The senior population in America, and globally, is increasing as a percentage of total population each year, and that growth will continue through 2050. As scientists, we know that good nutrition and physical activity can add many healthy years to the average adult life. Our work, from the basic cell science to epidemiological research to animal and human clinical investigation, is impacting the global field.



Collaboration is a cornerstone of HNRCA activity both within our labs and within the University. HNRCA scientists conduct an impressive array of University-wide collaboration in teaching, service, and research.

Publications and communications are central to our mission. Sharing our research with fellow researchers, academics, practicing clinicians, dieticians, and the public will help support our mission and lead to healthier citizens. As such, HNRCA scientists collectively averaged more than one high-impact scientific journal publication per business day over the past decade. is prolific publication rate leads to significant coverage in the popular press. In the first half of 2012, our work was featured by the *Associated Press*, *Boston Globe*,

USA Today, *Reuters*, *ABC News Radio*, *the Times of London*, *El Mundo*, *the Today Show*, and *the Los Angeles Times*, to name but a few.

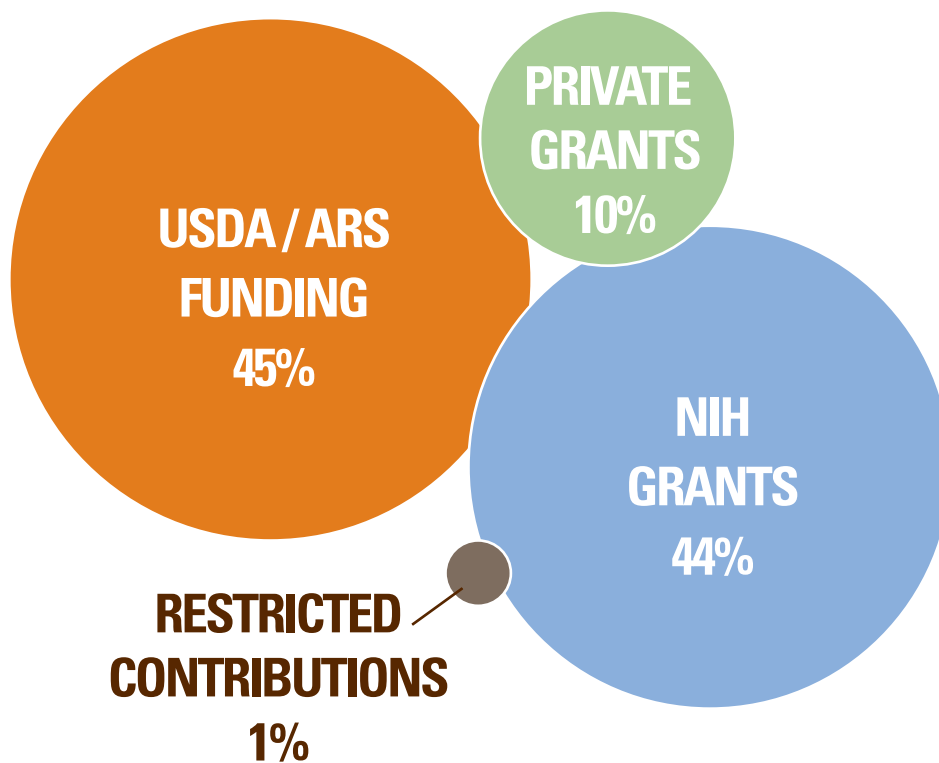
We are pleased with all we have accomplished and our many contributions to the field of healthy & active aging. is annual report includes some of our most significant study results and news of 2011 and 2012.

A handwritten signature in black ink that reads "Simin Meydani". The signature is written in a cursive, flowing style.

Simin Nikbin Meydani, D.V.M., Ph.D.

DIVERSIFYING FUNDING SOURCES

The HNRCA has an outstanding record of securing research funds to support the work conducted in our 19 labs and 7 core units. In FY2011, funding for research activities reached \$23,472,343. Our support comes from several primary sources, including USDA (45%), Federal grants – majority NIH (44%), private grants (10%), restricted contributions (1%), and state and foreign grants (less than 1%).



With the USDA's Agricultural Research Service cooperative agreement funding serving as a solid foundation, the HNRCA has established the identification of new funding sources as a top strategic priority. It is intended to meet the challenge of flat and declining federal research dollars, keep pace with the increasing cost of laboratory support, and to provide the necessary resources for promising new research.