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# Nutritional Sciences

## NSC Grad Student Wins Teaching Award



Congratulations to **Thao Nguyen, MS**, who has been honored with the *Fall 2016 CALS PhD Graduate Teaching Assistant*. Between working on her Master's and now her PhD, Thao has been a Teaching Assistant in Nutritional Sciences for several years much to the delight of the faculty she has supported. In the last couple of years she has focused on supporting student-delivered metabolic disease presentations in *NSC 308: Nutrition and Metabolism*. Thao has been instrumental in structuring the project to guide our sophomore/junior students through locating, evaluating, and organizing the latest scientific literature on these diseases into a coherent and informative presentation. She has unselfishly spent as much time as needed with these students for them to grasp recent research on pathophysiology and medical/nutrition therapies. In asking for feedback from students in the class about Thao's guidance, they overwhelmingly thought her assistance was invaluable. Thao absolutely deserves this award!

## Alumni Recognition

**Rachel Shorthouse, MS, MPH, RDN** received the Outstanding Dietetics Student Internship award from the Arizona Academy of Nutrition and Dietetics in June. Rachel graduated from the UA NSC graduate program with her MS in Nutritional Sciences in May 2015 and completed her dietetic internship with Banner UAMC in 2016. She is currently a practicing dietician on the San Carlos Indian Reservation.

The Arizona Academy of Nutrition and Dietetics selected **Elizabeth L. Graham, RDN** as the 2016 AZ Young Dietitian of the Year. Elizabeth is a graduate of the UA Nutritional Sciences program and the UA's Individualized Supervised Practice Pathway Dietetic Internship. She is currently a Clinical Dietitian at Tucson Medical Center

## UANN Receives Award for Outstanding Service to City of Tucson Parks & Rec



The University of Arizona Nutrition Network (UANN), as a part of a comprehensive obesity-prevention approach reaching Supplemental Nutrition Assistance Program – Education (SNAP-Ed) eligible youth, has partnered with KIDCO for over 6 years. KIDCO is an after-school and summer youth recreation program administered by the City of Tucson's Parks & Recreation Department. One of KIDCO's goals is to provide, "...a place to practice physical fitness, experience healthy alternatives and learn respect for the body." To help meet this goal, the UANN has provided nutrition and physical activity training, resources, and equipment to KIDCO staff. The UANN has also implemented evidence-based nutrition and physical activity education, games, and healthy food tastings with KIDCO participants during summer programming.

To demonstrate their appreciation for the UANN program, KIDCO leadership requested that the UANN be honored at a City of Tucson Mayor and Council meeting on May 17<sup>th</sup>, 2016. At this meeting, Mayor Rothschild presented an award to Hayley Moretz, the UANN/KIDCO Program Coordinator, for outstanding service. The UANN looks forward to many more fruitful years of partnership with the City of Tucson Parks & Recreation Department, and will continue to provide meaningful obesity-prevention activities, education, and interventions to KIDCO participants.



# Research

## Faculty Research Brief: Dr. Ningning Zhao



**Dr. Ningning Zhao** has received training in human physiology, biochemistry, nutritional science, molecular biology and cell biology that he is now applying to the research of biomedical questions relevant to human diseases. The long-term goal of his research is to advance the understanding of disease mechanisms, identify therapeutic target genes, and improve the life quality of patients. His current research interests focus on metal transport proteins. Mutations and malfunctioning of membrane metal transporters is closely related to the initiation and the progression of an increasing number of human diseases, including hereditary hemochromatosis, cancer, and neurodegeneration. The Zhao laboratory is focused on advancing molecular mechanisms for the function and regulation of plasma membrane metal transporters. His most recent research program aims to investigate the mechanisms underlying the regulation of a newly identified metal transport protein, ZIP14, and to examine the function of ZIP14 in establishing metal homeostasis in the body.

ZIP14 possesses unique functions in mediating body metal homeostasis: it can transport zinc, iron, manganese, and cadmium; it mediates both transferrin-bound iron and non-transferrin-bound iron uptake into cells; it is the only metal importer identified to date that is upregulated by excess iron, suggesting that ZIP14 contributes to tissue iron loading under high iron conditions, such as hereditary hemochromatosis; mutations in ZIP14 result in early-onset neurodegeneration associated with brain manganese accumulation in humans. Despite the clear importance for human health, the precise role of ZIP14 in establishing body metal homeostasis remains unknown. Dr. Zhao's research has identified a novel iron-dependent proteasome-mediated pathway for regulating the degradation of ZIP14. A critical next step will be to understand the detailed mechanism of this regulation. Data from his studies suggest that two novel topics are involved in the regulation of ZIP14: membrane dislocation and the tumor suppressor p53. His laboratory is conducting a more complete examination of the mechanisms underlying the regulation and the degradation process of ZIP14.

## Diabetes Prevention Begins with Youth

More than 5,000 per year – that's the government's estimate for the number of people under the age of 20 who are newly diagnosed with diabetes in the United States annually. An increasing number of these cases are Type 2 diabetes, a serious and preventable chronic illness previously seen only in adults. Led by CALS Nutritional Sciences faculty member, **Dr. Melanie Hingle**, a University of Arizona-YMCA team is teaching families how to help prevent diabetes through E.P.I.C. Kids (Encourage Practice and Inspire Change), a program poised to become a nationwide model for community-based and youth-focused diabetes prevention. Dr. Hingle received funding from the National Institutes of Health to lead the design and implementation of E.P.I.C. Kids, which involves faculty across several UA colleges and a team of lifestyle coaches at the YMCA of Southern Arizona.

E.P.I.C. Kids was modeled after the YMCA Diabetes Prevention Program, a nationwide prevention program for adults taking place in the YMCA. Focusing on preventing pre-diabetic conditions in youth who have at least one risk factor for diabetes, the E.P.I.C. Kids team engages children and

their families in weekly sessions in which they learn about healthy eating, being physically active, reducing sedentary time, quality sleep, and the importance of family time. Each session is led by trained YMCA Lifestyle Coaches. "Risk factors for diabetes emerge early in life, which is why we are doing our intervention now, and with the entire family," Hingle said. "If we can prevent or delay the onset of diabetes, we can potentially save folks a lifetime of major health and financial burden, while boosting quality of life."

Dr. Hingle and her collaborators are still analyzing data collected from program participants over the past year, but preliminary findings are promising: improvements in child BMI, home food and physical activity environment, and diet and physical activity behaviors were observed. For more information: *Hingle M et al. The EPIC Kids Study: a randomized family-focused YMCA-based intervention to prevent type 2 diabetes in at-risk youth. BMC Public Health (2015) 15:1253*  
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# Graduate Program

## Current Student Achievements



**Jamie Coborn, MS** completed an internship at the United States Department of Agriculture (USDA) Agricultural Research Service in Beltsville, Maryland during the summer of 2016. Funded by a USDA Graduate National Need's Fellowship, Jamie worked with Drs. David Baer and William Rumpler at the Beltsville Human Nutrition Research Center (BHNRC) Food components and Health Laboratory, which is a division of the Agricultural Research Service.

Jamie participated in a large-scale clinical feeding trial aimed to determine if the quantity of lean beef in a Mediterranean-style diet impacted risk of cardiovascular disease. Jamie entered data, assisted with patient blood collection, documented blood collection information and provided quality control checks for phlebotomists. She also worked with an Instrumentation Laboratories ACL ELITE/ELITE PRO system. This system is a high capacity analyzer designed specifically for clinical use in the hemostasis laboratory for coagulation and/or fibrinolysis testing. Jamie developed a standard operating procedure for the analyzer and measured Fibrinogen-C and Factor VII, two clotting factors associated with cardiovascular disease risk, in over 1600 samples. Jamie also developed a protocol in collaboration with Dr. Rumpler and her current mentor, Dr. Jennifer Teske, to use a room calorimeter to determine the effect of acute exposure to environmental noise on sleep, energy expenditure and markers of satiety and inflammation in humans. She will continue this collaboration during her doctoral studies. This project extends Jamie's work in Dr. Teske's lab, which utilizes rodent models to understand how sleep disruption by environmental noise causes metabolic dysregulation to promote weight gain.

At the November 2016 meeting of The Obesity Society in New Orleans, LA, **Megan Hetherington-Rauth's** poster (*Comparison of direct measures of adiposity with indirect measures for assessing cardiometabolic risk factors in preadolescent girls*), was selected as one of only 10 Poster Award Recipients in the Research in Diverse Populations Section. Congratulations Megan!



*Megan-Hetherington Rauth (fourth from right) pictured with other award recipients*

## Alumni Update: Ashley Vargas



Ashley J. Vargas, PhD, MPH, RDN, FAND is a Registered Dietitian Nutritionist and molecular epidemiologist. Dr. Vargas received her PhD in Nutritional Sciences from the University of Arizona in 2013, where her dissertation focused on the role of dietary polyamines in colorectal cancer under the mentorship of Drs. Patricia Thompson and Cynthia Thomson.

Ashley was selected to the National Cancer Institute's (NCI) Cancer Prevention Fellowship Program upon graduation and went on to obtain an MPH from Harvard University (2014). Her research focus at NCI was on diet, cancer, biomarkers and the microbiome. In July of 2016, she accepted a position in health science policy with the Office of the Director at the National Institutes of Health where she currently focuses on disease prevention research and policy.

Dr. Vargas has won multiple awards and authored multiple peer-reviewed manuscripts, including publications in Nature Reviews Cancer, the American Journal of Clinical Nutrition and the American Journal of Epidemiology. Ashley has also served as a consultant to for- and non-profit industries on her areas of research. Using her experience as a clinician, she has been elected to the accreditation board that oversees dietetics education in the US (ACEND) and co-authored guidance materials for clinicians. Ashley's goal is to improve the nutritional health of our nation and aims to do so by working in a variety of research and policy areas.

When Ashley is not counting cells, crunching numbers, or cracking scientific problems she enjoys traveling near and far, reading and hiking.



# Undergraduates

## Shelby McFarlane and Basilea Mena Volunteer at Felicia's Farm



Felicia's Farm is an excellent place to volunteer if you don't mind getting down and dirty. Felicia's Farm is about four acres of land that grows seasonal vegetables and herbs; and raises goats, chickens and bees. The farm was started to provide fresh food for homeless and low-income people in the Tucson community. All produce and eggs from the farm are donated to Casa Maria's soup kitchen. Volunteering at Felicia's Farm

was rewarding for me. I love to garden and hope to own a farm so I enjoyed learning more about farming.

Although fun, farming involves a lot of work. During the time I volunteered at Felicia's Farm, I churned the compost, maintained the garden, fed the goats and the chickens, harvested squash and peppers, and planted carrots and onions. I learned a lot, including the importance of both a water-drip system and patience. Also, it's important to plant legumes first because they enrich soil by providing it with nitrogen. One of the most rewarding things that I did at Felicia's Farm was plant seeds and harvest produce. I felt like I was making a difference, knowing that the produce I harvest would all be donated. [snmcfarlane@email.arizona.edu](mailto:snmcfarlane@email.arizona.edu)

Felicia's Farm was created to honor the memory of Felicia Ann Cutler, whose vision was to "feed the people and teach them to feed themselves." As a student majoring in Dietetics, my goal is to teach people to feed themselves to become healthier. Part of eating healthy is knowing where your food comes from and how it's grown.



I started volunteering at Felicia's Farm for my class *NSC 395a: Experiential Learning in Nutritional Sciences*. I chose to work there because I wanted to experience the process of using sustainable farming practices and to aid the farm with its local efforts helping the low income and homeless community eat healthier. At the farm, I learned that weeding is a necessary evil. I also planted and harvested vegetables, attempted to milk a goat, and turned over compost piles with a pitchfork. I had a memorable experience and I encourage others to get involved as well!  
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## Madison Egan Selected for ACEND Scholarship



Though I have been interested in nutrition for most of my life, I had not considered studying it until coming to UA. Welcoming professors and an exciting program drew me in, and I could not be happier with my decision! My ultimate goal is to use nutrition to help patients prevent and better manage chronic disease. Food is an incredible and accessible tool when coupled with education, and I hope to do my part to empower people through nutrition.

As part of my undergraduate experience, I have enjoyed volunteering in a variety of settings ranging from underserved communities with UANN to recovering patients at HealthSouth Rehabilitation Institute (via *NSC 395a: Experiential Learning in Nutritional Sciences*) to The Garden Kitchen and WIC. In each environment, it has been a joy to see how food can make a difference and how eager people are to learn more.

One of my favorite projects is the EPIC Kids Program, designed to help children at risk of developing Type 2 diabetes and their families make healthy and sustainable lifestyle changes. As part of the EPIC team, I used nutrition education and behavior change strategies to empower families to set attainable goals. This past summer, I presented our program at the Society for Nutrition Education and Behavior Conference!

This Fall, I was honored to be selected by ACEND as the recipient of the Lois M. Jackson Scholarship. It is awarded to a dietetic student or intern with a commitment to community service and leadership. I feel I have found my place during college working in a variety of settings, always with the objective of helping others achieve goals and maintain their successes.

After I graduate in May, I hope to continue on to a dietetic internship, and look forward to a career caring for others and helping them to find their healthy lifestyle!  
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# Outreach

## The Nutritional Sciences Club at UA Food Day

The Nutritional Sciences Club participated in the 2016 UA Food Day Fair in October. Food Day is a nationwide celebration of healthy, affordable, and sustainably produced food and a grassroots campaign for better policies. Each year the University of Arizona students, faculty, and staff come together to celebrate and enjoy real food. The Nutritional Sciences club shared their mission, programming, and knowledge by tabling all day at the event. The club gave out information about the benefits they offer as an organization such as community experiences, professional growth, social intercommunication, leadership development, and career networking. Finally, the Nutritional Sciences Club had an interactive display and exciting food prizes to collaborate with students that were passing by. The display highlighted the grams of added or natural sugars in popular snack items and beverages to spark thought and conversation regarding healthy and real food choices for college students.



The Nutritional Sciences Club bi-annual Food Drive is coming up! The Food Drive will be held November 28<sup>th</sup> through December 1<sup>st</sup> from 10:00 am to 3:00 pm. The collection site will be located in the Alumni Plaza which is the courtyard next to the Student Union. Any unopened non-perishable food donations will be accepted. This semester all proceeds will be donated to the UA Campus Pantry. The UA Campus Pantry and Nutritional Sciences Club share similar missions and overall goals. These organizations are partnering to help to reduce food insecurity in the Wildcat Community.

Contributed by NSC Major Katherine Sayre: [klsayre@email.arizona.edu](mailto:klsayre@email.arizona.edu)

## The University of Arizona Nutrition Network (UANN) and farmers' market partnerships: Promoting healthy shopping to low-income populations in Pima County



Farmers' markets provide healthy food options and continue to rise in popularity as the demand for local produce increases. Despite their popularity, many lower-income Pima County residents are still unfamiliar with local farmers' markets or feel that the cost of farm-fresh produce is not accessible within their food budget. However, many farmers' markets in Pima County are now accepting Supplemental Nutrition Assistance Program (SNAP) redemptions, and many also participate in the "Double-Up SNAP" program, where SNAP participants can double their SNAP-dollars.

The UANN collaborates with the Women, Infant, and Children (WIC) clinics, senior community centers, and public housing sites to promote the redemption of SNAP/WIC benefits at farmers' markets. The UANN provides a "Farmers' Market 101" course that includes market location, hours, transportation, how to redeem benefits, food safety tips, and recipes. The lesson also includes a food demonstration using seasonal produce. Market tours are offered to assist participants to become familiar with the benefit redemption process and highlight market offerings. The purpose of the course and the tours is to reduce the perceived barriers that low-income residents may face when considering shopping at the farmers' market.

The UANN helps managers of interested markets become SNAP-authorized by providing assistance with the United States Agriculture Department application. Additionally, the UANN helped one local market receive a free Electronic Benefits Transfer (EBT) machine from the Farmer's Market Coalition, a non-profit dedicated to supporting farmers' markets nationally. Through promotion and targeted technical assistance the UANN aims to increase SNAP/WIC redemption rates at farmers' markets and increase fruit and vegetable intake among the low-income population of Pima County.

Contributed by UANN Program Coordinators Lauren McCullough, MPH and Natalia Santos, MPH:  
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# Extension



## NSC Majors Spend a Semester on the Farm

Next to the bustling traffic of Campbell Avenue you'll find an unlikely oasis of sustainable agriculture and healthy food; if you

know where to look! Part of UA's College of Agriculture and Life Sciences and Pima County Cooperative Extension, the Tucson Village Farm (TVF) is a seed-to-table program designed to teach young people how to grow and prepare fresh food, help them to reconnect to a healthy food system, and empower them to make healthy life choices.

This Fall, interns from Nutritional Sciences helped TVF to deliver its elementary agriculture and nutrition education program, "Growing Forward". The interns are enrolled in NSC 395A: *Experiential Learning in Nutritional Sciences*, and as a part of their coursework volunteer weekly as educators.

**Lexi Pepin** describes her decision to work with Tucson Village Farm this way, "When I was choosing where to volunteer, I wanted a site that would give me the opportunity to engage with the general public... the ability to connect with people and hopefully educate them about some nutritional topics. The farm also allowed me to be outside which was a huge plus since it makes the work so enjoyable."

**Eugene Moss** chose to enroll in NSC 395a and volunteer at TVF to expand the edges of his "comfort zone" and gain experience working with a younger demographic. "I've never taught a kid in my life; now I'm working with kids- teaching them about nutrition. Kids are all about learning so you can really impact someone's life."

"I love the idea of helping children to understand that they can often grow their own foods. Children and adults alike sometimes need reminders that their bodies require proper nutrition and taste isn't the only factor, they can go together!" says **Mariateresa Bissinger**.



The interns agree that teaching in an outdoor setting can be challenging, but can also have a meaningful impact on their chosen profession. For Bissinger, "It is helping me speak in front of all age groups, manage people in a large group setting and find ways to help people learn [about nutrition]". Similarly, Pepin notes, "Growing Forward definitely compliments both my career and academic goals because it is giving me the opportunity to educate people about nutrition and show them the importance of eating healthy."

To learn more about the Tucson Village Farm and Growing Forward, email Parker Filer at [parkerfiler@email.arizona.edu](mailto:parkerfiler@email.arizona.edu) or visit <http://tucsonvillagefarm.arizona.edu/about>

## Support Nutritional Sciences

Supporting the Department of Nutritional Sciences has never been easier! All contributions are made to the UA Foundation, a 501(c)3 organization. Through this foundation donors may choose how their gift is applied. All gifts are tax deductible. Visit <http://nutrition.cals.arizona.edu/invest> for direct links to the UA Foundation for secure, online investments.



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**Nutritional Sciences**

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