Summer 2016

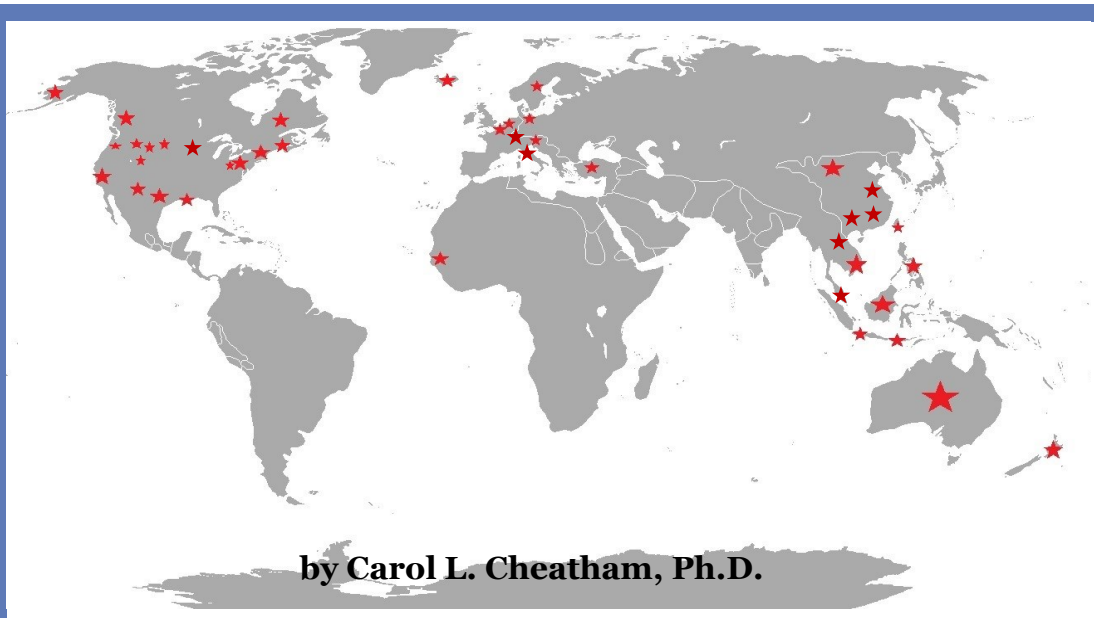
Cheatham Chat

Cheatham Nutrition & Cognition Lab

Updates and Information from the Cheatham Nutrition & Cognition Team

In this issue

500 Laureate Way
Room 1102
Kannapolis, NC 28081
704-250-5018
www.cheathamlab.com



by Carol L. Cheatham, Ph.D.

Over the past few years, I have been privileged to travel the world and share my passion for nutrition and the positive effects it has on the brain. For this issue of Cheatham Chat, I would like to share the tale of the amazing places work has taken me.

There are several purposes for my travel. Allow me to enlighten you about the 3 C's: conferences, consulting, and collaborations.

Conferences are the best way to get our research out to the academic community and to stay current in one's field, but when one is doing transdisciplinary work (i.e., more than one field), staying current can be unwieldy. Generally, faculty in a sole discipline will attend one or two conferences. Because I work in Psychology, Neuroscience, Genetics, and Nutrition, in the past 12 months, domestic conference travel has taken me to Maine, Massachusetts, Montana, New Mexico, Pennsylvania, and Texas. Moreover, I attended an international conference in Austria.

The consulting work is dearest to my heart as it is my way of getting our research to health care providers who will use it to improve the lives of children. What better way is there to help children than to travel to countries where help is needed most? Yes, we need the knowledge spread in the United States as well, and I do that at conferences and to the media. However, there are areas in the world where people do not even have a basic understanding of how nutrition affects brain development.

Continued on page 2

Dr. C's Corner (continued from the front page)

Thus, for the past 7 years, I have travelled to those areas, or to where the health care practitioners are attending conferences of their own, to speak to them about nutrition and brain development.

For the purpose of this article, let's focus on the past twelve months. This consulting season was very important as I had a new message to share – not only are maternal and infant nutrition important for brain development and subsequent cognition, but our latest research shows that nutrients work together to support the brain. So, taking a supplement is not the same as eating whole foods – something that, as you know, I have been preaching for years. Now, I have proof. Armed with this evidence, I set out on a lecture tour that took me to Denpasar, Bali and Jakarta, Jakarta in Indonesia and on to Taipei, Taiwan. I think the message was well received. I received good questions and feedback. During that tour, I also did three press conferences that will help us spread the word even further.

In past years, I have spent a considerable amount of time around Southeast Asia doing this work. This year brought a new area into my purview: the Middle East. Recently, I presented to a group of about 250 health care practitioners from the Middle East in Vienna, Austria. They were in awe of the technology (the ERP system) and the idea that their children could be made "smarter" with better nutrition for pregnant mothers and infants. I was very excited to have reached this population.

One last note - the travel for collaborations took an even more pleasant turn this year, taking me to New Zealand! I am so very glad that Kiwis grow great berries and that they are interested in working with us on more berry research. The scientists at Plant & Foods Research in Palmerston North (north island) and Nelson (south island) will be helping with some bioassays of the samples from the BERRY study. Also, they will be working with me on a new grant with which we will seek the specific bioactives in berries that help with cognition. This new collaboration is very exciting and has already led to some very lively scientific conversations as well as some amazing hikes in the New Zealand rain forest and on its beaches. Hey, all work and no play….you wouldn't want me to be dull, would you?

So, I hope that explains my absences. I feel what I am doing on the road is very important to millions of children around the world, and I hope you agree. Now, I must close and go buy some food for my cat as in the morning, I get on a plane!

~Dr. C

B.E.R.R.Y Study: We are done!

by Carol L. Cheatham, Ph.D.

As we age, we experience gradual cognitive decline as our brains process things slower and our ability to remember things decreases. Blueberries contain anthocyanins, which have been shown to effect the areas of the brain that are related to memory and processing in animal studies. The effect of blueberries on brain function in humans is only now beginning to be tested. Thus, we received funding to conduct the B.E.R.R.Y (Blueberries: Exciting Research Relevant to You) study, and set out to determine if consuming blueberries would have an effect on mild cognitive decline in humans.

In order to answer this question, we conducted a 6-month double-blind (neither the researchers nor the participants knew to which powder group they belonged) clinical trial with 65- to 79-year-olds. We used freeze-dried blueberry powder supplied by the Wild Blueberry Association of North America and purchased a placebo developed by the Highbush Blueberry Council. Study groups included a reference group of with no cognitive decline, a group with mild cognitive decline who consumed 35 grams of blueberry powder a day (equivalent to two cups of blueberries) for 6 months, and a group with mild cognitive decline who consumed 35 grams of placebo powder a day for 6 months. In total, we screened 296 participants to arrive at the final sample of 71 in the intervention group and 45 in the reference group: a total of 113 participants in the BERRY Study. The last session was completed in May 2015.

Preliminary Reports:

The preliminary reports suggest that the blueberry intervention was effective in improving cognitive scores on the Montreal Cognitive Assessment (MoCA), a paper-based test used to diagnose mild cognitive decline. Interestingly, we saw no difference from MoCA scores between the blueberry and placebo group, until we separated the men's scores from women's scores (**see Figures 1 & 2**). The blueberry intervention had a significant effect on the men in the study. We have discussed that this result may be due to the women in our study benefitting from the social interaction and support from attending the sessions more than the men did.

In addition, we found that the blueberry intervention had an effect on processing speed in our most difficult test in a computerized test battery. One of the tasks required the participant to push a button when a certain pattern of numbers was seen. The blueberry group improved on this specific task across the 6-month period compared to those who were on the placebo.

Figure 1

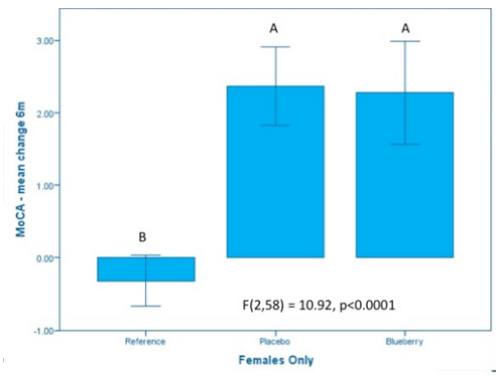
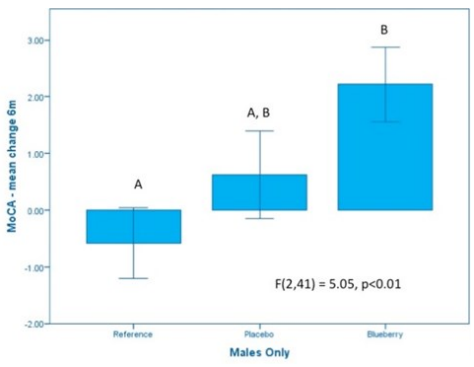


Figure 2



We dedicate this issue to the memory of
J. Steven Reznick, Professor of Psychology & Neuroscience
University of North Carolina at Chapel Hill

In Fall 2007, I met with Dr. Reznick about an open position at a "new nutrition campus." We talked way longer than scheduled. I will never forget that conversation, and I am certain that without his support, I would not have landed this position. Steve was an inspiration to me as an assistant professor, a mentor to me when times were tough, and a guiding light in my career. Importantly, to his credit, he never shamed me for not following his beloved Tarheels. His legacy will live on in my lab and my career. ~Dr. C

THE BELOW ARTICLE BY GARY MOSS IS REPRINTED FROM THE UNC CHAPEL HILL WEBSITE.

'A legacy of courage and inspiration'

J. Steven Reznick, Professor in the department of psychology and neuroscience in the College of Arts and Sciences at UNC-Chapel Hill, died Tuesday, July 5, after a three-year battle with amyotrophic lateral sclerosis (ALS). He was 65. "This is a tremendous loss for Carolina," said Kevin M. Guskiewicz, dean of the College of Arts and Sciences. "Just as Steve taught generations of students to be the very best citizens, scholars and psychologists, he taught us all how to handle adversity with strength and grace. He leaves behind a legacy of courage and inspiration." During his career, Reznick focused on studying infant cognitive development and early development of autism. His heart followed a wide-ranging path of service that led him back to his home state and alma mater that he loved with equal measure.

After graduating from Carolina in 1973 with a psychology degree, Reznick earned his master's degree in general psychology at Wake Forest University, then started his doctoral work at the University of Colorado in Boulder, where his research focused on the cognitive development of infants. That interest would lead him to Harvard, and later Yale, before it brought him back to Carolina in the summer of 1998. It was like coming back home, he said. He liked to tell people, "I came back to Chapel Hill for my 25th reunion and just stayed." Reznick said he has always thought of himself as a "meliorist," a person who believes that the world can become a better place. With that belief, Reznick said, comes the obligation to do all that you can to make it better.

And so he did. Almost from the time he arrived back at Carolina, he began expanding his interests – and service – beyond the bounds of his research lab and classroom. As a member of the Faculty Athletics Committee, he led the effort to develop a registration priority process that addressed scheduling conflicts for groups ranging from student-athletes to ROTC students to Robertson Scholars. As president of the Faculty-Staff Recreation Association, he was the driving force behind upgrading the facilities (known as "the Farm"), including replacing the rundown farmhouse that had served as the office with a modern building. He also served as associate dean for first-year seminars and academic experiences and co-chaired, with admissions director Stephen Farmer, the Enrollment Excellence Task Force. Even though he had been on disability leave since 2014, Reznick continued conducting research with his students and became a participant in several ongoing projects in which a scientist with ALS brings a unique and valuable perspective.

In November, friends and colleagues filled the grand room inside Graham Memorial to celebrate with him as he received the Order of the Long Leaf Pine. As the ceremony began, Farmer remarked how "this beautiful and storied place" was the "perfect place to honor and recognize Steve" because it was named for former UNC president Edward Kidder Graham, who had done so much to "connect what we learn and teach and discover on this campus to the needs of our brothers and sisters far beyond." "And so it is right that we are gathered here today in this place to honor a person who embodies this idea." When Reznick finally was called to the stage, he noted that everybody who mattered so much to him was there, including the one group that perhaps matters most of all. "I see a lot of my students here and I will take this as good evidence that the statement you have heard me make might be true: 'It ain't what you know, and it ain't who you know that matters, it's who knows you and what they think of you.'"

To honor his lifelong commitment to Carolina, the family has requested that donations be made to the J. Steven Reznick Diversity and Psychological Research Fund that will encourage and honor undergraduate students who conduct exemplary research on topics of concern to diverse groups that have traditionally been underrepresented in psychological research. To learn more, go to http://college.unc.edu/2016/07/06/reznick-fund-honors-career-life-of-beloved-professor/.

By Gary Moss, University Gazette
Published July 7, 2016

The Electric Maze Task

By Kelly Sheppard, Ph.D.

We have a cool new task: the Electric Maze. Some of you had the chance to try out the maze in a recent study. I hope everyone had fun. We have now looked at the data. As it turns out, the Electric Maze Task (EMT) works very well as a measure of planning, which is exactly what we were trying to do. So, yay!

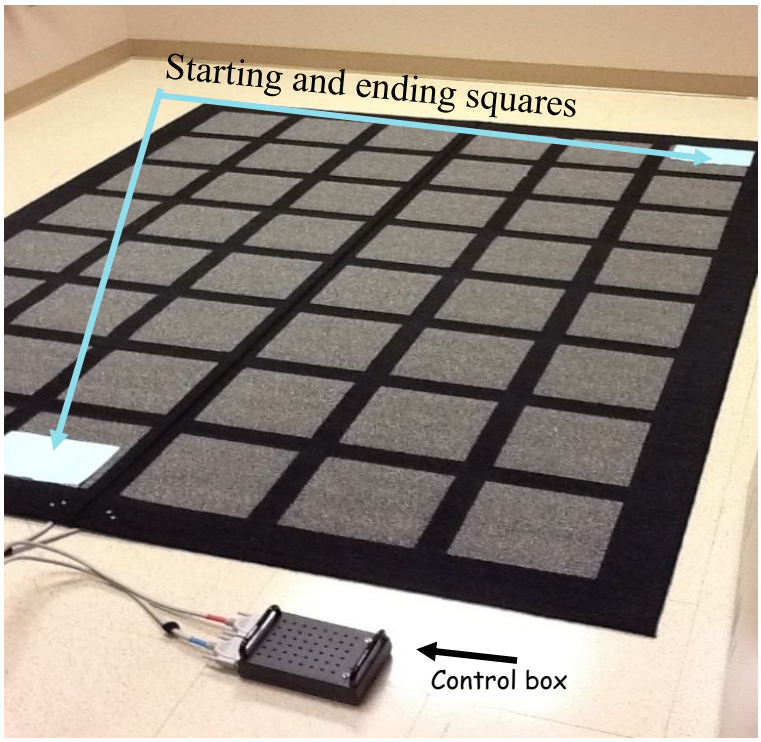


Exhibit A

First, what is planning? Planning is a complex cognitive function that we use every day to think through what we need to do that day or in the next few hours. Some things, like coordinating family schedules so that everyone gets where they need to be on time or mapping out long-term projects at work so deadlines are met, take careful planning. We don't have full-on planning abilities until we are adults, but planning abilities are developing in childhood. Development begins with the basics like the ability to hold several items in mind and the ability to focus without getting distracted by unneeded information. Have you ever gone to the grocery store for eggs but come home with milk and chocolate and peas, but no eggs? (I hope that's not just me!) Our goal was to create a new task that encouraged participants to plan how they were going to solve a problem (in this case, getting through the maze) and that we could change in different ways to test these developing parts of planning. Of course, we wanted to create a task that was fun.

Second, what is the EMT? The EMT uses a 6' x 8' mat of gray squares that is connected to a control box (see Exhibit A). Each square has a sensor beneath it that beeps if someone steps on it. We turn off the sensors by placing a peg in the corresponding hole of the control box, thereby creating paths that don't beep. Participants are asked to find the correct (non-beeping) path through the maze (planning) by remembering and avoiding squares that have beeped (working memory). To make it easier, we marked the beginning and end. To make it more difficult, we placed red and yellow stars and circles all over the maze (see Exhibit B), and participants played either the color game or the shape game. In the color game, the correct squares were all one color (either red or yellow). In the shape game, the correct squares were all one shape (either stars or circles). The participants solved two color-game paths and two shape-game paths. Switching from one game to another is difficult because your brain is used to using a rule, but you have to stop, for example, stepping on red squares and step only on circles.

Exhibit B

Third, what did we find? Well, we found that results from the EMT were related to commonly used measures of planning and working memory in children 7-12 years old. We also found that brain activity related to better performance on those commonly used planning tasks was related to better performance on the EMT. These results proved that the EMT provided a new and exciting way to measure planning development. Importantly, we found that omega-3 fatty acid intake and the omega-6 to omega-3 fatty acid ratio were related to performance on the EMT. Children with lower ratios (who were thus, eating fewer omega-6 foods) and greater omega-3 intake solved the mazes faster and made fewer errors on the 8-step (i.e., more difficult) mazes. Since this was our first study with a brand new task, these results are very exciting. We will be working on expanding our results to older and younger children, and we are hoping to learn even more with the EMT. By using the rule-switching game, we tested out just one thing we can do with the Electric Maze Task. There are a lot of other fun games we could play, and we are excited to try some of these new ideas out soon.

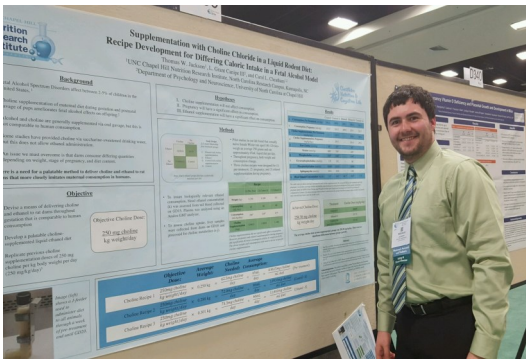
Thanks

...to everyone who helped us test out the mazes! I hope that even more of you can come play with us with the Electric Maze Task and make it even better!

Cheatham Lab
Laser Tag
June 2016

Experimental Biology | San Diego, CA April 2-6, 2016

Experimental Biology is an annual multidisciplinary scientific meeting, consisting of award lectures, pre-meeting workshops, and oral and poster sessions. The annual meeting includes over 14,000 scientists and exhibitors. The fields of study that are represented include, anatomy, biochemistry and molecular biology, investigative pathology, nutrition, pharmacology, and physiology. This year, EB took place in San Diego on April 2-6, 2016. Dr. Cheatham, Grant Canipe, and Thomas Jackson presented work that is taking place in the Cheatham Lab.



I presented a poster titled, "Supplementation with Choline Chloride in a Liquid Rodent Diet: Recipe Development for Differing Caloric Intake in a Fetal Alcohol Model," where I presented on the development of a new way to supplement diets with choline chloride. Choline is a micronutrient found in foods like peanuts, liver, and eggs, and choline supplementation during gestational periods has been shown to ameliorate fetal alcohol effects on offspring. Our lab has devised an exciting new method to deliver choline to rodents in a liquid diet. EB was a great experience – I was able to attend seminars from world renowned researchers on topics ranging from how to tell a great story and present science in unique, exciting ways to the survival of transplanted fetal neurons into adult brains. The eye-opening presentations vitalized my enthusiasm for research, and the scientific discourse offered a great opportunity to expand my knowledge of the fields of nutrition, psychology, neuroscience, and genetics. My poster presentation went well, and I received critical feedback that will aid in the preparation of future manuscripts.

-Thomas Jackson, Research Tech

This was my second trip to EB, and San Diego was a little different than Boston last year. Mostly there was a lot less snow! In addition, this year I was chosen to give an oral presentation. This was my first talk at a major conference in my field, and it was quite the whirlwind experience. My presentation was titled, "Effects of DHA & choline supplementation on developmental outcomes of typically developing and fetal alcohol exposed rat pups." In this presentation I shared the results of a recent project where we explore the beneficial effects of DHA and choline on brain development in rodents. Choline and DHA are two of the important nutrients that we study in the Cheatham Lab, and have been shown to have great positive effects on prenatal brain development. Other than my presentation, the experience of EB was phenomenal! I attended some fantastic talks that sparked some ideas for future research and was able to speak with some big name people in our field. It was also really educational to see how scientists in different fields approached the same question. For example, a talk I attended by a nutritional biochemist showed how certain chemicals in fruit can influence the rate at which our brains create new neurons. She was able to paint the development of new neurons in an entirely new light by showing neuron growth using a different method than we do in our lab. All in all, EB was incredible and I left the conference with a lot of great ideas and new connections as well as feeling more confident about the niche I will occupy in my field one day.

-Grant Canipe, Graduate Student

The Kids are Back!

We have great news!

We recently received funding to invite the children who participated in the breast feeding study as infants back to the lab for a follow-up study.

In February we began scheduling the kids who are now 5 and 6 years old. This follow-up is especially fun for the kids because they have the opportunity to wear the EEG net and play computer games. Our follow-up will continue through the summer. If your child participated as an infant or toddler, and you have not heard from us, give us a call and we will give you more information about the exciting next steps in this study.

202 Completed the study as babies

120 Completed the study as toddlers

66 have completed as 5 and 6-years olds, since February.

If you are interested in reading the published data from this study thus far, the journal articles are available for free online. Please visit our website at www.cheathamlab.com, and you will find the information under the "About Our Research" tab.

Newer Additions to Team Cheatham

Charanya Uppalapati, Intern

Charanya will be a junior at Lake Norman Charter High School this fall where she is involved with clubs like Pre-Med and Student Council. She is already looking ahead to the fall of 2018, where she hopes to be enrolled at The University of North Carolina at Chapel Hill. Charanya plans to double major in Biology and Psychology and would like to go on to study medicine. As a volunteer at the local hospital, Charanya was captivated by the various cognitive approaches doctors took to help patients feel better. By working in the Cheatham Nutrition and Cognition Lab, Charanya hopes to enhance her interest in cognition.

Olga Savka, Intern

Olga is a junior at the University of North Carolina at Charlotte where she is majoring in Biology with a minor in Biotechnology. She aspires to improve overall health and wellness, and plans to attend graduate school to further these goals. With both research and medicinal aspects to her goals, she hopes to expand her knowledge and skills in nutrition and research with her work in the Cheatham Nutrition and Cognition lab. She believes that nutrition is imperative to human health, and wants to improve quality of life by improving nutritional status in the United States and overseas.

CONGRATULATIONS DR. KELLY SHEPPARD!

Passing the Baton…

As Ph.D.s in academia, one of our distinct pleasures is to train the next generation of scientists. The scientists that we train and all their subsequent accomplishments reflect on us as mentors. Thus, it was with great pride that I recently hooded my first Ph.D. By now, you have seen the announcement about Dr. Kelly Sheppard on our Facebook page. We celebrated after she successfully defended her dissertation, but the formal degree-conferring ceremony was not until May 7th. We had a nice day in Chapel Hill. After the ceremony, we went out to lunch with her husband (she did not have one of those when she started with me) and her parents (who have been amazing every step of the way: I met them the day after I first met Kelly). Then, we went to stand in line in our heavy, hot robes to take the traditional picture at the Old Well. It was a grand day that I would like to share in pictures.

~Dr. C

Kelly's future plans –

After this summer, Kelly will make her way north to Columbus, Ohio, where she will be a Post-Doctoral Fellow at the Research Institute at Nationwide Children's Hospital and an Instructor in the Department of Pediatrics at The Ohio State University College of Medicine. She will be working with Dr. Sarah Keim, an epidemiologist who studies nutrition and cognitive development with a focus on infants born premature. Kelly will be involved in Dr. Keim's longitudinal work with infants born preterm (some now 5 to 6 years old and some toddlers) and also, will work with people in the lab's omega-3 fatty acid working group. This group is engaged in a variety of projects related to the role of omega-3 fatty acids and health. Kelly would also like to follow up on her dissertation, working with the maze and continuing to look at the role of omega-3 fatty acids and health.

Team Cheatham Updates

This lab has been incredibly fortunate to have so many wonderful lab members over the years. Two members of the Cheatham Team will be moving on in their professional life at the end of the month.

Best Wishes to Grace & Christa!

Grace Millsap has been a research assistant in the lab since 2010. She is the only research assistant who worked on the BERRY study from beginning to end. In 2013, she completed a 200-hour yoga teacher certification, and has completed other yoga trainings across the country since then. In July, she leaves for a 14-day adventure in Nicaragua to complete 50 more hours of teacher training. Grace wants to express her gratitude to everyone she has met and interacted with during her 6 years with the lab. Every participant, coworker, intern, and community member has left an impact and will never be forgotten! You can find Grace teaching at Be Yoga or Charlotte Athletic Club, or follow her on Instagram to join her on her journey (@gracemillsapyoga).

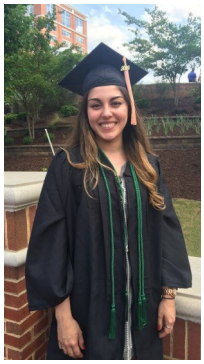
Christa Turski, a recruiter in the lab since 2013, will also be leaving the lab at the end of June to embark on a new adventure. She has accepted a position with Chartwells K12 in Burke County as a marketing specialist. The company works to provide delicious and nutritious meals to the students in the school system by working with local farmers, registered dieticians, and in-school chefs. A great deal of her time will be spent out in the community sharing the importance of healthy eating, similar to work she did in the Cheatham Lab. Christa will greatly miss her role and coworkers at the lab.

Congratulations to...

Tyler Dishman

Steven Talbert and Tyler Dishman, Cheatham lab interns, were recently hired into full-time positions on the NC Research Campus.

Steven has moved up a floor, where he was hired as a research technician in Dr. Hursting's lab at the UNC-CH NRI. Tyler was hired as an animal technician with Specialty Operations Solutions located in the Core Lab building.



Lucy Connoly, one of the lab's long-term interns, graduated in May from The University of North Carolina at Charlotte with a degree in Public Health.

Cheatham Lab in the Community!

Members of the Cheatham Lab have had the opportunity to share health, nutrition, and fitness-related information with the local community. Our team has had a great time and we wanted to share with everyone some photos from our events.

Salisbury Academy


Boger Elementary

STEAM, Concord Library

Kaleidoscope Festival, Downtown Kannapolis


STEAM, Kannapolis Library


Boys & Girls Club of Cabarrus County



Cheatham Nutrition & Cognition Lab
UNC-CH NRI
500 Laureate Way, Rm 1102
Kannapolis, NC 28081
Phone: 704-250-5018
Website: www.cheathamlab.com
E-mail: feedingbrains@unc.edu

Connect with us!

Follow us on Twitter!
@DrCarol_NRI

Like us on Facebook!
Cheatham Nutrition & Cognition Lab

Watch us on YouTube!
Search: clcphd

Connect with us on LinkedIn!
Cheatham Nutrition & Cognition Lab
Carol L. Cheatham

UNC NUTRITION RESEARCH INSTITUTE

REMINDER!

You are receiving this newsletter because you are a friend of the Cheatham Lab. If you do not wish to receive this newsletter in the future, please email us at feedingbrains@unc.edu or call us at 704-250-5018.

Next time you visit the Cheatham lab, join us at the UNC Lettuce Eat Café!

"We invite you to make us your destination for your book club, coffee club, and business meetings! Or just for lunch!"

The UNC Lettuce Eat Café is located in the same building as The Cheatham Nutrition & Cognition Lab!

Open M-F 9am—2pm