

uncg research

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Research, Scholarship and Creative Activity

**BUZZ
WORTHY**

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Transformative research. We have seen this term used more and more over the last two decades, spurred in part by its adoption by major funders like the National Science Foundation and the National Institutes of Health. The phrase originated with physicist, historian, and philosopher of science Thomas Kuhn, who introduced the academic world to the idea of paradigm shifts that restructure and revolutionize scientific inquiry.

Transformation is also a pillar of UNCG's new strategic plan, which officially launched this year, on the 125th anniversary of the opening of our university.

But what does that transformation — of students, of our region, and of knowledge — look like?

With stories of refugee resettlement, new views on African art, bettering public health, improved educational outcomes, and more, this issue of UNCG Research illustrates just a few of the vast variety of approaches our university is employing on our path to achieving that lofty goal.

Whether it's bringing high-tech methodologies like blockchain to old-world problems such as property ownership, or digging more deeply into bees' own natural defenses to find solutions for modern agricultural challenges, transformative scholarship both demands different forms of knowing and results in different forms of knowing.

Methodology is key. New ways of knowing are found through interdisciplinary approaches, such as the Medicinal Chemistry Collaborative's combination of differing viewpoints, specialties, and techniques. Another major driver is the collective impact that arises from community-engaged research, exemplified in our work on food security, where faculty and community partners are pooling understanding and effort to debunk myths, generate data to illuminate critical issues, and develop and implement solutions.

Transformation can also begin simply through the process of engaging in research. As the students highlighted in this issue have found, conducting research transforms researchers themselves. And, as partners in research, UNCG's diverse students are also transforming knowledge, the labs in which they work, our campus, and, ultimately, our workforce.

UNCG's faculty, students, and community partners know that transformation demands cognitive flexibility, openness, struggle, and, yes, a little bit of luck. But as anyone witnessing our giant steps can see, it's worth it.

TERRI L. SHELTON, PHD
Vice Chancellor for Research and Engagement

For more information about research at UNCG and the Office of Research and Engagement, go to research.uncg.edu.

FEATURES



Medicinal Chemistry Collaborative

New treatments lurk in fungi, herbs, and yet-to-be-developed compounds. The innovative scientists of MC² harness the energy of collaboration to combat cancer, MRSA, and more.



The Harvest at Home

Money. Transportation. Know-how. There are lots of barriers to healthy eating. Researchers and community partners are taking a hard look at our food systems to ensure we have what our bodies need: food that's good for us.



Buzzworthy

What hurts honey bees threatens our food supply. The Social Insect Lab takes on mites, viruses, and even lifestyle-related stress, as it zeroes in on honey bee health.

uncg research

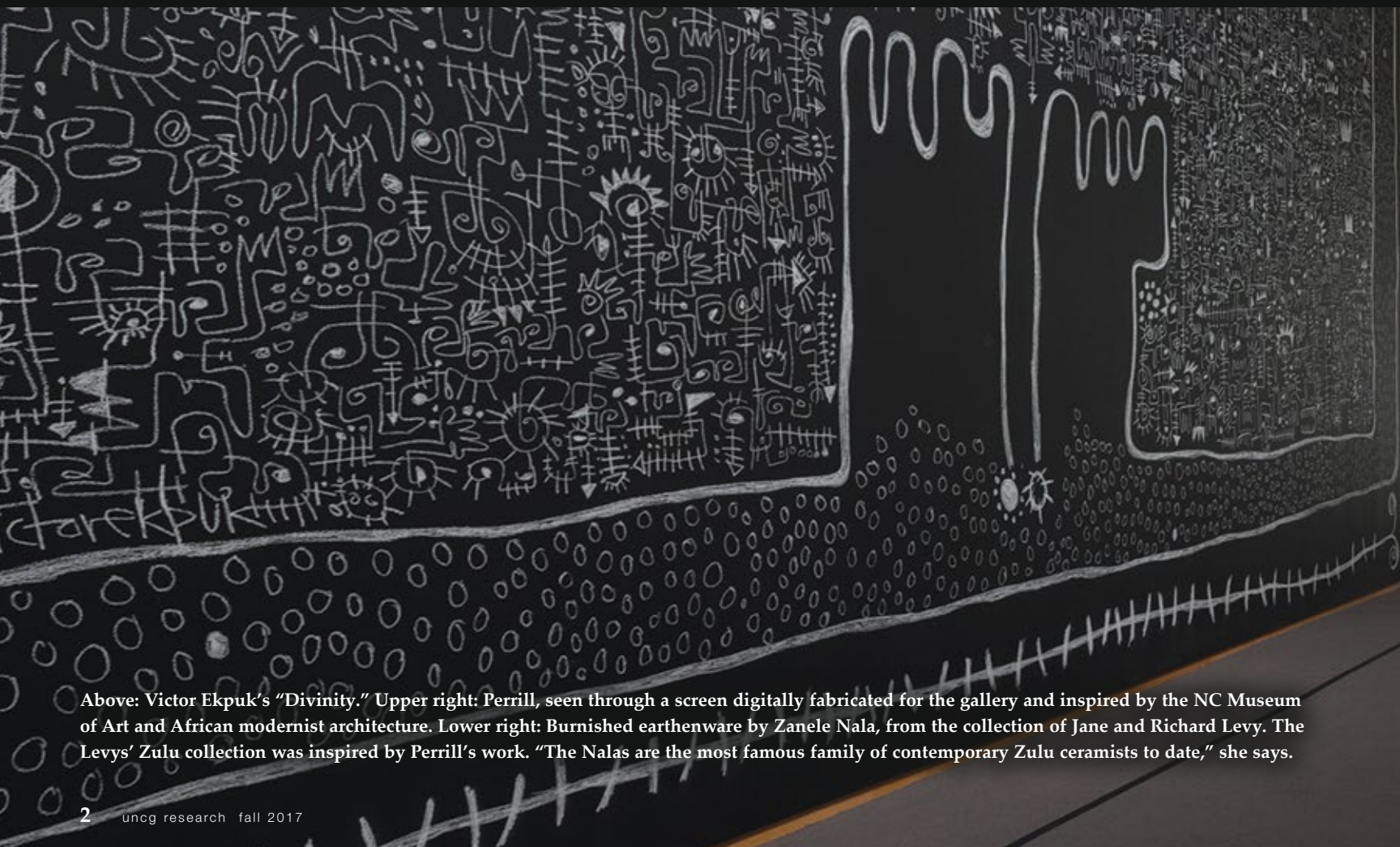
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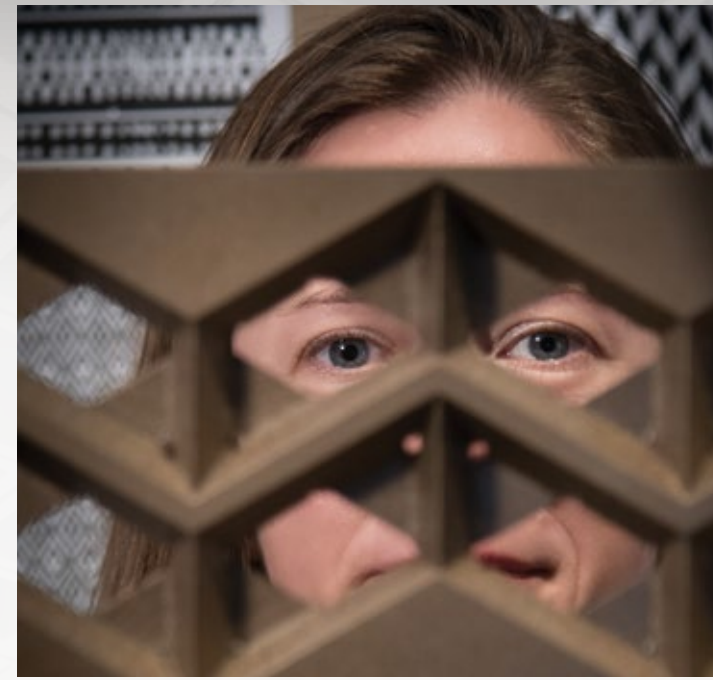


ROOM FOR A VIEW

North Carolina's most prominent African art gallery reenvisioned



Above: Victor Ekpuk's "Divinity." Upper right: Perrill, seen through a screen digitally fabricated for the gallery and inspired by the NC Museum of Art and African modernist architecture. Lower right: Burnished earthenware by Zanele Nala, from the collection of Jane and Richard Levy. The Levys' Zulu collection was inspired by Perrill's work. "The Nalas are the most famous family of contemporary Zulu ceramists to date," she says.



French impressionist Edgar Degas once said, "Art is not what you see, but what you make others see."

That's certainly the case at the North Carolina Museum of Art's newly expanded African art gallery — an effort made possible through the expertise of Elizabeth Perrill, associate professor of art history.

At a time when African art is becoming increasingly popular among collectors and museums worldwide, Dr. Perrill's skilled oversight as curator helped the museum reimagine and nearly triple the size of this gallery space. In particular, Perrill brings a specialized expertise in Zulu ceramics, with her seminal book on Zulu pottery now a touchstone for educators, curators, and anyone developing collections in the United States, Europe, and South Africa.

Her contribution also comes as a timely addition to the state museum during an era when African immigration to the southeastern United States, including North Carolina, is at an all-time high. The state's African-born population has doubled each decade since the 1970s. As of 2014, nearly 6 percent of the state's foreign-born residents came from Africa.

"As we become a destination state for African immigrants, we want all of North Carolina to understand the diversity of Africa," Perrill says. "We want visitors to recognize that Africa is an entire continent, and there are subtleties and complexities within each region."

Visitors to the gallery, which opened this past summer, are now greeted by a large map of Africa divided into regional sections. The exhibit's focus areas are dedicated to specific kingdoms, regions, and aesthetic traditions spanning 16 centuries. Section titles such as "Gold as Regalia," "Art Abounds," and "Geometry and Abstraction" are designed to "shake people out of their expectations of what African art is," Perrill says.

More than 100 of the pieces on display — including ceramics, textiles, jewelry, metal works, wooden sculptures, masquerade attire, beadwork, paintings, and multi-media collage — have never been seen before in a public exhibition or have not been exhibited in decades.

One of the most contemporary pieces is a transitory chalk mural by Nigerian-born artist Victor Ekpuk, who now lives in Washington, D.C. During one week's time, Ekpuk created the 30- by 18-foot mural, titled "Divinity." Immigrants and refugees from Africa who now live in North Carolina have joined in conversations about the piece, which will remain up for one year. They will be invited to return and help Ekpuk erase the mural next year, in accordance with many African cultural traditions that celebrate art as ephemeral.

The gallery, which was funded through a \$500,000 grant from the William R. Kenan Jr. Charitable Trust, also features a North Carolina wall dedicated to the state's connections to African art. Currently, that display includes a collection from Bennett College — a historically black women's college in Greensboro — that rivals the quality of objects at the Met, Perrill says.

In addition to studying African art itself, Perrill has become known for her work examining the life histories and cultural identities of Zulu artists — most often women. "Many people look at the aesthetics of art, but I want to know the backstory of exactly what informed the style," says Perrill, who has spent a decade getting to know artists personally, often staying in their homes.

This firsthand approach to research has given her an unrivaled expertise in the shifting hierarchies of the art marketplace. For instance, because many Zulu ceramic pieces are created for spiritual or utilitarian purposes, they were not considered art until the 1980s and 1990s. Even today, a discrepancy exists between what collectors define as "fine art" versus "folk art."

"It's important to me to document the voices of women as artists and connect that to the art market and what it means to make African art," Perrill says. "Dealers have started to respond to the scholarship and have started to say, 'Oh we should know the names of the artists because they are alive and working.'" In the book she's currently working on, tentatively titled "Burnished: Zulu Ceramics, Between Urban and Rural South Africa," she's bringing those stories of artists intersecting with the market to the fore.

"I've started to realize how much that I'm a part of the market now. I can't be separated from it as a scholar. As a scholar, you're constantly making decisions that you realize are impacting people's lives."

She hopes her knowledge and experience will deepen viewers' understanding of the new gallery space as well as impact the future of collecting African art.

"With the museum's launch of the larger space, donors and funding agencies start to realize that you're dedicated," she says. "I really think that the North Carolina Museum of Art has signaled through this reinstatement that we're committed. All of this is going to strengthen art in North Carolina."

By Dawn Martin • Photography courtesy of the North Carolina Museum of Art; top photo by Martin W. Kane • Learn more at <https://opa.uncg.edu/bios/elizabeth-perrill>



Safe & harbor



GREETINGS Natacha Nikokeza, Clementine Aulath, Dr. Sharon Morrison, and Dr. Holly Sienkiewicz join hands before a Swahili salutation at the August Umoja gathering.

Navigating the healthcare system isn't easy. For Clementine Aulath, who immigrated to Greensboro from Central Africa three years ago, language and cultural barriers made health and financial decisions even harder.

UNC Greensboro, UNC Chapel Hill, and NC A&T State faculty are joining forces with Aulath and women like her in a community-engaged effort to ease these transitions.

Aulath is president of Umoja Women's Group. Umoja — "unity" in Swahili — was launched in 2014 when a refugee resettlement agency caseworker noticed an influx of Congolese women who were single mothers and reached out to the UNCG Center for New North Carolinians, or CNNC, for advice.

"Our main purpose was to help women new to America adapt ... so they don't think they are alone," Aulath explains in Swahili, interpreted by her son.

Nonprofits help refugees learn English and job skills, but federal funding for that support ceases after 90 to 180 days. Refugees are expected to rapidly become self-sufficient. Umoja hopes to facilitate that process — with a particular focus on one of the most vulnerable populations, Congolese women.

According to Pew Research Center, the Democratic Republic of Congo was the top source country for refugees resettled in the U.S. in 2016. In addition to stresses and challenges facing all

refugees, Congolese women are at particular risk because of the high incidence of sexual violence in their country of origin. A 2011 American Journal of Public Health study found up to 1.8 million Congolese women had experienced rape in their lifetimes.

"The Congo is known as the worst place in the world to be a woman," says CNNC director Dr. Holly Sienkiewicz.

Last November, the CNNC received Community Foundation of Greater Greensboro funding to implement an Umoja leadership and capacity-building initiative. The project includes plans for case management services, skill development workshops, and social support — all facilitated by Congolese refugee women — and aims to prepare participants for employment and economic independence.

"Our refugees come from circumstances we can't imagine, and when they get here, their primary goal is, like everybody else, to take care of their families and to survive," says UNCG associate professor of public health education Sharon Morrison.

The group of 35 women meet once a month, eat together, listen to speakers, celebrate life accomplishments, and provide social support.

Dr. Morrison works with Dr. Rachel Boit (UNCG, human development and family studies), Dr. Maura Nsonwu (NC A&T, social work), and Dr. Beth Moracco (UNC-CH, health behavior) to assess the group's unique needs and connect it with community resources.

The interdisciplinary team focuses on child and maternal health, psychosocial issues, financial literacy, and household safety, with an emphasis on evidence-based practices.

A major accomplishment so far, Morrison says, is building trust between the vulnerable population and the faculty. The CNNC's Natacha Nikokeza has been instrumental in building that bridge, she says.

Nikokeza immigrated to Greensboro from war-torn Burundi in 2008. She was trained at the United Nations Refugee Agency and as a resettlement assistant at World Relief.

Resettlement agencies do their best to provide what's needed but sometimes fall short, she says. "I've seen those gaps, and I'm trying to see if they can be filled."

The group is transitioning to the next phase of a two-year planning process in which members will select leadership and move forward with personal and collective goals.

"Ultimately," explains Dr. Sienkiewicz, "we want the women to have the support and structures they need to be successful as they've defined success."

By Elizabeth L. Harrison • Photography by Martin W. Kane
Learn more at <https://cnmc.uncg.edu>



PEAK CONNECTIVITY

Contemplating how the newest technologies might improve the lives of individuals in developing nations is not a theoretical exercise for Nir Kshetri, a professor in UNCG's Bryan School of Business and Economics.

Dr. Kshetri, an authority on how digital technologies might be applied to improve the economic well-being of some of the world's poorest people, grew up in a village in eastern Nepal, near Mount Everest. He knows the challenges of living in a place that lacks much of the governmental and financial infrastructure taken for granted in the industrialized world.

Consider blockchain, for instance. The heady technology, originally developed for cryptocurrency like Bitcoin, is currently a focus of the Bill and Melinda Gates Foundation. Like Kshetri, the Gates Foundation sees this secure, digital mechanism as a means to improve millions of lives.

Blockchain, Kshetri explains, might be used to maintain land ownership records in places where Western-style deeds never existed. The information, stored on Internet-connected computers and accessed via smartphone, would be available to anyone. But the data could only be changed by the property owner or an assignee with access to the digital key for that specific record.

One of the thorniest challenges facing developing countries in the coming decade "is the registration of property," Kshetri says. "It's a big issue."

Blockchain also has applications for identification and personal finance. "In Nepal, people have to show at least four different documents to open a bank account," Kshetri says. "It is almost impossible for them to participate in any type of formal banking activities."

In lieu of birth certificates and ID cards, a blockchain scheme might offer identity verification via a smartphone photo and an audio voiceprint. Such proof of identity would enable person-to-person transfer of funds at minimal expense, Kshetri says.

Some 2.5 billion people do not have access to banking or financial services, he notes, and 1.5 billion people have no form of identification. With no recorded deed, property cannot be used as collateral to secure a loan to start a business. These conditions effectively exclude billions of people from participation in the 21st century economy.

Another aspect to Kshetri's research focuses on the use of blockchain for digital currency like Bitcoin. Cryptocurrency, he posits, could



Cellular technology and inexpensive smartphones will eventually span the planet, propelling nonindustrialized societies into the digital era, says Kshetri. With smartphones come smart solutions.

potentially provide billions with the tools to improve their livelihoods and build wealth.

Cryptocurrencies offer advantages over credit cards and bank-based financial transactions. Transaction costs of 10 percent or more in Pakistan have been reduced to 1.5 percent or less thanks to Bitcoin, he says.

Kshetri has published seven books and around 100 articles on subjects such as cloud computing, cybersecurity, big data, and the Internet of Things, and he is widely quoted as a technology authority. He is currently a consultant to the United Nations Conference on Trade and Development and its biannual series, Information Economy Report. Based in Geneva, UNCTAD seeks to enhance the capability of societies to engage in trade and development.

"I'm just a regular guy interested in technology," Kshetri says. "The advantage I have is that I was poor. I know the problems poor people face."

By Tom Lassiter • Photography and illustration by Mike Dickens
Learn more at <https://go.uncg.edu/nirkshetri>

MIND ON THE MOVE

Any monkey will tell you laboratory tests are repetitive, mundane, an environment ripe for mind wandering. If your aim is to better understand why we daydream, the laboratory should be the perfect setting. But can we rely on laboratory experiments to explain how these internal distractions limit our ability to focus on day-to-day events in the real world?

Professor Michael J. Kane is the first to address that question in a National Institutes of Health-funded study, recently published in *Psychological Science*. He and his colleagues equipped a large sample of students with a device that would prompt them randomly with a series of questions about what they were just thinking about and what they were doing.

"We wanted to better understand what cognitive and personality factors influence how often people are mind wandering in everyday life," says Kane. In the lab and the field, he found we seldom concentrate on the task at hand. Our minds wander a lot, on average a third of the time.

Scientists have just begun to investigate the purpose of our regular drift in focus. Over the past decade, results from laboratory experiments and brain scans have revealed the mechanisms and neural networks associated with a wandering mind. They show that while it feels like our brain is getting a break when we daydream, it's actually quite active, processing memories for long-term storage or working through complex problems.

Kane's interest in mind wandering derived from a desire to better understand the relationship between attention and intelligence. On average a subject's mind wanders at a rate of 30 percent, but he was struck by the variability around that average. "We regularly have people say they were mind wandering only once or twice a week," he says. "Whereas



IN THE FIELD Kane gave participants PalmPilots to track their levels of mind wandering through the day. "If your phone rings, your first thought is not 'Was I just mind wandering?' It's 'Who's calling me?'" he explains. Receiving surveys via the unique device trained participants to immediately assess what they were paying attention to whenever it beeped.

other students were off-task 80, 90 percent of the time." Kane wondered if differences in cognitive ability, specifically in working memory, might be a factor.

Working memory indicates our ability to briefly store information necessary to reason through and solve problems. "In the lab, we generally see that people with higher working memory, mind wander less," explains Kane. But, when Kane looked at results from the real world, lower working memory did not predict a daydreamer.

"We think working memory is measuring, in part, your ability to control your attention only when you need or want to," he says. "In a lot of life, you don't need to pay attention." Higher working memory did predict less mind wandering during periods when subjects were trying hard to concentrate or doing challenging activities. It also correlated with more mind wandering when subjects weren't trying to concentrate.

The greatest predictor of mind wandering in the field was a personality trait known as openness. "People high in openness were more likely to be daydreaming, or fantasizing, than people who were low in openness." He explains that this personality prefers creative thoughts for the sake of entertainment if given the opportunity.

Kane is currently conducting a National Science Foundation study on mind wandering and learning. "We thought statistics would be an interesting domain to study," he says. "In part because it's important for science, but also there are a lot of anxieties about math." The results of Kane's current and future experiments are valuable to educators interested in designing a curriculum that maximizes a student's retention.

By Rebecca Guenard • Photography by Mike Dickens
Learn more at <https://psy.uncg.edu/people/kane>



CLOSING THE GAP

In the last 15 years, African American females at UNCG graduated at a rate higher than any other group, followed by African American males.

"I don't know if it's the best kept secret of our institution, but for the last 10 years, UNCG has essentially had no educational achievement gap as it relates to ethnicity," says Dr. Joseph Green, executive director at UNCG's Student Success Center.

A recent flow of funding proves that the university's student-focused approach, leadership in undergraduate research, and track record for creating access for first-generation and underrepresented students is no secret.

- **In January**, UNCG received \$1 million from the National Science Foundation to enroll academically talented and financially challenged minority, female, and first-generation students seeking degrees in STEM, as part of the Science, Technology, and Math Preparation Scholarship (STAMPS) program.

- **In March**, UNCG was selected for the Gates Foundation's Frontier Set, joining 31 institutions across the country working to close achievement gaps in higher education. Participating institutions, already identified as pioneers in advancing student outcomes, partner and share best practices as they work to improve student success and transitions to the labor market.

- **In May**, the university received a \$1.4 million National Institutes of Health Maximizing Access to Research Careers Undergraduate Student Training in Academic Research (MARC U-STAR) grant to support underrepresented minority and disadvantaged students pursuing biomedical and behavioral health degrees.

- **And in September**, UNCG was selected to host a \$1.2 million McNair Postbaccalaureate Achievement Program to prepare first-generation, low-income, and underrepresented undergraduate students for doctoral studies.

"I think these awards demonstrate confidence in the university, in our commitment to provide quality educational experiences for all students," says Dr. Lee Phillips, director of the Undergraduate Research, Scholarship, and Creativity Office.

This year, UNCG rolled out its new strategic plan, laying the groundwork for "giant steps" in transforming education by more strongly addressing the needs of a diverse student body.

UNCG is recognized as a designated minority-serving institution. Close to 66 percent of undergraduate students are female, 35 percent are considered an underrepresented minority, and 45 percent are Pell Grant-

eligible. And the graduation rate for African American students at UNCG is 18.6 percent higher than the rate for African American students at its top 15 peer institutions.

"We are committed to all of our students being successful," says Dr. Terri Shelton, vice chancellor for research and engagement. "But, in particular, we've begun to drill deep, using data and evidence-based practices, to look at how we close some of the gaps we see in retention and graduation rates, and how we respond to a lack of diversity in certain workforce opportunities."

The university is using a combination of data and hands-on care to meet the different needs of students.

"We encourage the use of 'high-impact practices' to promote learning," says Provost and Executive Vice Chancellor Dana Dunn. "These are active-learning strategies that engage students and motivate them to succeed."

Programs like STAMPS emphasize faculty and peer mentorship. "A lot of evidence suggests if students feel they are part of a community, they stay in school," explains project director Dr. Lynn Sametz. The four-year graduation rate for an earlier version of the STAMPS program was 57 percent higher than UNCG's average four-year graduation rate.

Undergraduate research is another high-impact practice that weaves through many UNCG initiatives, lying at the heart of programs like McNair and MARC U-STAR.

"If we want diversity in STEM, disadvantaged students need access to research experiences and mentoring and information on navigating the system," says Phillips.

Students aren't the only ones receiving an education. Programs like MARC U-STAR also train faculty on how institutional racism manifests in STEM.

"We want to transform the culture on campus," explains Dr. Dan Herr, a co-principal investigator on MARC U-STAR.

As students and faculty succeed in this endeavor, our economy and society will benefit, says Dunn. "We are in this together. Education is the promise of the future, and this work is key to achieving that promise."

By Elizabeth L. Harrison • Illustration by Mike Dickens • Read in-depth coverage of our Frontier Set, MARC U-STAR, McNair, and STAMPS initiatives at <https://researchmagazine.uncg.edu>



Sex Ed goes VIRAL

Dr. Amanda Tanner examines sexual and reproductive health, with a focus on HIV infections among young people. She is widely known for her innovative, multi-method approaches to behavioral health and interventions. The associate professor of public health education, who also holds an appointment at Wake Forest University School of Medicine, attributes her success to a diverse, national network of research collaborators; strong, interdisciplinary teams of colleagues and students; and an emphasis on community engagement.

A NONTRADITIONAL PATH

"As a teenager, I witnessed how educational opportunities closed to young women who were pregnant. That inspired me to volunteer with a nonprofit bringing sex education to teenagers, and, after college, to join an international women's health care organization. I loved the work and decided to get a master's in public health to move forward with that career. Then, in grad school, I got involved in research and found my passion.

"My background keeps my feet on the ground. I'm committed to collaborating with communities and community-based organizations to ensure that my research is relevant to the populations I work with and can be implemented at an organizational and clinical level. I don't want to work in an ivory tower, so UNCG's dedication to community-engaged scholarship has been a great fit for me. We're at the forefront of that type of work.

"Seeing my scholarship's impact on interventions and policies and creating sustainable change — that's what excites me."

REFRAMING THE ISSUES

"While many of my projects focus on understanding and preventing HIV and STD transmission, more broadly my research is about promoting sexual and reproductive health — normal aspects of development. In my primary prevention work, we try to keep youth healthy and HIV-free. We don't say, 'Don't have sex.' We approach health from a risk reduction paradigm. We say, 'Here are ways to be safe and healthy: use condoms, talk to your partner, get tested. Know your options.'

"I also do secondary prevention work with youth living with HIV. Thanks to biomedical advances, HIV is not the death sentence it used to be, and people who are infected can lead healthy, happy lives. Many people don't know that once someone is virally suppressed with medication, their ability to transmit HIV becomes very, very small. It's called 'treatment as prevention.' To realize the benefits, we must ensure that people diagnosed with HIV are linked to care quickly and that they stay engaged in care."

A VULNERABLE POPULATION

"Of the 1.2 million people living with HIV in the U.S. in 2011, 30 percent were virally suppressed with medication, and thus extremely unlikely to transmit. But when you looked at virally suppressed young people, that number dropped to 6 percent. We're seeing HIV rates decreasing for all age groups — except 13-24.

"We need to think about what we can do to support youth in accessing the services they need. There are factors we can change at the clinical level, at the more macro level, that really support healthier

adolescents. If we train staff in adolescent clinics to meet youth where they are developmentally, if they are trained to interact with transgender youth, and so on, then young people with HIV are more likely to come to the clinic and stay in care.

"I'm leading an NIH study where we followed 135 youth at 14 clinical sites across the U.S., as they navigated the transition from adolescent to adult care — a time when we see a significant drop in adherence to treatment. We collected data from patients and clinic staff to try to better understand what's happening. We're identifying what youth need, what adolescent clinics can do to prepare youth for the transition, and what adult clinics can do to support them once they get there, so they stay engaged in care and on medication."

COMMUNICATION AND CARE

"There are so many great new ways to share information. Technology is key to maximizing our resources and reach and developing cost-effective interventions.

"I'm currently working with a Wake Forest School of Medicine team on a project using social media to help young people living with HIV adhere to care and medication. That project, funded by the U.S. Health Resource Service Administration, focuses on young African American and Latino men who have sex with men and transgender women — populations often needing extra social support. We're connecting them to health educators, who send reminders, answer questions, and check in with them, using texts and apps like Facebook and Grindr. We also have primary prevention projects using social media to spread information about health and HIV testing.

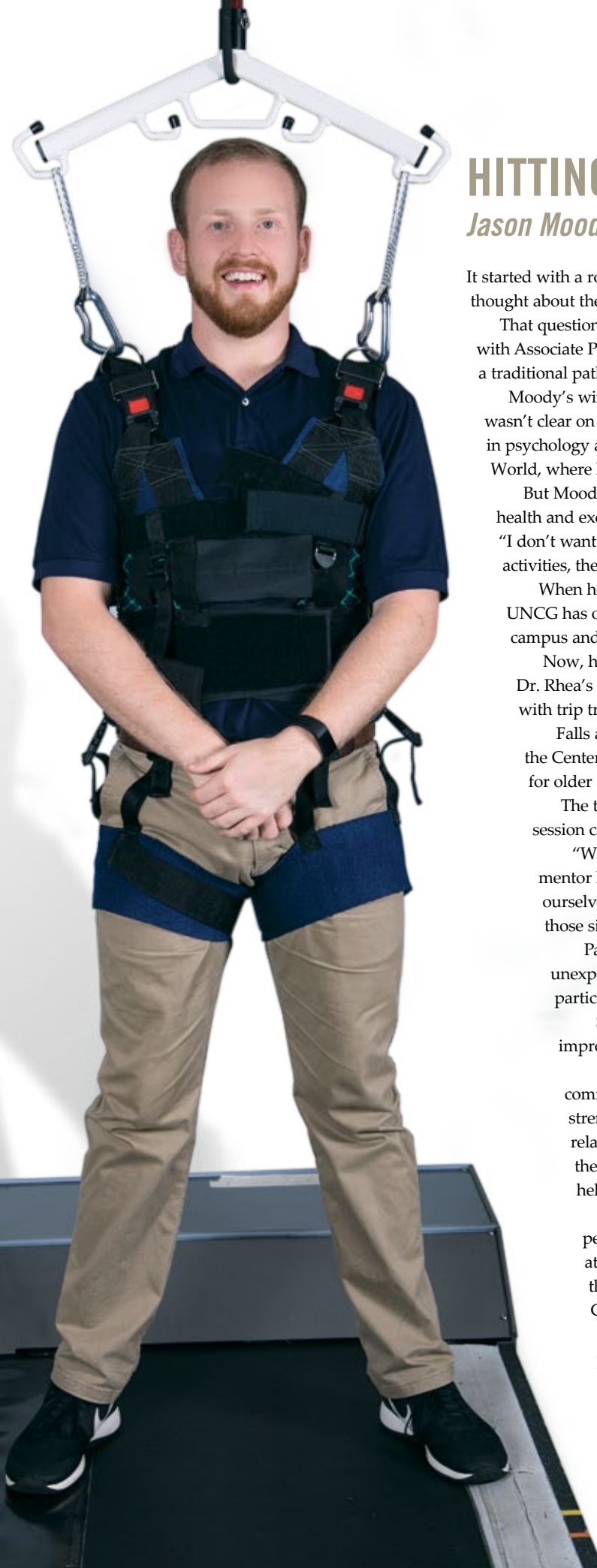
"I'm also developing an online intervention for first-year college students, funded by a National Institute of Alcoholism and Alcohol Abuse R01 grant, with a team from UNCG and Penn State. The program addresses issues that arise where alcohol use and sexual behaviors intersect. A lot of similar curricula are high-resource, face-to-face interventions. Our program is something students can do easily, on their own, as part of orientation."

A STRONGER WHOLE

"I want to build stronger, healthier communities, and reducing health disparities according to age, gender, sexual orientation, and race and ethnicity is part of that. When we have people, especially young people, who are unhealthy, that affects all of us.

"So when we invest in HIV prevention, treatment, and care, we don't just affect individuals. We also see community- and population-level benefits. When we commit to making everyone as healthy as they can be, we make our world a better place."

Interview by Sangeetha Shioaji, with Hope Voorhees
Photography by Mike Dickens
Learn more at <https://go.uncg.edu/amandatanner>



HITTING HIS STRIDE

Jason Moody, undergraduate researcher

It started with a rolled ankle during a daily run. That's when undergraduate Jason Moody first thought about the body's biomechanics. How did his ankle turn, and what did it mean?

That question ultimately led him to the Department of Kinesiology, where he conducts research with Associate Professor Christopher Rhea and Assistant Professor Anne Brady. But he didn't take a traditional path.

Moody's winding journey started in high school, where he played football and wrestled. He wasn't clear on his career goals, but, when he came to UNCG as a freshman, he decided to major in psychology and minor in theatre. Then, he took a break from school to intern at Walt Disney World, where he honed his communication skills, interacting with a wide variety of people.

But Moody knew Disney wasn't his destiny. As an avid runner, he shifted his focus to health and exercise, wondering whether he could help others live longer, healthier lives. "I don't want to work with athletes," he says. "I want to help older people with everyday activities, their everyday life — to help them be here for their grandchildren."

When he — literally and figuratively — stumbled into kinesiology, Moody discovered UNCG has one of the strongest and fastest growing departments nationwide. He returned to campus and jumped into undergraduate research.

Now, he works with older adults to improve their physical capabilities and stability. In Dr. Rhea's lab, Moody partners with graduate researcher Brian Cone to help adults over 75 with trip training — an effort designed for fall prevention.

Falls are a leading cause of injury and death among older Americans, according to the Centers for Disease Control and Prevention. In 2015, Moody says, the cost related to falls for older adults totaled about \$32 billion dollars.

The team is testing whether putting participants through a 15-minute trip-training session can help them alter their walking patterns to avoid falls.

"When we're kids, we constantly play and control our balance," explains Moody's mentor Rhea. "As we get older, one reason we fall more may be because we're not putting ourselves in these unbalanced, unexpected situations anymore." Trip training provides those situations.

Participants wear safety harnesses and motion-recording sensors. Researchers unexpectedly stop the treadmill eight times, simulating trips, and record data on how participants — unharmed thanks to the harness — recover.

So far, Moody says, results show a single trip-training session results in gait improvement.

This past summer, he also helped Dr. Brady collect data at local retirement communities, assessing elements of resident health such as body composition, strength, endurance, and balance. The aim of the project is to better understand the relationship between how older adults perceive their physical capabilities and how they actually perform. The data will also go to the communities' fitness directors to help them better plan and implement programming for residents.

Moody, currently vice president of the UNCG Kinesiology Club and head personal trainer at UNCG's Kaplan Center for Wellness, has presented his work at UNCG's Undergraduate Research, Scholarship, and Creativity Expo and at the Human Movement Science and Biomechanics Research Symposium at UNC Chapel Hill.

As a next step, he plans to pursue a graduate degree in clinical exercise physiology. He credits much of his success to UNCG's faculty.

"At larger schools, faculty can't engage every student. UNCG is different. Our faculty genuinely make a great impression on students."

*By Whitney J. Palmer • Photography by Mike Dickens
Learn more at <https://kin.uncg.edu>*

THE PITFALLS OF PERFECTIONISM

Kelly Harper, graduate researcher

It's a common misconception: Perfectionists are typically viewed as hard-working, high-achieving, self-confident individuals. However, according to clinical psychology student Kelly Harper, perfectionism can come with costs.

Existing research highlights two types of perfectionists — adaptive and maladaptive. Adaptive perfectionists maintain high standards and feel pride in their accomplishments without berating themselves for mistakes. Maladaptive perfectionists employ similarly high expectations, but they focus on shortcomings and often feel anxious or unhappy with their performance.

Harper, whose findings have been featured in the online publication PsyPost, is examining the motivations behind maladaptive perfectionists' behavior, as well as their interpersonal problems, through the UNCG Depression Treatment and Research Program. The program, directed by her advisor Dr. Kari Eddington, focuses on improving the lives of individuals living with depression via innovative research and clinical services.

"I really want to help perfectionists. They are the ones who typically come in for psychotherapy," the doctoral student says. "They are at a higher risk for any number of psychological problems — depression, anxiety, eating disorders, and personality disorders."

Harper, who won the UNCG Outstanding Thesis Award in 2016, says maladaptive perfectionists have the highest levels of depression, social difficulties, and stress. They're self-critical and often pursue goals based on external pressures rather than internal motivations, leading them to feel less pride in their work.

For her thesis, to determine if perfectionists worked harder than non-perfectionists, she had undergraduates perform a simple computer task while wearing electrodes. Cardiac and respiratory data revealed perfectionists didn't expend more effort on the task than other participants, in contrast to previous findings based on self-reporting. But maladaptive perfectionists did perceive the task as more difficult and felt worse about their performance.

Harper has also analyzed how perfectionists feel about their daily accomplishments and why they pursue goals. In her most recent study, she surveyed 130 undergraduates about their daily progress toward goals, over a two-week period. She found maladaptive perfectionists pursued goals to satisfy others and felt more guilt, even if they were making progress.

But identifying behaviors and motivations is only part of her research. She also wants to create better treatments. Currently, psychologists use cognitive behavioral therapy, but this strategy doesn't always have a specific focus on the sensitivity, hostility, neediness, and tendency toward conflict maladaptive perfectionism can create. Maladaptive perfectionists, Harper says, could benefit from cognitive behavioral therapy focused more specifically on social difficulties or more socially focused therapy.

For her dissertation, Harper, who's already been published in the multidisciplinary journal PlosOne, hopes to collect data three times daily from 150 undergraduates on social interactions, how they feel about those interactions, and how they believe they will impact their future social experiences. She predicts maladaptive perfectionists will report more negative interactions and that they'll blame themselves, which in turn will lead to an expectation of future negative social experiences and higher levels of loneliness.

The research is important, she says, because psychologists who understand maladaptive perfectionists' approaches to social interactions can design better treatments.

"I hope my findings will be used to help perfectionists learn skills that will result in improved mental health," she says. "These are skills that will make life better."

*By Whitney J. Palmer • Photography by Mike Dickens
Learn more at <https://psy.uncg.edu>*





MC²

Harnessing the energy of collaboration to take on cancer, MRSA, and more

NEWLY DISCOVERED MOLECULES that could prove to be anti-cancer agents.

Plant-derived compounds that could give us new ammunition against deadly drug-resistant bacteria such as MRSA.

Nanoparticles that might one day help doctors focus cancer drugs more precisely on tumors.

New drug candidates to minimize damage to the brain after a stroke.

That's a small sample of the research that UNCG's Medicinal Chemistry Collaborative — MC² — is carrying out.

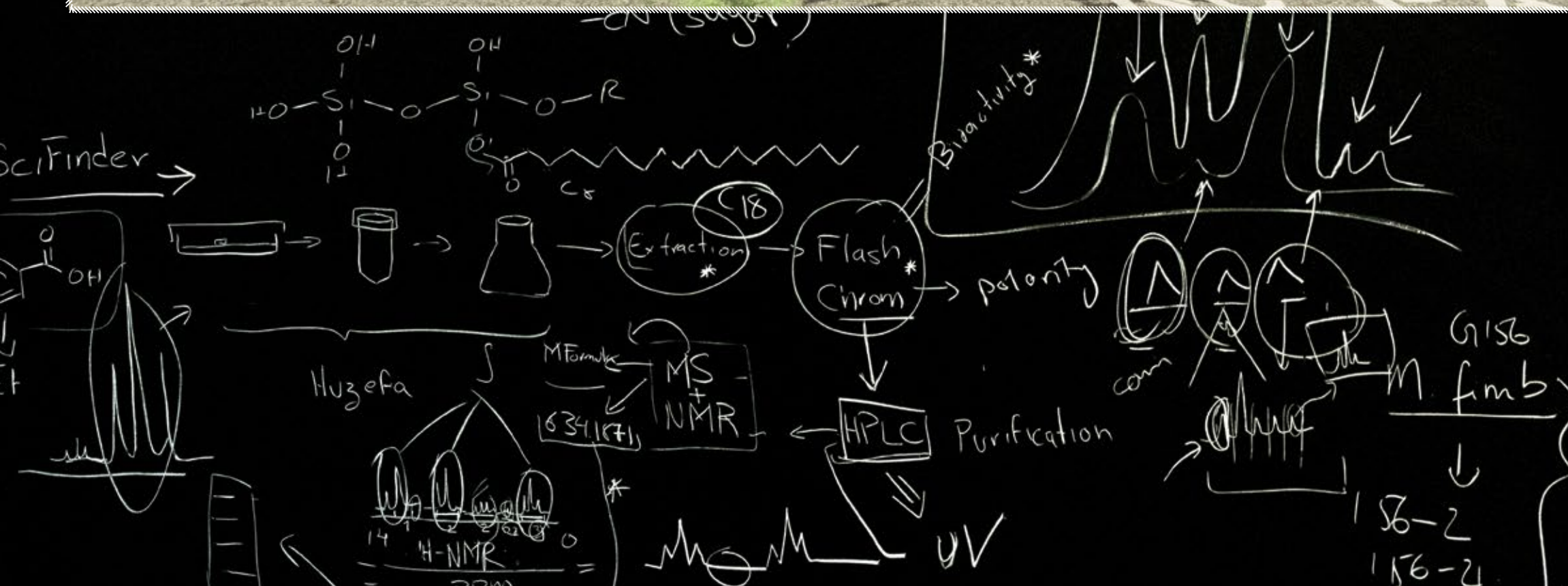
And there's certainly more where that came from. That's what happens when you combine a couple dozen chemists, biochemists, biologists, and other scientists, plus their labs, students, and millions of dollars in research grants, together in a single center.

MC² has been around, under different names, for about 10 years. But the new name is part of an effort to draw in a wider array of researchers and provide the UNCG scientists involved with more chances to learn from one another.

"The goal is to support each other, and to train students, and to engage with the greater scientific community and the community in general," says Professor Nadja Cech, who, along with Professor Nick Oberlies, is co-director of MC².

Sometimes that means one researcher saying something or sharing a story that sparks a new idea. Sometimes it means opportunities to collaborate and combine knowledge or access to special resources. Sometimes it means another colleague to ask for advice or finding the perfect mentor.

It certainly means high-impact research.





NATURE'S VARIETY Oberlies and his collaborators hope to identify next-gen drugs in natural products. "Fungi are the second most diverse organisms on the planet," he explains. There are millions of unidentified fungal species — each one a treasure trove of unidentified compounds with the potential to improve health and save lives.

A NUMBERS GAME

Dr. Oberlies and his students have spent a lot of time wading through streams and ponds in parks around North Carolina, collecting fungi. They take them back to the lab, grow and analyze them, and start looking for new molecules that might have therapeutic or other practical applications.

"Fungi are the second most diverse organisms on the planet," Oberlies says. Scientists estimate there are millions of species, but only about 120,000 have been named. In fact, Oberlies and his team frequently find new species; recently they discovered a whole new order of fungi.

In the last decade, Oberlies says, his lab has collected and analyzed thousands of fungal species, isolated and determined the structures of hundreds of new compounds from those fungi, and then tested those using biological assays to see which might have medicinal value.

He's also able to tap the expertise and resources of another professor, Cedric Pearce, an adjunct faculty member and CEO of Hillsborough-based biotech company Mycosynthetix Inc. That company maintains a library of over 55,000 fungal species collected from around the world.

"Mycosynthetix pioneered the miniaturized high-throughput approach to culturing fungi and has spent the past 16 years providing access to this valuable resource to drug discovery groups," Pearce says. "The chance of finding new molecules from our fungi is therefore high, and by using the historical data we can quickly find active compounds."

Oberlies says the knowledge and expertise that Mycosynthetix brings to the lab bench have been invaluable.

"We went through 4,000 fungi, we isolated 400 compounds

and we've got four promising leads," he says. "It's a bit of a numbers game."

Those four leads? Three have the potential to be used against cancer, and the fourth shows promise against MRSA — methicillin-resistant *Staphylococcus aureus*, the dangerous staph infection plaguing healthcare facilities worldwide.

Oberlies' team has tested the compounds in his lab, in test tubes, and now they're moving into in vivo trials at other research labs, where scientists will see if they work in a living organism.

NATURAL SYNERGIES

MRSA and other bacterial infections were also a target for a five-year investigation into how goldenseal, an herbal supplement, kills bacteria.

Unlike traditional drugs, where a single compound does all the heavy lifting, plant-based products often have many molecules working together, says Dr. Cech, whose research focuses on medicinal plants.

"We have found multiple compounds in that same plant that target bacteria in different ways and that work together synergistically," she says. "We're seeing that you get a different result when you treat an infection with goldenseal extract from the plant, or a tea from the plant, than you would get if you took just one of the isolated compounds from it."

Cech is an analytical chemist by training — an expert at breaking down something into its constituent parts and figuring out what those parts are. The goldenseal research taps those analytical strengths. "We can say which compounds are working in what way, and how they collectively do a better job of wiping out bacteria."

LIGHTING THE WAY

Dr. Sherri McFarland, who joined the Department of Chemistry & Biochemistry a year ago, is focused on photodynamic therapy, using light energy to activate or strengthen therapeutic compounds in the body.

She and her partners have founded a company — Photodynamic Inc. — based on light-responsive natural products that can eliminate oral biofilms, which are associated with cavities and gum disease. They've also licensed a light-responsive bladder cancer drug to another company; that treatment is now in human trials.

For her work at UNCC, the professor is turning her attention to nanophoto medicine.

One of the challenges with some photodynamic applications, she says, is that not all wavelengths of light are equally effective. Sometimes, the frequencies that penetrate tissues the best don't carry enough energy to activate light-sensitive, therapeutic compounds to attack cancers.

But some types of nanoparticles — very tiny particles with specific chemical structures — can "up-convert" the light, absorbing a lower-energy photon and then emitting a high-energy photon. That new, high-energy light has enough energy to activate the therapeutic compound.

"The idea is we could then treat larger tumor volumes," McFarland says. By combining light-therapeutic compounds with

McFarland and her collaborators have developed a light-responsive bladder cancer drug that is now in human clinical trials with Theralase Technologies. They're also collaborating with the company to develop drugs to treat glioblastoma, a type of brain cancer.

these nanoparticles, doctors could potentially treat tissues deeper in the body, where longer-wavelength light can penetrate and then be converted to shorter wavelengths to activate the drug.

"You start out with a lot of different combinations of individual molecules and nanoparticles and then you whittle those down to the top performing, according to whatever screening procedure you're using," McFarland says.

Combinations that work successfully in the lab will go on to further testing. They could also form the basis of new companies that could be spun out of McFarland's lab.

SCALABLE SYNTHESIS

In drug development, finding a compound that might have therapeutic properties is only half the battle. Researchers must still be able to make enough of the substance to test it. And if it ends up being approved for use in humans, drug makers must also figure out how to produce large quantities of it.

That's one of the things that Mitch Croatt, associate professor of organic chemistry and the head of the Department of Chemistry & Biochemistry, does.



DIGGING IN Cech and research scientist Huzefa Raja lead a team of graduate and undergraduate students on a sample-collecting trip. In 2016, Cech won an \$800,000 National Institutes of Health predoctoral training grant to support graduate students working in natural products. This year, she received the UNCC Undergraduate Research Mentor Award. Of the 50 undergraduates she has mentored, 60 percent have gone on to graduate programs or professional programs.

Professors' life experiences spark collaborative reactions

You might say that Cech and Oberlies are connected to their purpose by the Pacific yew tree.

Cech grew up on a farm in Oregon where she learned about the local plants and their traditional medicinal uses. One of the trees on her family farm was the yew, long used in traditional medicine.

Cech skipped high school, starting at Oregon's Rogue Community College when she was 14. A science professor there introduced her to chemistry. He would take Cech and her classmates on field trips to remote lakes and streams to test water quality.

"For me, chemistry was always a very hands-on thing, and the link between chemistry and the natural world was always very obvious," she says. "I actually thought I might pursue botany when I first went to college because I loved plants so much, but then realized that I really loved how chemistry makes order out of the world."

That love of chemistry persisted through graduate school — including a stint doing mass spectrometry in a windowless concrete building in New Mexico. Then, she came to UNCG in 2001 and started doing research on plants.

"I was just absolutely enthralled," she says. Cech knew she wanted to conduct research on natural products, but despite her analytical chemistry bona fides and childhood knowledge of plants, she had no formal training in the chemistry or analysis of plants.

She needed someone who knew about natural products and chemistry, which led her to Oberlies, who ran the Natural Products Laboratory at the Research Triangle Institute in Research Triangle Park, N.C.

Oberlies learned about the yew tree a different way, from mentor scientists at Research Triangle Institute, Dr. Mansukh Wani and the late Dr. Monroe Wall. Those scientists are known around the world because they derived Taxol, an important cancer drug, from the bark of the Pacific yew.

Oberlies has traveled all over the world with Wani, listening to him speak to groups. Audience members sometimes weep during his talks, and afterward come to speak to him.

"They'll say things like 'My mother passed away from cancer, but she had five extra years because of Taxol,'" Oberlies says. "I've seen that happen more times than I can count."

In 2009, he joined Cech at UNCG.

It's been a fruitful partnership. One of their latest endeavors is the NIH Center of Excellence for Natural Product Drug Interaction Research, a \$10 million collaboration with Washington State University and the University of Washington. UNCG is the analytical lead on the project, which is examining how the body's metabolism of natural products can impact the effects of modern medicines.

For Oberlies, who has always seen science as a process of discovery, this is the idea that animates his work: To find something that makes a difference.

"I just want to do something that positively affects humanity," he says. "You're doing it because you want to have an impact on society."

In July, Cech and Oberlies became inaugural recipients of Patricia A. Sullivan Distinguished Professorships in the Sciences.

"We make molecules," he says. "The approach that guides us is to try to make compounds in as few steps as possible. This reduces the time, waste, and cost of a synthesis."

For one project, Dr. Croatt created a new process — nine steps instead of 15 — to synthesize isocarbacyclin analogues, starting with simple, inexpensive materials. Collaborators at the Stanford University School of Medicine are testing them. Early results suggest they could minimize brain damage after a stroke.

Croatt says one of the most valuable aspects of MC² is the synergy created by the interaction among the scientists.

"By talking and sharing research results, we can help one another by either directly collaborating or simply giving advice," he says. Six of his last eight published papers were collaborations with other MC² members.

For example, he's working with Cech and Oberlies to isolate compounds from fungi that may have anti-cancer effects, and then optimize the structure of those molecules. Science, Oberlies notes, "is all about teamwork."

That teamwork extends far beyond the relationships among faculty.

NEXT GENERATION SCIENTISTS

UNCG faculty take their responsibilities to teach students and mentor future scientists seriously.

Derick Jones, a doctoral student in medicinal biochemistry, works in the McFarland lab. One of his primary duties is to work with cancer cell lines. He grows the cancer cells that are used to test drug candidate compounds in test tubes. Then he observes the way light interacts with the compounds to (hopefully) kill those cancer cells.

"We have state of the art instruments and technology that are extremely novel in the science community," Jones says. "I am excited to delve into uncharted territory within the photodynamic therapy field."

Beyond the opportunity to do cutting edge research, Jones says, the mentorship from McFarland is also invaluable.

"I feel like one of the most fortunate people alive to be working with her," he says. "She has pushed me past what I had considered being my best."

MC² faculty also work closely with undergraduates. Biochemistry major Luis Mejia Cruz has been working in Cech's lab to better understand how certain compounds combat MRSA.

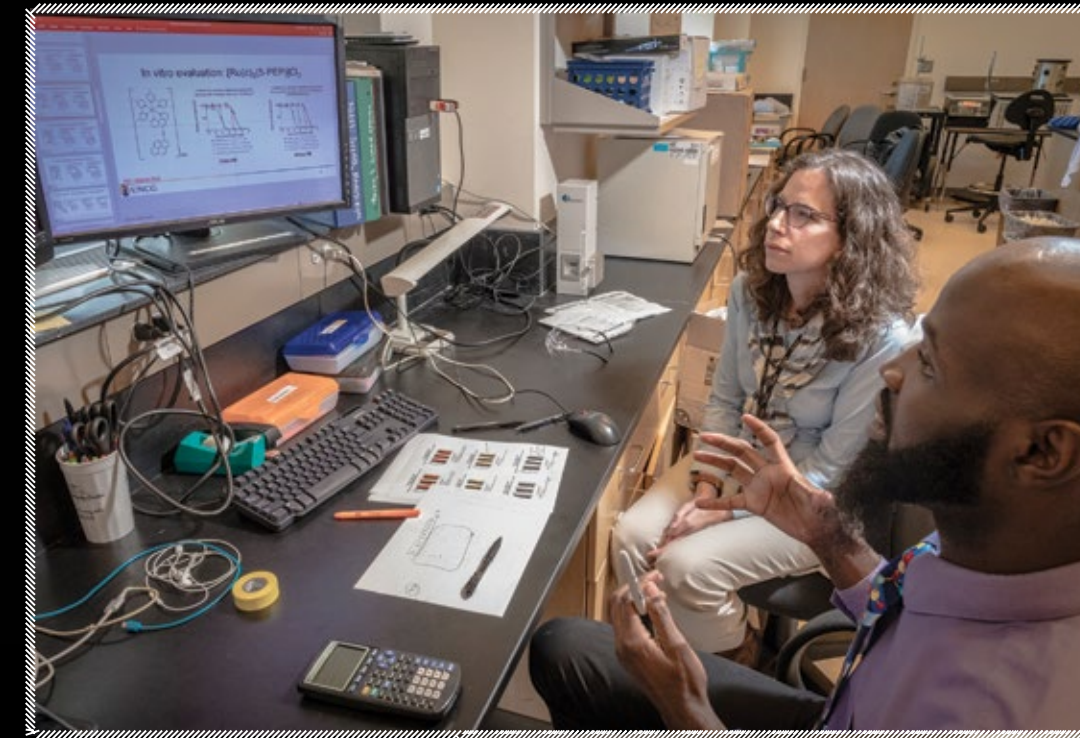
"I was involved in all of the processes, from simple lab techniques such as sample preparation, to culturing the strains of bacteria, to running the bioassays and screening them using analytical instruments such as high-performance liquid chromatography and mass spectrometry systems, as well as processing the data," he says.

Mejia Cruz plans to pursue a master's degree in chemistry and one day work as a researcher, perhaps in medicinal chemistry.

Cech finds great satisfaction in having the same kind of impact on students that her first college chemistry professor had on her. Grant funding won by the center does more than support research, she explains. It supports students — and sometimes changes their lives.

"They're getting into the lab and finding out that chemistry is something they didn't expect at all," she says. "They're going off to careers as research scientists. That's what having funded research does."

By Mark Tosczak • Photography by Martin W. Kane
Learn more at <https://mcsquared.uncg.edu>



BETTER TOGETHER "Our nickname, MC², alludes to Einstein's famous equation," says Cech. "It reflects the energy created by our collaboration." Students are an essential part of that formula. Clockwise from top: McFarland with graduate researcher Derick Jones (right), former undergraduate researcher and current postbaccalaureate researcher Michael Brandon Schroder Spano (left) with Croatt, and undergraduate researchers Tatiana Hines (right) and Ann Marie Lee (left) with Oberlies.





The *Harvest* at Home

Growing conversations around food security



HE JUST WANTED TO GO TO THE GROCERY STORE. But for Gai Riak, who immigrated to the United States from Kenya in 2001, it wasn't as easy as you'd think. For starters, Riak didn't have a car. He studied maps and schedules in a foreign tongue and learned the bus system for his first trip. Then, when he arrived — at a store much bigger than anything he was accustomed to — the aisles of packaged items and unrecognizable produce left him overwhelmed and confused. “The food is not the same as the food we get back home,” he says. Labels and price tags meant nothing to him.

Over time, Riak learned the ropes, but without reliable transportation, his trips to the grocery store remained infrequent. “I would buy a lot of nonperishable foods because I never knew when I would have an opportunity to come back,” he says. Rarely did Riak leave with fresh fruits and vegetables.

Grocery shopping challenges like Riak's impact more than immigrants. Two years ago, Greensboro received a startling distinction: Out of the top 100 major metropolitan cities in the U.S., the Greensboro-High Point area ranked number one for residents experiencing “food hardship.”

Food hardship speaks to a person's financial ability to buy food, explains Marianne LeGreco, associate professor of communication studies. But hardship, she says, isn't really the whole story.

Dr. LeGreco mobilizes conversations around food, challenging her students and community partners to look at the problem through a wider lens. To truly address issues of hunger and health, she says, we have to look at “food security,” which puts the focus on physical as well as economic access to food, and on issues such as nutrition and education.

“When we talk about food security, we take a broader look at our food systems,” she says. “That helps us implement true, lasting solutions.”

LeGreco is working to increase food security by uniting organizations with shared goals — from university researchers to community organizations to faith-based groups — who are tackling the problem from different angles.

“We didn't focus solely on food hardship,” she says of the community's response to its 2015 ranking. “We mobilized people to start paying attention to food deserts and food insecurity in the community — and more.”

WATERING FOOD DESERTS

As a communication expert, LeGreco understands that the way we talk about food impacts the solutions we put in place.

For example, “there's a difference between ‘availability of’ and ‘access to’ food,” she explains. In North Carolina, fresh vegetables and many fruits are available year-round. “At the very least, you can grow sweet potatoes. Pound for pound, calorie for calorie, that's one of the best foods you can eat,” LeGreco says.

But while food may be available in Guilford County, it's not always accessible — at least not to everybody. Many residents live in “food deserts,” which the U.S. Department of Agriculture defines as areas in

which most residents live more than a mile from a grocery store, and below the poverty line.

People living in food deserts can feel stuck there. Like Riak, residents are not in walking distance to a grocery store, and some cannot afford transportation.

“The idea of ‘access’ seems easy to wrap our minds around,” LeGreco says. “And we think we can fix that easily by starting a food pantry, a community garden, or a mobile market. But really, there's more to it than that.”

This is where the rhetoric we use when trying to solve problems around food becomes especially important, she adds. Increasing physical access to nourishing foods doesn't always get at the root of accessibility. “For example, I've had several study participants tell me that they would eat better if they knew how to cook. When you've grown up in an area where you have access to only convenience foods, you might have never learned to cook,” LeGreco says.

If you give it a try, you run the risk of making a mistake. Suppose you invest in ingredients for a casserole and you drop or burn the casserole while preparing it. “Someone like me might be able to recover from that. I might go out to dinner that night or go buy a replacement ingredient,” she says. “But not everyone has that privilege. Some folks might not eat that night.”

According to the U.S. Department of Agriculture, food insecurity is an economic and social condition of limited or uncertain access to adequate food. Food insecurity includes issues beyond simple hunger, such as levels of food intake and nutrition.

In 2014, LeGreco partnered with the Guilford County Department of Public Health and numerous community partners to launch the Mobile Oasis Farmers Market. This farmers market on wheels provides fresh, local food to people living in food deserts. Even though the market has been a huge success — Guilford College now operates four locations, including one at a local community health clinic, and it won the 2015



COMMUNICATION IS KEY

In 2015, LeGreco (above), alongside faculty from UNCG's Department of Public Health Education and Department of Interior Architecture, launched the "Local Foodstorm," a brainstorming event that connected more than 120 community members and students and faculty from UNCG, NC A&T State, Guilford College, Greensboro College, Bennett College, and Guilford Technical Community College. Participants discussed relationships between food and obesity, immigration, race and gender, and economic opportunities. The event is now annual, with hosting responsibilities rotating among campuses.

Ideas gleaned from Local Foodstorm have informed the Guilford County Cooperative Extension's Local Food Guide and the City of Greensboro's Fresh Food Access Plan, which makes connections between local food systems and entrepreneurship opportunities.

LeGreco has also partnered with several agencies and community partners, including local farmers, the Guilford County Cooperative Extension, and NC A&T, to establish the Guilford Food Council.

Achievement Award in Health from the National Association of Counties — LeGreco points to a key lesson she and her partners learned from data they collected over two years. "Increasing access to healthier food options alone doesn't guarantee that people are actually going to use them," she says.

However, they found that increasing access alongside other health resources does encourage participation. "We had much more return business when one of our community members offered recipes and taste tests so that people could know what to do with a butternut squash, or different ways to incorporate ingredients," LeGreco says. "When we provided those supports, we started to see the creation of community because people would come back."

LeGreco and her team tracked the participation of 644 Mobile Oasis customers using a web-based app and conducted hundreds of on-site interviews. Forty-three percent of those interviewed said they liked the market because it creates a space to meet people. "Markets are spaces to meet friends, share recipes, and engage in some important social support practices," says LeGreco.

The takeaway for policymakers? "When we incentivize grocery stores to come into particular neighborhoods, we're not always capturing the entire problem. We might be doing a lot to create access to resources that people can't immediately use," LeGreco says. "It can be far easier to build a store than to fix other problems like a lack of social support or a lack of knowledge or time to cook."

LeGreco is working to help her community create a strong, sustainable food system that goes a step further than availability and access — to support.

UNDERSTANDING INSECURITY

LeGreco is not the only UNCG researcher focused on food issues.

Jigna Dharod, an associate professor of nutrition and a fellow with the UNCG Center for New North Carolinians, works with two seemingly unrelated populations — U.S.-born, low-income women with children, and immigrants and refugees — who both struggle to buy and prepare nourishing food for themselves and their families.

Dr. Dharod has found that rates of food insecurity are far above average in both populations — "even among pregnant women, who are in what is supposed to be a protected stage of life," she says.

For these groups, Dharod says, food insecurity is associated with a higher intake of sugar-sweetened beverages and meat, and a low intake of nutrient-dense foods such as fruits and vegetables.

That diet walks hand in hand with health issues.

In a recent study of refugees from Bhutan, Somalia, and Sudan, Dharod found extreme rates of chronic diseases like hypertension, diabetes, and high cholesterol.

She pinpointed two causes: First, because of food shortages prior to their journey to the United States, refugees enter their new home with skyrocketing stress levels and a nutritional imbalance. These challenges are only exacerbated by what Dharod calls tremendous access to high-fat, high-sugar foods. "Foods that were previously limited are now cheaper. Here, a bottle of soda is less than a bag of oranges," she says. "They feel like with limited money, they can buy what was once, in their countries of origin, a luxury item. They aren't used to comparing nutritional labels."

Similarly, Dharod has found that food insecurity and obesity coexist among low-income women. "To prevent hunger for themselves and their children, low-income women frequently rely on cheaper food options that are generally high in calories, saturated fat, and sugar,"



HIDDEN COSTS In a study of Liberian refugee and immigrant families, Dharod (left) discovered that refugees experiencing food insecurity actually spent more money on food than their food-secure counterparts. Ability to drive was a major factor — those without a license spent 40 percent more on food.

explains Dharod. "And many are living under high stress, which in turn might increase an appetite for comfort food."

Despite government support, these difficulties also persist among pregnant women. Dharod recently completed a study on food insecurity and pregnancy outcomes with the Guilford County Department of Public Health's Women, Infants, and Children (WIC) Program. After interviewing nearly 200 pregnant women on WIC, she found that 51 percent struggled with food insecurity.

Dharod found that depression during pregnancy is significantly higher among food-insecure women. Currently, she is working with Cone Pediatrics to investigate how food insecurity affects breastfeeding initiation and other infant-feeding practices.

The majority of the women interviewed were obese or overweight prior to becoming pregnant, and an even larger majority experienced unhealthy levels of weight gain during their pregnancies. Because weight gain during pregnancy is a significant predictor of both postpartum weight retention and childhood obesity, says Dharod, pregnancy is a crucial time for interventions related to food insecurity. "We have the potential to avert two generations of obesity."

Dharod's research findings are making waves at home. Local

nonprofits and resettlement agencies have learned the importance of extending their training to include food-related issues. A Guilford College program with ties to UNCG's Center for New North Carolinians began delivering fruits and vegetables grown on campus to refugee neighborhoods. And NC A&T opened its farm for refugees to harvest vegetables. "These women come from farming backgrounds, so they were thrilled to have the opportunity," Dharod says.

Dharod's team also implemented a farmers market at a local WIC office. The project, which won the Catawba County Government Team Award, increased fruit and vegetable consumption among surveyed WIC clients by 50 percent.

Ultimately, she says, her goal is to improve access to nutritious food and prevent poor health. Such interventions will improve health outcomes for multiple generations — and save taxpayers' money. "We can reduce health care costs through this whole process."

CONNECTING THE DOTS

LeGreco always rests somewhere between big picture and nitty gritty, a trait that gives her perfect reach to all sides. "I am the person who runs around the middle and makes sure everybody is talking to each other," she says. "I connect ideas to details so they don't die on the way there — and so we aren't constantly reinventing the wheel."

LeGreco is currently organizing a timeline that includes every step taken by researchers and organizations across Guilford County since 2010 to make a stronger food system.



PEAS IN A POD Over the last five years, LeGreco and Dr. Niesha Douglas (back row, left) have worked together to address local food security issues. Here, they visit the Mobile Oasis Farmers Market with Guilford College colleague Audrey Mangili (back row, right) and a group of volunteers and students. Over the past 10 years, LeGreco's students have spent 3,425 hours collaborating with community partners.

In 2011, LeGreco worked with Guilford County Department of Public Health epidemiologist Mark Smith and a 36-member task force from Greensboro's Warnersville community, to identify resources to improve the health of community residents. That task force's work laid the foundation for the Warnersville Urban Garden, which has supplied more than 2,500 pounds of food directly to the community, to local nonprofits such as Share the Harvest and Greensboro Urban Ministry, and to the Mobile Oasis Farmers Market.

Her timeline includes projects such as Kitchen Connects GSO and the Mobile Oasis Farmers Market, which are only successful if they meet the needs of the citizens they're designed to serve. To identify immediate impacts, researchers can survey people who use these programs. "But you also have to look at the bigger picture," LeGreco says. "Sometimes it takes a long time to get from idea to implementation to impact, so we need to look at what else is going on in the food system while these programs are being developed. We need to ask if we are making the right recommendations as we move along."

To that end, LeGreco is partnering with other UNCG faculty in areas such as kinesiology, nutrition, and sociology — and community stakeholders such as local hospitals and health agencies — to develop common goals and research tools that help communities track and monitor healthy eating, physical activity, and local food systems and determine when projects are successful.

"At the basic level, we as communities need to work to ensure everybody has access to food, water, and shelter," LeGreco asserts. "Greensboro does a lot of economic development by attracting new people and companies to come here. We talk about our diversity, and how we are a great home to immigrants and refugees."

But when Greensboro also appears on a list of communities with high food insecurity, it shows that people still struggle. "We have to take care of each other once we are here," LeGreco says.

"No matter if you were born in the U.S. or not, and no matter your economic and cultural background, we really have to walk the walk when it comes to making sure this is a good place to live and raise our families."

By Robin Sutton Anders • Photography by Mike Dickens • Learn more at <http://go.uncg.edu/legreco> & <http://go.uncg.edu/dharod>



CULTIVATING ENTREPRENEURSHIP Amy Peddie of Fermentology Foods shreds cabbage in Out of the Garden Project's shared-use kitchen. Costs and regulations can make it challenging for small business owners to prepare food for sale. Shared-use kitchens help startups like Fermentology Foods take off.

A UNIVERSITY-WIDE APPROACH

Across departments and disciplines, faculty at UNCG are partnering with community stakeholders to solve challenges around food. These researchers don't develop solutions *for* the community. They work *with* the community to identify problems and design solutions together. Below are just a few of the initiatives that UNCG supports.

KITCHEN CONNECTS GSO

Turning a garden full of cucumbers into a grocery store shelf stocked with pickles may seem like a pipe dream for an entrepreneurial gardener, but that's the kind of idea brought to fruition through the Kitchen Connects GSO program, a collaboration among the Greensboro Farmers Curb Market, the nonprofit Out of the Garden Project, and Guilford County Cooperative Extension. Stephen Sills, an associate professor of sociology who directs UNCG's Center for Housing and Community Studies, and LeGreco are partnering to collect data about the shared-use kitchen project to track its impact for the project funders, the City of Greensboro and the U.S. Department of Agriculture.

COTTAGE GROVE BUILD HEALTH CHALLENGE 2.0

Dr. Sills is also working on food security issues with Greensboro's Cottage Grove neighborhood. With community, agency, nonprofit, and university partners, the neighborhood is combatting widespread health problems such as diabetes and asthma. "Many of these health issues are preventable or treatable with changes in environmental conditions and access to nutritious food, safe places to be active, and healthy housing," says Sills. The Center for Housing and Community Studies is serving as the independent evaluator and data consultant on the project.

MONTAGNARD HYPERTENSION RESEARCH PROJECT

When leaders from Greensboro's Montagnard refugee community asked area higher education institutions to partner with them to address widespread hypertension and other chronic health conditions, Dr. Sharon Morrison and Dr. Sudha Shreeniwas developed the Montagnard Hypertension Research Project. The associate professors from the Department of Public Health Education and the Department of Human Development and Family Studies are leading an interdisciplinary team that examines a variety of factors contributing to the community's health, including food insecurity.

PROJECT GREEN LEAF

Anthropology professor Susan Andreatta developed Project Green Leaf over fifteen years ago as a way to strengthen ties between small-scale farmers and consumers. Over the years, project participants have worked to support the local food system and local agriculture with strategies that include direct marketing and educational and outreach programs. Students also get a chance to get their hands dirty and practice what they've learned in UNCG's Campus Gardens, which Dr. Andreatta co-directs.

(((BUZZ))) WORTHY

Social Insect Lab researchers tackle sticky problems

DOZENS OF YOUNG HONEY BEES swirled and buzzed through the air on the warm, late June day. The two undergraduates, though, weren't sure how to proceed. Collecting bees for research purposes isn't covered in most classes.

UNCG's Sara Rubio Correa and Erin Estes, a Northern Michigan University ecology and mathematics major visiting UNCG for the summer Math-Bio Research Experience for Undergraduates program, asked Professor of Biology Olav Rueppell for help. Dr. Rueppell, who runs UNCG's Social Insect Lab, was happy to demonstrate.

He eschewed the beekeeper's hood and other protective gear and seemed oblivious to the dozens of bees swirling around him. Young bees like this, it turns out, rarely sting.



This year, the Rueppell lab won a \$999,000 U.S. Department of Agriculture grant to continue its varroa mite research. They'll collaborate with three other universities, extension specialists, and beekeepers in North Carolina and Minnesota to test their innovations and share lessons learned. The ultimate goal is to help the honey bee industry nationally and globally.



HIVE OF ACTIVITY From left to right: Wagoner, Rueppell, and undergraduate researcher Christopher Reid work with honey bee brood (eggs, larvae, and pupae) to test for hygienic behavior. Master's student Taylor Reams examines a worker bee under a stereomicroscope. Postdoctoral researcher Esmaeil Amiri discusses a molecular test for immunity with an undergraduate.

Removing a frame of honeycomb from the hive, he gently knocked some of the bees into a plastic funnel. They fell through the funnel into clear plastic cups — the kind you might otherwise use for an iced latte on a day like this.

The two students observed from several feet away.

He moved briskly, and in less than five minutes had collected several cups of bees for the two students to take back to the lab.

The bees were headed inside to be sedated and then studied — all part of PhD student Shilpi Bhatia's research to better understand if some strains of honey bees are more virus-resistant than others.

The virus resistance project is one of several studies underway in Rueppell's lab, where he and more than a dozen undergraduate and graduate students are working to better understand how honey bee genetics, behavior, and health fit together. That research could lead to ways to strengthen the health of honey bees, which are critical for our food supply.

A HIVE OF RESEARCH

The lab is quiet — no buzzing here — but still busy. An undergraduate, biology major Saman Baral, is entering data into a spreadsheet about the survival rates of different groups of bees from Bhatia's research.

A few feet away at a lab bench, doctoral candidate Carlos Vega Melendez is showing another undergraduate, biology major Kevin Le, how to measure the size of honey bee eggs photographed through a microscope. Vega Melendez's own research looks at how gene expression changes in bees when they're exposed to stress at different stages in their egg-larva-pupa-adult life cycle.

In this case, they're stressed by exposing them to higher-than-normal temperatures — about 113 degrees Fahrenheit.

"We saw very subtle differences in gene expression," says Vega Melendez, who's been working with Rueppell for four years and plans to finish his PhD by December 2018. "Some intriguing genes were overexpressed in the stressed bees," adds Rueppell.

That in turn leads to other questions: Are stressed bees

more or less vulnerable to disease? Does their behavior change, and if so, does it do so in ways that are helpful or harmful to the overall health of the colony?

The work in Rueppell's lab follows two rails of research.

First, he wants to better understand fundamental biological problems, such as how genes influence behavior. Honey bees, which are social insects, had their genome fully sequenced more than 10 years ago, and so are a good organism for this kind of research. The insights gained can be translated to other organisms, from ants to human beings.

Second, Rueppell believes that by better understanding how genetics and the environment interact in honey bees, he and other researchers may be able to help beekeepers keep their hives healthier, and therefore help us all.

Humans have worked with bees for centuries, harvesting honey and beeswax. But in the last decade or so, bee populations have declined markedly. Colony collapse disorder, where most worker bees disappear from a hive and leave the queen to fend for herself, is just one well known but poorly understood cause.

"Colony collapse disorder is sort of the tip of the iceberg," Rueppell says. He ticks off a range of other problems: less diverse food sources, pesticides, diseases and mites, and lifestyle-related stress.

Lifestyle-related stress? For insects? We'll get back to that.

A STICKY PROBLEM

Rueppell and his students aren't the only ones concerned about bee health. Beekeepers typically lose 20 to 40 percent of their bees each year — millions of bees for a single commercial beekeeper.

These losses threaten their business model and our food supply. That's because honey bees do a lot more than just make honey. In fact, making honey is just a nice side benefit of their arguably more important function: pollinating billions of dollars of produce each year.

"There are thousands of wild bees in the U.S. as well, and their value is quite important," Rueppell says. "But in the agricultural landscape that we have modified so extensively,

most of these wild pollinators can't survive. We have to rely on the honey bee for at least a good part of the pollination services."

Go into the produce section of a grocery store and look around; without honey bees, many of the fruits and vegetables you see simply wouldn't be there. By some estimates, honey bees add about \$15 billion in value to U.S. food production each year.

Commercial beekeepers, who can own thousands of hives, transport hives across the country to farms to pollinate crops such as broccoli, peppers, and almond groves each year.

This brings us to the matter of bee lifestyle.

"The commercial bees get shipped all over the place in trucks," Rueppell says. "They are usually kept in very high density conditions, where 20 or 30 bee colonies are right next to each other.

"If you think about the naturally evolved context, they lived in tree cavities and the next colony was a mile away."

Imagine how you'd feel if you grew up in a small, rural town where you knew everyone, and then you were relocated to New York City and forced to live in a crowded, noisy high-rise. You'd be stressed, too. Bees, however, can't take yoga classes.

In addition, their agriculture use means that many bee hives get most of their nutrition from a single crop or a small number of crops, rather than the diversity of plants they'd encounter in the wild. And they can be exposed to pesticides. It's tough to be a honey bee these days.

"These beekeepers are doing a fantastic business in trying to restart, split their colonies, and manage as well as



they can," Rueppell says. "But they're running out of tools. We need easy, long-term, sustainable solutions for improving honey bee health."

CLEANING UP MITES

Work in Rueppell's lab by PhD-candidate-turned-postdoc Kaira Wagoner may turn into one of those tools. To understand Wagoner's research, you must understand one of the biggest threats honey bees face: varroa mites.

The mites, also called Varroa destructor, are tiny, rust-colored arachnids, just barely big enough to be seen with the naked eye. They prey on bee larvae, sucking their blood when the larvae are defenseless in the cells of honeycombs. Not only do varroa harm and sometimes kill bees in the larval stage, they also transmit deadly viruses.

If you can stop the varroa, you can protect bees from the mites and from the diseases they carry. Some treatments, such as pesticides, can potentially hurt bees. Wagoner discovered something that may be much better.

For her doctoral dissertation, she studied bee hygienic behavior. Worker bees sometimes open honeycomb cells that contain larvae and, if they find mites, remove the parasitized larvae, leaving healthy ones to continue growing. This behavior gives bees a way to police their own hives against varroa.

But how do bees know when to do this?

Wagoner identified a chemical signal — a biochemical alarm that triggers bees to start the hygienic behavior. If further studies prove out, it may provide beekeepers a simple way to treat hives they suspect have varroa infestations. Simply spray the chemical in the hive, and the worker bees will be triggered into hygienic behaviors, eliminating varroa mites themselves.

Researchers may also use the insights gained by the Rueppell lab to breed healthier bees that are more responsive to the chemical alarm.

TO BREED BETTER BEES

Humans have been breeding bees for probably centuries.

“Even looking at today’s bees, we can see the impact of selection,” Rueppell says. “Beekeepers want docile bees that produce lots of honey.”

But some of those breeding decisions may have had unintended consequences for bee health. Take the push for honey, for example. Modern honey bees have been selected in part to maximize how much honey they produce. Since they produce more honey, that means they gather less of a substance called propolis, Rueppell says.

Propolis is a sticky, resin-like substance bees collect from plants. They use it to seal off cracks in their hives. But because it’s sticky and gooey, it tends to get all over beekeeping equipment and make it tougher for keepers to maintain their hives. But, Rueppell says, research shows that propolis has antimicrobial properties and helps keep bee colonies healthy.

“So maybe we have to breed that back into the bees,” Rueppell says.

The idea that we can breed stronger, healthier bees is an important one that Rueppell and his students are approaching from multiple angles. The mapping of the honey bee genome allows them and other bee researchers to look at bee traits in a very precise way.

Another tactic that’s getting a lot of attention is breeding bees that are more disease resistant. Bhatia’s research could provide insight on that.

The bees that undergrads Rubio Correa and Estes were collecting were one of several distinct strains from across the

country that grad student Bhatia is deliberately infecting with two major honey bee viruses: Israeli Acute Paralysis Virus and Deformed Wing Virus. The first has been linked to colony collapse disorder. The second is one of the diseases spread by varroa mites.

Everybody in Rueppell’s group hopes that what they learn can help improve honey bee breeding for sustainable apiculture.

Understanding genetic differences around things like disease resistance or likelihood to engage in hygienic behaviors is just the beginning of this research. Making it commercially applicable produces its own challenges, Rueppell says.

“At the moment, the selection scheme for making hygienic bees is very labor intensive,” he says. “It involves liquid nitrogen.”

That’s where Rueppell and the young scientists he’s educating in his lab come in.

“There’s a lot of talk about breeding healthy honey bees at the moment and increasing their natural defenses through selective breeding,” Rueppell says. “But you have to understand the genetic architecture and the constraints that the system has for breeding. There’s a lot you need to know to be successful in creating those breeding programs.”

The students and researchers in Rueppell’s lab, from undergraduates to postdocs, all have a role to play — a bit like honey bees in a hive. Many of them — perhaps most of them —

will go on to something besides honey bees. But before they do, they will have learned some science and contributed a bit of new knowledge to what we know about honey bees.

And they will take with them new skills and valuable experience, no matter where they go when they fly off to the next stop in their careers.

“I learned how to design and conduct a research project from beginning to end,” says undergrad Rubio Correa of her summer in Rueppell’s lab. “I now have an understanding of what a researcher does.”

She also discovered that, regardless of what your seasoned bee-researcher professor does, you don’t have to follow his example when it comes to protective clothing while working with bees.

“Fear only came along when bees were old enough to fly and could sting,” she says. “As long as I had the proper clothing, my fear would dissipate.”

By Mark Toszczak • Photography by Martin W. Kane
 Learn more at <https://biology.uncg.edu/people/olav-rueppell>



BEES' NEEDS Clockwise from top: Rueppell, Baral (center), and undergraduate researcher Taylor Pritchard (right) assess a queen bee’s egg-laying pattern as part of a study of virus resistance in bees. A researcher collects a queen for closer investigation. Bhatia measures virus levels in an infected bee.



SUMMER OF SCIENCE In addition to mentoring UNCG students in his lab, Rueppell also serves as co-principal investigator, with Mathematics Professor Jan Rychtář, on the National Science Foundation-funded Math-Bio Research Experience for Undergraduates. Hundreds of students across the country apply to participate in the selective, interdisciplinary summer program at UNCG that gives undergraduates hands-on research experience and the opportunity to help solve scientific problems at the intersection of biology and mathematics.

“There are two models of how we, as a society, solve problems,” says Rueppell. “One is a garden hose approach. When there’s a fire, we call for the hose — targeted research — to try to put it out. The other is the reservoir approach, where we accumulate knowledge into a reservoir. We can dip into that pool whenever a fire breaks out. For me personally, most of my basic research has given me scientific tools and ways of thinking. That put me into a position to contribute to the applied problem of declining honey bee health.”

DEVELOPING KNOWLEDGE Top: Master’s student Anissa Kennedy presents findings at a lab meeting. Bottom: A researcher extracts a honey bee pupa from its cell to investigate chemicals on its exterior that might trigger hygienic behavior.



U.N. necessary

The United Nations was chartered in 1945, following the end of World War II. The organization is often depicted as an attempt to make right the shortcomings of Woodrow Wilson's League of Nations. The league, created following World War I, had failed in its mission to prevent war through collective security and to resolve disputes between states through negotiation and arbitration.

But was the U.N. really a new idea?

Jerry Pubantz, professor of political science and an authority on the United Nations, holds that the roots of the U.N. can be traced to the late 18th century.

"The U.N. is an evolutionary outcome of a process that began in the Enlightenment," says Dr. Pubantz. He and longtime collaborator John Moore, a professor of diplomatic history at California State Polytechnic University, have produced several books on the U.N. Their latest is a significantly updated second edition, "The New United Nations: International Organization in the Twenty-First Century."

In 1795, the German philosopher Immanuel Kant published a slim volume titled "Perpetual Peace." That book, Pubantz says, lays out Kant's "formula for decreasing the number of wars and moving toward a peaceful world."

Crucial to Kant's vision are states governed as self-determining democracies; hospitality, which translates to this era's broad economic intercourse; and the need to confederate to solve problems.

Pubantz calls the U.N. "a sort of neo-Kantian institution" that seeks to realize the plan Kant laid out more than 200 years ago. "There isn't a book I've written that doesn't mention Kant."

The U.N., he explains, is more than just a global body for negotiations among its 193 member states. He describes it as "a far more democratic entity" where non-governmental organizations, corporations, states, and individuals wrestle with issues "that weren't even noted when the U.N.



charter was drafted 75 years ago."

Prominently missing from the U.N. charter is the term "peacekeeping." Yet that function has become a vital U.N. mission. The U.N. currently has around 100,000 peacekeepers serving in 15 missions, but only about 3,000 U.S. troops serve as peacekeepers wearing the U.N.'s signature blue helmets.

Though the U.N. headquarters are in New York, the organization is absent from the daily lives of most Americans, Pubantz says. That's not so in developing nations and hotspots such as Haiti, the Democratic Republic of the Congo, Kosovo, and Syria. Large segments of the world's population see blue-helmeted peacekeepers or are served by U.N. agencies every day.

Now, as in 1945, Pubantz says, "The U.N. seeks to foster world peace despite the existence of national sovereignty. It's very hard, as George W. Bush found, to operate in the world and succeed without turning to the U.N. at various points."

The U.N. is rather unpopular with Americans these days, continuing a trend that began during the Reagan era. But it wasn't always so.

"It's ironic because it was an American creation, founded in large part by the U.S. State Department and promoted by the Roosevelt administration," says Pubantz. "Its headquarters are in our country for that reason."

In researching a book examining U.S. presidents and the U.N., Pubantz read all of Harry S. Truman's 1948 stump speeches. "He began each one by touting how great the U.N. was, and how we needed to make it work. Can you imagine an American candidate doing that today?"

By Tom Lassiter • U.N. photography from "The New United Nations: International Organization in the Twenty-First Century," courtesy of Jerry Pubantz. Inset photography by Mike Dickens. • Learn more at <https://psc.uncg.edu/people/pubantz>

FEEDING EQUALITY

The right to breastfeed isn't only about feeding babies. It's also about reproductive rights, gender equality, and social justice.

"We want mothers to be able to work and we want them to be able to participate fully in public life," says Paige Hall Smith, professor of public health education and director of UNCG's Center for Women's Health and Wellness. "Being able to feed your child the way you want is part of that."

Dr. Smith is a trailblazer in scholarly activity concerning the sociocultural, economic, health, and political contexts that influence women's ability to breastfeed. For 12 years she has organized the Breastfeeding and Feminism International Conference, or BFIC. It's one of the main breastfeeding conferences in the United States, and the only one focused around social justice, women's rights, and structural systems that either inhibit or encourage breastfeeding.

This year, the fourth volume of essays from conference participants, "Breastfeeding, Social Justice, and Equity," was published by Praeclarus Press. Smith edited the volume with Dr. Miriam Labbok, then director of the Carolina Global Breastfeeding Institute at UNC Chapel Hill and BFIC co-organizer, and UNCG doctoral student Brittany Chambers.

Essay topics are diverse and far-reaching, including discussions of emergency global situations where breastfeeding support determines the survival of infants, and conversations about chronically vulnerable populations in the United States.

"There's still a lot of disparity in breastfeeding by race, by social class, by education, by income across communities," says Smith. "Women who are able to control their life, their space, and their time are much more likely to breastfeed and breastfeed for longer."

Much of the research in the book focuses on the workplace and structural changes necessary to support breastfeeding. Smith and her colleagues have found that most contemporary work environments, both in the U.S. and globally, are not prepared to fully support breastfeeding.

"We continue to have gender expectations and norms that reinforce women as the primary caregivers of children and men as the main economic providers. And we create social structures to buttress these gender roles," Smith says.

"Bringing babies and breastfeeding into the workplace is a real challenge to our expectations for motherhood and for employees. It challenges both the way we believe work and family should be separated, and what we believe men and women should be doing."

Since its first incarnation in 2005, the conference has grown significantly. Participants, who have come from 30 countries, include top researchers, policy makers, health care workers, and parent support program advocates. Through a scholarship program, conference organizers bring in voices that might not otherwise be heard, including some of the international participants.

Today, Smith says, as more people become aware of the concerns of breastfeeding families, there is growing support for breastfeeding in health care, in communities, in emergency situations, and in workplaces.

"There's more and more discussion around breastfeeding and social justice," Smith observes. "And I think we've been instrumental in helping to shape the conversation at the national and global level."

*By Susan Kirby-Smith • Photography by Mike Dickens
Learn more at <https://hhs.uncg.edu/wordpress/cwhw>*



"We're identifying the social and economic inequities that affect infant feeding practices and experiences," says Smith. "And we're developing strategies to respond to them."



Lessons from a lesser-known Christianity

Derek Krueger, professor of religious studies, often shakes up his class on Christianity in Byzantium with this view: “The Bible doesn’t come down from heaven pristine and complete, shrink-wrapped in plastic.”

The reaction from students, many raised in the Bible Belt, usually goes one of two ways. Those with a rebellious streak, he says, “are eager to destabilize the authority of the Christianity they grew up with.” On the other hand, some students are threatened by the different viewpoint.

For the past 25 years, Dr. Krueger’s scholarship on Christian culture in the Eastern Mediterranean in the Middle Ages has enriched — and at times veered from — traditional Western views of the religion. In his latest contribution, “The New Testament in Byzantium,” he has co-edited a series of essays exploring the transmission and reception of the Bible in the medieval Greek-speaking world, in the region around Constantinople — today’s Istanbul, Turkey.

Mostly illiterate, Byzantine worshippers from the 5th through 12th centuries C.E. learned about the New Testament through prayers, songs, chants, and lengthy, melodious sermons — led by clergy who interpreted and embellished Bible stories. Such an oral and visual tradition is less familiar to worshippers today who generally embrace the Bible as a text and buckle down on Sunday mornings for an hour of Scripture reading and preaching, with the occasional hymn.

“In Byzantium, the Bible came alive not just in the reading,” Krueger says. “The authority wasn’t so much in the words themselves but in the way in which the stories were interpreted. Most people in the Middle Ages didn’t cite the Bible verses to fight about this-or-that social issue. They tended to engage with the Bible in a way that was part of their broader imagination about the way the world worked.”

SCRIPTURE SCHOLAR Krueger, the Joe Rosenthal Excellence Professor in UNCG’s Department of Religious Studies, is the recipient of prestigious fellowships from the Institute for Advanced Study, the Israel Institute for Advanced Studies, and the European Institutes for Advanced Study.

The book emerged from a 2014 conference of Byzantine studies scholars at the Dumbarton Oaks Research Library and Collection in Washington, D.C. Among them was Robert S. Nelson, the professor of art history at Yale University who co-edited the volume with Krueger.

Krueger also contributed one of the book’s essays, exploring how clergy quoted Scripture in teachings about the lives of saints. “The vast majority of quotations are from the words of Jesus and the Gospels, usually the version that’s in Matthew and sometimes the letters of Paul,” Krueger explains. “The more learned an author expected his audience to be, the more esoteric the quotations would get.”

The finding, he says, advances understanding of a largely ignored Christian culture. “We can start talking about who was consuming biblical knowledge and what levels of biblical knowledge different people in different levels of society were expected to have.”

It also rolls over into the classroom.

“Part of being able to teach the history of Christianity starts with scholars doing this type of spade work,” he says. “We’re looking at Christianity differently and trying to tell a broader and more diverse story about it.”

By Chris Burritt • Photography by Mike Dickens
Learn more at <https://rel.uncg.edu/faculty/krueger>

CHAMPIONS IN LIFE

As a field hockey goalkeeper in college, Dr. Erin Reifsteck was no stranger to long hours in the gym. But, after graduation, she found it difficult to keep up the regimen.

“My college athletic experience was a big part of my identity, and that transition out was challenging,” says the assistant professor of kinesiology. “You lose part of who you are. I wondered if others faced similar problems.”

Being a physically fit college athlete doesn’t mean someone automatically knows how to become a healthy adult. Many struggle to find the right path.

“They know how to intensely train, but in many cases, they don’t know as much about maintaining a healthy lifestyle,” explains Reifsteck.

Recent studies indicate college athletes may be at risk for developing a range of chronic health problems once they stop competing, she says. “Coupling regular physical activity with healthy eating is key to preventing this.”

The two-time Academic All-American and Northeast Conference Scholar Athlete of the Year began her investigation into the issue as a graduate student at UNCG. Reifsteck wanted to know what motivates student-athletes to stay active after college and how they view themselves post-graduation. By surveying former student-athletes, she developed a theoretical model for how identity and motivation impact health behaviors.

Enter the “Moving On!” program. Reifsteck launched the initiative as a postdoctoral fellow at the UNCG Institute to Promote Athlete Health and Wellness, collaborating with UNCG Associate Professor of Nutrition Lenka Shriver and Salem College Associate Professor of Exercise Science DeAnne Brooks. The program helps former college athletes transition to healthy post-college lifestyles.

The three researchers are all former Division I student-athletes. “It has a personal connection for us,” explains Reifsteck.

With funding from the National Collegiate Athletic Association, they

designed four, 90-minute, weekly sessions that introduce participants to lifelong exercise options, as well as smart food choices. The program, which includes facilitator and participant workbooks and a website with instructional videos, helps student-athletes create a positive post-competition identity and set realistic goals for designing and managing their new lifestyle.

Reifsteck tested “Moving On!” with Division I and III student-athletes. Participants reported improved knowledge about physical activity and nutrition, and feeling better prepared for a healthy transition out of college.

In October, Reifsteck received the Association for Applied Sport Psychology’s Distinguished Applied Contribution Award for her work. Other schools are now adapting “Moving On!” for their student-athletes.

Currently, Reifsteck is continuing this line of research by following a cohort of college athletes through their final competition season, and then post-season until graduation. Students will wear accelerometers, report on their nutrition and physical activity, complete fitness testing, and have their blood drawn periodically.

The goal, she says, is to assess early changes in fitness and cardiometabolic disease risk as participants move on from university athletics, and to continue to develop evidence-based strategies that motivate this group to stay healthy.

“Obviously, their lifestyle will shift,” she says. “We want to help them learn how to keep moving, stay active, and eat healthfully without the constant supervision and structure of college athletics.”

It’s a forward-thinking approach. “Here at UNCG, we say we’re developing champions in life. To do this, we must care about what happens to student-athletes after they graduate. We need to provide resources and services that promote their long-term health and well-being.”

By Whitney J. Palmer • Photography by Mike Dickens
Learn more at <https://go.uncg.edu/erinreifsteck>



SPARTAN LIFESTYLE She may be new faculty, but she’s not new to campus. Reifsteck completed a master’s and doctorate in kinesiology, a doctoral minor in educational research methodology, a graduate certificate in women’s and gender studies, and a postdoctoral fellowship — all at UNCG.



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AREAS OF DISTINCTION As we celebrate our 125th anniversary, UNCG also looks to the future with the establishment of a Millennial Campus along Tate Street and West Gate City Boulevard. The two Millennial Campus districts — one focused on health and wellness, the other on visual and performing arts — will partner with private-sector entities to fuel economic growth, innovation, and job creation, transforming our university and the city beyond. <https://newsandfeatures.uncg.edu/giant-steps-millennial-campus>

