RIPPLE EFFECT
Step into the world of science. And transform it.
pg. 22
Innovation. Ask 15 experts about it – like the “Idea to Value” blog did in 2016 – and you’ll get 15 different definitions. But there are some common elements. Across multiple fields, innovation involves creativity, a new idea, addressing a real challenge, and creating value. It’s an application of better solutions that results in new ways of thinking or doing.

According to Stephen Johnson, author of “Where Good Ideas Come From,” innovation and evolution thrive in networks, within shared physical and intellectual spaces. These creative collisions and connections facilitate ideas.

That’s why innovation thrives at UNC Greensboro.

One area of fertile ground is that space where students and faculty learn from each other – where the magic occurs between mentor and mentee and discovery happens. Minerva Lithium, which you’ll learn about in our “It’s a Go” feature, took root there.

Another is in the efforts of our entrepreneurial LaunchUNCG team, who empower our researchers to develop discoveries with the potential to change our world, by offering them access to innovative networks, industry feedback and partners, seed funding, and much more.

As you would expect, many examples spring from our Bryan School of Business and Economics, celebrating its 50th anniversary this year. You’ll find two stories about the Bryan School’s stellar researchers within this issue.

Innovation is about broadening our way of thinking, on campus and off.

It’s when we take a devastating disease like Alzheimer’s and look for a new approach, like physical exercise, to keep memory loss at bay.

It’s when we harness the relationship between athlete and coach to fight concussions and enhance the long-term health of athletes.

It’s when we take a devastating disease like Alzheimer’s and look for a new approach, like physical exercise, to keep memory loss at bay.

In this issue:

TERRI L. SHELTON, PH.D.
Vice Chancellor for Research and Engagement
DOES YOUR PREMIUM PAY OFF?

When you’re paying an insurance premium, the question “Does my health insurance actually make me healthier?” might be more esoteric than genuine curiosity.

But for Assistant Professor of Economics Martin Andersen this question fuels a unique set of research questions at the nexus of health insurance and health.

WHAT THE DOCTOR ORDERED

The National Institute of Diabetes awarded Dr. Andersen $275,000 to study prescription drug utilization and health outcomes, as they relate to diabetes, urinary tract infections, and pneumonia.

He’s exploring the effects of utilization management – restrictions that insurance companies can place on medications, treatments, and procedures – on beneficiaries’ health outcomes.

HTIs and pneumonia are quite common for Medicare subscribers – and require medications if not treated promptly. While many older patients are able to see doctors regularly and most have contracts with preferred providers, they’re still vulnerable to chronic conditions.

Andersen’s research set to explore the effects of prescription drug utilization management.

PROOF OF CONCEPT

American farmers have faced a historic challenge: finding ways to make their crops more resistant to diseases, such as corn rust. In his research, Andersen is exploring the potential of utilizing genetically modified organisms (GMOs) to create crops that are resistant to these diseases.

RECOVERING INVESTMENT BANKER

Andersen’s passion for the recovery of historic sites began in his previous life as an investment banker. He covered pharmaceutical companies, sparking his interest in the economics of the drug and health care industries. To delve into the big questions he saw facing health care, he decided to pursue graduate studies in public health and health policy.

In 2017 the U.S. spent $3.5 trillion on health care, or 18% of the national economy. “There’s no prospect of this number going down in the near future. So my fundamental question is: Are we getting value – longer, better, healthier, happier lives – as a result of that spending?”

“My hope is my research will help decision makers understand that health insurance is not a luxury. It can genuinely affect people’s lives for the better – making them healthier and more financially secure.”

By Susan Poulson

Learn more at go.unca.edu/andersen

In 2017 the U.S. spent $3.5 trillion on health care, or 18% of the national economy. “There’s no prospect of this number going down in the near future. So my fundamental question is: Are we getting value – longer, better, healthier, happier lives – as a result of that spending?”

“My hope is my research will help decision makers understand that health insurance is not a luxury. It can genuinely affect people’s lives for the better – making them healthier and more financially secure.”

By Susan Poulson

Learn more at go.unca.edu/andersen
CAREGIVER SUPPORT Washington and facilitator Lisa Taylor (l-r, standing below) meet with a group of kinship caregivers. Kinship care groups like this — offered by Family Solutions, Guilford Child Development, Senior Resources of Guilford County, and Aging, Disability, and Transit Services of Rockingham County — are one way the project is recruiting participants.

African American Kinship Care

There is a long history of informal kinship care in African American communities, Washington says. “Kinship care happens for all races and ethnicities, but it’s highest for African Americans. This is something African Americans have been doing since the time of slavery.”

During the Great Migration, for example, millions of African Americans left the rural South to escape racial and economic oppression. They sometimes left children in the care of relatives while seeking jobs and establishing themselves in new communities. A common situation might involve a young parent who leaves a child in the care of grandparents to go to college. Other children end up in informal kinship care when parents die, are incarcerated, or suffer from substance use or mental health disorders.

When Dr. Tyreasa Washington was a practicing social worker, she dealt with many children who didn’t live with their parents.

Sometimes they had been placed by the state into traditional foster care. Sometimes they were living with a relative or perhaps a godparent who had a family connection; an arrangement called “kinship care” that is more common than traditional foster care. Children in kinship care, Washington noticed, bounced between foster homes less often, had more stable lives and generally better prospects — though they still face challenges that other children don’t.

Now, as an associate professor of social work, Washington is studying kinship care among African American families. There’s already plenty of research that details the challenges, obstacles, and poor outcomes kinship care kids face. However, children in kinship care arrangements still tend to do better than kids in traditional foster care. Washington wants to understand why.

“We’ve taken more of a positive approach,” Washington says. “What are the families doing well? What are the strengths and resources in these families that contribute to children’s social competence, academic competence, and better behavioral health?”

Washington has won a $445,000 National Institutes of Health grant to study approximately 200 African American children in kinship care, to tease out what factors contribute to better outcomes for these children.

She and her research team will recruit families through social services agencies in Guilford and Rockingham counties, as well as at events and through online channels. She will survey them to collect quantitative data and then follow up with in-depth interviews to dig into their experiences.

Earlier pilot studies Washington conducted indicated that the involvement of birth parents improves outcomes for kids. The new study should shed light on what that birth parent involvement actually looks like and how caregivers manage it.

The results could be helpful for social workers, teachers, and others who work with kids in kinship care, as well as to caregivers themselves.

“We want service providers to get the information,” Washington says. “We want families to have the information.”

“Especially since we’re focusing on informal as well as formal kinship care, she’s turning a lens on a population that has previously been invisible,” says Hannah Kaye, a graduate of the UNC-GC A&T Joint Master of Social Work program, who will be project coordinator for the study.

Kaye conducted research with Washington as a graduate student and is interested in eventually pursuing a Ph.D. The research should also lead to more insights on how caregivers who provide kinship care could be better supported. “North Carolina is one of the states that does not pay kinship caregivers, unless they become a licensed foster parent, and that’s very challenging,” Washington says.

“We’re asking a family that’s already most likely marginalized and struggling to now take on other responsibilities, which causes challenges in the family. It has a lot of policy implications.”

By Mark Tosczak • Learn more at hhs.uncg.edu/swk

By Dr. Tyreasa Washington and her co-investigators — Dr. Sonya Leathers from the University of Illinois at Chicago and Dr. Stephanie Irby Coard in UNCG Human Development and Family Studies — are also collaborating with the Guilford and Rockingham departments of health and human services, the Black Child Development Institute, and the Children’s Home Society of North Carolina.
Tuberculosis kills more than a million people each year. The World Health Organization says it’s the leading cause of death from a single infectious agent — more deadly than HIV/AIDS.

One reason TB is so dangerous is that, out of the 10 million or so infections that arise each year, roughly 900,000 are from drug-resistant Mycobacterium tuberculosis – bacteria immune to physicians’ first, and sometimes second, choice of antibiotics.

M. tuberculosis’ ability to mutate and evolve drug resistance is poorly understood. It’s a problem that naturally interests Dr. Eric Josephs, whose research centers on mutation.

Most organisms use an ancient molecular proofreading mechanism called DNA mismatch repair. As strands of DNA are replicated in the process of cell generation, mismatch repair reads each new string and, if it finds mistakes, fixes them.

“Almost every organism on the planet has the same proofreading mechanism, except for bacteria related to tuberculosis,” says Josephs, an assistant professor at the Joint School of Nanoscience and Nanotechnology. “They appear to have a weird, independently-evolved proofreading mechanism suggestive of mismatch repair. But people don’t know what proteins are involved or how it works.”

Understanding that mechanism, and what turns it off and allows drug resistance to evolve, could one day unlock new treatments for TB and other diseases.

As a postdoc, Josephs used nanoscale techniques to study mismatch repair and mutation. A year after arriving at UNCG, he received a $291,000 grant from the National Institute of Allergy and Infectious Diseases to apply those same techniques to TB bacteria. The R21 grant supports early stage research with potential to create transformative breakthroughs. Josephs’ mutation research has implications not only for drug-resistant TB, but also for other diseases.

“Proteins involved in mismatch repair can malfunction and cause cancers,” Josephs says. “They can also influence the onset of Huntington’s disease and a number of neuromuscular diseases.”

This year, Josephs also won a $1.7 million NIH R55 Maximizing Investigators’ Research Award, a grant designed to support outstanding researchers early in their careers. The funding will support a wide-ranging exploration of the mechanisms of mutation and mutation avoidance. Josephs hopes his work will shed further light on how diseases work and point the way to new potential treatments.

“New understanding about genetic mutation can be applied broadly to a number of different disease systems,” he says. “The work could also have other applications in biotechnology and agriculture, where the ability to engineer changes in an organism’s genetic makeup is critical.”

By Mark Tosczak • Learn more at go.uncg.edu/josephs

**WHEN REPLICATION RUNS AWRY**

*The right idea*

By Mark Tosczak

**JOGGING YOUR MEMORY**

Dr. Jennifer Etnier recently gave her 79-year-old mother a smartphone. Her mother’s memory is almost impeccable, and Etnier knew she would quickly adapt to the technology. Her father, on the other hand, is in the early stages of late-onset dementia.

One difference between the two? Exercise. Throughout her life, Etnier’s mom has maintained high levels of physical activity. By contrast, her dad was active as a younger man, but let his exercise decline in his later years.

“I started wondering if their differing exercise patterns contributed to this phenomenon,” says Etnier, now the Julia Taylor Morton Distinguished Professor in the Department of Kinesiology at UNC Greensboro. It’s that curiosity that has guided Etnier’s research since she arrived on campus in 2014, but put her ahead of the curve in her field, and led to her latest $3.4 million National Institutes of Health study.

The funding will support Etnier and her fellow researchers as they work to determine what effect exercise might have on middle-aged and older adults with a genetic risk of Alzheimer’s disease – a leading cause of death in the U.S. They hypothesize that those with a family history of dementia or Alzheimer’s disease can cognitively benefit from exercise.

“Dementia is a term used to describe cognitive declines serious enough to interfere with daily living,” says Etnier, who is a fellow of the National Academy of Kinesiology and the American College of Sports Medicine. “Alzheimer’s disease is the most common cause of dementia and is characterized by the death of neurons in the brain.”

By Mark Tosczak • Learn more at go.uncg.edu/etnier

**Tuberculosis**

***runs away***
It’s a fear woven deep in the fabric of humanity, and especially prevalent as we age: the fear of suddenly losing your ability to think and process – to remember. And the fear is valid, as the prevalence of Alzheimer’s disease – a specific form of dementia – is on the rise, with no known cure or pharmacological interventions to prevent the disease.

Etnier gets that, and her work is proving that we can do something about it. She’s already discovered that long-term physical activity is beneficial for older adults with a family history of Alzheimer’s, regardless of their genetic risk for the disease.

In 2013, Etnier and team conducted their first Physical Activity and Alzheimer’s Disease research study, or PAAD, with $394,625 from the NIH. In the original PAAD study, Etnier and her fellow researchers observed that exercise correlated with improvements in memory, with effect sizes ranging from small to large. “If you think of a test where the average grade is 70 and the standard deviation is 10, essentially we found that exercise increases your performance on that test by between 2.7 and 10.5 points,” Etnier said. “If it increased it by the largest amount, that would be like increasing your ‘grade’ by a full letter grade.”

The initial study was small – with 54 subjects – and lacked a control group for comparison, thus limiting the researchers’ ability to definitively say that changes in memory were in response to the exercise.

This time around, in PAAD2, Etnier is including a control group and also wants to find out whether or not there are genetic variables that identify people who might benefit more from exercise than others. She is looking at the apolipoprotein E, or APOE, genotype as a potential variable to determine how much one can benefit from exercise. The APOE genotype is a predictor of Alzheimer’s.

After the age of 30, cognitive decline begins even in healthy adults. But people with a genetic predisposition or family history of Alzheimer’s may be experiencing those declines at a faster rate. “We know the brain is malleable across the lifespan. Although the brain is more plastic – able to change in response to experiences – at young ages, it is still plastic even in older adults,” Etnier says. “Physical activity is important at all ages – but the benefits may be even more critical as you get older.”

Etnier and her team are now working to recruit 240 people from Guilford and surrounding counties over the next three years. Unlike other studies looking at physical activity for prevention of Alzheimer’s disease, PAAD2 focuses on a younger age group – 40- to 65-year-olds – and will utilize group exercise instead of solo exercise. Those factors help distinguish the study from any other in the country.

“If an individual is cognitively normal when they are 60-80 and have both a family history of Alzheimer’s and a genetic risk for Alzheimer’s disease, then they may have some other genes in their make-up that are giving them protection against Alzheimer’s,” Etnier says. “By targeting a younger cognitively normal group, we hope to bypass that issue.” The researchers also hope using a group exercise program will offer participants social support.

Participants undergo testing at the beginning, middle, and end of a year-long period, to measure thinking abilities, brain structure and function, and biomarkers related to Alzheimer’s disease. Half of study participants commit to an hour-long exercise program of walking and training with resistance bands three times a week for a full year, while the other half continue living their normal lives without regular exercise. Importantly, at the end of the study year, participants in the control group receive a short-term YMCA membership to encourage them to get active as well.

Executive Director David Higgee of Greensboro’s Bryan Family YMCA helped Etnier secure partnerships with YMCA’s in Alamance, Davidson, Forsyth, Guilford, Randolph, and Rockingham counties for the project’s exercise programs.

Etnier’s team has found that participating in a regular exercise program for as few as eight months is associated with improved memory performance in older adults. Among those at genetic risk for Alzheimer’s, the researchers also observed alterations in brain function.

Graduate students and postdoctoral fellows, like Jared Vance (far left) and Dr. Kyoungshin Park (third from left), run participants through various cognitive tests at the beginning, middle, and end of the year-long study. Below, Vance and Park administer one such test to a staff member (not a project participant).
PHYSICAL ACTIVITY MAY GIVE YOU THE PROTECTION YOU NEED TO STALL THE ONSET OF CLINICAL IMPAIRMENT OR TO PREVENT IT ALTOGETHER,

Etnier says. "If we can delay the onset of Alzheimer’s by five years, that’s five more years with better quality of life – that’s five more years with your children and grandchildren.”

It was a radio ad asking for PAAD2 study participants that got Ginny Ebert’s attention.

“I was excited right away,” she says. “It touched home.” Ebert’s grandmother and father have Alzheimer’s, and at 50, she’s pretty sure she’s on the way. Her mind feels like a pinball machine, she says. Things that once came easily are now more difficult, and she has trouble processing and making connections. Then she forgets what she’s trying to figure out in the first place.

Ebert graduated from UNCG in 1990 with a degree in nutrition, and throughout most of her life she was very active – swimming, running, and weightlifting. But then she took a long hiatus.

She began the PAAD2 exercise program in August, and so far, she has felt a lot better, both mentally and physically. But the thing she values most is the community she has built with the other participants.

“Getting to meet other people in a similar situation has created a supportive and positive environment,” Ebert says.

Community is just a small piece of the enormous impact Etnier’s work could have on both individuals and the future of Alzheimer’s research.

“I hope that once we finish the PAAD2 study, we can give people at risk the tools they need to potentially delay or even prevent the onset of this disease,” Etnier says. “If our expectations are realized, this could give hope to the millions of individuals who have seen a family member suffer the heart-wrenching effects of Alzheimer’s disease and who may fear the same fate because of their family history.”

By Elizabeth L. Harrison

Learn more about PAAD2 and how you and your loved ones can participate at go.uncg.edu/PAAD2.
The news from the U.S. Patent and Trademark Office came in the form of an old-fashioned letter. We have received, it said, your application for a patent on a device to measure knee laxity. That letter, says Professor Sandra Shultz, represented a monumental step.

“All the pieces are coming together,” she says. “That’s two years of work right there. If you had ever told me I was going to be doing this, I would have thought you were crazy.”

Knee laxity is a measure of motion in the human knee, critical in diagnosing joint and ligament health. Shultz, a co-director of UNCG’s Applied Neuromechanics Research Laboratory, is a scientist, more familiar with the body’s skeleton and musculature than the intricacies of product development and commercialization.

But luckily for Shultz and Professor Randy Schmitz, her collaborator and lab co-director, UNCG has people and mechanisms in place to help faculty, staff, and students navigate the labyrinth of research-based entrepreneurship. It’s called LaunchUNCG.

The goal, says LaunchUNCG Director Justin Streuli, is to provide “white-glove service to help achieve a commercially viable product.”

In 2020, that’s a broader, more nuanced concept than what once was simply called technology transfer. Today, white-glove service might mean facilitating preliminary research to confirm that a market exists for a new product. It might include aid in securing funds for product development, networking in the business world, or engineering advice.

Whatever assistance may be needed, LaunchUNCG has on-campus connections or an external network to provide it.

LaunchUNCG is a critical driver to further UNC Greensboro’s strategic goal of student, regional, and knowledge transformation, says Dr. Terri L. Shelton, vice chancellor for research and engagement. “It’s about fostering a culture of innovation and enhancing the impact of our research.”

An important piece of that culture is a recent partnership between UNC Greensboro and NC A&T State University, and the National Science Foundation’s Innovation Corps program, better known as I-Corps.

Facilitated by LaunchUNCG, the Greensboro I-Corps site guides select students, faculty, and alumni of UNCG and NC A&T through an entrepreneurial bootcamp, encouraging them to perform market research early when their innovations are still at a nascent stage.

Early market research allows intellectual property developers to determine whether they have properly identified their intended customer base. Research team members interview prospective customers for feedback on their innovation’s design and functionality, including its physical features and benefits.

LaunchUNCG program manager Sam Seyedin describes I-Corps as a “go/no-go test.”
AN ELECTRIFYING IDEA

Imagine cleansing wastewater of a harmful yet valuable element while, at the same time, helping to satisfy the world’s growing demand for high-performance batteries. Transformative research at the Joint School of Nanoscience and Nanoengineering, or JSNN, promises to do just that. The project is led by Associate Professor Hemali Rathnayake, assisted by graduate student Sheeba Davood. The element lithium is in great demand as a primary component in long-lasting batteries that power everything from smartphones to Tesla electric vehicles.

“There is a huge market for lithium for energy storage applications,” Rathnayake says. Demand is so high that the light-colored substance has been called “white gold.”

The world’s largest lithium deposits are in Australia, with other large concentrations in South America. Yet trace amounts of lithium are quite common, especially in wastewater that is a byproduct of extracting petroleum from the earth. The traditional method of removing this lightweight metal from petroleum wastewater utilizes evaporating settling ponds, a process that can take up to two years. And that’s just stage one of the reclamation process. Then, dried, settling material must be separated and refined to be of use.

Rathnayake and Davood have devised a new way to remove lithium from petroleum wastewater—a lithium-trapping filter derived from a renewable resource. This proprietary nanomaterial is able to trap molecules of lithium measuring only one to three nanometers, or about a billionth of a meter. The Greensboro I-Corps program, and then a $50,000 national I-Corps Award, supported Davood as she conducted field research in the U.S. petroleum industry, including attending a trade show where she was able to access one of the reclamation processes. Then, dried, settled material must be separated and refined to be of use.

During the project, Davood discovered the potential of their nanofilter, with whom Davood is working to create a commercial-scale nanofilter. This process has the potential to be a cheaper and more efficient way to extract lithium from wastewater than traditional methods.

Another advantage of the nano-filter process, Rathnayake says, is that the polymer used to create the filter is naturally abundant, renewable, and therefore relatively inexpensive. The petroleum industry, always looking for ways to trim costs and boost profits, has taken much interest in the filter. Davood says, especially in Pennsylvania, North Dakota, and Arkansas. Those states mandate that petroleum production wastewater must be cleansed to remove environmentally harmful material.

Nationally, Davood said, the petroleum industry annually produces 700 billion barrels of wastewater. Like the gold dust that attracted prospectors to California in 1849, harvesting minute amounts of lithium can turn into real profits. It doesn’t take long to understand why these researchers are excited about their innovation’s potential.

Davood, a scientist with an entrepreneur’s passion, hopes to create a company that will license the process and take it to market. She’s also identified firms that she might partner with to achieve the same end.

“There’s another fascinating aspect to this nanotech innovation: the polymer that makes up the filter is a conductor. Once packed with lithium particles, the filters essentially become batteries, ready to store electricity.” Rathnayake and Davood have trademarked a brand name for their nascent product, a name that pays homage to UNCG: It will be called Minerva Lithium."

EVERY MINUTE MATTERS

A UNCG I-Corps team recently received a $225,000 NSF SBIR grant and a $75,000 NC Biotechnology Center Technology Enhancement Grant in support of their device to detect heart attacks more quickly and accurately. After completing training with the first Greensboro cohort in 2017, Dr. Jianjun Wei and Dr. Taylor Maba also won a $50,000 grant to participate in the national I-Corps program, where they received “Spirit of I-Corps Award” for their efforts.

Greensboro I-Corps

$1.2M

16

companies launched

16

companies

$1.2M

development and startup funding

56

teams

56

teams

16

graduate and undergraduate students trained

75%

minority-led

68%

female-led

Launched in 2017, LaunchUNCG helps qualified UNCG and NC A&T to become an I-Corps Site in 2017 in a status achieved by only three other campuses in the UNC System. As an I-Corps Site, the universities received a five-year, $500,000 grant from the NSF.

With that funding, LaunchUNCG facilitates the training of multiple cohorts of innovators each year. As part of the training, cohort members receive funds to cover field research travel expenses. Depending on the product and intended market, research might be accomplished within a limited area, such as the Carolinas or Southwest. Other projects might send researchers farther afield.

The NSF funds required may be only a few thousand dollars. But those funds can make a critical, money-saving difference in the long run, especially for graduate students, professors, and recent alumns.

“A thousand bucks can go a long way for somebody who doesn’t have anything.” Streuli says.

I-Corps grant funds can also support building product prototypes, but only after extensive market and design research. Streuli requires at least 30 field interviews with potential customers before considering a prototype grant request.

Researchers with promising innovations that require further development may also apply to the national-level I-Corps program for more training and funds.

Closer to home, LaunchUNCG offers additional avenues of support. Streuli has allied the Greensboro I-Corps Site with two state organizations dedicated to fostering entrepreneurs—NC IDEA, a private foundation supporting entrepreneurial endeavors with high-growth potential, and First Flight Venture Center, a non-profit business incubator focused on high-tech companies.

One of First Flight’s programs, called LiftOff, provides assistance and consulting to startups to help them navigate the early stages of developing their businesses. Participation in the LiftOff program costs $5,000, which can be a stretch—or impossible—for an early-stage company. Thanks to a grant from NC IDEA, each year LaunchUNCG may send one team of entrepreneurs to take part in LiftOff. So can each of the other I-Corps Site campuses in North Carolina.

Successfully completing LiftOff gives teams a leg up in applying for top-level National Science Foundation grants from the Small Business Innovation Research, or SBIR, program. Seed funding awards of up to $150,000 are available, with no equity stake required.

“My goal,” Streuli says, “is for LaunchUNCG startups to get SBIR grants.”
ENTREPRENEURIAL EDUCATION
Creating a culture of innovation requires more than supporting researchers on campus who already have big ideas, says Shultz. Through NC Entrepreneurship Center events, LaunchUNCG reaches out to get the entire campus and community thinking like entrepreneurs.

UNCG ENTREPRENEUR DAY The annual event, now in its tenth year, matches over 90 classes across campus with guest lecturers from the business and nonprofit sectors, impacting over 2,000 students in a single day.

2 MINUTES TO WIN IT The annual idea pitch competition gives 20 finalists from colleges across the Triad the opportunity to win over $2,000 in cash prizes, plus coworking memberships, business consultations, and more.

JERRY MCGUIRE STUDENT ENTREPRENEUR OF THE YEAR AWARD A $1,000 annual scholarship supports UNCG’s most entrepreneurial student or team.

UNCG • FORGE MAKESHIFT An annual scholarship winner receives a membership to Greensboro’s makerspace, The Forge, to work on prototypes for their product idea.

FOCUSED ON THE KNEE

Much of Professor Shultz’s career research has focused on what may be humanity’s most problematic joint, the knee. Of specific interest to Shultz – and to many trainers, therapists, and physicians – is the condition of the knee’s ligaments.

The amount of ligament looseness, known as knee laxity, is an indicator of joint health. “When force is applied to the tibia – the lower leg bone,” Shultz explains, “knee laxity dictates how much it moves relative to the femur, or thigh bone.”

Knee laxity in young women has been of particular interest to Shultz (photo below, right) and other researchers. Too much knee laxity, the kinesiologist says, “is a pretty strong predictor of future knee injury in young athletic females.” In older adults, greater knee laxity increases the risk of – and can also be caused by – osteoarthritis.

Most investigation of knee laxity is accomplished by manipulating the knee by hand. Mastering the process requires significant training and practice, and each diagnosis of knee laxity is highly subjective. The amount of laxity detected determines the treatment regimen prescribed, which may involve exercise, a brace, or perhaps surgery to tighten ligaments.

Devices to measure knee laxity exist, but current instruments measure only one range of motion. The knee, however, has three axes of motion.

Graduate student Elvis Foli makes final adjustments to device components created with the university’s 3D printer. This type of printing was a first for UNCG Libraries, according to Digital Media Commons head Dr. Arnarda Collins.

Shultz and Schmitz (photo left) saw need for a device that could accurately measure all aspects of knee laxity. They envisioned a device that would not require intensive training to use. It would be sized to fit on a training table and be light enough for a trainer or medical technician to set up and use. The device would mechanically manipulate the lower leg and measure all three axes of motion.

Profit, Shultz says, was not a motivating factor. The real drivers were a passion for research and knee joint health.

“This was something we needed,” she says. “We needed to continue to advance the research. And then we realized that this has big commercial potential.”

Guided in their quest by LaunchUNCG, the researchers located talent and resources on campus to assist in developing a prototype. Through the I-Corps program, kinesiology graduate student Elvis Foli conducted field research across the Southeast. He interviewed trainers and physicians for their perspectives on improving knee laxity diagnoses. The information Foli gathered confirmed demand for the device.

Shultz and her team knew what the device needed to accomplish, but the team lacked the engineering expertise necessary to pull off a prototype. This time LaunchUNCG had the expertise in-house. Program manager Seyedin (photo left, center) has a background in aeronautics. His engineering expertise costs the team of kinesiologists nothing.

Other campus resources helped the team further minimize costs. Then-kinesiology graduate student James Coppock collaborated with UNCG Libraries, employing their Fusion400 3D printer to create a complex component for the device. Printing the part took more than 36 hours. Not to mention all of the design work leading up to that final step.

Internal UNCG Grant Steps seed funding and a $100,000 NC Biotechnology Center grant are currently supporting the team as they continue to develop the prototype.

It was a decade ago when Shultz and Schmitz first kicked around the idea for a knee laxity diagnostic tool. But they were scientists first, not businesspeople. Without a fertile environment to nurture it, their idea lay dormant.

The development of LaunchUNCG, which created a “one-stop shop” to access all the resources available to academicians turned entrepreneurs, breathed new life into their idea.

With UNCG’s expanding resources in place to help move transformative ideas toward commercialization, the researchers are energized.

“We want to keep people healthy,” Shultz said. “We want to keep people physically active. That’s the goal of what we do in the lab.”

By Tom Laskier • Learn more at launch.uncg.edu • go.uncg.edu/shultz • go.uncg.edu/ncbiotech

3 NEW PATENTS IN 2019

“NON-AROMATIC DIFLUORO ANALOGUES OF RESORCYLIC ACID LACTONES” Inventors: Mitchell Crayton, Nicholas Oberlies, Lara Fahouri, and Cedric Pearce / New class of chemical compounds, derived from a natural fungal compound, with potential applications in the treatment of carcinomas, leukemias, and other cancers.

“VIRTUAL REALITY TRAINING TO ENHANCE LOCOMOTOR REHABILITATION” Inventor: Chris Rhea / A VR method to rehabilitate patients who have difficulty walking as a result of illness or injury. Can serve a wide variety of populations, with potential for use by patients in their own homes.

“METHODS AND COMPOSITIONS FOR INDUCING HYGIENIC BEHAVIOR IN HONEY BEES” Inventors: Olov Ruesspell and Kaarina Wagener / Nontoxic methods to improve removal of dead or diseased brood among honey bees, to curb the devastating impacts of parasitic mite Varroa destructor on colonies and, ultimately, the agriculture industry and food security.

See all UNCG innovations currently available for licensing at innovate.uncg.edu
TRUTH TO POWER

“My upcoming book will be about youth activism and will include the upsurge of climate activism among youth. Quite a few people have taken umbrage with the challenging nature of young climate activist Greta Thunberg’s rhetoric. ‘You should be ashamed,’ she tells leaders. ‘Our house is on fire and you’ve done nothing.’ She uses a lot of condemnationary language that can be hard for audiences to hear. ‘Conversely, I’ve already written about a group of youth who, starting in 1990, connected tens of thousands of young people to support a stance in Los Alamos, against nuclear war. These teens worked, in a conciliatory manner, with adults who shouted them down at council meetings. Those adults behaved pretty abominably—and were ultimately successful. Civility doesn’t always get the job done, and civility doesn’t only go one way.”

PARKLAND PROTESTS

“I find youth activism around the school shootings issue really inspiring, and my recent research analyzes youth involvement in March for Our Lives protests. I’m frustrated with media coverage framing their activism as success or failure—the idea that elections will show whether they succeeded. As though that will settle agreement about— they bring so much openness, energy, and honest, earnest desire to engage and understand one another.”

WHO TELLS THE STORY?

“My first book was ‘Rhetoric in American Anthropology: Gender, Genre, and Silence.’ Anthropology developed in a colonialist way, connected to a nineteenth-century desire to control and contain. But by looking at work developed by white women, women of color, Jewish women, and older women who joined the field of anthropology, we see that was not the entirety. Women anthropologists like Margaret Mead and Ruth Benedict wrote out of different relations with the communities they studied.

Some wrote as insiders, like Zora Neale Hurston or Lakota writer Ilia Carla Deloria. They often wrote in experimental forms, resulting in less problematic, more reciprocal approaches.

“There’s a lot of discussion in creative nonfiction and many academic disciplines about the line between fact and truth and knowledge and reality. These women researchers were wrestling reality with questions of how representation affects reality and whether the way you write can shape both the perception and reality of the thing you’re writing about.”

BEING DIFFERENT

“My research considers how people use their bodies to disrupt public space and try to bring attention to different matters—from their clothing and appearance to demonstrations, sit-ins, and protests.

“Our understanding of an issue can be changed by bodies making us think differently. I am inspired by how many of my students came to UNCG because they want to be in diverse classrooms. When we talk about challenging issues—they do not all have the same prior experiences with; that they do not all agree about—they bring so much openness, energy, and honest, earnest desire to engage and understand one another.”

ACT LIKE A PROFESSIONAL

“A feminist perspective on gender, language, and communication is central to everything I do. I’ve written about the ‘The Independent Woman,’ a feminist periodical in the 1920s that promoted economic opportunity for women. It focused attention on grooming, appearance, dress—ways to look unassailably professional in order to not have your competence questioned, to not disrupt the tastes and sensibilities of people around you in the workplace.

‘Women bore the burden of being seen as having a gender, while men represented themselves as gender-free, merely objective in their tastes and preferences. A lot of advice readers received was about ways to minimize disturbance: ‘don’t wear heavy scents,’ ‘don’t draw attention to your body in any way.’ They had to scrupulously survey their own bodies to ensure no one was ever disturbed by the fact they were female.

“My interest came in part from the lack of change in this area. I help graduate students who are on the job market, and a lot of the advice that circulates is still extremely gendered, heteronormative, racialized, and about having a body no one can object to. That puts all the burden on women, on people of color, and on sexual minorities to act like a professional.”

“We demand change.

THE YOUNG PEOPLE WILL WIN.

March for Our Lives Greensboro and March for Our Lives North Carolina

Learn more at english.uncg.edu/directory/applegarth

Interview by Mike Harris • Applegarth pictured center (left) with leaders from March for Our Lives Greensboro and March for Our Lives North Carolina

Dr. Risa Applegarth received the Junior Research Excellence Award for her work in rhetoric. As an associate professor of English and women’s, gender, and sexuality studies, Applegarth focuses on scientific and professional discourse and social movements. She is widely recognized for her scholarship and teaching, with accolades including the Outstanding Book Award from the Conference on College Composition and Communication and UNCG’s Mary Smith Sharp Award for Teaching Excellence.
COMING UP NEXT
Viola Munos, undergraduate researcher

In high school, Viola Munos excelled in biology, chemistry, and math. But she never took a physics class – her school didn’t offer it.

“Even though I’d never had a class, I knew I wanted to do something with physics in college,” she says. “It was the only thing I knew I would be challenging enough to hold my interest.”

Munos enrolled at UNCG last year, after earning an associate degree. Though she’s an academic junior, Munos plans to remain for at least another two years, gaining as much experience as possible. A big part of that, she says, is undergraduate research.

UNCG’s STAMPS program, which supports underrepresented students showing significant science and math capabilities, presented her first research opportunity. Through the NSF-funded initiative, she visited the Joint School of Nanoscience and Nanoengineering, where she secured an internship with Professor Tetyana Ignatova.

In Ignatova’s lab, Munos is working on methods to transfer single-atom thick biosensor materials – specifically graphene – onto chips. The biosensors can help scientists determine how much force a cell applies during growth. “Neuroscientists want to see how they send information from one to another – how they move, how they push against each other,” Ignatova says. “Potentially, this could be used to see how they send information from one to another.”

The biosensors can help scientists determine how much force a cell applies during growth. “Neuroscientists want to see how they send information from one to another – how they move, how they push against each other,” Ignatova says. “Potentially, this could be used to see how they send information from one to another.”

For Munos’s work, which she will present during an upcoming South Carolina conference, has contributed to the lab’s creation of a 5mm x 5mm graphene nanosheet, which is large enough to house around 100 biosensors.

“If it’s a first step in a long process, Munos explains. “She’s also putting clean, continuous graphene on glass, in collaboration with nanobiologists at the BSN, to study graphene-bacteria interactions. The results could benefit medicine and beyond.”

“I’m contributing to improving graphene’s efficiency, so it can be used in everyday life,” she says. “Maybe technologies will be less expensive so we can cure different diseases.”

By Whitney Palmer
Learn more at uncw.uncg.edu
jsnn.ncat.uncg.edu

WHO’S PAYING FOR THIS?
Huicheng Wu, graduate researcher

The apparel industry is one of the most wasteful on the planet. Not only do consumers throw out wearable clothing that ends up in landfills, says Huicheng “Jeff” Wu, but production of textiles consumes large amounts of water, energy, chemicals, and fibers, creating a large carbon footprint. The push for low-cost apparel also often leads to unethical treatment of workers.

Wu worked in marketing and other front-end positions at Chinese apparel companies for a dozen years, before coming to the Bryan School of Business and Economics. He chose the program, he says, because it is one of the largest and best respected in the country.

When Wu explored the literature on sustainability in apparel supply chain practices, the doctoral student says, “There was a void.” Publications focused on engineering questions rather than human interactions, which can determine whether sustainable solutions are actually used.

He was particularly interested in open costing, an industry technique that has been growing in popularity over the last five years.

“International buyers from developed countries often refuse to pay higher unit prices that would compensate manufacturers for environmental costs,” he says, putting pressure on manufacturers to ignore sustainability. “Economists have a word for these ignored costs, which must still be paid by society in the form of health care and environmental clean-ups – externalities.”

But manufacturers are beginning to respond to this issue by openly including sustainability costs in their negotiations with buyers. “The open costing method,” Wu explains, “uses a list of itemized cost elements when a garment is presented to buyers, instead of a lump-sum unit price.”

To learn more about the human dynamics of open costing, Wu drew on research methods and theories from the social sciences. He conducted 30 in-depth interviews and administered 200 surveys, employing a snowball sampling strategy where his contacts in the Chinese industry reached out to other likely respondents in China and Bangladesh. The two countries account for 42% of world apparel exports.

Wu found that open costing is helping suppliers adopt more sustainable practices. He also discovered unexpected impacts on supply chain partnerships.

Itemizing costs might seem like an obvious thing to do, given our consumer experiences with cash-register receipts. But between businesses, revealing information creates vulnerabilities, thought to be exploited by competitors seeking to cut corners. Despite this traditional model of fear and secrets, Wu found open costing increased trust between long-term supply chain partners.

The work garnered Wu a Most Promising New Research Award at the 2019 meeting of the International Textile and Apparel Association in London. He hopes his efforts will contribute to a greener future for a global industry.

By Randall Hayes
Learn more at grs.uncg.edu • go.uncg.edu/cars
FOR CENTURIES IN THE WESTERN WORLD, the study of science has been dominated by a specific demographic – those with economic and cultural advantages necessary to advance in academics and research careers. Likely white, likely male.

In 2018, a National Institutes of Health study found that, over the previous seven years, only 1% of NIH grants for experienced investigators went to underrepresented minorities. The percentages for early stage and new investigator funding were only slightly higher.

Diversifying research is crucial, not only for the benefit of the young scholars entering various fields, but for the disciplines themselves, says Dr. Lee Phillips, director of UNC Greensboro’s Undergraduate Research, Scholarship, and Creativity Office.

“A diverse set of researchers can more effectively identify and address problems, particularly in a country like America where our professional workforce doesn’t reflect our diverse demographics.”

But to shake up the scientific workforce, Phillips and his colleagues say, you have to start at the beginning.

Most students enter college unprepared for research careers. They don’t know how to ask questions, conduct projects, or present their results.

What takes undergraduates to the next level? What gets them to the point where they may consider graduate school and a scientific career?

Phillips says mentorship from a faculty member is proven to help students succeed in college and then advance to graduate school. Students also thrive with exposure to the professional research world.

But a student needs economic freedom to spend time doing that. They need peers, mentors, or educational experiences to introduce the idea of conducting research – both the reasons and the processes.

Much of this depends on socioeconomic circumstances. And that undeniably keeps students and universities, as well as fields of study and industry, locked within systematic racism.

Two years ago, nanoscience professor Dan Herr, Phillips, and their colleagues won NIH funding to launch a MARC U-STAR program. Through the two-year program, promising underrepresented students receive financial support, targeted mentoring, hands-on experience, and exposure to the professional world of research.
The program has opened up new possibilities for the recruitment of students of color and women, giving new structure to the pipeline.

A COMMITMENT TO CHANGE

Dr. Joseph Graves, an NC A&T State University professor at the UNCG-NC A&T Joint School of Nanoscience and Nanoengineering, is another principal investigator, or PI, on the project. He also teaches courses, such as “Genes, Race, and Society,” at UNCG.

Graves has worked with MARC U-STAR programs and similar initiatives since 1985. As the first African American to have earned a Ph.D. in evolutionary biology, he believes the most effective mentorship for minority students comes from minority scientists. Throughout his career he has made a point of seeking out these students to mentor them. Graduate and postdoctoral researchers in his lab are encouraged to provide similar mentorship to the next generation of researchers.

“Creating an atmosphere where students feel at home,” he explains, “Universities have traditionally not been accommodating to underrepresented minorities, so within these institutions we create an environment where students feel supported by people who look like them.”

Associate Professor of Chemistry Kim Petersen mentioned MARC fellows when the project launched, and recently joined the PI team. Another critical student relationship, she says, is with academic enrichment coordinator Traci Miller, who tracks their progress, advises them, and plans professional development opportunities.

We’re giving students those big experiences. Then we build in mentoring activities,” says Petersen. “This is taking undergraduate research to the next level, especially with the amazing conferences.”

The team plans to follow the careers of successive cohorts of MARC students for a minimum of 15 years, to study program impacts. Here says the program is a long-term commitment, not just in terms of charting student progress, but in maintaining a connection and continuing to provide mentorship.

“It feels more like an extended family,” he says. “I tell the MARC students: ‘wherever we are, call me anytime.’”

DEVELOPING SCHOLARS

One of the biggest conferences the students attend is the Annual Biomedical Research Conference for Minority Students, which Phillips calls “a rock show for biology and chemistry students.” UNCG MARC fellows attend the conference for both years of the program, with an impetus to present research their second year. Above, students in the program with Oberlies, is also the recipient of an NSF STAPMS – Science, Technology and Math Preparation – scholarship. The STAPMS program and MARC U-STAR are just two of a host of initiatives at UNCG targeting underrepresented students.

One of the professional development opportunities.Coordinator Traci Miller, who tracks the students’ progress, is critical to the success of the program. Another critical student relationship, Petersen mentored MARC fellows when the program began, and he began working in Sullivan Distinguished Professor Nicholas Oberlies’ natural products lab as a sophomore, but his admission to MARC allowed him to increase his lab time considerably.

During his on-campus research experience this past summer, he learned to work through many different phases of research, with the ultimate goal of identifying anticancer drug leads from different fungi.

He began by mastering the extraction of fungal cultures and quickly advanced to techniques, such as high-performance liquid chromatography, for purifying drug leads. Once compounds are isolated, he analyzes their structures via nuclear magnetic spectroscopy and mass spectrometry, gaining valuable skills on UNCG’s highly precise research instruments.

Roberts knew he could succeed in the classroom, but he says he couldn’t have learned how things work in the lab without hands-on research experience – and his mentor agrees. “There’s something about chemistry that’s very tactile. You just have to do it,” says Oberlies.

In the natural products chemistry lab, Roberts has also found new motivation. “What drives me is finding ways to cure different diseases. It interests me how different medicines are produced. There are around 5 million species of fungi and only around 130,000 have been investigated...”

Roberts knows that more than half the drugs that treat cancer are derived from a natural source, and, like everyone in Oberlies’ lab, Roberts is eager to test as many new fungal compounds as possible against human cancers. With funding from the National Cancer Institute, they test up to 300 species a year. “1,500 people will die from cancer today. Our goal is to find a compound to minimize that number in the future,” says Oberlies. “Could that discovery come from an undergraduate? Absolutely.”

Doctoral student Sonja Knowles has served as another mentor for Roberts. “In the beginning, I would be with Chris through every step, to train him on techniques as well as the rationale behind them,” recalls Knowles. “But he has grown tremendously and now works independently, including troubleshooting when a problem arises.”

Now, Roberts is training other student assistants. “Chris has been an asset to not only me but the whole lab,” says Knowles. “He has become a great example for new students.”

As a MARC scholar, Roberts will next complete a summer experience at an external doctoral institution. While positions in every university are highly coveted, Oberlies says Roberts is much more likely to be able to find one as a MARC fellow. As a funded student who already has experience in the lab, he is an asset.

STAND-OUT GROWTH

Senior biology major Mo’nyay Rodgers applied to become a MARC fellow in 2018. In her cell biology course during her junior year, she realized, for the first time, that she had potential to excel as a scholar.

“Cancer cell cycling was interesting to me,” she recalls. “It wasn’t a class where I had to study, but I wanted to.”

She was accepted into MARC, and though she could have graduated in 2019, she decided to stay an extra year to fully make use of the research opportunities and mentorship she would receive.

Now in her second year of the program, she has assisted in Dr. Graves’ genomics laboratory for two different projects and also worked at the Purdue University Center for Cancer Research.

Rodgers is especially pleased about the opportunity to attend and present her work at academic conferences – not only ABRCMS and UNCG’s Thomas Undergraduate Research Expo but also the Biocomputational Evolution in Action Conference, an NSF-funded event in Lansing, Michigan.

At the most recent ABRCMS, Rodgers presented her work on iron magnetite resistance in E. coli, and the resulting genetic adaptations that can produce more dangerous strains of the bacteria.

“The work Mo’nyay is participating in helps us better understand how bacteria may evolve resistance to novel nanomaterials,” explains Graves. “We want to slow down the spread of multidrug-resistant bacteria.”

“Roberts, pictured left collecting samples with Oberlies, is also the recipient of an NSF STAPMS – Science, Technology and Math Preparation – scholarship. The STAPMS program and MARC U-STAR are just two of a host of initiatives at UNCG targeting underrepresented students.”

Rodgers says her most meaningful inspiration comes from peers and mentor networking. “In science, I don’t always get to see people who look like me,” she says. “To be in a room full of people that is really exciting, and to have them so happily and openly ready to work with me is thrilling.”

24 uncg research spring 2020}

SEEING YOURSELF AS A SCIENTIST

Rodgers says her most meaningful inspiration comes from peers and mentor networking. “In science, I don’t always get to see people who look like me,” she says. “To be in a room full of people that is really exciting, and to have them so happily and openly ready to work with me is thrilling.”
Define the direction

Senior kinesiology major Lauren Dorn began her first foray into research as a technician for a High Point University neuroscience professor, studying neuralglial cells and binge drinking.

In 2017 she was selected to join UNCC’s first MARC cohort and began conducting research with Safiri-Ennis Distinguished Professor of Kinesiology Laurie Wideman. They are studying psychosocial factors in children’s lives that impact health and psychological wellness over time.

“The outcome of my first project at UNCC suggested that neighborhood characteristics – park or green space access, crime levels, and public transportation – as well as parenting behaviors impact insulin levels, BMI, and ultimately cardiometabolic risk,” says Dorn. “We looked at a reactive protein, which is indicative of inflammation and stress in the body. We found a relationship there, so that was really interesting.”

Dorn presented the work at ABRCMS. “I wanted to research and study medicine, and the MARC program has made it more of a possible reality for me,” she says. “It has allowed me to put myself out there in ways I wouldn’t have been able to.”

For her external summer research experience, Dorn worked at the Mayo Clinic, looking at the effect of Vitamin D on myocarditis, an inflammatory condition that can progress to heart disease.

“I actually have a personal connection with that,” she explains. “Some of my family members have had Vitamin D deficiencies that negatively impacted their health.”

Although Dorn has already completed her second year as a MARC fellow, she is continuing her research with Dr. Wideman, now analyzing Vitamin D as a hormone working in tandem with estrogen in the body.

Their latest work examines a larger cohort of adolescents and more variables – such as seasonal Vitamin D level variations and subject demographics. Dorn will also study neighborhood environments, especially factors influencing physical activity and birth control intake. She will present her results at UNCC’s 2020 Thomas Undergraduate Research Expo.

“The goal is to get a manuscript out by the time she leaves campus,” says Wideman.

Dorn, who next plans to pursue a graduate program, knows she will be an asset to the research community, particularly after completing MARC.

“There’s so much information out there that is untapped or understudied. Diversity ensures we have a variety of perspectives and motivations to continue. I like that I’m able to use my own personal experiences in the research and affect my community,” she says. “And we may have the next discovery that helps somebody drastically improve their health.”

Moving forward

Former student-athlete Alexis Rice is in the first year of her master’s program in applied sport psychology at UNCC. As an undergraduate, she was in the first cohort of UNCC’s MARC program.

Her mentor is Assistant Professor of Kinesiology Erin Reifsteck, whose research focuses on promoting physical activity and health through sport and life transitions. The Moving On program, which aids college athletes in planning for a healthy lifestyle after college, was developed by Reifsteck with funding from the NCAA.

“I like being able to actually apply what you find,” says Rice. “A lot of my family have been athletes or played a sport. So, when I talk to them, I can explain it through the lens of their experience, and they understand.”

Rice’s first research project found a significant difference in exercise identity between ethnic minority college students and white, non-Hispanic students, particularly among women. Reifsteck says Rice’s findings could inform tailored physical activity interventions for college students.

Her understanding of how research works improved a lot during that first year,” says Reifsteck, recalling how they worked on Rice’s writing and her process – including a literature review and developing and analyzing questions.

Rice pursued her external research project at the Physical Activity Research and Community Implementation Laboratory at Virginia Tech, examining physical activity among community-based health educators and the degree to which they met recommendations.

“It was different, but enlightening,” she says, recalling the adjustment period. “I took what Dr. Reifsteck taught me and applied it in a different way. She required me to be at a certain level, and she pushed me a little bit, so when I got to a different institution, I could push myself.”

Upon her return to UNCC, Rice participated in a number of trainings and workshops for professional development, graduate school preparation, and even how to battle feelings of impostor syndrome.

“It was a good balance,” she says. “We had courses with Dr. Graves and other mentors where we really had an opportunity to learn how to analyze at a higher level.”

At the beginning of her graduate career, Rice is already an accomplished young researcher and taking part in the greater conversations in her field. This spring, UNCG will host the Diversity in Sport Conference, supported by the Association for Applied Sport Psychology, and Rice is part of the planning committee.

Her mentor notes that kinesiology is one of UNCG’s biggest majors and increasingly diverse, but at the student level. Diversifying faculty is the next step, and Reifsteck sees MARC as an important tool in the process.

“One way we can improve diversity and representation in our field and in our communities is through the graduate student pipeline. These programs give us opportunities to work with students and prepare them to be professionals and academics. I think that’s really critical for our field and other disciplines this program targets.”

By Susan Kirby-Smith

Learn more at marc.uncg.edu

Rice (above) first worked with Reifsteck on applied sport psychology as a MARC student researcher. Now, she works with her as a graduate student at UNCC.
A mouse click starts the YouTube video. An orchestra score slowly swells beneath the lofty voices of two cast members, as they perform “When You Believe” from DreamWorks’ epic new London stage production of “The Prince of Egypt.” Music supervisor and arranger Dominick Amendum gently nods his head, conducting the scene in his mind.

“This... here,” he says, gesturing to the screen, as the orchestra and voices suddenly rise in unison. Those background vocals and the shape of the song’s arrangement are the result of his work. Amendum’s eyes well up slightly, evidence of the heart and soul he has put into bringing the moment to fruition.

Amendum’s eyes well up slightly, evidence of the heart and soul he has put into bringing the moment to fruition.

This much-anticipated show on the West End is not Amendum’s first big production. UNCG’s Smart-Tillman Artist in Residence served nearly a decade as associate music supervisor of the hit musical “Wicked.” He also conducted and music-directed the show on Broadway, in Los Angeles, and on its first national tour.

As coordinator of UNCG’s Musical Theatre program, Amendum (bottom right, with students) has found his sweet spot – his love of teaching, he says, feeds and informs his work in the professional world and vice-versa. And he expects as much from his students as he does from Broadway performers.

“By Matthew Bryant • Learn more at musicaltheatre.uncg.edu

LIFETIME CONNECTIONS Amendum’s commercial theater work means he brings current industry knowledge and connections to the classroom, but that’s not all his students value. “I carry his teachings with me,” says UNCG alumnus Deon’te Goodman (above), of “Hamilton” Broadway fame. “Despite his insane schedule and incredible amount of responsibility, it never felt as though he didn’t have time for me. Not only did he verbally express his belief in me and my potential, he showed it by providing me with opportunities that allowed me to learn, grow, and prove myself. He stressed the importance of being a kind person just as much as a skilled professional.”
By Eddie Huffman  •  Learn more at see and hear the impact of your research,” she says. “If people in the capoeira and Mestre Canjiquinha, who taught a generation of capoeira instructors. In her book, Höfling includes rarely seen historical photographs and widely used in dance studies. But I think it’s time to move on.”

Thompson made claims about African dances in the 1970s that have become is and what is not African is part of my analysis. Art historian Robert Farris cultural authenticity and how the form evolved. “Rethinking claims of what capoeiristas; they were danced and performed by capoeiristas. Why is that not international stages robbed capoeira of its power and authenticity. Höfling created a well-known teaching manual and record. Höfling has immersed herself in the practice and history of studied with Mestre Bimba, “an amazing historical figure,” she says, who taught since 1994 and follows some of its name from a course Hodgkins has taught for both scholars and ordinary readers. The Wiley-Blackwell publication takes understanding God and his people.” Hodgkins says, “the Bible contains the great plot lines that still animate our favorite entertainments from the alienated outsider hero to the king incognito; from the ‘Jezebel’ to the social prophet; and from the One Who Lived to the One Who Died. Luke Skywalker, Peter Parker, Harry Potter, Steve Rogers, Carol Danvers – they’re all there.”

The book also showcases recent scholarly findings on how many Biblical elements that appear chaotic, random, or overly repetitive to a modern Western reader have been carefully crafted over centuries of collaborative work. “The Bible brings together the Hebrew commitment to multiple viewpoints, the Greek rational philosophical tradition, and the Anglo-Saxon statement of one true thing,” Hodgkins says. “When you recognize these cultural traditions interweaving through time, you experience the scripture as a remarkable work of art.”

By Susan Kirby-Smith Learn more at go.uncg.edu/hodgkins english.uncg.edu/hodgkins

THE RIGHT MOVES

Authorities misunderstood and suppressed capoeira as it arose on the streets of Brazil, frequently arresting practitioners of the martial art. Assistant Professor of Dance Ana Paula Höfling thinks scholars have misunderstood capoeira’s subsequent movement from the streets to the stage, an error she works to correct in her latest book, “Staging Brazil: Choreographies of Capoeira.”

An acrobatic form with African roots, capoeira incorporates elements of dance, with dramatic leaps, flips, sweeps, and flying kicks. “Players alternate between strikes and defenses as in improvised and fluid call and response,” says Dr. Höfling. “It is a combat game that requires intense focus and cooperation. There is nothing else quite like it.”

Capoeira traveled from the Brazilian underclass to world stages in the 1980s, becoming “a moving postcard of Brazil,” Höfling says. She became captivated as an undergraduate in California when she enrolled in capoeira classes at a school near her home. Her first instructor, Mestre Acordeon, studied with Mestre Bimba, “an amazing historical figure,” she says, who created a well-known teaching manual and record. Höfling has immersed herself in the practice and history of capoeira in the years since, making it the focus of her dissertation and her most recent book, published in 2019 by one of the top academic presses for dance studies. She interviewed practitioners across Brazil and in New York City. She spent time in libraries, newspaper archives, and people’s homes, studying articles, photographs, and instructional record about and manual.

“I tried not to reproduce claims that were made before without rethinking them,” she says. The process corroborated some earlier beliefs about capoeira, but debunked others.

For example, some claim the transition from Brazilian streets to international stages robbed capoeira of its power and authenticity. Höfling challenges those arguments: “These spectacles were choreographed by capoeiristas; they were danced and performed by capoeiristas. Why is that not part of the practice?”

She tried moves based on illustrations and descriptions in the old manuals and records. Doing so helped with her analysis of larger themes involving cultural authenticity and how the form evolved. “Rethinking claims of what is and what is not African is part of my analysis. Art historian Robert Farris Thompson made claims about African dances in the 1970s that have become widely used in dance studies. But I think it’s time to move on.”

In her book, Höfling includes rarely seen historical photographs and shines a spotlight on previously unheralded capoeiristas. They include Emilia Buarque, Liancardi, the first woman to direct a folkloric ensemble featuring capoeira, and Mestre Canjiquinha, who taught a generation of capoeira instructors. Practitioners have thanked Höfling for these inclusions. “It’s great when you see and hear the impact of your research,” she says. “If people in the capoeira community are reading the book, that makes it worth it.”

He illustrated his manuscript by tracing the work of photographer Pierre Verger.

Höfling reenacts moves from a manuscript created by Mestre Vicente Pastinha.

Pastinha founded the first capoeira angola – or traditional-style – school in 1942.
An epidemic spreads regardless of blameworthiness or culpability. “We can’t stop epidemics with handcuffs and prison sentences—that’s not how they work,” says Assistant Professor of Sociology Trevor Hoppe. “Blame is not an effective solution to disease.”

In his new book, “Punishing Disease: HIV and the Criminalization of Sickness,” Dr. Hoppe analyzes how and why more than two dozen states adopted laws targeting people with HIV. These laws made a wide range of behaviors crimes, regardless of whether there was any real risk of disease transmission. No other disease in modern U.S. history, he says, has been criminalized so systematically.

**SEXUALITY, MEDICINE & THE LAW**

Awards in the areas of sociology, sexuality studies, criminology, and public health including the Centers for Disease Control and Prevention’s Young Innovator Award—a testament to Hoppe’s expertise in multiple fields and cross-disciplinary impact.

“I’m sort of an odd duck,” he says. Hoppe’s research sits at the intersection of sexuality, criminology, and medical sociology, with a focus on how the state controls and manages aspects of our lives. “I’m interested in how punishment has become an institution of social control, and how sexuality has been the subject and target of this control.”

His previous book, “The War on Sex,” co-edited with Dr. David M. Halperin, explores methods used by governments and society to prevent stigmatized sex, and makes a case for why sexual liberation is indispensable to social justice and human rights. For “Punishing Disease,” Hoppe reviewed 500 criminal cases, looking at outcomes based on demographics and how relevant laws were constructed. He says lawmakers often passed HIV-specific criminal laws based on societal fear of gay people. However, heterosexual men and white heterosexual women are disproportionately convicted under those laws. “If you are in a community where HIV is highly prevalent and you find out you had sex with someone with HIV, you’re not as likely to call the police,” he notes. The idea of being exposed to HIV is less shocking. “But if you are a white woman living in rural Ohio in the same situation, phoning the police might be a more ready-made response.”

**FIXING PROBLEMS WITH PRISON**

In his work, Hoppe invites fellow sociologists—and advocates working to reform legal and public health institutions—to consider the dangers of using punishment to stop the spread of disease.

“America’s failed war on drugs is a telling case study. The billions of dollars we spent on incarceration haven’t put a dent in average drug usage rates. Why keep trying? Because addiction and HIV disproportionately impact highly stigmatized minorities: African Americans, gay men, the poor. Where stigma lurks, blame is easy to assign.”

He warns, “It’s important for today’s and tomorrow’s epidemics that we resist the impulse to imprison people to contain disease. There will be another epidemic.”

- **Police brutality.**
- **Racial profiling.**
- **Travelling of disease.**
- **Social stigma.**

By Susan Poulos  
Learn more at soc.uncg.edu/people/trevor-hoppe/ 
	trevorhoppe.com

“Punishment is not an effective or appropriate solution to a medical problem like HIV,” says Hoppe. His latest book, “Punishing Disease,” has received awards from the American Sociological Association, the Law and Society Division of the Society for the Study of Social Problems, and POZ, a magazine for people affected by HIV.

Originally from Salt Lake City, NATHAN SOUTHWICK is a doctoral student in musical arts who carries his 250-year-old violin around campus in a colorful, sticker-strewn case. It’s a souvenir of his time studying in Austria, which he describes as “a shocking and HIV disproportionately impact highly stigmatized minorities: African Americans, gay men, the poor. Where stigma lurks, blame is easy to assign.”

He warns, “It’s important for today’s and tomorrow’s epidemics that we resist the impulse to imprison people to contain disease. There will be another epidemic.”

- **Police brutality.**
- **Racial profiling.**
- **Travelling of disease.**
- **Social stigma.**

By Susan Poulos  
Learn more at soc.uncg.edu/people/trevor-hoppe/ 
	trevorhoppe.com

“Punishment is not an effective or appropriate solution to a medical problem like HIV,” says Hoppe. His latest book, “Punishing Disease,” has received awards from the American Sociological Association, the Law and Society Division of the Society for the Study of Social Problems, and POZ, a magazine for people affected by HIV.

Originally from Salt Lake City, NATHAN SOUTHWICK is a doctoral student in musical arts who carries his 250-year-old violin around campus in a colorful, sticker-strewn case. It’s a souvenir of his time studying in Austria, which he describes as “a shocking and

- **Police brutality.**
- **Racial profiling.**
- **Travelling of disease.**
- **Social stigma.**

By Susan Poulos  
Learn more at soc.uncg.edu/people/trevor-hoppe/ 
	trevorhoppe.com

“Punishment is not an effective or appropriate solution to a medical problem like HIV,” says Hoppe. His latest book, “Punishing Disease,” has received awards from the American Sociological Association, the Law and Society Division of the Society for the Study of Social Problems, and POZ, a magazine for people affected by HIV.

Originally from Salt Lake City, NATHAN SOUTHWICK is a doctoral student in musical arts who carries his 250-year-old violin around campus in a colorful, sticker-strewn case. It’s a souvenir of his time studying in Austria, which he describes as “a shocking and
HOW DO YOU KNOW IF SOMETHING’S REALLY #TRENDING?

Dr. Aaron Beveridge studies how public opinion and digital communication are shaped by data-driven technologies – like social networks. In his digital rhetoric course, “How to Be an Influencer,” UNC Greensboro students develop a video series or podcast, and learn to use network analytics to better engage audiences. In bringing together research and teaching, Dr. Beveridge challenges his students with the question: What does it really mean to be “trending?”