

ILLUMINATED  
magazine

Graduate  
Student  
Research  
Magazine

ETSU SCHOOL  
OF GRADUATE  
STUDIES

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# STAFF

## FROM THE SCHOOL OF GRADUATE STUDIES

The East Tennessee State University School of Graduate Studies is proud to present *Illuminated*, a magazine that showcases the excellent work of our graduate students and their faculty advisors. There are over 2,400 students enrolled in graduate programs at ETSU. *Illuminated* presents some of our students' research and creative works that make meaningful contributions to various disciplines, and contribute to our strong graduate programs. *Illuminated* features research and creative projects that are currently happening on campus, and provides updates on alumni of ETSU graduate programs.

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# GRADUATE STUDENTS & ADVISORS

Are you excited about your research and would like to share your hypothesis or findings? YOU MIGHT BE A PERFECT FIT FOR *ILLUMINATED*.

There is more than one way to get into the next issue of the magazine!

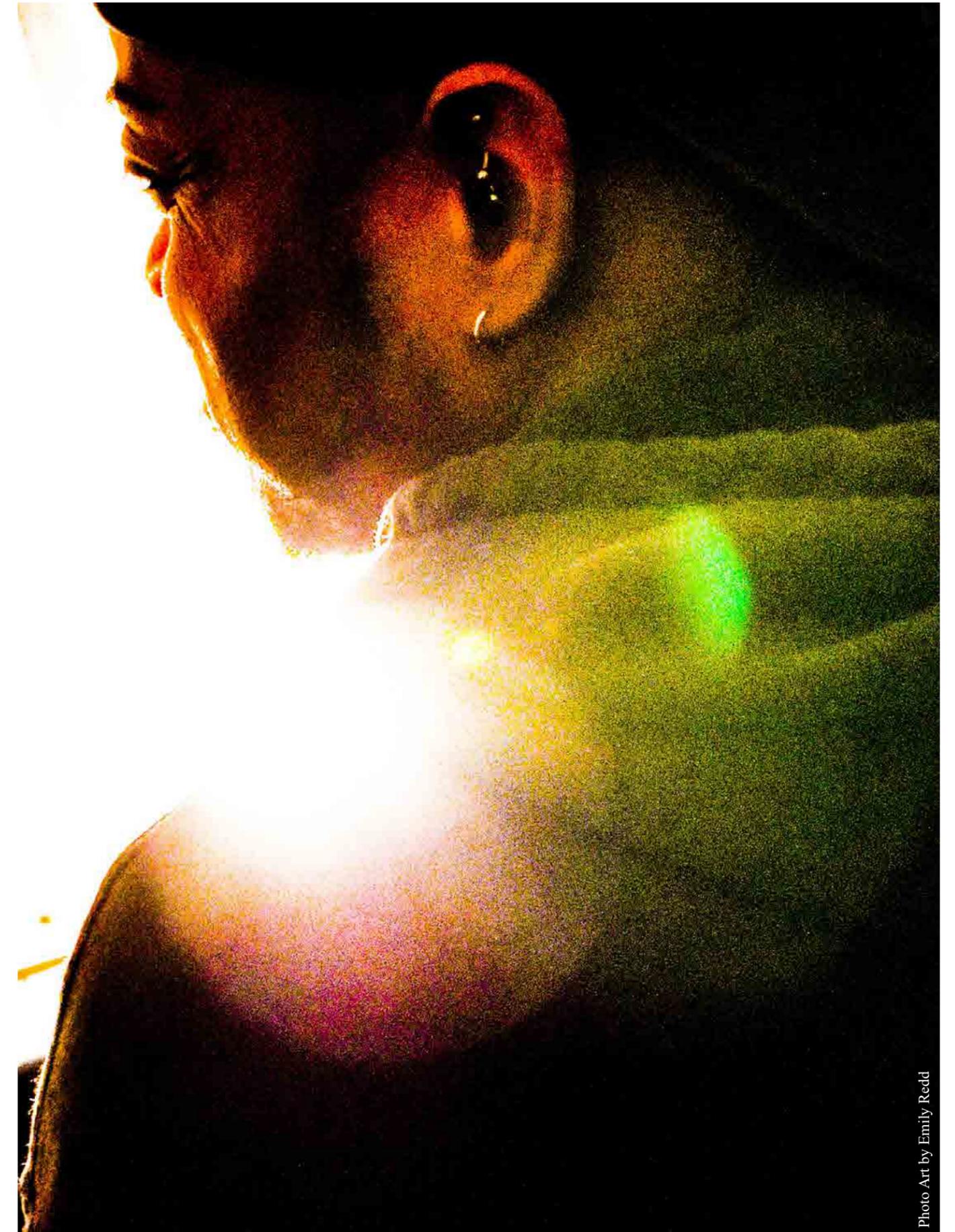


Photo Art by Emily Reidd

## 🌀 For current graduate students and their advisors:

Are you or one of your graduate students working on a culminating experience (e.g., thesis, dissertation, capstone)? Your research could receive additional exposure through *illuminated* magazine and help educate the rest of the campus about your department and program. This is a unique opportunity to get your work recognized!

## 🌀 For current graduate students and their advisors:

Did you or one of your students get into an excellent doctoral program or get an excellent position? We want to hear about it! Share your story in the "Where Are They Going?" section.

## 🌀 For former graduate students and their advisors:

Do you know an outstanding student who graduated from ETSU more than a year ago? We want to hear from them! The "Where Are They Now?" section features former ETSU graduate students who are now professionals in positions across the country.

## 🌀 Click here for Nomination Form: [https://www.etsu.edu/gradschool/documents/illuminated\\_nomination\\_form.pdf](https://www.etsu.edu/gradschool/documents/illuminated_nomination_form.pdf)

For more information on nominating students or getting featured in *illuminated*, please contact: Dr. Karin Bartoszuk, [bartoszu@etsu.edu](mailto:bartoszu@etsu.edu)

# OPTIMISM, HEALTH-RELATED SELF-EFFICACY, AND QUALITY OF LIFE

by Hannah Warren



When Morgan describes her role as a future clinical psychologist, she speaks of an environment in which all members involved in patient care work together as a team. In most health care settings, primary care physicians see patients for basic needs and refer patients to outside specialists for services beyond the scope of their practice. Yet, in rural areas, the limited availability of mental health providers, presence of stigma, and the high cost associated with specialized mental health care often deter individuals from seeking treatment. Using a team-based approach to care and placing mental health providers in medical settings, however, may help to alleviate perceptions of stigma and increase accessibility to mental health care. From a rural community herself, Morgan was drawn to attend a university that allowed her to focus on providing psychological services to medically underserved individuals in rural communities.

While attending Susquehanna University in central Pennsylvania, Morgan earned a Bachelor of

Arts degree in psychology, with a minor in sociology. She decided to apply to a Ph.D. program in psychology, as a doctoral degree would open up more opportunities for employment in her field compared to a master's degree. Exploring programs, she found much of her interest centered around the role of psychology in physical health and well-being, and she began to narrow her list of potential graduate schools to those whose programs had a health psychology emphasis. ETSU's program stood out to her, as it is one of the few clinical psychology programs in the country with a training focus on integrated health and multidisciplinary team-based approaches to treatment.

Once at ETSU, Morgan became especially interested in chronically ill populations and their health-related quality of life (HQOL), along with risk and resiliency factors for physical and mental well-being. The Laboratory of Resiliency in Psychological and Physical Health, directed by Dr. Hirsch, has a

Left, Morgan Treaster // Right, Dr. Jameson Hirsch



similar focus on the intersection between positive psychological factors, and mental and physical health in vulnerable groups, including veterans, LGBTQ persons and people with chronic illness. For her dissertation, Morgan is focusing on two existing data sets in the lab, including a sample of persons living with remitted or current cancer and a sample of individuals living with fibromyalgia. She seeks to address a gap in the existing literature regarding potential mediators, or pathways, through which an optimistic future outlook translates into better subjective ratings of physical health.

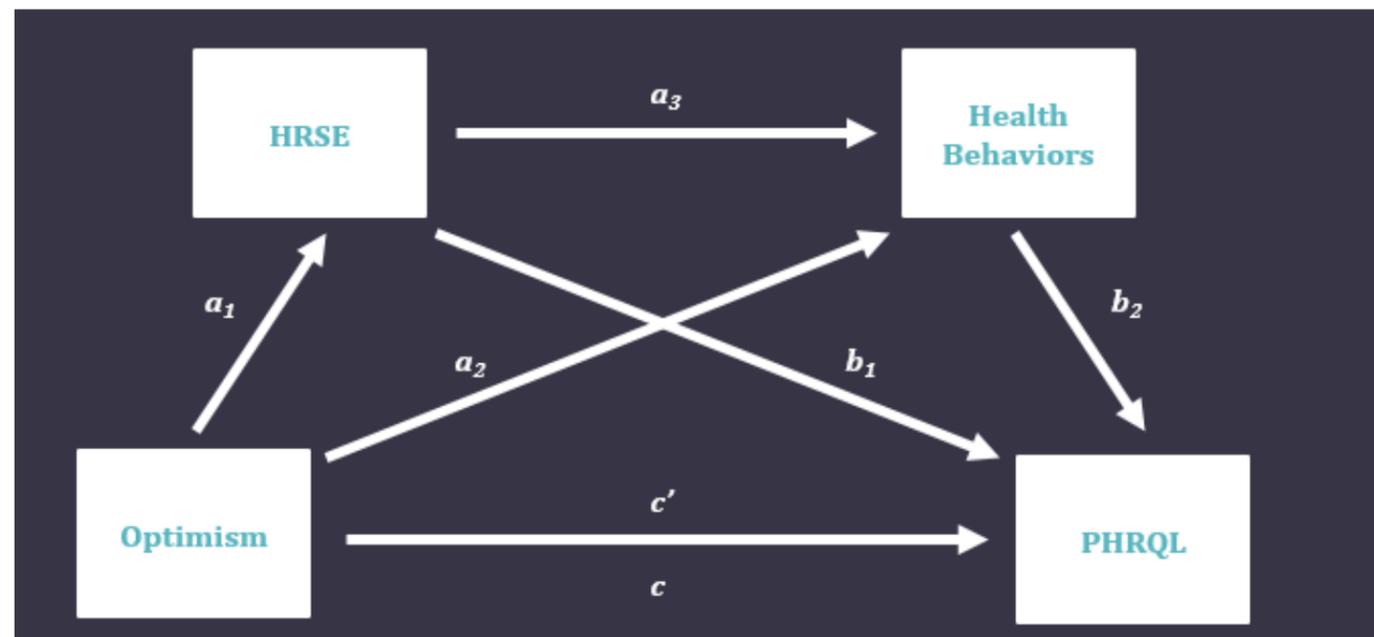
In particular, Morgan is interested in the idea of locus of control and the degree to which individuals feel they can personally manage or influence their health, which is a belief that is often diminished in individuals living with a chronic illness. Thus, she will examine health-related self-efficacy, or one's confidence in their ability to manage or control health, as one potential mediating variable. She will also investigate engagement in adaptive health behaviors as a

second mediating variable, given that previous research suggests that greater efficacy is associated with increasingly active self-management of disease.

For her dissertation, Morgan has hypothesized that people with higher levels of optimism will report greater health-related self-efficacy and, in turn, will be more likely to engage in positive health behaviors and experience better physical health-related quality of life (PHRQL). The data she will be examining was collected online and is comprised of self-reported responses to reliable and valid health and psychosocial questionnaires. All data analysis will be conducted in SPSS, using Hayes' PROCESS Macro for conducting serial mediation multiple regression analyses. Serial mediation is used to identify the pathways through which an independent variable is associated with a dependent variable. Through her research, Morgan hopes to discover the underlying cognitive-emotional and behavioral linkages between optimism and health-related quality of life, and to

discern whether differences exist in this pattern of effects between individuals with a current diagnosis of fibromyalgia versus those with a past diagnosis of cancer. Of note, if supported, her findings may also have clinical implications for other medical and clinical populations. For example, although she is still in the early phases of this project, in her previous research, Morgan has found that positive psychological factors tend to have a positive impact on quality of life, including in diverse groups such as parents of children with disabilities.

Leading up to her dissertation research project, Morgan has participated in several local, regional, and national conferences, presenting posters and giving oral presentations at, among others, the conventions of the Tennessee Psychological Association, the Southeastern Psychological Association, and the American Psychological Association. She is also an active research and clinical mentor for undergraduates and first-year graduate students in the Department of Psychology. Currently, she is completing a clinical externship at ETSU Pediatrics as a behavioral health consultant. After graduation, Morgan hopes to work on an interdisciplinary health-care team at a children's hospital, providing therapeutic and behavioral health services to chronically ill children and their family members. ■



Mediation Model

# BECKETT AND THE CREATIVE WRITING PROCESS

by Hannah Warren

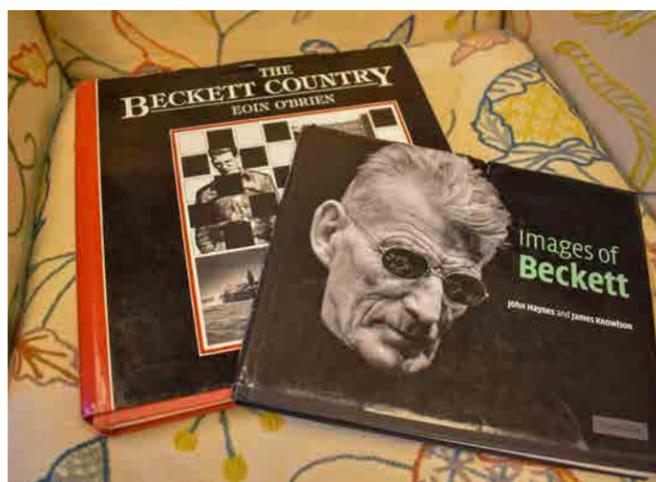


Sam Campbell fondly recalls memories of her mother reading to her every night as a child, long before she could read on her own. While completing her undergraduate education at ETSU, Sam fell in love with the learning environment fostered by the faculty of the Department of Literature and Language. She knew she had only begun to scratch the surface of what there is to learn and decided to continue her education at ETSU. The passion she developed for literature so early laid the foundation of the career she is now building while pursuing an English M.A. in the department of Literature and Language at ETSU.

Sam's thesis explores the influence of Samuel Beckett's work on contemporary writers. Beckett was an Irish playwright, novelist, poet, director, and literary translator. He wrote in every medium imaginable: short stories, plays, poems, novels, radio plays, and scripts for both television and film. He fought for the resistance in World War II and then volunteered for the Irish Red Cross afterwards. In 1969 Beckett won the Nobel Prize in literature. Sam's project explores how Beckett's experimentation in content, form, and genre blending has impacted the creative writing discipline as a whole by using two contemporary works (Aimee Bender's short story collection *The Girl in the Flammable Skirt* and Mark Z. Danielewski's novel *House of Leaves*) to show the lasting effects of Beckett's influence. As Sam points out, his writing spans across several genres with each work informing another. Unlike many writers of his era, genre boundaries blend together in Beckett's work. For example, some of his plays resemble prose poems; if one were to examine the manuscript of his play *Not I*, they might assume it was a poem.

Sam first became fascinated with Beckett's

works after watching ETSU's rendition of *Footfalls* and taking an Irish theater class taught by Dr. Katherine Weiss, a Beckett expert herself. After reading *Waiting for Godot*, she knew she wanted to learn all she could about this author to become a better writer herself. Her own Beckett research began with an essay on the theme of love in Beckett's works. She went on to present that paper at the Southern Appalachian Student Conference on Literature, a conference hosted by ETSU annually that is free of charge to all graduate and undergraduate students who wish to participate.



According to Sam, from the time she started her studies as an undergraduate, Dr. Weiss has played a huge role in her education. She has helped her better understand and appreciate different styles of writing and continues now, as her thesis director, to push her and encourage her as both a scholar and writer. After completion of her master's, Sam hopes to continue her education by obtaining a Ph.D. or M.F.A. in creative writing and to eventually become

an English professor. Dr. Weiss states that the thing she admires most about Sam is that she writes without fear. She is unafraid of taking risks by asking questions or sharing her interpretation of a text that might not have been brought up. This opens the opportunity for other scholars to join the conversation and contribute.

In preparation for her thesis, Sam was able to travel with Dr. Weiss to Trinity College of Dublin, Ireland for the Samuel Beckett Summer School, a week-long event on all things Beckett. This event allowed her the opportunity to participate in several lectures and seminars taught by some of the most respected Beckett scholars, including Dr. Weiss, on several themes from Beckett's writings. The seminar Sam attended, which focused on Beckett's plays, was taught by Dr. Jonathan Heron, the Director of the Institute for Advanced Teaching and Learning (IATL), Senior Fellow of the Higher Education Academy, and Associate Professor at the University of Warwick. At the end of the week, at Samuel Beckett trivia night, Sam was part of the winning team and won a year's membership to the Samuel Beckett Society.

Creating a literary thesis begins with selection of a text, deciding how to analyze it, choosing a literary theory to apply to the selection, and completing research by reading other scholar's works on similar topics and understanding their perspectives. When she began brainstorming topics for her thesis, Sam was torn

because she is interested in so many different areas in English and did not want to choose only one. So, like Beckett, she has crafted a project that blends elements of all her interests: literature of the past and present, creative writing, and composition theory. As a creative writer herself, Sam also hopes to gain a better understanding of the entire process by the end of the project.

Creative writers analyze texts by examining the intentional ways authors create their work. Instead of reading a piece only to follow along with the plot of the story, creative writers also

read to understand how the story was woven together. They look at how the writer hooks the reader's attention, keeps it during development of the plot, and how the author concludes the piece. Sam's favorite part of creative writing is what she refers to as the "magic of writing." She loves being able to translate people, places, actions, and experiences into words on a page and is amazed when those words come to life for the reader, allowing them to meet those people, see those places, and experiences as if they were real—because, she asserts, even in fiction there exists reality. ■



Left, Dr. Katherine Weiss // Right, Sam Campbell



# Where Are They Now?

## DAVID BRYANT

*Master of Science in Allied Health, concentration in Leadership and Teaching, Department of Allied Health ETSU, 2013*



Profession Division. I am responsible for: overseeing that all programs maintain their accreditation standards, and assist in preparing self-study reports and accreditation site visits; strategic planning, developing and implementing goals, and collaboration with the curriculum committee on any new curriculum changes or updates; annual catalog revisions, academic audits, and overseeing student advisement in programs.

I am also responsible for departmental budgets, employee evaluations, unit and departmental outcomes, along with committee assignments; and responsible for maintaining the division standards for the Southern Association of Colleges and Schools Commission on Colleges.

*How did your time at ETSU prepare you for your career?*

I have used something from each class that I took in this program, from budgeting, to writing policies, to developing new programs, and understanding how to lead a team.

*What advice would you offer current or future graduate students?*

The most important advice I can

give is to use what is given to you. By this I mean the information is there, the professors are very eager to assist you any way they can, and don't be afraid to ask for assistance from anyone. Some of the information from the budget class I thought I would never use. I thought I'm never going to develop a program from the ground up, but guess what, now it makes sense to me. Go and find something in each class that you can connect with your life experiences and use it to push forward. ■



# Where Are They Now?



## WILHELMINA VAN DIJK, Ph.D.

*Master of Arts in Education, concentration in Early Childhood Special Education, Department of Teaching and Learning ETSU, 2015*



At ETSU, I received many opportunities from the department and faculty to increase my skills as a university instructor and researcher. I was lucky to work as a research assistant, graduate teaching associate, and adjunct faculty member.

*What advice would you offer current or future graduate students?*

Graduate school can be a very intense experience, and at times overwhelming. I found it imperative to have a support system of family and friends, but also to take time to step back and rest. Find something that will help you think of something else for a while. At ETSU, I spent a lot of time at the climbing wall; that really helped me focus my thoughts on something that was not school-related. Here in Florida, I run, preferably on trails. Both climbing and trail running require total attention to the activity; if I don't pay attention, I'll probably end up falling! ■

*Why did you choose ETSU for your education?*

Before coming to the US, I worked at a bilingual high school in Guayaquil, Ecuador. During my last year there, two professors from ETSU spent a sabbatical year there. We became good friends, and they encouraged me to come study. The location and size of the school really appealed to me, and I was excited to learn more teaching skills in order to help all students learn!

*What is your current position and/or research?*

I am a Dean's Postdoctoral Research Scholar in the Department of Psychology, affiliated with the Florida Center for Reading Research at Florida State University.

*What does your current position/research entail?*

My position is partially supported through an NIH grant, LDbase. In this project, we are building a data repository for educational research conducted on reading and math development, especially for students with learning disabilities. One of my responsibilities is to use advanced statistical methods to link different data sets together to create large integrated samples of data. With these samples, our team answers novel questions about reading and math development. Additionally, I teach one undergraduate course on dyslexia and help teach a graduate course on psychometrics.

*How did your time at ETSU prepare you for your career?*



# DISCOVERING THE ROLE OF ANANDAMIDE IN *Physcomitrella patens*

by Hannah Warren

Imdadul Haq began his education in Bangladesh, where he studied biology. He then completed his first master's in Malaysia in biotechnology and came to the USA, because he saw that most scientific journals in his field were being published out of the United States. For Imdadul, ETSU was an easy choice. He already had a close friend that had come to the area and felt comfortable following him. It was during his master's studies at ETSU that Imdadul first met Dr. Aruna Kilaru when she served on his thesis committee. Upon completion of his master's degree, he went to work at the University of Florida in Gainesville. When Imdadul decided to come back to ETSU for his Ph.D., he knew he wanted the chance to study under Dr. Kilaru in her lab again. Having worked with him already, Dr. Kilaru knew and trusted the level of biochemistry skills he possessed; and after discussing goals for his Ph.D., she decided they would work together again.

For his dissertation, Imdadul decided to examine a neurotransmitter that has been of particular interest to scientists, especially those who study brain chemistry, since its discovery almost thirty years ago. It is known to play a role in human response to stress, anxiety, depression, and addiction, but its role in plants and many of the mechanisms surrounding how this neurotransmitter is synthesized and broken down are not well understood. His dissertation focuses on these mechanisms, and he hopes to understand the applications this molecule might have in mediating stress responses in plants.

The molecule of particular interest is the endocannabinoid, anandamide. Endocannabinoids are a class of molecules that are synthesized endogenously (by the brain naturally) and, as their name implies, bind to the same receptor types as exogenous Phyto cannabinoids like THC, the psychoactive compound in marijuana. To understand possible pathways

surrounding anandamide, Imdadul selected a unique moss called *Physcomitrella patens* to study. This moss is a transitional organism, a species that appeared on land when most plants were still in water. Because it appeared earlier in the evolutionary cycle than modern land plants, it has more primitive characteristics and lacks complex vasculature that are features of more modern land plants. Surprisingly, this moss has the ability to produce anandamide, while land plants that evolved later cannot. Because of this, it is hypothesized that anandamide could've helped *P. patens* survive in the harsh environment that was present during the time they begin to populate land.

Understanding how *P. patens* produces anandamide, how it breaks down, and at what stage in the plant life cycle the molecule is made could lead to new findings that relate to human brain function. Attempting to define anandamide's metabolic pathway, specifically how to inhibit its production or break-down is unique to this study. To tie the findings from



this moss back to humans, Imdadul first had to find the gene sequence that encodes for enzyme in the moss that was similar to the one in humans that has been identified as responsible for breaking down anandamide. He found a gene sequence that appeared similar and was hypothesized to have similar enzyme activity as in humans. Much of the project now focuses on determining whether or not the product of this gene sequence does actually break down anandamide, and if so, how it affects the plant if it is removed. This required Imdadul to first confirm the function of the gene sequence and then “knock out” or remove the gene sequence from his moss.

Since this study examines a particular protein, a biochemical approach is used in the lab. Imdadul's biotechnology and biochemistry backgrounds have given him the skills he needs to conduct his research on his own in Dr. Kilaru's lab. First, he begins by cloning the gene sequence into a bacterial system (as they can accomplish this much more quickly than the moss) to express the enzyme. This protein is extracted from bacterial cells, and purified protein is used to test the activity. If the gene sequence Imdadul identified is the correct one, it should be able to break down anandamide. To test this, Imdadul used anandamide in which one carbon is radiolabeled (carbon isotope), and he added the enzyme for the reaction to take place. If his hypothesis is correct, the enzyme will break down the radiolabeled anandamide into a product that is also radiolabeled. This substrate and product can be detected by a



separation technique and scanning for the radiolabeled product. Standardization of the experiment has been a trial-and-error process. After proving the activity of the enzyme, Imdadul proceeded to “knock-out” the gene in the moss to understand what happens to the plant when anandamide is not broken down.

Dr. Kilaru understands there are certain experiences needed to become a successful scientist that cannot be obtained from the classroom alone. She encourages all of her students to attend conferences and seminars each semester to expand and reinforce their classroom and laboratory training. Aside from excelling in the classroom and laboratory, Imdadul has attended and received funding for numerous conferences including a 22-day training with some of the world's



most prestigious biologists at the respected Cold Springs Harbor Laboratory. He has also presented at conferences at least once a year since beginning his masters at ETSU.

For Imdadul, the decision to pursue higher education and research was never difficult. When asked about this choice, he explained it the way an influential professor once explained education to him: “On the first floor of a building, you can only see so much. If you go up to the second or third, you can see more than you could on the first, but it still isn't the best view. You get the best view when you go to the top floor.” Currently, Imdadul plans to defend his thesis in December and be awarded his Ph.D. in the spring. He plans to do postdoctoral work and continue to be a scientist who is always seeking new discoveries. His passion for his field is evident in every facet: his enduring search for knowledge, his dedication to making new opportunities for himself, his leadership as ambassador for the American Association of Plant Biology, and passion to inspire future generations of scientists. ■

# EXAMINING THE FOREST SETTING IN EARLY MODERN LITERATURE

by Hannah Warren

Raised in Kingsport, Tennessee, Brooke Johnson chose ETSU for both her undergraduate and graduate degrees because she found opportunities available in our program that she was not finding as an option at other universities she looked into. ETSU provided her with the opportunity to take an independent study course in conjunction with the undergraduate John Milton and His Age class where she was able to dive deeper into the early poetry and political tracts she read (while an undergraduate student) such as Milton's Latin sonnets, *Damon's Epitaph*, and *De Doctrina Christiana*. This helped her have a better understanding of Milton as a writer and to be able to critique his works in more detail.

As a sophomore, Brooke took Dr. Joshua Reid's European literature class, because in her previous English classes, she had mostly covered only American literature. In his class she learned of Dante, who quickly became one of Brooke's favorite authors. Dr. Reid was going to be teaching a special topics class on Dante late in the year and encouraged her to sign up for his Milton and His Age class in the meantime. This class on Milton was a transformative experience. Even though Dante remains one of her favorite authors, this class opened her eyes to Milton's early modern world. As she began to read Milton's early poetry and *Paradise Lost*, it became clear that Milton's work interested her more than any other author she'd ever read before. At last, she had found an author that, in her words, she "could listen to, read, and write about forever and be content." The more she learned about Milton, the more she wanted to know. Now a graduate student, she has still yet to find another author that can hold her attention the way Milton's beautifully complex style is able to. For Brooke, one of the most interesting things about Milton's work is that scholars can debate endlessly about context and meanings of lines, and even single words from his text. His extra-biblical interpretations of characters like Eve have caused a decades-long discussion about feminism in *Paradise*



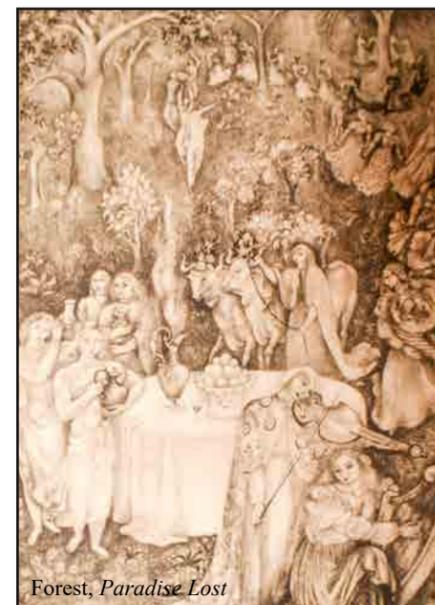
*Lost*. With lines like "He for God only / she for God in him" (PL 4.299), questions about a woman's place in the hierarchical structure between God and Man issue forth. At the same time Milton describes Eve as a subjected being, he gives her agency and rounds out her character. She even has the last spoken lines of the epic.

Brooke decided to turn her fascination with Milton into her graduate thesis. Her project examines how *Paradise Regained*, the sequel to *Paradise Lost*, re-interprets the Biblical account of Jesus' temptation by the Devil for forty days and forty nights in the desert. Unlike the Biblical account, Milton's version liberally uses trees in the desert environment. She found this facet especially thought provoking as Milton frequently takes creative liberties while interpreting the Biblical text. However, Milton never seems to take those creative liberties without just cause. Brooke's thesis then attempts to explore the possibilities as to why Milton includes this minute, albeit interesting, detail in *Paradise Regained*, looking at the poem from different angles such as how the relationship between *Paradise Lost* and *Paradise Regained* creates what

she calls a "medieval romance structure" when read in tandem, and how the solitude of the wilderness setting creates a means for psychological transformation.

By examining works from Milton and his forefathers, she wants to understand the use of the forest setting in early modern English literature, the time period from the 16th to 18th centuries. Primarily her research comes from studying *Paradise Regained* and to a lesser extent *Paradise Lost* where Milton describes a "woody maze." Traditionally, the forest setting has a reputation as a place to become lost in, a place of danger. In *Paradise Regained* Milton describes the reclamation of what Adam and Eve lost in *Paradise Lost*, making his use of the forest setting and temptation an interesting choice over the crucifixion as a focal point on Jesus' life. The transformation of the characters from the *Paradise* books can be compared to those in Dante's *Divine Comedy*.

Brooke's idea of examining the forest setting began as a topic for a conference paper that she took to the Renaissance and Medieval Conference at UVA-Wise in 2018.



For this paper she was using Dante and Milton as the endcaps of the Renaissance period, and using Shakespeare's *A Midsummer Night's Dream* to represent a midpoint. After realizing the magnitude of the topic, she scaled the project to one that was feasible to complete during her master's work.

Dr. Reid was quick to praise Brooke's dedication to her studies and acceptance of leadership roles both in and out of the classroom. She has served as his research assistant, helped with department events such as the Milton Marathon and Southern Appalachian Student Conference on Literature (SASCOL), and completed an independent study on Milton's *Paradise Lost*. She has taught an undergraduate class period on the character Eve in book 10 of *Paradise Lost*, ran a book exhibit and curated an art exhibit on Dali's illustration of Milton. Dr. Reid was so impressed by the notes and perspectives Brooke presented in her lecture that he asked her permission to use her notes in his future classes on the same topic in his British Literature class. This October, Brooke presented a paper

(that will be a portion of her thesis) at the US 2019 conference on John Milton in Birmingham, Alabama. Having the opportunity to present at this conference as a master's student represents an incredible accomplishment in her academics, as the majority of presenters there are advanced scholars and Ph.D. candidates. In fact, Dr. Wendy Furman-Adams, Albert Upton Professor of English at Whittier College, remarked that Brooke's paper was "indistinguishable in quality from those by the two mid-career colleagues who spoke before and after."

Brooke plans to graduate in May of 2020 and continue on to a Ph.D. program with the intention of becoming a college professor. She hopes to study the evolution of the Eve-figure from the early modern to Victorian periods, in addition to how Milton can be better taught in the undergraduate classroom. Teaching has been a dream of hers since she was seven years old, and she's always felt at home in the university setting. By pursuing a life of teaching and learning, Brooke hopes to find that Miltonic "paradise within." ■

# Where Are They Going?



## MEG ROUSSOS

Master of Fine Arts, concentration in Studio Art,  
Department of Art & Design  
Expected graduation, ETSU, 2019

### Why did you choose ETSU for your education?

The Art and Design department at ETSU provided me the opportunity to work interdisciplinary with highly talented faculty. The department offered teaching experience, which was a priority for me while pursuing my Master's degree. ETSU allowed me to re-locate to the beautiful Appalachian Mountains.



### What is your position?

I am currently a studio assistant for artist Meghann Riepenhoff. Working for Meghann allows a variety of responsibilities. I cut and coat large cyanotype paper, assist her in the field, and photograph and fine tune digital documentation of her cyanotypes. I am responsible for her complete inventory, packing and shipping work to galleries, and I am currently the project manager for large commission work for the City of San Francisco.

My current research considers interventions and experiences in the landscape through a variety of lenses. I work from the highly personal, to the social and technological. My art requires trekking in the landscape, often alone in unideal conditions. I carry my camera, drag a treadmill, or will methodically walk a hillside to create work that takes

### What advice would you offer current or future graduate students?

Take risks. Converse and get to know the entire faculty in your department. Reach out to your peers for feedback and collaboration. Create lasting relationships and connections with mentors and colleagues. Keep your head down and work hard. ■



form through traditional imagery, photographic artist books, documentation of land art, or videos.

### How has your time at ETSU prepared you for your career?

The faculty at ETSU gave me valuable feedback and insight with my studio work, grant writing, and helped connect me with artists in my field. Through those experiences, I earned notable internships, worked towards my thesis exhibition, and feel prepared to enter the art world.

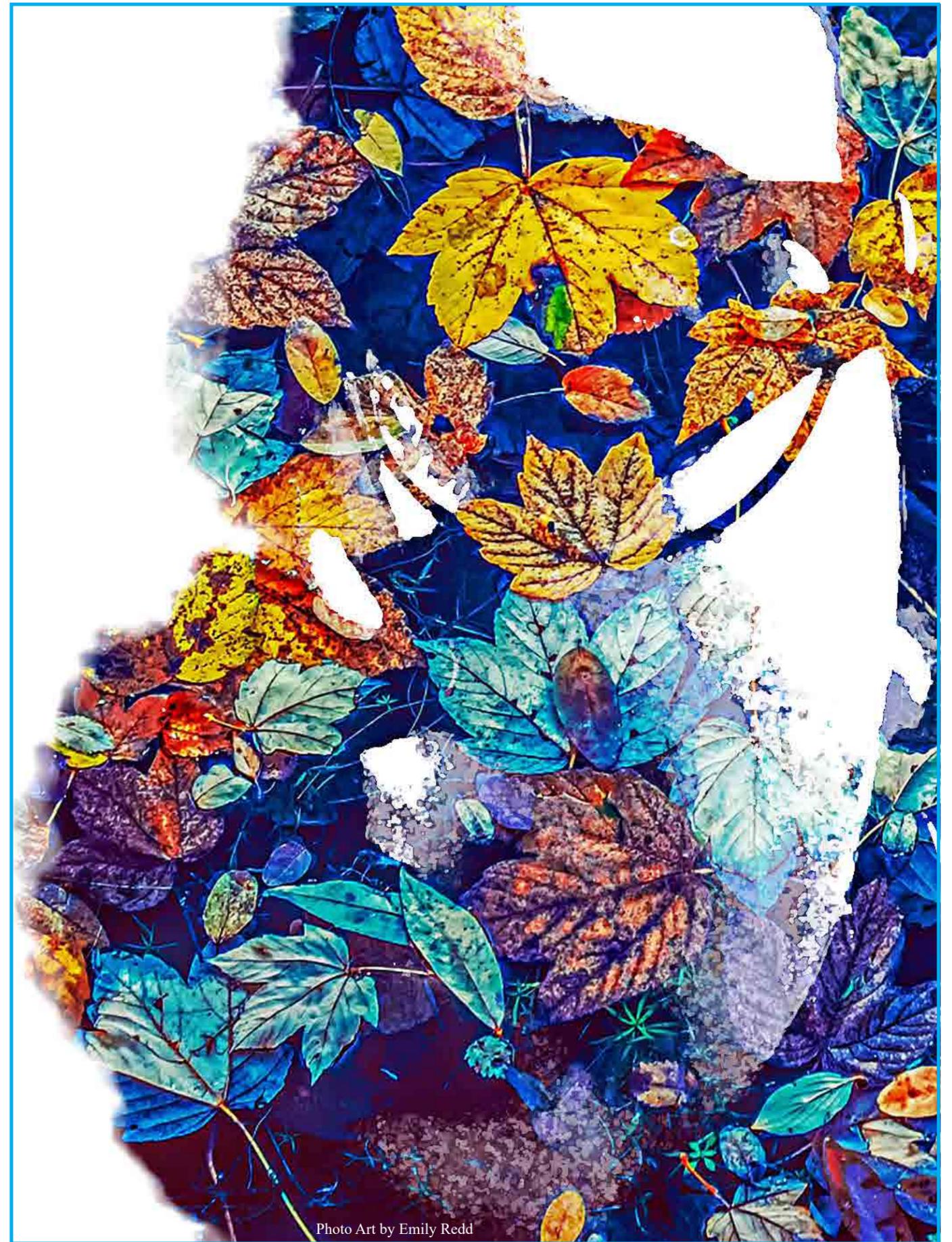


Photo Art by Emily Redd

# IDENTIFYING RISK FACTORS REGARDING PHTHALATE EXPOSURE

by Hannah Warren



Denise Chavez Reyes currently holds a bachelor's degree in Human Services and a master's degree in Technology with a concentration in entrepreneurial leadership; both degrees were awarded by East Tennessee State University. While pursuing her first master's degree she was hired as a research assistant by Dr. Mildred Maisonet from ETSU's Department of Public Health to conduct research, which required a Spanish-speaking interviewer. While studying in a bilingual high school in Ecuador, she met a math teacher from East Tennessee who was teaching at her high school and encouraged her to apply to ETSU.

Prior to changing her major to Human Services, she was studying corporate finance and investment, a field that can sometimes describe human beings as a "cost" of business rather than assets to business. As a requirement to be accepted into the MS in technology program, Denise needed to fulfill a thesis requirement. She wanted to understand the factors that influenced Hispanic participation in higher education, and learn how to get more individuals from Hispanic backgrounds involved in higher education. In need of a bilingual Spanish-speaking research assistant who could interact and engage with the Hispanic community for a project, Dr. Maisonet reached out to Denise, who at that moment was about to defend her thesis, to be a research assistant.

When Denise started to work for Dr. Maisonet to collect interview data, she found her niche and learned that some of the factors studied in her research were also determinants of health outcomes. She decided to pursue a second master's degree in Public Health. Dr. Maisonet's research focuses on chemical exposure and hormone levels in women. Specifically phthalate levels in a female Hispanic sample. Phthalates are a class of man-made chemicals found in many household cleaners. As potential endocrine disruptors, they compete for binding sites on receptors within

the body that human hormones would normally bind to, and may interfere with body processes such as cognitive development, growth, metabolism and reproduction. The two hypothesize that women in certain occupations may be at risk of higher exposure to phthalates than others. If they are able to confirm this, they can work to create community education programs to educate workers on ways to minimize their exposure to phthalates in order to promote better health.

To begin the project, Denise read about phthalates, how they interfered with hormone binding mechanisms in humans and created a modified translation of study-specific questions from the US National Health and Nutrition Examination Survey (NHANES) created by the Center for Disease Control and Prevention. Denise first visited Hispanic communities in Erwin, Greeneville, Kingsport, and Johnson City to talk with potential volunteers about the importance of the study she was hoping to



Left, Denise Chavez, Right, Dr. Mildred Maisonet

conduct. After she had recruited enough people who were interested in participation, she conducted interviews to gather background information to verify that they met study inclusion criteria of being a female over the age of eighteen. She provided education on how to collect their biological specimens, and provided all supplies required for collection. Because phthalate metabolites are detectible in human urine, urine samples - both easy to collect and relatively inexpensive to process - served as the method of data collection for this study. Once participants had collected their biospecimen Denise sent them to colleagues of Dr. Maisonet at the University of Tennessee at Chattanooga for analysis. Due to funding limitations, the project was capped at 50 participants, despite receiving interest from more than 50 women. At this time, Dr. Maisonet and Denise are awaiting results from the urinalysis of phthalate levels from each of the specimens, which will be compared to the National average to confirm or deny their initial hypothesis. If their hypothesis is confirmed, she and Dr. Maisonet plan to use results from this research as pilot data to gain support for a larger project.

Denise's devotion to helping others extends far beyond this single project. Since her arrival in Johnson City, she has always been engaged with the community and an advocate for the area's Hispanic community. The Migrant Education Program organized by Conexión Americas in Tennessee, is a summer camp that brings children from families that work in agriculture to various campuses across the Tennessee where they learn about various topics. This summer the focus was on building



Denise Chavez (center), Friends Committee on National Legislation in D.C.

confidence and leadership in students in order for them to successfully identify and follow their dreams.

Another project that Denise and Dr. Maisonet spearhead is education on the importance of advocacy to ETSU students. In March, Denise, Dr. Maisonet and Dr. Fiuza traveled with nine ETSU students to Washington D.C. to be trained on the lobbying process for immigration policy change and border security options through the Friends Committee on National Legislation (FCNL), a Quaker organization that promotes non-confrontational, non-partisan lobbying by focusing on establishing long-term relations with elected officials. While in Washington the group was able to meet with several local politicians including Phil Roe, Lamar Alexander, and Marsha Blackburn where they were able to have conversations about current issues surrounding the rights of immigrants to America and advocate for the humane handling of immigration issues. This year the FCNL's focus is on carbon pricing, and Denise will act as delegation

leader and representative for ETSU. In addition to representatives of FCNL visiting ETSU, a group is preparing to attend another training session, which will take place in D.C. in March.

After graduation Denise plans to take time to gain work experience before applying to a doctoral program in public health. She finds joy in being able to integrate each piece of her education, in some manner, into the work she currently does, inspired by the concepts of grit and hardiness. Being in leadership, having a multifaceted perspective regarding public health, and acting as a role model, both the students and community members she works with have taught her resilience, and serve as a reminder that even though she may face adversities within her own research, the outcome is worth persevering for. She has been able to form lasting connections in the community and created a strong network that will continue to foster her work both here in Johnson City and wherever her future takes her next. ■



# Where Are They Going?

## OCEANE TANNY

Master of Arts in Sociology Major, concentration in Applied Sociology  
Department of Sociology & Anthropology  
Expected graduation, ETSU, 2019

*What degree are you currently working on?*

I am currently working towards getting a Master of Arts in Sociology, with a concentration in Applied Sociology. I received both my undergraduate degrees (Bachelor of Arts in History and Bachelor of Arts in Sociology) at East Tennessee State University.

*How has your degree helped you?*

Studying sociology at the master level has enabled me to improve my research skills and has given me the opportunity to apply these skills to numerous projects at ETSU's Applied Social Research Laboratory. I have been trained to use various research tools such as SPSS, Qualtrics and Nvivo. My training and internships at ETSU have rendered me a qualified candidate for multiple higher education institutions.

*What professors/advisors were instrumental in helping you?*

All of the instructors in the sociology department have been of a great help to me. I am grateful to all of them and particularly, I salute Ms. Cole, who was my undergraduate advisor, Dr. Copp who is my current advisor, and my mentor Dr. Foster.



Outside of the sociology department, professors who have always supported me are Dr. Carter, Dr. Maxson, Dr. Newcomer and Dr. Burgess (in the History department), Dr. Johnson (in the Engineering department) and Dr. Pealer (in the Criminal Justice department).

*What program/degree will you be pursuing*

Thanks to my background and training, I was deemed a qualified candidate for law school. My experiences at ETSU and level of education have helped me secure a seat at Wake Forest School of Law, where I was awarded a full tuition scholarship.

*What career opportunities will you pursue?*

I am hoping to become a lawyer. Currently, my areas of interest in law are social law, medical law and international law.

*What advice would you give to current graduate students who would like to pursue a doctoral degree?*

Never give up, and make sure to utilize all resources available to you for your success. Resources are not only libraries or classrooms, they're also professors and peers. It is important that students realize that professors are here to work with them; they will always be there to help. I would also suggest that students look more into peer learning. It is true that education gets competitive, but other students are valuable resources that can promote learning. Additionally, students must be willing to put in the work necessary to achieve their goals. Another important thing that is often neglected: Students must take care of their mental health and not shy away from seeing a therapist. There is free counselling available for students on ETSU campus.

*Anything else you would like to share?*

I would like to once again thank all my instructors, as well as all the people who supported me through college and grad school. The feeling of gratitude I have cannot be matched. ■

# Where Are They Now?



## JOHN WAGLE, Ph.D.

Doctor of Philosophy, Sport Physiology & Performance, concentration in Sport Physiology, Department of Sport, Exercise, Recreation, & Kinesiology, ETSU, 2019

*Why did you choose ETSU for your education?*

When I was deciding to leave my position at DePaul, my highest priority was to find the opportunity that allowed me to learn from the best. The faculty at ETSU are world-renowned within the field of sport and performance science, so the choice was easy.

*What is your current position and/or research?*

I am currently the Director, Performance Science/Player development for the Kansas City Royals. Within that role, I oversee all aspects of physical development and monitoring within our player development system. I am staying involved in research as well, but this is mostly happening via collaborations with colleagues embedded within the university setting.

*What does your current position/research entail?*

I manage a staff of around ten S&C coaches, and collectively, we are responsible for the physical development of all Royals' athletes within the player development system. More simply, this includes all resistance training, speed development, conditioning, change of direction, etc. Furthermore, we are tasked with leveraging the



latest sport technology to design processes that allow us to evaluate the physical development status of the athletes, and the efficacy of our programming.

*How did your time at ETSU prepare you for your career?*

More than anything, my time at ETSU surrounded me with faculty and fellow students that challenged me to develop a greater level of subject matter expertise. I learned how to think critically and be pragmatic in my application of scientific principles. Refining valuable skills under the guidance of elite-level practitioners is a once-in-a-lifetime opportunity that prepared me for virtually any role that would follow.

*What advice would you offer current or future graduate students?*

Don't be afraid to "waste time".

Some of the most rewarding learning experiences that I had while at ETSU were in casual conversations with faculty and other students. Going through a graduate program with the demands of ETSU requires a great deal of focus, time, and effort on keeping up with the rigors of the program. However, being willing to take a step back and enjoy the resources that are available to you allows for a much deeper learning experience. ■



# PREDICTING THE PAST AND FUTURE ENVIRONMENTS OF THE FRASER FIR AND RED SPRUCE

by Hannah Warren



Native of North Carolina, Danika began her education at Appalachian State University where she studied environmental science, atmospheric science, geology, and studio art, specializing in painting and metalwork. She was introduced to Geographic Information Systems (GIS) and realized this area of study would allow her to combine all of her scientific interests. In 2017 she had the opportunity to be a naturalist intern at Grandfather Mountain State Park, the highest peak on the eastern escarpment of the Blue Ridge Mountains. After her class on GIS she became more interested in the curriculum offered by ETSU's Department of Geosciences. Before Danika even arrived at ETSU, her unique combination of interests stood out to Dr. Joyner, now head of her thesis committee. In geosciences, the ability to visually convey information is of utmost importance, especially in cartography where visual art and science intersect. Once beginning the program, she realized she was especially passionate about ecology, weather, and climate.



Original artwork by Danika Mosher

For her thesis Danika decided to further develop the project she completed for her capstone at Appalachian State that was inspired by her time at Grandfather Mountain examining Southern Appalachian Spruce Fir forests. She refers to these forests as "sky islands", entirely unique from

forests at only slightly lower elevations, with species such as the Blue Ridge Golden Rod and Heller's Blazing Star being found almost exclusively in these regions. Now she is examining the effect of climate change on these forests, particularly on Red Spruce and Fraser Fir tree populations as a two-part thesis. This project is significant, because unusually warm temperatures resulting from climate change may be impacting some species, causing some to move to cooler, higher elevations, but they will only be able to do this for so long, as the mountains are only so tall. Consequently, several plant and animal species found in these forests have been placed on the endangered species list.

Danika is using Ecological Niche Modeling, a form of machine learning, to combine current species distribution data from citizen science reports of sightings of the Red Spruce or Fraser Fir, primarily in North Carolina, with climate parameters that include temperature and precipitation variables from the WorldClim database. She is the first known person to create this type of model of the Fraser Fir in this region. She evaluates 19 'bioclimatic' variables, along with altitude, degree of slope, and aspect to produce a suitability surface that predicts potential species distribution. The niche model 'learns' where the species are present based on environmental values at each species observation by looking for patterns within the data resulting in a prediction for habitat suitability. Fraser Fir trees are endangered and are usually found above 5,500 feet, and Red Spruce reside around 4,500 feet in elevation and are of least concern (the lowest level of 'threatened' status); however both species have upper elevation limits. Both species are known as glacial relics dating back to the Last Glacial Maximum, they were both abundant in the south, but as the glacier retreated, they only had three options: move up the mountains, move farther north, or die. Abundant rainfall and fog have allowed them to survive in this region of Appalachia by reducing the effect of solar radiation. Maximum average temperatures have been on the rise and are posing a grim future outlook for these trees.

Danika is currently testing three models - Maximum Entropy (MaxEnt), Random Forest, and Boosted

Regression to determine which perform best in predicting Red Spruce and Fraser Fir habitat extents, through statistical analysis and validation with remotely sensed spectral data. Remote sensing allows geoscientists to see what is present in a given area without having to actually explore it. Once she has the spectral data, she can compare the predicted results of her model with the known tree presence to confirm its validity.

Once she determines which model performs best, she will be able to inform the historic and future distribution of both species. One thing Danika loves about the Department of Geosciences is that it has a paleontology side. In addition to her required coursework, she has taken courses in paleoecology and conservation paleobiology, resulting in a more holistic and comprehensive interpretation of the historic distribution. From the historical perspective, she will be focusing on the Mid-Holocene era, approximately 6,000 years ago and the end of the Last Glacial Maximum, approximately 22,000 years ago. For the future, she will be projecting her model to 2050-2070 based on the 5th Assessment Report from the Intergovernmental Panel on Climate Change (IPCC), which predicts what could happen with our climate in terms of worst-case and best-case scenarios based on socio-economic impacts. The best-case scenario from the IPCC is cessation of all emissions. Worst case is we make no improvements or changes in policy from where they are currently. Danika intentionally chose the years 2050 and 2070, because studies have shown that things will likely improve for many species short term and then potentially take a turn for the worst. She hopes that by looking at the past, present, and future distributions of the two tree species that she will be able to inform their migration patterns and directions.

As a side project, Danika is also examining snowfall amounts around ski resorts in North Carolina



Left, Danika Mosher. Right, Dr. Andrew Joyner

from 2010-2017/18 using a form of citizen science called Community Collaborative Rain, Hail and Snow (CoCoRaHS) weather stations. These "backyard" stations report precipitation twice daily to the CoCoRaHS website. She categorizes the data by trends in seasons and then by overall climate variability, considering effects of large atmospheric patterns such as the Arctic Oscillation, North Atlantic Oscillation, and El Niño-Southern Oscillation to compare yearly trends. She also examines worst-case and best-case scenarios for snowfall in western North Carolina. By identifying the changes in number and location of CoCoRaHS stations, she hopes to encourage implementation of more stations in areas throughout the region. With only a small number of stations, there can be large gaps in data resulting in less than ideal snowfall estimates in many areas.

Ultimately, Danika hopes that her work can be useful in informing policy and legislation, and ultimately conservation efforts. She understands that while it may be too late for some species in this area, scientists in other regions where these same species occur may be able to identify the most at-risk species and act accordingly before it's too late. This past summer,

guided by Dr. Joyner, she was accepted to the 10-week NASA DEVELOP National Program internship in Asheville, North Carolina as a project lead for a remote sensing project that assisted the Kansas Department of Agriculture in identifying the early onset of drought conditions based on reductions in soil moisture that are not readily apparent. During the internship, she established a friendship with Tami Houston, the NOAA liaison for State and Regional Climate offices, who could see the positive impact Dr. Joyner is having on Danika's education. Currently Danika is in the process of publishing her snowfall data research, and recently presented it to the professional GIS community at the annual East Tennessee Geographic Information Council meeting in Knoxville. She will also present her snowfall research at the Southeastern Division of the American Association of Geographers conference in Wilmington, NC in late November. She plans to graduate in spring of 2020 and hopes to work at the North Carolina Institute for Climate Studies through NC State University or at CASE Consultants International. Her ultimate goal is to work at NOAA's Earth System Research Lab in Boulder, Colorado. ■



# Where Are They Now?

## MELODY RUSSELL

Master of Arts in Sociology, concentration in Applied Sociology  
Department of Sociology & Anthropology  
ETSU, 2018

### Why did you choose ETSU for your education?

I chose ETSU for my graduate education, because the program allowed for a non-thesis track that focused on the application of skills being taught through a supervised internship. I chose the applied track, because I wanted to gain real-world experience through an internship that would give me skills that could carry over into the workforce outside of education. Additionally, I had completed the Undergraduate Sociology BS program at ETSU (graduating in 2016). Since I knew who my professors were and their teaching styles, I knew that I would enjoy the program.

### What is your current position and/or research?

I'm a Market Research Manager at WBA Research, located in Lanham, Maryland (about 15 miles north of Washington D.C.). I have been in this position for over a year.

### What does your current position/research entail?

As a member of the project management team at WBA Research, I am involved in managing all components of the research process, including client communica-



tion, questionnaire development and testing, coordinating fieldwork, data analysis and report development. The main area of research I am involved in at WBA pertains to health care. However, I have been involved with projects relating to higher education and transportation, along with various employee satisfaction studies.

### How did your time at ETSU prepare you for your career?

The professors who teach courses through the Sociology MA program teach up-to-date practices and methods of performing survey research, which equipped me with the knowledge I needed to start working outside of academia right after I graduated. Also, the internship and Graduate Assistantship I had gave me working skills that I could take with me into a

real-world job, such as communicating well with internal/external clients, general management skills, and learning how to prioritize tasks to reach my goals/milestones.

### What advice would you offer current or future graduate students?

The advice I would give would be to try to find a field that you feel passionate about, stay open to learning new things and hearing new ideas, and network as much as possible by getting involved in communities related to your field (join organizations related to what you are studying, volunteer within those organizations, maintain relationships that you build within these communities, and sign up for their listserves so that you can stay updated on what is being discussed by experts in your field). ■



# Where Are They Now?

## DARRYL B. HOOD, Ph.D.

Doctor of Philosophy, Biomedical Sciences, concentration in Biochemistry, Department of Biomedical Sciences  
ETSU, 1990



### Why did you choose ETSU for your education?

Geographical location, Excellent new medical school at the time, Great offer as per full scholarship, Top tier faculty for a school of its size, Expertise of faculty, Demonstrated commitment to diversity and inclusion.

### What is your current position and/or research?

Pending promotion to full professor

### What does your current position/research entail?

A twelve-month contract with requirement for teaching, research, service and commitment to undergraduate and graduate students

with significant mechanistic, environmental justice and community-based research and outreach.

### How did your time at ETSU prepare you for your career?

My degree prepared me for a rigorous four-year postdoctoral fellowship in Molecular Toxicology and Biophysics at Vanderbilt University School of Medicine where I was able to write successfully for an NSF Postdoctoral Fellowship. During the second phase of my career at The Ohio State University, I've continued my innovation in discovery as co-architect of the novel Public Health Exposome framework. This paradigm-altering framework interrogates hypotheses focused on determining if there are associations between the built, natural and social environment and disparate health outcomes observed in vulnerable populations.

My cumulative work of nearly three decades was recently recognized by the USEPA in the 2017 Integrated Risk Information System Assessment (IRIS) for the environmental contaminant benzo(a)pyrene [B(a)P] which cited multiple articles from my laboratory as a basis for recalibrating the reference concentrations (RfC) for inhaled B(a)P exposures in reproductive and neuro-toxicity studies.

At The Ohio State University, my passion regarding the importance of teaching and training minority students is based on the statistics where the proportion of environmental public health investigators is strikingly lower than the percentage of minority US citizens. It is well known that while 12-percent of the population is Black, less than 0.25 percent of persons holding Ph.D. degrees in the environmental public health sciences are Black.

### What advice would you offer current or future graduate students?

My advice to graduate students is to use those initial didactic years of uncertainty in graduate school to really hone-in, and find your passion in whatever you are interested in. In an era that will lend itself to working in transdisciplinary research teams, it is imperative that you find what area of science you are in love with so that you might hit the ground running, which will make discovery even the more exciting from day-to-day! ■



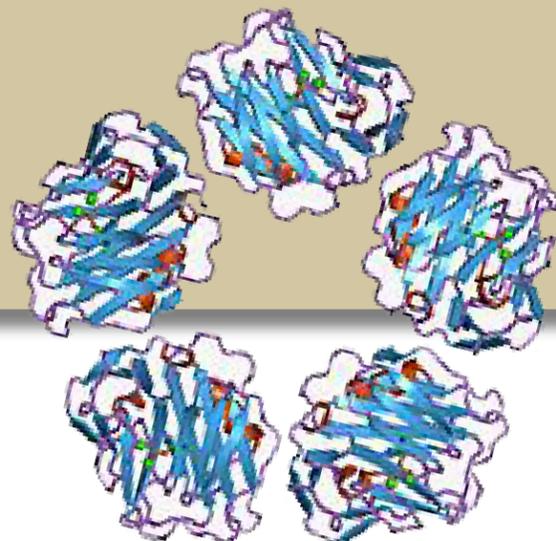
# ANTIMICROBIAL FUNCTIONS OF C-REACTIVE PROTEIN

by Hannah Warren

Donald Ngwa has always had a passion for understanding and solving scientific problems. His passion developed his love for mathematics, chemistry and biology. Given how these subjects merge together in biochemistry, he decided to pursue his studies in this field, where all of his interests intersect. Born in Cameroon, Donald attended the University of Buea for his bachelor's degree where he worked on a project called Proficiency Testing in the Measurement of Creatinine and Urea by some local laboratories in the southwest region of Cameroon. After graduation he received an offer from Professor Wilfred Mbacham of the Biotechnology center of the University of Yaounde 1 in Cameroon to work on another project titled Research on Economics of Artemisinin-Based Combination Therapies (REACT), which examined the use of artemisinin combination therapies by local hospitals to circumvent artemisinin resistance in the treatment of malaria. Two years later, at the conclusion of this project, Donald began considering options for graduate programs where he might continue his education. At the time, Donald's aunt, a master's student at ETSU, encouraged him to look into ETSU's Department of Biomedical Sciences. Intrigued by the research of Dr. Alok Agrawal and after conversations with friends already attending ETSU, he decided to apply. In 2014, Donald was accepted to ETSU for his master's degree in biochemistry, and that same year began working in Dr. Agrawal's lab.



Left, Donald Ngwa, Right, Dr. Alok Agrawal



The research Donald began with Dr. Agrawal focused on examining the anti-pneumococcal properties of C-reactive protein (CRP) and to find an effective treatment for pneumococcal septicemia. CRP is constantly produced in the liver at low levels and released into the bloodstream. Because CRP levels rise dramatically with inflammation or during bacterial infection, they hypothesize that CRP may have not only anti-pneumococcal functions, but general antibacterial functions as well. Like a fever, elevated levels of CRP indicate that something is not right in the body. Elevated levels of CRP do not directly determine what is wrong, but serve as a marker for physicians to know that further examination may be needed. By the end of his thesis, they found that CRP acts by changing its structure in response to inflammation to kill pneumococci, and they identified a modified form of CRP capable of fighting pneumococcal septicemia.

Upon completion of his master's degree, Donald wanted to further investigate his thesis topic and made the decision to pursue a Ph.D. at ETSU. Dr. Agrawal and Donald worked together to plan a four-year translational dissertation project that they hope to one day see in clinical trials. Beyond the anti-pneumococcal functions of CRP, this new project examines how their modified CRP compares with traditional antibiotics used in the treatment of pneumococcal infections. Their other projects involve identifying the site on CRP responsible for its binding to multiple pathologic proteins like those present on the surfaces of bacteria, as well as how the body regulates biosynthesis of CRP in the liver.

To study the anti-pneumococcal properties of CRP, Donald and Dr. Agrawal use a traditional

mouse model. They inject a lethal dose of streptococcus pneumoniae into these lab mice and determine what, if any, role CRP and its modified forms play in clearing the infection. Proteins have a highly folded structure, and changes in the cellular environment such as temperature or pH can cause conformational changes in the folded structure of the protein. These changes in the protein conformation can expose previously inaccessible binding sites. This relates the function of a protein to its structural conformation. Donald, by mutagenesis, creates modified versions of CRP with changes that mimic those that may be occurring in CRP in the human body during pneumococcal infections. They then study the novel anti-pneumococcal properties of these mutant CRP species. Pneumococci infected mice are injected with these modified CRPs, and they look for an immune response that is superior to what they get using unmodified wild type CRP. To monitor progression of the disease in infected mice, they perform bacteremia studies and



Donald Ngwa



Left, Dr. Alok Agrawal Right, Donald Ngwa

record the mice survival rates daily. This allows them to compare efficacy of modified proteins to unmodified wild type CRP and traditional antibiotic therapies. If CRP is ultimately found to have general antibacterial functions, it could be used as a treatment of choice in bacterial infections and should greatly reduce the antibiotic resistance currently seen with bacterial infections, especially in the treatment of pneumococcal infections.

The end goal of his project is to design and synthesize a chemical compound which could be administered to humans, that will bind to endogenous wild type CRP and alter its structure so that it confers the same anti-pneumococcal properties seen with their exogenously modified CRP. If they are successful in finding a compound that can accomplish this, it could have implications far beyond treatment of just pneumococcal infections and may be used in the treatment of other bacterial infections that use similar mechanisms to evade the host immune system such as streptococcus pneumoniae. This is quite significant because, such a treatment would reduce the need

for antibiotics and the problem of antibiotic resistances rates, which pose a huge health problem.

Donald is currently writing a manuscript to publish his findings and plans to defend his dissertation in March, and graduate in the spring. The final portion of his dissertation will focus on complete characterization of how modified CRP interacts with immune resistant pneumococci as well as the regulation of CRP gene expression. For Donald, this project is truly a labor of love; a dream come true to have a project to work on that has infinite facets to examine. Being able to work with Dr. Agrawal, a scientist with an equal passion for the field and desire to see his students succeed, has been an invaluable experience for Donald. During his time at ETSU, he has presented at the Appalachian Student Research Forum, the Tennessee Physiological Society conference, and the American Association of Immunologists Conference. After graduation he plans to complete post-doctoral work in the field of infectious diseases and immunology and hopes to one day return to Cameroon to be a professor. ■

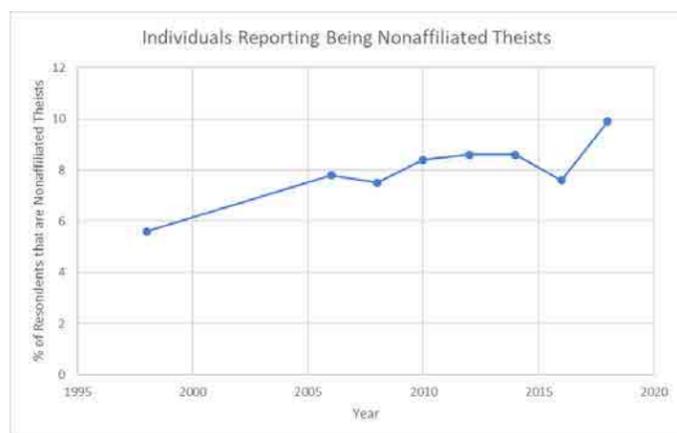
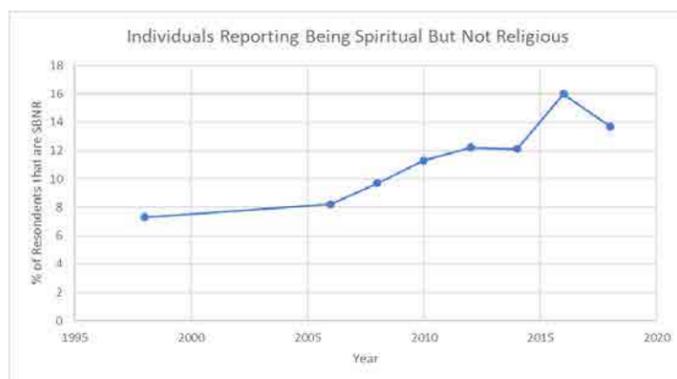
# SPIRITUAL BELIEFS AND HEALTH OUTCOMES: A COMPLEX ASSOCIATION

by Hannah Warren



Alexander Smith, who is originally from Rogersville, Tennessee, graduated from ETSU with his bachelor's degree in psychology and philosophy. After graduation, he began working at Pellissippi State Community College in Knoxville, TN as a Student Success Specialist for biology. Only one year after graduation he was eager to begin a graduate program. After looking into several schools, he decided he would return to his Alma Mater for a master's degree in sociology. Coming from a psychology background, Alexander found the study of everyday social interactions of human behavior fascinating since it involves taking concepts from psychology and applying them to larger groups. He enjoys examining how interpersonal behaviors influence human actions in a given situation.

For his thesis, Alexander is using secondary data from a large existing data set to explore his interest in the relationship between religion, spirituality, and health outcomes. Alexander notes that a large portion of social life is and has historically been based on religion. Affiliation with an organized religious group provides community and fosters fellowship with like-minded individuals, and for many, their religious affiliation, or lack thereof, influences their life outlooks and daily behaviors. Alex wanted to learn more about this as it applies to health outcomes. Individual outlooks and behaviors have been closely linked to health outcomes. Specifically, he decided to examine individuals who identify as "spiritual but not religious" and their health outcomes. These groups are not tied to a religious institution. In this study identification as both spiritual and religious was self-reported in a survey and can be cross-classified to look at the people who report being spiritual but not religious. Three health outcome variables were selected for the study including the number of days of the month that were good days physically, the number that were good mentally, and overall subjective rating of general



well-being. The survey data is from the General Social Survey conducted by the University of Chicago and has been collected since 1972. The GSS contains data from both English speakers, and within the last 10 years, Spanish speakers over the age of 18 years. The portion of the data Alexander is focusing on is the portion collected from 2002 until the present.

For analysis, Alexander accessed the public data and recoded his variables of interest before running statistical analysis. The independent variable is status of religious affiliation and the dependent variable is health outcome scores he has coded from data in the General Social Survey. He is still in the process of creating the regression models he will use for analysis so he can control for other variables

that can impact health outcomes including education and economic status. Currently, there are very few studies that examine the health outcomes in the spiritual but not religious category. Previously Dr. Baker, Alexander's committee chair, examined religiously nonaffiliated theists, those who believe in God but are not affiliated with a religion, which differs some from spiritual but not religious. However, this study showed that nonaffiliated theists had lower health outcomes than those who identified as both actively religious and atheists. He hypothesizes that this discrepancy arises from the lack of a definite set of relationships and identities. For example, atheists who believe in no god and no religion still have a community and others that share a common, definite set of beliefs. Nonaffiliated theists stand in a limbo, so to speak, according to Alexander, since individuals can fall in many places on the spectrum.

Because Alexander's work is exploratory and very little literature exists on this topic, he hopes that his project will help us better understand how secular beliefs affect health, and more broadly, how religion or spirituality can impact overall health. In similar studies that have previously examined religion and health, all individuals who do not fall within a well-defined religious or secular category such as such as agnostics, nonaffiliated theists, or the spiritual but religious have been lumped together into a single secular category, which is inefficient and can lead to incorrect generalizations since it does not take into account the various sub-groups within the broader category of nonreligion. In general, there seems to be a strong relationship between those that identify as religious and



Left, Alexander Smith, Right, Dr. Joseph Baker

outcomes regarding their physical health, mental health, overall well-being, and mortality.

Alexander has also completed a historical lineage of unstructured spiritual belief in the United States from transcendentalism until today that takes a deeper look at subcategories of beliefs among those who identify as spiritual but not religious to better understand the concept and trends regarding this shift. Since the mid-1990's there has been a dramatic increase in the number of Americans who report having no religion, as that number has almost tripled in 30 years. Despite the increased number of individuals disaffiliating from formal religion, the number that identify as atheist has stayed relatively unchanged. This is what prompted Alexander to further examine these subcategories, allowing him to break up the variety of categories that have been lumped into one secular category and more accurately understand how different

degrees of spirituality and religion affect health outcomes. Identifying as spiritual but not religious makes it possible for individuals to manage stigma that is attached with identifying as secularists, such as identifying as atheist, especially for those who have transitioned out of an organized religious community. With social networks theorized to play a huge role in health outcomes by being able to have other individuals with similar views for support, Alexander hopes his work will give us a better understanding of how "uncategorized" spirituality impacts health so we can understand how to create better networks for these communities to promote better outcomes. His research will also open doors for future studies in this area.

When Alexander's research is complete, he plans to use the data to create several papers to present and publish since there is little existing knowledge on his particular topic. He hopes to apply to a Ph.D. program in the spring. ■



# RESEARCH GRANT RECIPIENTS



AMY BERRY

*Program:* Ph.D., Biomedical Sciences  
*Title:* Determining the Effects of the Inhibition of Chlamydia Muridarum Host Cell Exit Mechanisms  
*Advisor:* Dr. Jennifer Hall



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*Program:* M.S., Chemistry  
*Title:* Identification of Intermediates of Guanine Oxidation in DNA using Model Compounds  
*Advisor:* Dr. Marina Roginskaya



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*Program:* Ph.D., Biomedical Sciences  
*Title:* The Role of Axonal Debris Removal and Inflammation Suppression in the Regenerating Olfactory System  
*Advisor:* Dr. Diego Rodriguez-Gil



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*Program:* Ph.D., Biomedical Sciences  
*Title:* Stressed Out Salamanders: Investigating the Biotic and Abiotic Factors Which Define the Elevation Range Limit in Plethond Mantanus and P. Glutinosus  
*Advisor:* Dr. Joseph Bidwell



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*Program:* Ph.D., Psychology  
*Title:* Culturally Tailored Positive Psychology Intervention  
*Advisor:* Dr. Stacey Williams



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*Program:* M.S., Geosciences  
*Title:* Technical Application of Ground Penetrating Radar: an Antenna Comparison  
*Advisor:* Dr. Eileen Ernenwein



EMILY LU

*Program:* M.A., History  
*Title:* (Hanja) to the Origin, Process, and Aftermath of Korea's Writing System Evolution  
*Advisor:* Dr. Henry Antkiewicz



HANNAH OAKES

*Program:* Ph.D., Biomedical Sciences  
*Title:* Effect of Chronic Methylphenidate Treatment of the Nigrostriatal Pathway  
*Advisor:* Dr. Brooks Pond



MEG ROUSSOS

*Program:* M.F.A., Studio Art  
*Title:* 1,000 miles on the Pacific Crest Trail  
*Advisor:* Dr. Tema Stauffer



NARGES SAREH

*Program:* Ph.D., Early Childhood Education  
*Title:* The Amount of Time Boys and Girls Spend in Block Center and its Relationship with Spatial Performance  
*Advisor:* Dr. Alissa Lange





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