LSU

Department of
Biological & Agricultural
Engineering

SPRING 2021 NEWSLETTER

LETTER FROM THE CHAIR

Dear BAE family, friends, and colleagues,

It is a great honor to write this column for the BAE newsletter as department chair. I recently took the reins from David Constant, who has retired after 36 years of distinguished service at LSU. I am deeply grateful to David for his indefatigable service to BAE during the eight years that he served as chair. During this time, David was instrumental in getting our teaching program moved from the College of Agriculture to the College of Engineering, while ensuring that BAE remain an independent unit. His sage leadership has resulted in, among other things, the establishment of a PhD program in biological engineering, which has further helped to "put us on the map" nationally. He continues to contribute to BAE as our newest emeritus faculty member and is kindly helping me to transition into this new role.

In some ways, it seems like yesterday when I started my professorial career in BAE in October 1996. I remember "learning the ropes" as an assistant professor and the way that a room full of faculty clapped for me when I landed my first research grant. When we built our first school playground some 20 years ago, more than half of the 130 BE students enrolled in the program came to help build. Over the years, the number of BE students and the diversity of research and outreach programs in BAE, have grown immensely. Though much has changed, the core values of this department have remained the same—a people-centered focus, a commitment to innovation at the intersection of biology and engineering, and a growth mindset that encourages everyone to do their best work.

I have been supported throughout my career by BAE colleagues, the broader community, and by BE students who have kept me nimble and inspired. I "grew up" professionally in LSU BAE, and I feel like I have had an amazing run career-wise. As chair, it is my aim to help facilitate an even more inclusive environment that will continue to support the core values of BAE and will serve others as they aspire to reach their goals.

I hope that each of you is safe and well and that you enjoy this issue of our newsletter! Feel free to drop us a line (mlima1@lsu.edu) and let us know how you are doing.

My best,

Marybeth Lima

Department Chair,
Department of Biological & Agricultural Engineering

Cliff & Nancy Spanier
Alumni Professor

DEPARTMENT HIGHLIGHTS

A Thank You to All of Our Supporters

Thank you for supporting BAE! Each day, we see the positive impact that donors like you have on our students, faculty, and staff and their growing impact on communities near and far. Your generosity positions us to deliver solutions to tomorrow's challenges and provides crucial resources to meet that commitment. Your partnership with us is a catalyst for transformation. Together, we are unstoppable.

A Message From the BAE Advisory Council

The Advisory Council, like everyone, has been inconvenienced by COVID-19, but we have not been idled. We continued to hold our meetings via Zoom in order to advance our goals of improving the quality of the student experience and the standing of the department. Last year, we were able to use Advisory Council funds to perform some needed updates to the BESO Student Lounge, which was in dire need of some TLC. We also funded esteemed lecturers to share details of their research with our department, both virtually and in person. We look forward to continuing the guest lecturer series to expose our students to cutting-edge research in their fields. Finally, the Advisory Council has been working diligently to establish the Louisiana Academy of Biological and Agricultural Engineering. This organization of alumni and faculty will work to drive improvements in the department's programs; maintain connections with and recognize alumni; and generate financial support to improve the student experience, faculty research, and department facilities. The academy is an exciting development and a great way to make a meaningful contribution to LSU BAE. I encourage everyone to participate when the academy is officially launched this spring.

Feel free to contact me or the other Advisory Council members for more information. We look forward to working with you to accomplish great things.

Richard Nelson
PMOLink LLC

BAE Advisory Council

Mission:

The mission of the Advisory Council is to advise and counsel the chairperson and the faculty of the Department of Biological & Agricultural Engineering (BAE) on matters pertaining to academic quality and stature of the department. The council will provide counsel on how the department and the college can improve relationships and meet the needs of students, industry, commerce, government, and the society through best utilization of available resources. This includes actively supporting the department's development efforts in securing additional resources through individuals and industry.

Goals

- Create the Louisiana Academy of Biological and Agricultural Engineers to organize and support the department's students, faculty, staff, and facilities development.
- Increase the Advisory Council fund to $20,000.
- Support one nationally recognized seminar speaker per month of the academic year.
- Support BESO with new couches and chairs for the BESO Student Lounge.

Dr. Yadong Wang Delivers Webinar to BAE Faculty, Students

Last fall, Cornell University Professor Yadong Wang presented a webinar on "Design Soft Materials for Biomedical Needs" to faculty and students in the department. Wang, who is a faculty member in Cornell's Meinig School of Biomedical Engineering, focuses his research on "creating biomaterials that will solve key challenges in the cardiovascular, nervous, and musculoskeletal systems." He earned his PhD from Stanford University in 1999, performed his postdoctoral studies at MIT, and joined the Georgia Institute of Technology in 2003 as an assistant professor. Wang has also co-founded two companies to translate the technologies developed in his laboratory.

Stephanie Green Wins Outstanding Staff Award

Stephanie Green, custodian in the Department of Biological & Agricultural Engineering, was recently honored with the Staff Outstanding Service Award. Those who know her describe Green as a "shining light to those who have the privilege of knowing her." She keeps the multi-building complex spotless. She takes great pride in her work and is considered the model of excellence and resilience. Green is incredibly caring and goes out of her way to learn everyone's name and offers kind words to those going through a challenging time. Even in the face of personal hardship, the department remained impressed by her grace, grit, and honor.

To the Moon and Back

BE Alumnus Serves as Core Stage Engineer for NASA Artemis Missions

On January 16, LSU Engineering alumnus Alex Cagnola fulfilled a lifelong dream by serving as a core stage engineer during NASA's Space Launch System (SLS) Green Run Hot Fire Engine Test for the Artemis Rocket, one of NASA's largest and most powerful rockets. This unprecedented test run was a precursor to a series of Artemis missions that will ultimately put astronauts back on the moon and, one day, on Mars.

Cagnola, who graduated from LSU in 2014, will be a part of three NASA Artemis missions over the next few years. Artemis I, which will launch in late 2021, will send an unmanned Orion capsule to circumvent the moon and return to Earth. Artemis II, which is currently in production at the Michoud Assembly Facility in New Orleans, will send astronauts to circumvent the moon and return to Earth in 2023. Artemis III will send the first woman and the next man to land on the moon in 2024.

"These missions will take astronauts farther out beyond the moon, farther into deep space than any human has ever traveled before," Cagnola said. "We eventually want to land on Mars, which is more than 140 times farther from Earth than the moon. The moon is a good place to do some real hard science and learn about how astronauts would react to living on another planetary body for a certain period of time."

To power the Artemis missions, NASA built the SLS rocket, which consists of the core stage between two solid rocket boosters, an upper stage, the Orion crew capsule, and the launch abort system.

"The core stage is the powerhouse of our entire Space Launch System," Cagnola said. "Artemis has unprecedented power and capability that offers more energy, volume capacity, and payload mass than any other rocket built today."
The SLS Core Stage, also known as the backbone of the rocket, is 212 feet long, 27.6 feet in diameter, and consists of five parts—a massive tank that holds 537,000 gallons of liquid hydrogen cooled to -423°F; a slightly smaller tank that holds 196,000 gallons of liquid oxygen cooled to -297°F; an intertank that joins the two propellant tanks, which houses avionics and electronics and is where the solid rocket boosters attach at the top of the core stage; a forward skirt that houses flight computers, cameras, and avionics, also known as the "brains" of the rocket; and the engine section that delivers propellants from the tanks to four RS-25 engines, has avionics to steer engines, and serves as the aft booster attach point.

"These four RS-25 engines produce a total of two million pounds of thrust, allowing the SLS to reach MACH 23 (faster than 17,000 mph) at an altitude of more than 100 feet in just over eight minutes," Cagnola said. "The 2.3 million-lb. SLS core stage is the largest rocket stage NASA has ever built."

Before sending the Orion capsule to the moon, NASA is conducting a green run test, which is an integrated test of the whole rocket stage to verify that it is ready for flight.

"When we completed the core stage production at NASA's Michoud Assembly Facility, I was assigned to NASA's Stennis Space Center in Mississippi to continue working with NASA contractors for the green run testing," Cagnola said. "A green

run is a series of tests that thoroughly check out the entire core stage and that culminates with a full-up [hot fire test] of all four of the stage's RS-25 engines at the same time to simulate a launch."

The first green run hot fire test for the Artemis moon rocket that took place on Jan. 16 at Stennis was heavily promoted by South Mississippi and South Louisiana media as an event not to miss. The firing of all four of the stage's engines were predicted to be louder than any other test run at Stennis. Hundreds of people flocked to the Mississippi Welcome Center with cameras in hand to capture the giant rumbling while residents in Diamondhead, Mississippi, said objects in their homes started rattling.

"When you start it, you slowly have to turn on the avionic boxes, then charge the batteries," Cagnola said. "You're methodically turning it on and doing verifications of each system as you go until you have one large core stage with all the systems working simultaneously. Both fuels are very, very cold and have to be cold to stay in liquid form and not their natural gas state. We're looking at temperatures of lower than -400 degrees for one of those propellants. Then when it's time for ignition, we get up to a few thousand degrees in just less than a second."

The test concluded with NASA running all four RS-25 engines for 67 seconds. Cagnola led the test commentary as the broadcast subject matter expert and was in charge of communicating with the green run test conductor and team members in the control room to relay information. NASA has analyzed the 800 terabytes of data from the green run test and will use it when launching Artemis I.

The Artemis team is set to conduct a second green run test in February for a longer duration. The core stage will then be transported through the Gulf of Mexico on NASA's Pegasus barge to Kennedy Space Center, where it will launch later this year. Cagnola hopes to be a part of launch operations as well.

"It's an absolutely surreal experience for everyone who's been working on this for the last few years, and longer than that for some," he said. "Everyone is really excited to see it launch for Artemis I and for future Artemis missions."

For Cagnola, becoming a NASA engineer was a dream, though getting to college was more than his family could have hoped for.

"Coming from Lafayette, just getting to college was a great accomplishment for me since I'm the first one in my family to earn a college degree," he said. "My whole goal was to get to college, then after that, I thought, what next?"

After graduating from LSU, Cagnola attended graduate school at the University of New South Wales in Sydney, Australia, where he received his master's in energy resource engineering in 2017. He then moved to Austin, Texas, to work for mechanical contractor Brandt, where he did mechanical process design. With some experience under his belt, Cagnola decided to go for it and apply to his dream job at NASA.

"It became important that I work on something I'm passionate about, something I could give my all to," he said. "NASA offered me a job and gave me two and a half weeks to report to work. It was very exciting."

In 2018, Cagnola moved to Huntsville, Alabama, to work at NASA's Marshall Space Flight Center as a propulsion engineer, designing and testing engine hardware. After seven months, he was put on a rotational assignment at Michoud and was involved with core stage production and assembly and all testing for the SLS Core Stage. Cagnola is now a permanent Michoud employee, helping astronauts live their dreams.

"I think it's important for those of us in NASA to continue to dream big and really push the boundaries of our space program, not only for us, but for future generations," he said. "I get a lot of satisfaction knowing there are young adults who watch our tests and launches and can be inspired to have a career in space. I'm still amazed by space every time I see a test run or watch a video. I'm mesmerized by it. I don't think it will ever get old."

PhD in Biological Engineering Program Now Available

The LSU Department of Biological & Agricultural Engineering is entering the second year of its PhD in Biological Engineering program. Formerly, only a PhD in Engineering Science with a Concentration in Biological Engineering was available. This relatively new curriculum allows for the integration of biology and engineering in what is a growing field. It also puts LSU in competition with other leading programs around the country and dovetails with the department's Fast Path Program–a partnership with LSU Health Sciences Center in New Orleans to offer students a bachelor's, master's, and PhD all in one to three years less than a traditional path.

"Currently, our program is not ranked nationally," said David Constant, former chair of the Department of Biological & Agricultural Engineering. "With the addition of [the PhD], our program will be competitively ranked, our visibility will be enhanced and the PhD enrollment will increase".

The burgeoning program trains students to prepare research proposals, conduct research, write and publish peer-reviewed papers, and teach and mentor undergraduate students, preparing them for the work they will conduct as successful members of society. Graduates are then ready to pursue careers in a variety of fields–including biomedical, bioprocessing, agriculture or environmental engineering–across academia, industry or government.

"Our graduates' contributions may be in research within biomedical companies or in the biotechnology job market, which is growing in Louisiana." Constant said. "This program will also generate the future workforce that can address the many issues in healthcare in our state and beyond."

Students interested in applying to the PhD program can do so online through the LSU Graduate School by visiting https://www.lsu.edu/graduateschool/admissions/apply.php.

You may also contact Cristina Sabliov, graduate program coordinator for the department, for more information at csabliov@agcenter.lsu.edu.

Boldor Wins CCELL Happy Award

The Center for Community Engagement, Learning, and Leadership (CCELL) recently announced that LSU Biological & Agricultural Engineering Associate Professor and Charles P. Siess Jr. Professor Dr. Dorin Boldor is one of 10 recipients of the 2020-2021 Happy Award.

Boldor has taught a junior-level biological engineering course, BE 4303: Engineering Properties of Biological Materials, to which he added a service-learning requirement after participating in CCELL's 2009-2010 Service-Learning Faculty Scholars Program. Since 2010, his biological engineering students have partnered with local public schools to work with K-12 students and teachers to develop and deliver interactive, fun lessons on engineering concepts that meet Louisiana's grade level expectations in science.

Happy Awards are given annually to 10 individuals to recognize excellence in service-learning. CCELL initiated the "Happy" to commemorate former director Jan Shoemaker's 10 years of distinguished service and commitment to educate and provide service for the common good. Happy Award recipients receive a commemorative lapel pin, which was designed by service-learning students based on input from Shoemaker's friends and colleagues. Award recipients can be faculty, students, and community partners. The nomination period occurs every fall.

STUDENT HIGHLIGHTS

BESO Officers

President
Tim Dobroski
(Senior)

Vice President
Tiffany Pham
(4/5-year Senior)

Secretary
Sahana Padumane
(Senior)

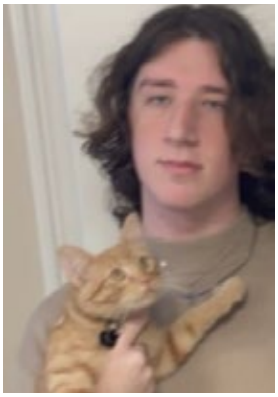
Treasurer
Ben Thomas
(4/5-year Senior)

Outreach Chair
Maria Kratz
(Junior)

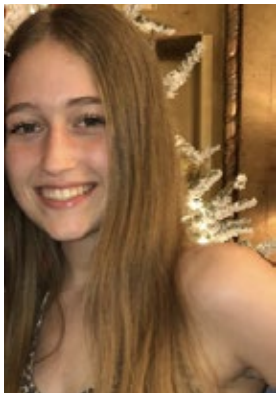
Social Chair
Chloe Heitmeier
(Sophomore)

Fundraising Chair
Alexis Benoit
(Junior)

Fundraising Chair
Emily McConnell
(Senior)



Fundraising Chair
Parker Hannan
(Sophomore)



Fundraising Chair
Emily Spera
(Sophomore)

Summer 2020 Graduates:

- Kendall Raymond

Fall 2020 Graduates:

- Samantha Aviles
- Jacqueline Begue
- Ann Clark
- Amber Cradeur
- Jake Fontenot
- Victoria Jordan
- Gracie Kennard
- Gabrielle Kerkow
- Adriana Montoya
- Shivani Pandya
- Sydne Rigby
- Fischer Robinson
- Jhacory Simien

Distinguished Communicators:

Jacqueline Begue

Jacqueline Begue's LSU experience was largely shaped by one organization: the Biological Engineering Student Organization. "It's a small community, but it is well established in my major and is special to so many people," she says. "I am grateful for the opportunities BESO has given me and for the friends I've made through the club." From organizing club meetings to leading the group as Vice President, Jacqueline was really able to put her skills from the Distinguished Communicator program into practice—something that will come in handy when she's using those same skills as an engineer. "Being an LSU Distinguished Communicator means having the ability to work with many different people from many different backgrounds and be able to have others understand your thoughts and ideas," she says. One of the achievements for which she is most proud was her role in organizing the Dr. Michael Mailander Scholarship Fundraiser, a scholarship for freshmen in BESO. "College can be expensive, and I definitely appreciated every penny I got from scholarships," she says. "To give a freshman a scholarship opportunity I had was one of my ways of giving back to the BESO community." That commitment to giving back continued with her internship during COVID-19 when her responsibilities at Three Roll Estate pivoted from assisting with spirit distillation to manufacturing hand sanitizer with ethanol. When Jacqueline isn't working on her goal of turning her home into a forest of houseplants, she'll be in search of new opportunities to explore different areas of engineering.

Fischer Robinson

For Fischer Robinson, the President's Alumni Scholarship paved the way for his college experience. "It allowed me to not worry about the financial burden of my education and I could focus on excelling academically and getting involved on campus," he says. That campus involvement extended into the community, including serving as a childcare worker for teenage mothers, a Reading Buddy for Volunteers in Public Schools, and his favorite project: the LSU Community Playground Project. "Designing playgrounds in BE 1252 was one of my favorite parts of the Biological Engineering curriculum and I wanted to stay involved with it somehow," Fischer says. "I was able to volunteer on builds around the Baton Rouge community and eventually was hired on the playground team." Fischer's experience with the Distinguished Communicator portfolio has given him the valuable opportunity to "paint a more well-rounded picture than just a resume." He also credits the program for helping him develop successful two-way communication in interpersonal settings. "I've seen an improvement in the way I approach conversations on teams, in school groups, and at work," he says. This skill, which he is always aiming to improve, will prove especially useful as he enters medical school and ultimately becomes a physician.

Discover Undergraduate Research Grant Recipients

Spring 2021 Recipients:

Lizabeth Breaux
Major: Biological Engineering
Department in which research will be conducted: Biological Engineering, College of Engineering
Mentor: Dr. Phillip Jung
Research: Multifactorial optimization and optogenetic stimulation to promote Schwann cell proliferation to accelerate axonal repair

Morgan Doyle
Major: Biological Engineering
Department in which research will be conducted: Biological Engineering, College of Engineering
Mentor: Dr. Elizabeth Martin
Research: Mimicking Tumor Matrix Composition and Fiber Alignment in vitro

Ignatius Semmes
Major: Biological Engineering
Department in which research will be conducted: Biological Engineering, College of Engineering
Mentor: Dr. Todd Monroe
Research: Development of a 3-D printed open-source sperm counting chamber

Kara Liimatta
Major: Biological Sciences
Department in which research will be conducted: Biological Engineering, College of Engineering
Mentor: Dr. Elizabeth Martin
Research: Effect of Inflammatory Cytokines on Endocrine Response in Estrogen Receptor Positive Breast Cancer

Fall 2020 Recipients:

Morgan Doyle
Major: Biological Engineering
Department in which research will be conducted: Biological Engineering, College of Engineering
Mentor: Dr. Elizabeth Martin
Research: Mimicking Tumor Matrix Composition and Fiber Alignment in vitro

ASABE Ethics Essay Competition

Viet Le won third place in the American Society of Agricultural and Biological Engineers Ethics Essay Competition for his paper titled, *The Ethical Implications of Groundwater Use*.

BE Students Design Playground Map With Visually-Impaired Children

For most children with visual impairments, scoping out a new playground entails having a parent or teacher lead them around while they memorize where the equipment is. Not only does this cut into playtime, but it can also lessen a child's independence. This is why a group of LSU Biological Engineering students teamed with faculty and staff at the Louisiana School for the Visually Impaired (LSVI) in Baton Rouge to design a tactile map for students there to learn the lay of the land on their own and have more time to play.

The concept started with LSU BE student Brandon Tramontana of Monroe, La., who was interested in ways to make playgrounds more universally accessible for children who are visually impaired and blind, as part of the LSU Community Playground Project Research and Design Team, led by LSU BAE Chair and Professor Marybeth Lima.

Tramontana received an LSU Discover Undergraduate Research Grant for investigative work that involved him and fellow playground team member Madison Ruston, of Baton Rouge, interviewing staff, students, and parents at LSVI and McMain's Children's Developmental Center in Baton Rouge about their experiences in play. After conducting a content analysis of these interviews, Tramontana came up with the idea for a tactile map that would allow students to feel the playground layout, since they were unable to visually explore it.

Tramontana graduated in the same semester in which he completed this research, so the project was moved into the design phase by a BE senior design team that would try to complete a 3D tactile map at an LSVI playground in two semesters. This team included LSU BE students Kenzie Dupont of Saint Martinville, Louisiana; Gracie Kennard of Denham Springs, Louisiana; Tiffany Le of Baton Rouge; Cameron Matherne of Saint Amant, Louisiana; Fischer Robinson of Houston; and Thomas Tran of New Orleans; as well as LSVI faculty and staff Stacy Cox, LaRonda Doakes, Blanche Faulk, Jennifer Gaudet, and Anna Gayle of Baton Rouge.

"Fischer's team took this concept and turned it into a workable solution, and took it much further than I personally imagined it going," Tramontana said. "They carried the idea forward and turned it into something wonderful."

Determined to design the best map possible, the LSU BE students blindfolded themselves and used canes on the LSVI playground to try and understand what life is like for a visually-impaired or blind child.

"The LSVI staff allowed us to use some of their goggles that simulated several different levels of visual impairments," Robinson said. "As I moved throughout the playground, I began to understand the importance of textures. I could tell what part of the playground I was on based on the way the cane felt as it glided along the ground. This idea played an important part in the design of the map."

One of the key components for the map design was using different colors and textures to signify different playground components, as was suggested by LSVI staff. Since some LSVI students are able to distinguish between contrasting colors, the team used bold colors to label the slide (red), play surfaces (yellow), and protective surfacing (black). They also used different textures to represent various sections, such as smooth (slides), raised semi-spheres (gravel/protective surfacing), and circular indentations (play surfaces). Auditory components were added to the map to facilitate better understanding of the activities on the playground.

Blanche Faulk, the O&M and Outreach Coordinator for LSVI, said the BE students had to figure out which height and angle worked best for the map (these dimensions were tested by LSVI students and staff), and they even put the map in an enclosed, chargeable box.

“The BE students were wonderful to work with and asked amazing questions,” Faulk said. “They really went out of their way to be able to understand the project. Our students love the map and think it’s cool. They love teaching the new students about it.”

The tactile map was such a hit that another BE senior design team is doing a second iteration design so that a child who is visually impaired can go to any playground with any type of equipment and use that playground with confidence. This LSU BE team consists of Abdullah Alturaifi, Jamekia Colbert, Eva Gatune, Isabelle Maxwell, all of Baton Rouge, and Shane Vallery of Gramercy, La.

Since 2000, Lima has worked with communities on building better playgrounds. When asked what it’s like to see her students’ enjoyment while doing the playground projects, as well as the children’s enjoyment while playing, Lima said, “I don’t know if I can put that into words. When you work together to accomplish a goal and you know it’s something that’s going to serve people in a really critical way for years to come, that was a feeling of pride like I’d never had.

“I always felt that engineering could be a force for good, and I’ve tried to work to make that a reality in a small way. These students are brilliant and achieve amazing things. It’s been a privilege of my career to watch these students come through the door as amazing human beings and embody the best of the human spirit and the best of LSU.”

Her students feel the same about her.

“Dr. Lima is the best, no exaggeration,” Robinson said. “She truly cares about her students, and it really manifests in the energy she brings to work every day, and the way she treats her students and our team. My favorite thing about her is that she has this natural ability to be a mentor. No matter what anyone on the team is going through, big or small, she always has insightful advice and knows how to stay positive. I have thoroughly enjoyed getting to know her over the past four years.”

“Dr. Lima is awe-inspiring,” Tramontana said. “She has worked so hard and made such a difference in the community. It’s really incredible to see.”

As for working with LSVI and the community, Tramontana said the playground project was very impactful for him personally. Not only did he go on to earn his master’s from Duke University in biomedical engineering, he now works for Duke Health designing medical devices.

“I’ve always had this idea that I want to work to improve the conditions of those living with disabilities, and this project inspired me to try and seek out more impactful opportunities within biomedical engineering,” he said. “I like the phrase, ‘It takes a village,’ because with a lot of these designs, it really does. It’s easy to get lost in the design work or trying to meet certain specifications, but you can step back for a second and realize that your design will impact a whole host of different people.”

RESEARCH HIGHLIGHTS

BE 3290 Professionalism Journal Article

https://digitalcommons.northgeorgia.edu/cgi/viewcontent.cgi?article=1321&context=jces

Introduction

All but one of the authors of this piece are juniors and seniors in biological engineering at LSU. We were enrolled in a course on ethics and professionalism specific to our field. As part of our class we read, discussed, and wrote about the book Strangers in Their Own Land: Anger and Mourning on the American Right by Arlie Hochschild. The following essay represents our collective thoughts and answers to three reflective prompts about empathy walls, one of the central themes of the book, and their role and importance in civil conversation. As young adults with impressionable minds in a politically charged climate, it is easy to feel secluded from our peers and the world around us because of our personal beliefs. This seclusion is not only a perception, but a shared idea that we think has deepened the divisiveness that plagues our modern society. These seclusions we have placed ourselves in can be dubbed "empathy walls," a term used by Hochschild in her book. Hochschild argues that empathy walls are made up of our own set of personal beliefs, emotions, and feelings, which may not always be rooted in facts. As a result, while we may often feel as though empathy walls are defense mechanisms we construct to keep others out, they also tend to keep us blocked in. The concept of empathy walls is a complex one, and the way they are built and maintained not only varies greatly from topic to topic, but from person to person. As a result, navigating empathy walls might involve crossing them or destroying them; some, in fact, may never truly be crossed or destroyed. Nevertheless, no matter an individual's belief on what an empathy wall is, or how difficult it may be to cross one, we believe that examining our empathy walls is crucial to initiating civic engagement and making societal progress.

Telling Our Stories Together:

How Universities and Community Partners Co-Create Engaged Scholarship

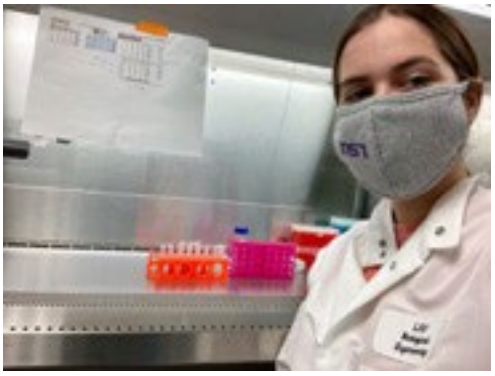
https://digitalcommons.northgeorgia.edu/jces/vol13/iss1/6/

Abstract

The inspiration for this paper came from an informal discussion among engaged faculty scholars about the ways in which we created written scholarship with community partners. We realized that while our methods had similarities and differences, none of us had ever read an article on this subject. A subsequent search of the scholarship of engagement literature yielded little information regarding scholarship co-authored by faculty and community partners. Based on practices shared by engaged scholars and informed by an analysis of publications co-authored by community partners and faculty members in three well-known engagement journals, we developed a framework to describe how such written scholarship can be co-created. The framework features steps of the publication process (initiation, drafting, finalizing the draft, and submission and publication), and specifies a corresponding degree of collaboration (co-attribution, co-authoring, and co-writing) for each step. This framework is intended to provide context for the dissemination endeavors of partnerships between universities and communities, and to ensure that products of these partnerships are well-planned and accurately documented. It can be used in conjunction with other tools for dissemination efforts detailed in community-based participatory research approaches, also discussed here.

My Experience as a Researcher

BE Senior Lizabeth Breaux



LSU BE senior Lizabeth Breaux, with the help of Dr. Philip Jung from the BE department at LSU and Dr. Doan Nguyen from the Department of Research at the Ochsner Clinic Foundation in New Orleans, were recently awarded the LSU Discover grant for multifactorial optimization and optogenetic stimulation to promote Schwann cell (SC) proliferation to accelerate axonal repair. SCs are non-neuronal glial cells of the peripheral nervous system (PNS) that play a crucial role in promoting peripheral nerve function. The goal of this project is to enhance the rate of proliferation of human Schwann cells (hSC) in vitro by identifying the optimal combination of extracellular matrix (ECM) protein formulations and optogenetic stimulation (OS). The hypothesis of the project is that an optimal combination of multiple ECM proteins and OS will synergistically enhance the rate of hSC proliferation in vitro in comparison to ECM or OS alone. The statistical calculation of the impact of proteins and biophysical stimulation will provide a basis for improving strategies to accelerate SC proliferation, thus PNS repair and possibly central nervous system (CNS) repair as well. OS is a biological technique using light at a specific wavelength to stimulate transfected cells that have been genetically modified to express light-sensitive ion channels. Recently, optical stimulation of transfected SCs at 473 nm for one hour at 20 Hz showed to rapidly improve the rate of proliferation of SCs. Due to the limited regenerative capacity of nervous tissue, scientists have investigated many different ways to enhance nerve regeneration.

“To our knowledge, few tissue engineering approaches for PNS repair have been attempted to investigate the impact of multiple ECM proteins along with OS,” Breaux said. “For society at large, this will impact the way clinicians and doctors can advance treatment options for innervation of damaged muscle tissues and improve functional recovery after traumatic nerve injuries. This information will help improve the quality of life for countless people worldwide and be a valuable teaching tool for the medical world. I am reminded every day of the vast abilities of science and the impacts they make, like the COVID-19 vaccine. It is amazing to feel like your work as an undergrad has an impact.”

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