The Hillock

where efforts summate to actions

Newsletter of the Department of Neurobiology and Anatomy
Drexel University College of Medicine

Volume 5 (December 2021)
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We extend special thanks to the Drexel University College of Medicine Marketing and Communications Department for their assistance with the preparation of this newsletter.

On the Cover:
Front — A very zoomed in look at a hippocampal neuron in a dense 21-day old culture. While the neuron is tagged with fluorescent PSD-95 and synaptophysin, the depth color coding really only makes it possible to differentiate the cell body (in green), imaged at the confocal at 63x by Shrobona Guha, Baas lab.

Back — Human iPSC-derived dorsal forebrain cerebral organoid (one month old). Organoid has undergone cryosection and immunolabeled with progenitor cells marker SOX2 in green, neuronal nuclei marker NeuN in red, and astrocyte marker GFAP in magenta. Submitted by Xiaohuan Beanie Sun, mentored by Dr. Liang Qiang and Dr. Peter W. Baas.

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Letter From
The Editors

It is with great joy that we present to you the fifth edition of The Hillock. We are full of gratitude and excitement over the persistence of this wonderful tradition across the past five years. The success of our newsletter lies in the zeal of our department members to share their stories of success and triumph in the laboratory and beyond the bench. We’d like to thank all of our contributors for making this issue of The Hillock possible.

We continue to remember the history of our department, this time from the perspective of Dr. Dennis DePace. Descending from the Department of Anatomy at Hahnemann, Dr. DePace takes us on a journey through his career from Hahnemann Medical College to what we know now as the Department of Neurobiology and Anatomy at DUCOM. His narrative provides historical context for the growth of not only our department, but also medical education.

As usual, we cherish the culmination of our successes throughout this past year by highlighting featured research, faculty and student awards and alumni spotlights. The feature pieces on the expanding Computational Neuroscience Center and the recently awarded Spinal Cord Injury Graduate Training [T32] Program underscore how the achievements of our department are rooted in our collaborative efforts. We highlight impressive ways our graduate students have shown leadership throughout 2021, but we do not shy away from the struggles that exist as we continue to navigate working through a global pandemic. To this end, we share perspectives from both first and second-year students to highlight the similarities and differences they have experienced while adjusting to graduate school during these unprecedented times. Finally, the spirit of individuality and uniqueness that spans across our students, staff and faculty is evident through our creative submission and culture survey answers.

Our wish is for The Hillock to ignite a sense of unity by sharing the rich narratives that weave through the fabric of our department but may not appear on the surface. We hope that you enjoy these interviews and personal stories, along with pictures of furry friends and fun activities.

The Editorial Team
Pictured (from left to right): Jeremy Weinberger, Joya Maser, Nancy Mack, Shrobona Guha, Ashley Opalka, and Andrey Borisyuk
A View From the Chair

With the publication of Volume 5 of our newsletter, we must celebrate a milestone in documenting our history, our achievements and our scholarship, and congratulate our students for managing this endeavor and passing the baton along the different years. Here the scholarship is driven to a large extent by our faculty and students underscored by the growth of funding and an impressive list of awards. I will highlight those achievements to emphasize the appreciation for individuals and the pride we have as an exceptional department inspired by the tradition of mentoring and collaboration. With respect to funding, I will first note the NIH R01 grants of Jessica Ausborn, Simon Danner and Liang Oscar Qiang, which opened the road for their promotion to become tenure track Assistant Professors, with all of them since receiving additional funding. Other additions to our portfolio include Peter Baas as a Multi-PI NIH R01 and two DoD grants; Tatiana Bezdudnaya with a Paralyzed Veterans of America grant; Kim Dougherty and Wenjun Gao with R21 grants; Shaoping Hou receiving a second NIH R01 grant; John Houle with an NIH supplement; and Mira Swissa that will allow him to continue his research as Professor Emeritus, Michael Lane collaborating with the University of Florida in a joint Nielsen Foundation grant and receiving a second Mosley Foundation Award; Ramesh Raghupathi receiving a major NIH R01; Jifa Rybak a multi-PI R01, and Veronica Tom receiving a Nielsen Foundation award and setting a department record with the anticipation of her fourth NIH grant. Her exceptional scholarship has been followed by an invitation to participate in the Executive Leadership in Academic Medicine (ELAM) program designed to prepare future chairs, directors and deans. A most amazing achievement last year was evident after the announcement of the Department of Health of the Commonwealth of PA that it would allocate $1 million per year to fund research in spinal cord injury. The six proposals that were funded were all from our department totaling the full $1 million allocated last year. These grants were awarded to Drs. Lane, Jin, Giszter, Bezdudnaya, Hou and Qiang. Is there a better indication of the quality and strength of our research? Another parameter of excellence has come from the prestigious T32 training grant for the funding of our graduate students and program in spinal cord research with Peter Baas as PI and Michael Lane as co-PI. A somewhat unexpected milestone in an area we usually do not pay much attention to has been achieved by Simon Giszter and his former students (Taegey and Arun) who invented a new way to produce braided electrodes in a patent that started to pay significant royalties of $1 million a year shared by the inventors, the University, the College of Medicine, the department and the lab. There is a lot more to our portfolio of funding, which altogether we expect to exceed $10 million for FY22 as you can find documented elsewhere in this newsletter.

The list of awards and honoraria is equally impressive even relative to the high standards established in previous years. Here the scholarship is driven to a large extent by our students. I will start with six first-place awards in Discovery Day. These included Sarah Bennisson – Outstanding Platform Presentation; Andrew Lockhart – Outstanding Junior Graduate Student Poster, Silvia Fernandes – Outstanding Senior Graduate Student Poster, Emanuela Piermarini – Outstanding Postdoctoral Fellow Poster, Wenqiang Huang – Outstanding Technicians Poster, Alexander Vasserman – Outstanding Undergraduate Poster. Other winners included second place for Leonardo Garcia Ramirez – Outstanding Postdoctoral Fellow Poster and Yashvi Shah – Outstanding Undergraduate Poster; third place for Benjamin Sherman – Outstanding Medical Student Poster; and honorable mention to Nancy Mack – Outstanding Senior Graduate Student Poster. The highly prestigious Bondi Fellowship awarded to a graduating student for overall excellence went to Genevieve Curtis; Cameron Trueblood, Sarah Bennisson, Sara Blazewiecki and Micaela O’Keefe received F31 Fellowships from the NIH and based on a competitive score Trevor Smith is likely to get his fellowship as well. Other awards went to Nancy Mack and Genevieve Curtis; Dr. Dean fellowship and Dana Iangel – the Brain Injury Association. Two of our postdoctoral fellows received funding for their independent research projects with Leonardo Garcia Ramirez receiving the Jekkal Fellowship of $53,000 and Emanuela Piermarini sharing the Christopher Reeve Fellowship of $20,000 with Tatiana Bezdudnaya.

Medical education has always been a challenge for the department because we are responsible for a significant portion of the first-year curriculum including Medical Neuroscience, Microanatomy, and in particular Gross Anatomy which requires preparation of the dissection lab and cadavers for 270 students. In the last several years, these challenges were amplified with a new curriculum of an inverted classroom, the adjustments we had to make for delivering these courses under COVID-19 restrictions, and with the opening of a new West Reading campus with an additional 40 students. Critical to the successful navigation of the education mission was the amazing leadership of Haviva Goldman. She has not only managed the departmental responsibilities in medical education, but became the de facto expert and leader of the Year 1 curriculum. Captain Goldman had an equally amazing team whose excellence has been acknowledged by the students and the College of Medicine with Golden Apple awards to Haviva Goldman, Francis Sessler and Janet Smith, the Outstanding Service to the Student Body award given to Dennis DePace, and the Mary DeWitt Pettit Fellowship to Caitlin Howe for her research project entitled “Accessing the Lab Remotely: Addition of Cadaveric 3D Models in Medical School Gross Anatomy Courses.” And then we had to recruit and train faculty to teach and organize the educational processes at the West Reading campus. By now you know that the West Reading team is comprised of Dania Peterson leading Medical Neuroscience and serving as the director of our medical education, Kelly Brennan leading Microanatomy as well as Pathology and Jenna Haperty leading Gross Anatomy. They have been working together as a team in all the disciplines facing a tremendous challenge because of the complex curriculum that was new to all three of them and because of the predictable difficulties in building up a new campus. Finally, I want to mention that one of Drexel’s highest awards was given to John Houle for his lifetime contributions to the 2021 Daniel V. Schirra, MD, Transformational Leadership Award.

I am writing this letter on Thanksgiving, which I feel is fitting, as I am grateful that despite the difficulties we encountered we continued to thrive and grow — reminding me that we are indeed fortunate to work with wonderful students who are engaged in scientific discoveries and enjoy the company of our colleagues every and each day.

Happy Holidays and Happy New Year.

Itzhak Fischer, PhD
Professor and Chair
Most of the histories in previous editions of The Hillock focused on the MCG leg of our legacy. I was asked if I could fill in a few of the details from the Hahnemann side and some perspectives on my own career.

In the spring of 1974, when I was completing my PhD at the University of Buffalo, I was offered a faculty position in the Department of Anatomy at Hahnemann Medical College & Hospital in Philadelphia. Since I knew little about Hahnemann, I approached the chairman of my department at the University of Buffalo, Dr. Harold Brody, and asked him for his perspective.

He described Hahnemann as a small, private medical college that, in his opinion, “was always striving for acceptability but never quite achieving it.” I can still hear my brash and overconfident 27-year-old self saying, “Maybe they’re waiting for me!” I had already defended!

Hahnemann was established in 1848 as a school to train physicians in homeopathic medicine. In simplest terms, homeopathy is a concept of medical practice based on the theory of treating patients with small doses of natural substances that in a normal person would produce symptoms of the disease. This in turn would stimulate the body’s “natural defenses” to cure itself. I’ve heard it said of homeopathy, “If it did no good, at least it did no harm.” Homeopathy was conceived by an 18th century German physician, Samuel Hahnemann, and though widely accepted in the 19th century, in the 20th century it was rejected by practitioners of allopathic medicine because of its focus on the symptoms of disease rather than the underlying causes. It appeared to me that Dr. Brody’s comments were likely rooted in the conflict between homeopathy and allopathy.

My account of the Department of Anatomy at Hahnemann begins in 1958 when Dr. Raymond Truex, who was chair of the department, recruited Dr. Peter Amenta to join the department. If the 1950s can be the ‘decade of the brain’ then the 1950s for heart disease increased and all things cardiac were hot. Dr. Truex had been trained as a histologist in the laboratory of William Bloom (Histology by Bloom and Fawcett) at the University of Chicago. He had expertise in tissue culture techniques and worked with cardiac muscle grown in tissue culture. His work and training made him a good fit for the department’s research interests at that time. Amenta and research and teaching and research progressed as expected for the first few years of his career. Courses were taught, funding was granted and the faculty did their committee assignments.

In 1961, Dr. Truex abruptly resigned his position, following a heated disagreement and an “or else” moment with Hahnemann’s dean, Dr. Charles Cameron. Dr. Amenta moved his research and some of his loyal faculty supporters up Broad Street to Temple University. While in the 1960s this situation would have been passed off as “academic differences,” from having known both men I believe the disagreement was more deeply rooted in the political climate of the time. This was near the end of the era of Senator Joseph McCarthy (R-Wisconsin) and what became termed McCarthyism, which Wikipedia defines as, “demagogic, reckless, and unsubstantiated accusations, as well as public attacks on the character or patriotism of political opponents.” Sound familiar? Senator McCarthy stoked Cold War era fears of communism and set about spinning conspiracy theories and innuendos to the purpose of convincing communities, homosexuals and other undesirables from Congress, government and the armed forces. It was a time in America in which neighbors spied on neighbors and people were judged in their political views. Two American citizens, Julius and Ethel Rosenberg were executed in the electric chair as Russian spies, offenses that pale in comparison to the events of last January 6.

In any case, it is never a good idea to say “or else I resign” to your boss, whatever your differences, unless you have another offer waiting on the sidelines, which Dr. Truex apparently did. Biases cause differences, unless you have another offer waiting on the sidelines, which Dr. Truex apparently did. Biases cause differences, unless you have another offer waiting on the sidelines, which Dr. Truex apparently did. Biases cause differences, unless you have another offer waiting on the sidelines, which Dr. Truex apparently did. In any case, it is never a good idea to say “or else I resign” to your boss, whatever your differences, unless you have another offer waiting on the sidelines, which Dr. Truex apparently did. In any case, it is never a good idea to say “or else I resign” to your boss, whatever your differences, unless you have another offer waiting on the sidelines, which Dr. Truex apparently did. In any case, it is never a good idea to say “or else I resign” to your boss, whatever your differences, unless you have another offer waiting on the sidelines, which Dr. Truex apparently did.

My personal history in the department began when I moved from Buffalo to Philadelphia in June of 1974. During that summer, while blissfully enjoying life in the City of Brotherly Love, I set up my lab, moved into my office and by August had met, unbeknownst to me at the time, my life partner, Donald Helms. I also learned that Hahnemann had a much better reputation in the medical community than I had been led to believe. Dr. Charles P. Bailey, an Hahnemann alumnus, had performed the first open-heart surgery in 1958. Dr. Truex had coauthored the neuroanatomy text we used in graduate school (Neuroanatomy by Truex and Carpenter) and had been a predecessor of Dr. Amenta as chairman of anatomy. Dr. Luther Brady, a pioneer of radiation oncology, chaired that department at Hahnemann Hospital, to name a few.

Two by two, like Noah populating the ark, we were hired to take up the yoke of teaching a ponderous disease rather than the underlying causes of a disease. I think that each of us held the expectation that we would serve the traditional three-pronged approach to an academic career, teaching, research and service. Hahnemann was in evolution to university status to include not only the medical college but also a graduate school and college of allied health professions. The college of allied health professions included Hahnemann’s original nursing program but also new programs in med tech, respiratory therapy, mental health technologies, creative arts therapies, physical therapy and radiologic technology. All of these programs needed support for anatomical science and so we all taught both in the medical school and undergraduate-level courses. In addition to being course director for Neuroanatomy in the medical school, I was also course director for the Anatomy and Physiology course in the School of Allied Health Professions courses. Professors had been director and sole faculty in the Anatomy course for the Radiologic Technologists, who apparently needed to know anatomy, but not physiology. I

The History of the Department of Neurobiology and Anatomy

CHAPTER 5: A Personal History and Recollections of the Department of Anatomy at Hahnemann University

by Dennis DePace, PhD
Adjunct Associate Professor in the Department Neurobiology & Anatomy

"He described Hahnemann as a small, private medical college that, in his opinion, 'was always striving for acceptability but never quite achieving it.' I can still hear my brash and overconfident 27-year-old self saying, ‘Maybe they’re waiting for me!’ I had already defended!"
was also tasked to teach Medical Terminology, so was able to use my four years of Latin from high school, who’d have thought? My interest had slightly different needs in terms of anatomy but this was helpful to me because I was challenged with a large variety of clinical situations that provided insight to significant clinically relevant concepts in which an understanding of anatomy was important. Also, interacting with students at different academic levels helped develop my teaching skills.

Needless to say, many of my colleagues, who were more interested in research careers, opted to move on. I was more interested in clinical anatomy and teaching, so along with a few others, like Dr. Suzanne Zarro, Dr. Judy Churchill, Dr. Peter Meyer, Dr. Alan Haraian and Dr. Michael Kenneth, I hung on, in what would become the ‘educator track’. There is great satisfaction in the ability to distill a difficult concept to its essential elements and to then reassemble them in a way that facilitates another’s understanding. This is how I view teaching. The distillation part is difficult because it sometimes requires learning the concept yourself, but this is also the most rewarding part.

The other is the look of joy on the face of a student when they recognize that they understand.

Taking on the Radiologic Technology program as Anatomy course turned out to be a strategically good move for me because it gave me access to an important clinical department that relied heavily on anatomy. I still remember Martha Thoroghgood, the director of the Radiologic Technology program telling me, “Dennis, my students only need to know two muscles, the diaphragm and the psoas major.” Radiographically, these two muscles have distinctive profiles in plain film radiographs. Free air under the diaphragm is a sign of perforation of the bowel, and blurring of the edge of the psoas major may indicate a hemorrhagic tear in the kidney. However, in 1975, CT, suddenly became not only an important diagnostic imaging tool, but also the basis of the radiologic technologist’s practice of medicine.

Anatomists always viewed the body in cross-section from the perspective of standing at the head and looking down towards the feet and looking up toward the head. This meant that any anatomical drawings I could use to devise such a course would have to be rotated and therefore would appear in CT scans. There was no way to scan the image and flip horizontally on my laptop back in the 1970s. Photonics was only beginning, so scanning the brain, taking this mean hours of setup and darkroom time, clipping strips of film and mounting slides. The course was created and I taught it in Hahnemann’s evening division, mostly to working radiologic technologists, through the ‘80s and ‘90s.

Dr. Haskin had a national reputation as the author of a book on radiologic medicine, which he co-authored with another Hahnemannian, Dr. George Teplick. At the time, radiology was limited largely to plain film radiography, so I could make out vague shadows of internal organs all squashed together, but with CT, it suddenly became more important to know what was in front of the stomach or behind the liver and what vertebral level you can get the best view of. I could then see the exact dimensions of a brain tumor and how much brain tissue can be spared in its excision.

Dr. Haskin asked me to develop a course in cross-sectional anatomy to help train his residents and technologists in what they would be seeing in these new images.

Cross-sectional anatomy had been studied in many medical schools over the years as a specialty for those who were interested in careers in surgery. At the University of Buffalo, where I trained, the Gross Anatomy lab had a large collection of human specimens and the faculty allowed me to dissect a hemarthrosis in the knee. However, in 1975, new technology was on the horizon that would revolutionize diagnostic imaging and present an entirely new way to view living anatomy outside the realm of surgery.

It was radiology that provided me with an interesting challenge and long-term career interest. In 1975, Dr. Marvin Haskin, chairman of the Department of Radiology, purchased the first-ever CT scanner in the Delaware Valley, another Hahnemann first. Dr. Anne Barnes, who was many of us in this department fondly remember, always mentioned in her lectures how the technology that supported the development of CT by the medical branch of EMI was paid for by the Beatles, since EMI was their record label early on.

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Feature Story: The Computational Neuroscience Center

In the not too distant past, computational neuroscience at Drexel was not just dominated by Dr. Rybak, it was Dr. Rybak.

Since joining the College of Medicine in 2006, Dr. Rybak has not only built up his lab, he has also built the Computational Neuroscience Center, Department of Neurobiology and Anatomy. The Computational Neuroscience Center has set out to accomplish something that not many other institutions offer — a seamless, collaborative group of computational and experimental researchers sharing a common goal of further understanding nervous system function. With a core faculty composed of Drs. Ausborn, Danner, Grizter, Markin and Shevstova, most have come from Dr. Rybak’s Laboratory for Theoretical & Computational Neuroscience. It is because of this tree from Dr. Rybak’s support that many of the ongoing projects in the Center are collaborative and overlapping with the core faculty and their experimental affiliates, including Drs. Bezdudnaya, Dougherty and Wong. Many of the current core faculty credit Dr. Rybak’s guidance as the main reason for how and why the Center was able to formulate to what it is today, and it is a worthy reason for why Dr. Rybak is currently serving as the director of the Center.

A proper understanding of how the mechanisms of the nervous system process information and how various neural circuits control behavior is fundamental to neuroscience. The Center works to provide a computational complement to the experimental studies that occur in the Department of Neurobiology and Anatomy. With the implementation of single-neuron models, conductance-based models, and neural network models (just to name a few), the Center is providing innovative tools to derive new hypotheses and guide experiments to test them. The computational modeling done in the Center is a cutting-edge and essential tool to develop models side-by-side. She branched off to have a collaborative environment that brings together the multidisciplinary research that is being conducted here at Drexel.

Dr. Danner’s next goal is to guide new students in the same way that he was once guided. As Dr. Danner alluded to, “…it is important to create something tangible for prospective students to see within the Center, and as time goes on we must continue to attract more students because they are what will allow for the Center to grow.”

Spotlight: Spinal Cord Injury Graduate Training Program (T32)

The Marion Murray Spinal Cord Research Center (MMSCRC) has a long history of supporting a collaborative environment that brings together the multidisciplinary research that is being conducted here at Drexel.

Stemming back to Marion’s dedication to spinal cord research when it was considered a dead-end without much promise, the MMSCRC is dedicated to pushing spinal cord research outside the box. The newly awarded Spinal Cord Injury Graduate Training Program (T32) led by director Dr. Peter Baas and co-director Dr. Michael Lane will build upon this successful history of spinal cord injury research with the goal of training a new generation of scientists to study spinal cord injury with the vigor that Marion did. The program is designed to prepare students for research with focuses on neural regeneration, neural engineering, rehabilitation, and computational neuroscience. The trainees will include all graduate students pursuing spinal cord injury research within the Neuroscience program and the awardees for the T32 fellowship will include Shayna Singh, PhD student in Dr. Kim Dougherty’s lab, and Jeremy Weinberger, PhD student in Dr. Marie-Pascale Côté’s lab.

and computational neuroscientists within Drexel and from across the world, the Center is using a collaborative, interdisciplinary computational and experimental approach to study mechanisms in the intact and injured nervous system as well as in neurological disorders.

Developing an independent lab in parallel with Dr. Simon Danner is Dr. Jessica Ausborn. Dr. Ausborn joined Dr. Rybak’s group as an instructor to return to computational neuroscience after spending much of her postdoc days as an experimentalist. The brand of computational neuroscience that Dr. Rybak’s group did was exactly what Dr. Ausborn liked to work on, which is in close collaboration with experimentalists to develop models side-by-side. She branched off to have a collaboration with Dr. van Reijn in Bioengineering, looking at visual processing and sensorimotor integration in the fruit fly, as well as a collaboration with Dr. Rybak and a colleague in France looking at the descending control of turning movements in mice. Although Dr. Ausborn did not plan on staying here at Drexel for more than two to three years, the quality of the work with the collaborative and collegial group in the Center allowed her to prosper and become a principal investigator and assistant professor after five years. As the Center is growing, Dr. Ausborn reminds students that this is an exciting time to join since they have the benefit of working with young PIs embedded in a larger group with a lot of expertise.
Creations


Rear side Crooked Grind on a Fall afternoon
Julien Boisy

Backside Crooked Grind on a Fall afternoon
Julien Boisy

From top: Red-tailed Hawk | Reflected Swan | Song Swallow
Dr. Baird

Let’s Tessellate
Shriabona Gupta

Human iPS-derived assembloid. The whole assembloid has been fixed and immunolabeled with total tau in green, phosphorated tau (AT8) in magenta and DAPI in blue. Beanie Sun

Human iPS-derived forebrain glutamatergic neurons, which has been cultured 2 months and immunostained with glutamatergic neuron maker VGLUT in green, dendritic marker MAP2 in magenta and nucleus marker DAPI in blue. Beanie Sun

Representative whole-mount immunostaining images of assembloids with phenotypes and morphologies relevant to the study of Frontotemporal Dementia.

Simeon Kofman

DRG from an adult (P61) mouse. It is lineage-labeled for Shox2 expression, which fills the nucleus, cell body, and many axons.
Shayna Singh
We asked recent graduates to share their current work, what their daily lives look like, and advice for current graduate students.

Alumni Spotlight

Sara Blazejewski, PhD
(2021 graduate)
Investigator in Industry

Sara Blazejewski is an Investigator in Reproductive Toxicology. Her role involves monitoring non-clinical safety studies that are conducted at contract research labs on behalf of GlaxoSmithKline. These non-clinical studies support the enrollment of women of childbearing potential on clinical trials. She is also involved with whole embryo culture, which is performed at earlier stages of drug development to predict whether a compound may impact embryo-fetal development. The goal of her work is to evaluate the safety of a compound at every developmental stage (fertility to embryo-fetal development to early post-natal, etc.) before it goes to market.

Most often during her work, Sara works on many varying projects for compounds at different stages of drug development. Each day is different, depending on what stages each project is at. Some days she might get new data sets to interpret or she could be reviewing a protocol or report for one of the studies she monitors. She also consults on many projects where she is asked to evaluate the literature on a target.

Career skills that Sara often uses are data interpretation, problem solving, critical thinking of background knowledge on neurodevelopment, evaluation of scientific literature, writing and cell culture.

Some advice she would provide to current graduate students is to network as much as possible! Go out of your way to make connections with people working in the area you want to work in. It is hard to make connections in industry when your mentors are all academics, but they will be valuable contacts. Start networking well before you begin your job search.

Hemalatha Muralidharan, PhD
(2021 graduate)
Industry Postdoc

Hemalatha works as a postdoctoral fellow in the neuroscience group, where her current work focuses on the investigation of pre-clinical targets and mechanisms in the field of neuro-immunology with focus on tauopathies.

Most often during her work, Hemalatha works on a wide variety of activities, ranging from designing, conducting and evaluating experiments, to participation at meetings and presenting findings. In addition, she also participates in career development programs, including mentoring interns.

Career skills that Hemalatha often uses are analytical, problem solving and communication skills.

Some advice she would provide current graduate students is to identify strengths, what you enjoy the most, but also know your limitations. Understanding and being aware of yourself will help choose the right career path for you.

Dana Lengel, PhD
(2021 graduate)
Academic Postdoc

Dana works as an academic postdoc focused on understanding the mechanisms of nicotine addiction. She investigates the medial habenula, a small epithalamic structure and critical mediator of the behavioral effects of nicotine. The goal of her research is to elucidate the cellular and circuitspecific mechanisms of habenular regulation of nicotine behaviors. Having a better understanding of the mechanisms through which the addictive effects of nicotine are mediated will hopefully lead to novel strategies to facilitate smoking cessation.

Career skills that Dana finds most important are time management, communication and writing.

Sara Blazejewski, PhD
(2021 graduate)
Consultant

Eugene Mironets, PhD
(2019 graduate)
Consultant

Eugene Mironets helps life science companies address any business needs ranging from pre-clinical study design all the way to marketing and commercialization. Most often during his work, Eugene reads primary research articles and some secondary market research. He typically spends time incorporating data he researched into PowerPoint slides or Excel spreadsheets. Some days, he spends two to three hours in phone meetings with clients or with other co-workers.

Career skills that Eugene often uses are critical reading of primary and secondary research, lots of Microsoft suite apps and communicating with clients.

Some advice he would provide current graduate students is to not be afraid to break the mold. There is an ocean of opportunity outside of academia and you may not know the best path for you to take unless you try.
The overarching goal of my project was to add to our growing understanding of neuronal MT organization. We wanted to assess the importance of MT crosslinking in neurons, and our current thinking is that these crosslinkers act in concert with the motor protein cytoplasmic dynein to maintain required MT polarity patterns. That being said, our experiments revealed interesting differences between the two crosslinkers, which merit further study. It is also unlikely that TRIM46 and PRC1 are the only proteins that act as crosslinkers, there are definitely other known proteins that can do this. Our kinesin-1 overactivation studies suggest that the motor has great potential to slide MTs, but that there are some regulatory checks that unleash this sliding only at certain key moments. Another takeaway from this project is that there is no one-size-fits-all answer for MT organization.

Disruptions of MT-mediated processes is a hallmark of neurodegeneration, and one cause of these disruptions could be a breakdown of the intracellular machinery required to maintain appropriate MT organization. An improved understanding of what the target neurons use to organize its MTs would help identify potential corrective or therapeutic strategies.

Impact of Sleep on Incubation of Cocaine Craving and Dopamine Terminal Adaptations Following Abstinence

by Pam Alonso

Sleep disruptions are commonly observed during recovery from chronic cocaine use and manifest as abnormal sleep-wake processes. The mesolimbic DA system is a critical mediator of cocaine reinforcement due to cocaine’s ability to inhibit the DA transporters— which, under normal conditions, is responsible for the swift removal of DA from the extracellular space. This work provides crucial insight into the value of a highly accessible and low-cost treatment option suggesting that interventions to improve sleep architecture in patients undergoing cocaine detoxification may prolong abstinence and decrease the probability of relapse. In addition, this novel approach represents a substantive departure from the few investigations associating sleep and motivation by proposing that DA neurotransmission in the nucleus accumbens may act as a crucial structure regulating motivational behaviors and sleep/wake processes. The results of this research will not only be important for generating new targets to attenuate cocaine-associated sleep disruptions but also to other sleep disorders commonly observed in DA-related diseases.
Interview With Taylor McCorkle, MS
Interviewed by Joya Maser

Taylor McCorkle, MS, is a fourth-year PhD candidate in the Neuroscience program. She also serves as the vice president and co-founder of Neuroscience Graduate Student Diversity (NGSD), treasurer of Drexel’s Black Graduate Student Union, served as a student member of the admissions committee, and as a member of Drexel’s Anti-Racism Task Force on the Graduate and Doctoral Student Life Committee.

Q: What is the biggest lesson you’ve learned about being a leader from these experiences that you and NGSD have gone through at Drexel?
A: One thing I knew, but not quite as much before, is how it feels to be seen and to convey your point in the right way. A lot of what we’ve been trying to do is not to say, ‘everything that’s being done here is awful and we just need to restart,’ it’s more, ‘can we work together to change and tweak things where we need to, to make them better.’ Also, realizing your own weaknesses. I grew up knowing about racism and feeling those explicit and subtle forms of it, but at the same time I learned so much more throughout the past year. If I’m going to tell people that they need to educate themselves, then I need to do the same. Taking the time to educate myself actually opened my eyes to a lot of things. The other part of knowing your own strengths is that it really does take a village as they say. Without everyone else in NGSD, there is no way we would’ve been able to get this far.

Q: On the other side, is there anything that you’ve been rewarded for that you can already see the benefit of?
A: The most rewarding thing for NGSD have been our outreach initiatives. We’ve met with people from local colleges and schools and have been able to resources for the students. We’ve teamed up with teachers at certain middle schools and done various virtual STEM activities with the students there. We also hold virtual panels and Q&A sessions for undergraduates/people who want to apply to graduate school about graduate school programs, applications, and career opportunities. These areas are where we have been thriving the most. Which is great, we want to be able to provide people with information, opportunities, and resources that they might not have had otherwise.

Q: What was it at Drexel, or even outside of our community, that motivated you to take so many of these leadership roles on?
A: We founded NGSD because of the racial injustice that resulted in the uproar that was the summer of 2020. Basically, while a lot of institutions were finally making strides to do better, we created NGSD to form a safe space for students and faculty of diverse backgrounds, as a means to bring changes to our department and graduate school as a whole, and to hold leadership accountable for actually following through and implementing these changes. Before the summer of 2020, I didn’t know about the Black Graduate Student Union, but through all of the Town Halls at Drexel last summer I met the president and got the opportunity to join their board this year. My roles on the admissions committee and the Anti-Racism Task Force also came out of the events that happened in 2020 and Drexel taking steps to combat systemic racism in academia.

Q: What was the most challenging part of trying to implement these changes?
A: I would say, getting people to acknowledge the fact that racism is embedded in so many of our everyday policies and language, that you can always do better, and the current systems in place are not perfect, by any means. Even if we, at Drexel, seem to be better than some other institution, we definitely don’t need to do this for everyone as so many people at Drexel are genuinely willing to make changes and are really supportive of NGSD’s mission. But in this way, making everything we do more intentional, is important for portraying a stronger message to people who are already with us and people who may need more convincing. It does sound sad when you hear it, but [Dr. Wilkins] told us, not everyone is going to care that you are crying about the racism that you are experiencing. When NGSD did face resistance as a group, we felt like there was only so much we could do. We were sharing personal stories at Town Halls, in general meetings, and in the NGSD book club. And if you’re waiting for someone to care that you’re spilling your trauma, you could be waiting forever. When meeting this resistance or not feeling progress as quickly as we all want, it becomes important to protect your own mental health, your peers, and to remind yourself of all the good that you have done. In NGSD we ended up having a support group every Friday and sometimes we would cry, sometimes we would just vent, and sometimes we would get in a much needed laugh, because it was a lot to deal with, the trauma and resistance. We felt like we needed to have some type of group therapy and allow other students to come and share their feelings or simply talk about what truly does take a lot of patience. Ultimately, I think people really do care and are trying to be helpful. But like I said, we can always do more.

Q: As a leader trying to move things in the right direction, how do you deal with meeting resistance?
A: Leadership, especially for racial justice, is something that I want to continue to be involved in. For me, taking on these leadership roles forced me to speak up. My first few years in the program, I was pretty quiet and kept to myself. With everything in the country that was going on at the time, someone needed to say something, and I thought, ‘it’s looking like it’s going to be me.’ But it was a good thing, taking on these roles has made me so much more comfortable with my peers in the department.

I want to continue doing this work because even if our efforts change one person’s life, by giving them the resources that they didn’t have access to, then that is a win. I want to be able to mentor people and be a resource for anything from looking over an essay for a grad school application or whatever it could be, to help as many people as we can.

And I hope that the work that we’ve done so far will make other people feel comfortable and confident bringing up the issues that are affecting them. The goal is to make everyone feel safe and supported in our department.

Q: Do you feel like your experiences at Drexel will push you to remain a leader as you move forward?
A: Leadership, especially for racial justice, is something that I want to continue to be involved in. For me, taking on these leadership roles forced me to speak up. My first few years in the program, I was pretty quiet and kept to myself. With everything in the country that was going on at the time, someone needed to say something, and I thought, ‘it’s looking like it’s going to be me.’ But it was a good thing, taking on these roles has made me so much more comfortable with my peers in the department.

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More 2021 Student Leadership News:

BENVISON AND MACK WIN ASCB COMPASS GRANT FOR NGSD OUTREACH “STEM STARTERS”
The Neuroscience Graduate Students for Diversity (NGSD) group is passionate about increasing diversity in STEM through outreach. At the 2021 Compass Outreach Grant from ASCB to help facilitate their work with STEM STARTERS. The $1,000 award will go to supplies for hands-on activities to help teach young children about the brain. Bennison and Mack, along with other NGSD volunteers, will facilitate these activities during winter 2021 and spring 2022.

NEUROSCIENCE STUDENTS SWEEP BSGSA LEADERSHIP BOARD
Over the past, neuroscience graduate students have always had a strong presence on the Biomedical Sciences Graduate Student Association (BSGSA) leadership board. Dr. Brielle Ferguson and Dr. Andrew Matamoros were both Presidents and Dillon Malloy has joined their ranks most recently. While the BSGSA board positions are up for reelection for the term of 2022-2023, we expect this board to retain some Neuroscience representatives: Andrey Borisuyk (VP of Professional Development), Candace Rizzi-Wise (VP of Event Management) and Shaborna Gulta (VP of Inclusion and Diversity).
**Graduates of 2021**

**Margo L. Randelman, PhD**  
Advisor: Michael Lane, PhD  
Thesis Title: Hypercapnia respiratory training to enhance plasticity after cervical spinal cord injury  
Defense Date: April 1, 2021  
Current Position: Postdoctoral fellow in the laboratory of Dr. Lane by day; “professional Odin cuddler” by night

**Ilse Pamela Alonso, PhD**  
Advisor: Rodrigo Esparta, PhD  
Thesis Title: Impact of sleep on incubation of cocaine craving and dopamine terminal adaptations following abstinence.  
Defense Date: April 8, 2021  
Current Position: Visiting Postdoctoral fellow in the Laboratory for Integrative Neuroscience at NIAAA/NIH under Dr. Lovinger.

**Sara M. Blazejewski, PhD**  
Advisor: Kazuhito Toyosawa, PhD  
Thesis Title: Dissecting cellular mechanisms of neurite formation in the developing cortex  
Defense Date: April 9, 2021  
Current Position: Investigator at GSK

**Philip L. Yates, PhD**  
Advisor: Peter W. Baas, PhD  
Thesis Title: A cellular approach to understanding and treating Gulf War Illness  
Defense Date: April 16, 2021  
Current Position: 3rd year medical student at Drexel University College of Medicine

**Ankita Patil, PhD**  
Advisor: Peter W. Baas, PhD  
Thesis Title: Static crosslinking and motor-driven sliding regulate the organization of axonal microtubules  
Defense Date: July 16, 2021  
Current Position: Scientist, Bioassay, Passage Bio

**Emily M. Black, PhD**  
Advisor: Rodrigo Esparta, PhD  
Thesis Title: Hypocretin receptor 1 modulations on specific neuronal subtypes in the ventral tegmental area impact mesolimbic dopamine and cocaine-associated behavior  
Defense Date: July 30, 2021  
Current Position: Postdoctoral fellow at Temple University in the Briad lab. Adjunct professor at Haverford College for the spring semester.

**Dana Lengel, PhD**  
Advisor: Ramesh Raghwapati, PhD  
Thesis Title: Mechanisms of hippocampal dysfunction following pediatric brain trauma  
Defense Date: July 26, 2021  
Current Position: Postdoctoral fellow at Icahn School of Medicine at Mount Sinai in the lab of Paul J. Kenny.

**Shasha Yang, PhD**  
Advisor: Wenjun Guo, MD, PhD  
Thesis Title: Thalamocortical inputs regulate the development of inhibitory circuitry in the mPFC  
Defense Date: August 4, 2021  
Current Position: Postdoctoral fellow in Fudan University, Shanghai, China

**Jadwiga N. Blichak, PhD**  
Advisor: Marie-Pascale Côté, PhD  
Thesis Title: Enhancing KCC2 expression restores reflex inhibition and improves locomotor function after spinal cord injury  
Defense Date: July 28, 2021  
Current Position: Postdoctoral fellow at University of Pennsylvania, Kayser lab

**Emily Zibal, MS**  
Advisor: Rodrigo Esparta, PhD  
Graduation date: May 5th, 2021  
Current Position: Regulatory, Quality, and Operations Rotational Associate, Integra Life Sciences

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**First Years of 2021**

(top, left-to-right) Birdie Eickel  
Julie Schaub  
Nichole Yokas  
Revathi Kaduru  
Shanna Samels  
Jana Smuts

(Middle, left-to-right) Quinn Stewart  
Jacob Clarin  
Xinyi (Jenny) Chen  
Christopher West  
Cydney Martin  
Sophie Cohen  
Meghan Hendal

(Bottom, left-to-right) Main Vahora  
Anurag Singh  
Anthony Morena Sanchez  
Nishell Savory  
Jason Wheeler  
Jazana Goolsby

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**First Years of 2020**

(top, left-to-right) Jenna McGrath  
Brody Carpenter  
Christina Curran-Allarco  
Adam Hall  
Kendra Case  
Arron Hall  
Andrew Lockhart

(Bottom, left-to-right) Priscilla Santos Acevedo  
Abby Keplin  
Manish Wulf  
Joya Maser
First-Year vs. Second-Year Perspective

Over the past two years, our first- and second-year students have transitioned into the department during the unprecedented circumstances of the COVID-19 pandemic. Despite the similarities between these classes — masks, social distancing, general uncertainty — the experiences of the newest members of our department have been very different! Below we’ll look at some of the first impressions of the two masked-cohorts, blazing their own trail — sanitizer in hand.

Lab Rotations

Of course, the most important impression of all is that of the mentors and P.I.s. As the newest scientists on the block, both first- and second-years felt welcomed and supported. Our students were impressed with your investment in their success and the eagerness to share knowledge and experiences with them.

Once settled in their new homes all our students enjoyed jumping into new projects and engaging with new techniques and skills. Of course, the change did not come without adjustments. Some of the most challenging aspects of rotations remain universal, coming in at 7 a.m., finding balance between new demands and outside life, and the fear of making mistakes.

Classes

Classes, like the COVID vaccine, might make you feel terrible but they’re for your own good. The first-year students of 2020, attended their classes online, lived in separate corners of the country, and many did not meet in person until this year! On the other hand, our current first-years of 2021 have already become a fixture at Queen Lane; tears and complaints of CORE flow down the halls once again.

So, how did the first-years’ expectations of classes compare to reality? Regardless of the differences in lecture setting, there was consensus that classes proved to be challenging, time consuming, and stressful. However, the second-years’ outlook is markedly more positive. Classes became more interesting, challenges were met, and the trauma of CORE has faded with time.

With their newfound wisdom and scholarly intellect our first- and second-years have left some sage advice for next year’s cohort. Their biggest recommendation: don’t procrastinate. And some additional advice that we could all use, prioritizing mental health, forging your own path, and reserving time for self-care!

Social Life

While our 2020 first-years were in their homes — memorizing metabolic pathways with parents, partners, and children — their one glimmer of hope was class discussions on zoom. On the other hand, our 2021 newbies enjoyed trivia nights, pumpkin carving, and spending time outside of the lab. Like many of us, both classes have found socializing in the pandemic-era stressful and challenging. Even with the difficulties, many of our students have found comfort in the friendships they have forged, new hobbies cultivated and opportunities for growth.

2021 Awards & Grants

Outstanding Junior Graduate Student Poster
1st Place – Andrew Lockhart
Mentor – Simon Danner, PhD

Outstanding Senior Graduate Student Poster
1st Place – Silvia Fernandes
Mentor – Shaoping Hou, PhD
Honorable Mention – Nancy Mack
Mentor – Wen-Jun Gao, PhD

Outstanding Postdoctoral Fellow Poster
1st Place – Emanuela Piermarini, PhD
Mentor – Liang Qiang, PhD
2nd Place – Leonardo Garcia-Rameriz, PhD
Mentor – Kimberly Dougherty, PhD

Outstanding Medical Student Poster
3rd Place – Benjamin Sherman
Mentor – Michael Lane, PhD

Outstanding Technician Poster
1st Place – Wen-qiang Huang
Mentor – Dong Wang, PhD

Outstanding Undergraduate Poster
1st Place – Alexander Vasserman
Mentor – Jessica Ausburn, PhD
2nd Place – Yashvi Shah
Mentor – Michael Lane, PhD

Selected for Platform Talks
Kathleen Bryant
Mentor — Jacqueline Barker, PhD

Barry Waterhouse Outstanding Platform Presentation
1st Place – Sarah “Sadiq” Bennison
Mentor – Kazuhito Toyo-oka, PhD
2021 Internal Student Awards:

**Bondi Fellowship**
Genevieve Curtis, mentored by Dr. Jessica Barson

**Blue Graduate College Fellow**
Nishell Savory, 1st-year PhD candidate

Dean’s Fellowship for Excellence in Collaborative or Themed Research
Nancy Mack, mentored by Dr. Wen-Jun Gao
Genevieve Curtis, mentored by Dr. Jessica Barson

**Drexel STAR Award Pitch Presentations: 2nd Place**
Yashvi Shah, mentored by Dr. Michael Lane

2021 Faculty Awards:
Jessica Barson, PhD - 2021 New Investigator Award
John Houle, PhD - 2021 Daniel V. Schidlow MD Transformational Leadership Award
Simon Giszter, PhD, was nominated by College of Medicine and became a Provost Solutions Fellow, in the Drexel Solutions Institute, together with Dr. Sandhya Kortagere
Michael Lane, PhD, was invited to become a fellow of the Royal Society of Medicine (London)

2021 Golden Apple Awardees
Dennis DePace, PhD - Award for Outstanding Service to the Student Body
Haviva Goldman, PhD - Foundations of Basic Science – Year 1 Class of 2023
Francis Sessler, PhD - Foundations of Basic Science – Year 1 Class of 2024
Janet Smith, PhD - Foundations of Basic Science – Year 1 Class of 2024

2021 External Student Awards:

**NIH F31 Fellowship**
Kathleen Bryant, mentored by Dr. Jacqueline Barker
Sarah "Sadie" Bennison, mentored by Dr. Kazuhito Toya-oka
Micaela O’Reilly, mentored by Dr. Veronica Tom
Cameron Trueblood, mentored by Dr. Shaoping Hou

**Association for Women in Science (AWIS) Travel Award**
Nancy Mack, mentored by Dr. Wen-Jun Gao
Shravana Guha, MS, mentored by Dr. Peter Baas

**The American Society for Neural Trauma and Repair (ASNTR) Travel Award**
Tara Fortino, mentored by Dr. Michael Lane
Margo Randelman, PhD, mentored by Dr. Michael Lane.
Margo also received a 1st place presentation award at this meeting.

**Barry Goldwater National Scholarship Nominee**
Nadia Bouras, mentored by Dr. Wen-Jun Gao

**Carl Storm Fellowship**
Jeremy Weinberger, MS, mentored by Dr. Marie Pascale-Côté

**Diversifying the Community of Neuroscience Fellowship (University of Minnesota)**
Taylor McCorkle, MS, mentored by Dr. Ramesh Raghupathi

**National Neurotrauma Society Trainee and Diversity Award**
Taylor McCorkle, mentored by Dr. Ramesh Raghupathi

**NIH Diversity Supplement Award**
Taylor McCorkle, mentored by Dr. Ramesh Raghupathi
Candace Rizzi-Wise, mentored by Dr. Dong Wiong

**Society for Neuroscience Trainee Professional Development Award**
Margo Randelman, PhD, mentored by Dr. Michael Lane
Alessia Niceforo, PhD, mentored by Dr. Michael Lane

Culture

**Q. Reintegrating into society post quarantine: how we feelin’?**

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>13.3%</td>
<td>Hermit. Do not talk to me.</td>
</tr>
<tr>
<td>77.8%</td>
<td>Some days I feel like socializing, others, not so much.</td>
</tr>
<tr>
<td>8.9%</td>
<td>Social butterfly!</td>
</tr>
</tbody>
</table>

**Q. In the past year, how many times have you left home without a mask?**

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>60%</td>
<td>Never I’m a mask pro now.</td>
</tr>
<tr>
<td>35.6%</td>
<td>Once in a while...</td>
</tr>
<tr>
<td>4.2%</td>
<td>I need a reminder almost every day!</td>
</tr>
</tbody>
</table>

**Q. What is your favorite snack?**

<table>
<thead>
<tr>
<th>Snack</th>
<th>% Popularity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Candy</td>
<td>24%</td>
</tr>
<tr>
<td>Chips</td>
<td>17%</td>
</tr>
<tr>
<td>Nuts + Granola</td>
<td>14%</td>
</tr>
<tr>
<td>Cheese</td>
<td>14%</td>
</tr>
<tr>
<td>Fruit</td>
<td>12%</td>
</tr>
<tr>
<td>Dessert</td>
<td>7%</td>
</tr>
</tbody>
</table>

Illustrations by Dr. Ankita Patil
Scientist Support Animals

Rooney James
Joya Maser

Sophie and Sylvie
Breanne Pirino

Fritz
Dr. Detloff

Sadie the Floof
Candace Rizzi-Wise

Paris
Shayna Singh

Chomchom
Shrobona Guha

Eddie
Dr. Jessica Ausborn

Hazel
Ashley Opalka & Kyle Samson

Fuzi
Xiaohuan Beanie Sun

Winter
Jani Bilchak

Mordi and Grey
Micaela O’Reilly

Rubble and Koen
Dr. Howe

Toby
Jana Smuts

Moonbeam
Jana Smuts

Bella
Nancy Mack

Josephine (Jo)
Jennifer Pastorino
Activities & Outreach

Ankita and Candace at the DIY candle making workshop by BSGSA

Philadelphia Flower Show

Côte lab dressing up the same

BSGSA Bouncy House Event

BSGSA Board at the Pumpkin Carving & Painting Event

Diwali "Festival of Lights" event by BSGSA

Dr. Brielle Ferguson presenting her work from Stanford University at the departmental seminar

Candace delivering Fall goodie bags from the BSGSA

Students meet Dr. Consuelo Wilkins, recipient of the Marion Spencer Fay Award

NeuroCamp 2021 at the Franklin Institute
Faculty Grants 2021

Jessica Ausborn, PhD  
NIH R01 NS118562 - (Ausborn and VonReyn - PI's)  9/15/20 - 6/30/25  
Title: Neural algorithms underlying diversity in visual feature integration  
Total Direct Costs - $700,305 (Ausborn)

NIH R01 NS118562 - (Ausborn and VonReyn - PI’s)  9/1/21 - 6/30/22  
Title: Research Supplement to Promote Diversity in Health - Related Research Program for Alisha Augustin  
Total Direct Costs - $10,200

Steinbright Career Development Center Research Co-op (Ausborn PI)  
3/29/21 - 9/28/21  
Title: Persistent activity underlying sustained behaviors in Drosophila melanogaster. Co-op: Alexander Vasserman  
TDC - $2,750

NSF 2113069 (Ausborn PI; Ilya Rybak Co-Investigator)  
10/1/21 - 9/30/25  
Total Direct Costs $441,412

Peter Baas, PhD  
Multi - PI R01 NS118177R01 (Baas and Morfini - PI’s)  9/30/20 - 6/30/25  
Title: Mechanisms of SPG4 hereditary spastic paraplegia  
Level of funding: $1,029,185 total direct costs to Dr. Baas; $1,028,547 total direct costs to Dr. Morfini

DOD W81XWH 21101189 (Baas PI)  
3/15/21 - 3/14/23  
Title: Novel microbubule - based hypothesis for Frontotemporal Dementia leading to therapy for military personnel and veteran  
Total Direct Costs - $200,000

NIH R21AG068597 (Baas PI)  
4/15/21 - 3/31/23  
Role of Tau in Microtubule Stability in Adult Neurons  
Total Direct Costs $275,000

NIH R21AG068597 (Baas PI)  
4/15/21 - 3/31/23  
Role of Tau in Microtubule Stability in Adult Neurons  
Total Direct Costs $275,000

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4/15/21 - 3/31/23  
Role of Tau in Microtubule Stability in Adult Neurons  
Total Direct Costs $275,000

Subcontract from Texas A&M University (Baas PI, Oscar Qiang Co-I)  
5/15/21 - 5/14/24  
Drosophila melanogaster. Co-op: Alexander Vasserman  

Title: Persistent activity underlying sustained behaviors in Drosophila melanogaster. Co-op: Alexander Vasserman  
TDC - $2,750

The Hillock. Volume 5 (December 2021)
PA Spinal Cord (Hou PI) 6/1/21 - 5/31/23
Rebuilding Supraspinal Regulation to Restore Voluntary Motor Control
Total Direct Costs $95,238

Pending NIH R01NS121336 (Hou PI; John Houle Co-I) 12/1/21 - 11/30/26
Combining serotonergic neural progenitor transplantation and exercise to improve cardiovascular disorders and autonomic dysreflexia after spinal cord injury
Total Direct Costs $1,250,000

John Houle, PhD
NIH R01 NS117821 – (University of SC Subaward J Houle, PI) 7/1/21 - 6/30/25
Title: Role of Stress Granule Protein Aggregation in Axon Regeneration
Total Direct Costs $349,059

Caitlin Howe, PhD
Mary De Witt Pettit, MD Fellowship (Howe PI) 7/1/21 - 6/30/23
Accessing the Lab Remotely: addition of cadaveric 3D models in medical school gross anatomy courses
Total Direct Costs $10,000

Ying Jin, PhD
PA Spinal Cord (Jin PI) 6/1/21 - 5/31/23
Gliaal Progenitor Grafts to Promote Regeneration and Functional Recovery after SCI
Total Direct Costs $95,238

Michael Lane, PhD
Neilsen Foundation University of Florida Subcontract (PI Lane) 2/1/20 - 7/30/22
Electrical Stimulation and Intraspinal Transplantation
Total Direct Costs $369,368

Subcontract from Texas A&M University (Lane PI) 1/1/21 - 11/30/21
NIH R01NS116404 (Dulin, PI)
Dissecting Connectivity and Functions of Transplanted Interneurons in the Injured Spinal Cord
Total Direct Costs $9,335

PA Spinal Cord (Lane PI) 6/1/21 - 03/12/23
A Novel Training Strategy to Enhance Respiratory Recovery after SCI
Total Direct Costs $190,476

Subcontract from Thomas Jefferson University (Lane PI) 7/31/21 - 7/30/23
Neilsen Foundation (Laporte PI)
Respiratory interneuron plasticity following cervical SCI: therapeutic promotion of relay circuits
Total Direct Costs $11,000

Mosley Foundation (Lane PI, Zhukovets, Co-I) 10/1/21 - 9/30/23
Broad Scale Genetic Screening of Human and Non-Human Neural Precursor Cells (NPCs)
Total Direct Costs $249,236

Dana Lengel, PhD
Brain Injury Association of America (Lengel, PI; Raghupathi, Mentor) 2/1/21 - 1/31/22
The Role of Fkbp6 - binding Protein 51 (FKBP51) in Long-term Psychosocial Outcomes of Pediatric TBI.
Total Direct Costs $5,000

Nancy Mack
1/01/21 - 6/30/21
COM Dean's Fellowship (Mack PI, Wenjun Gao, Mentor) Total Direct Costs $20,274

Micaela O’Reilly
NIH F31NS118841 (O’Reilly PI, Tom Mentor) 4/1/21 - 9/30/23
Role of NF - kib in sympathetic hyperreflexia after spinal cord injury
Total Direct Costs $110,503

Emanuela Piermarini, PhD
Christopher Reeve Fellowship 7/1/21 - 6/30/22
"Mechanisms of neurodegeneration in SPAST-based Hereditary Spastic Paraplegia"
Total Direct Costs $20,000

Liang Oscar Qiang, MD/PhD
Mosely Foundation (Qiang PI) 11/1/20 – 10/31/22
Title: Using "Mini - Brains" from Patient Derived Pluripotent Stem Cells as the Models to Investigate Novel Microtubule Based Mechanisms and Therapies for Tauopathies.
Total Direct Cost - $250,000

PA Spinal Cord (Qiang PI) 6/1/21 - 5/31/23
Gene Therapy via Spastin Overexpression to Promote Axon Regrowth for SCI Repair
Total Direct Costs $1,250,000

Spastic Paraplegia Foundation (Qiang PI) 7/1/21 - 6/30/23
Therapeutic monoclonal antibodies for the treatment of hereditary spastic paraplegia
Total Direct Costs $150,000

Ramesh Raghupathi, PhD
NIH/R01NS110898 (Raghupathi – PI)
"Mechanisms of neurodegeneration in SPAST-based Hereditary Spastic Paraplegia"
Total Direct Cost – $250,000

NIH/NINDS R01NS110898 (Raghupathi – PI)
Ramesh Raghupathi, PhD
Total Direct Costs $150,000

SPG4 - based Hereditary Spastic Paraplegia
Elucidate impaired autophagy as one of the major contributors to SPG4 - based Hereditary Spastic Paraplegia
Total Direct Costs $150,000

NIH R01NS118898 (Raghupathi PI) 2/1/21 - 2/28/24
Dopaminergic mechanisms underlying behavioral deficits following mild TBI
Total Direct Cost $1,215,460

NIH R01 NS110898 (Raghupathi PI) 2/1/21 - 2/28/24
Dopaminergic mechanisms underlying behavioral deficits following mild TBI
Research Supplement to Promote Diversity in Health - Related Research Program for Taylor McCorckle
Total Direct Costs - $170,043

Subcontract from Rowan University (Raghupathi PI) 4/1/20 - 3/31/22
New Jersey Brain Injury Research (Waterhouse PI)
Effects of Repeat Mild TBI on Flexible Attention and the Norepinephrine Transmitter System
Total Direct Costs $11,260

Steinbright Career Development Center Research Co-Op (Raghupathi PI) 3/29/21 - 9/28/21
Title: A prototype device to induce brain injury using high frequency ultrasound. Co-Op: Daniel Hendricks.
TDC - $1,500

Ilya Rybak, PhD
NIH R01 NS10550 (Rybak – Multi PI with Frigon and Prilutsky)
2/15/20 - 1/21/25
Limb Coordination during locomotion before and after spinal cord injury
Total Direct Cost $1,897,403 Rybak $680,630, Frigon $680,625 and Prilutsky $645,017.

Trevor Smith
NIH F31 NS124347 - scored 14th percentile (PI Smith, Gisztner Mentor) 4/1/21 - 6/30/24
Independence of Spinal Motor Modules and Motoneuron Recruitment from Motor Modules: New Experimental Tests
Total Direct Costs $120,055

Veronica Tom, PhD
NIH/R01NS122371 Score 13th percentile (Tom PI, Bethae Co-I) 12/1/21 - 11/30/26
Multipronged approach to diminish sympathetic hyperreflexia and ensuring cardiovascular and immune dysfunction after spinal cord injury
Total Direct Costs $1,833,550

Kazuhiyo Toyooka, PhD
CURE 2019 Competition (Toyooka PI, Gao Co-I) 6/1/21 - 5/31/23
Targeting AMPK in Autism Spectrum Disorder
Total Direct Costs $75,000

CURE 2019 Competition (Spiliotis PI, Elias, Toyooka and Han Co-I’s) 6/1/21 - 5/31/23
Roles of the autism and schizophrenia risk kinase TAOK2 and its phospho - target SEPT7 in neurogenesis
Total Direct Costs ($75,000)

Cameron Trueblood
NIH F31 NS122445 (Trueblood PI, Hou, Mentor) 7/1/21 - 11/30/22
Elucidating Serotonergic Mechanisms Regulating Cardiovascular Recovery After Grafting Embryonic Raphe Neurons into the Injured Rat Spinal Cord
Total Direct Costs $74,551

Dong Wang, PhD
NIH R01 NS101910 (Wang PI) 6/1/21 - 11/30/23
A raphe - hippocampus pathway for regulation of memory specificity during consolidation
Research Supplements to Promote Diversity in Health - Related Research Program for Candace Rizzi - Wise
Total Direct Costs $18,000
Karkhanis AN. Kappa-opioid receptor-dependent changes in dopamine and anxiety-like or approach-avoidance behavior occur differentially across the nucleus accumbens shell rostro-caudal adenosine 2A receptor. Neuropharmacology. 2020 Dec 15;181:108341.


Kimberly Dougherty, PhD


Kimberly Dougherty, PhD


In press.

John Houle, PhD

Houle, JD and Detloff MR 2021 Exercise as a therapeutic intervention for neuropathic pain after spinal cord injury, in Spinal Cord Injury and Transplantation. John Houle, PhD

Michael Lane, PhD


Ramesh Raghupathi, PhD

Ramesh Raghupathi, PhD


Veronica Tom, PhD


Dong Wang, PhD


Veronica Tom, PhD


Dong Wang, PhD
