Cell Biology & Physiology

CBP In the Loop

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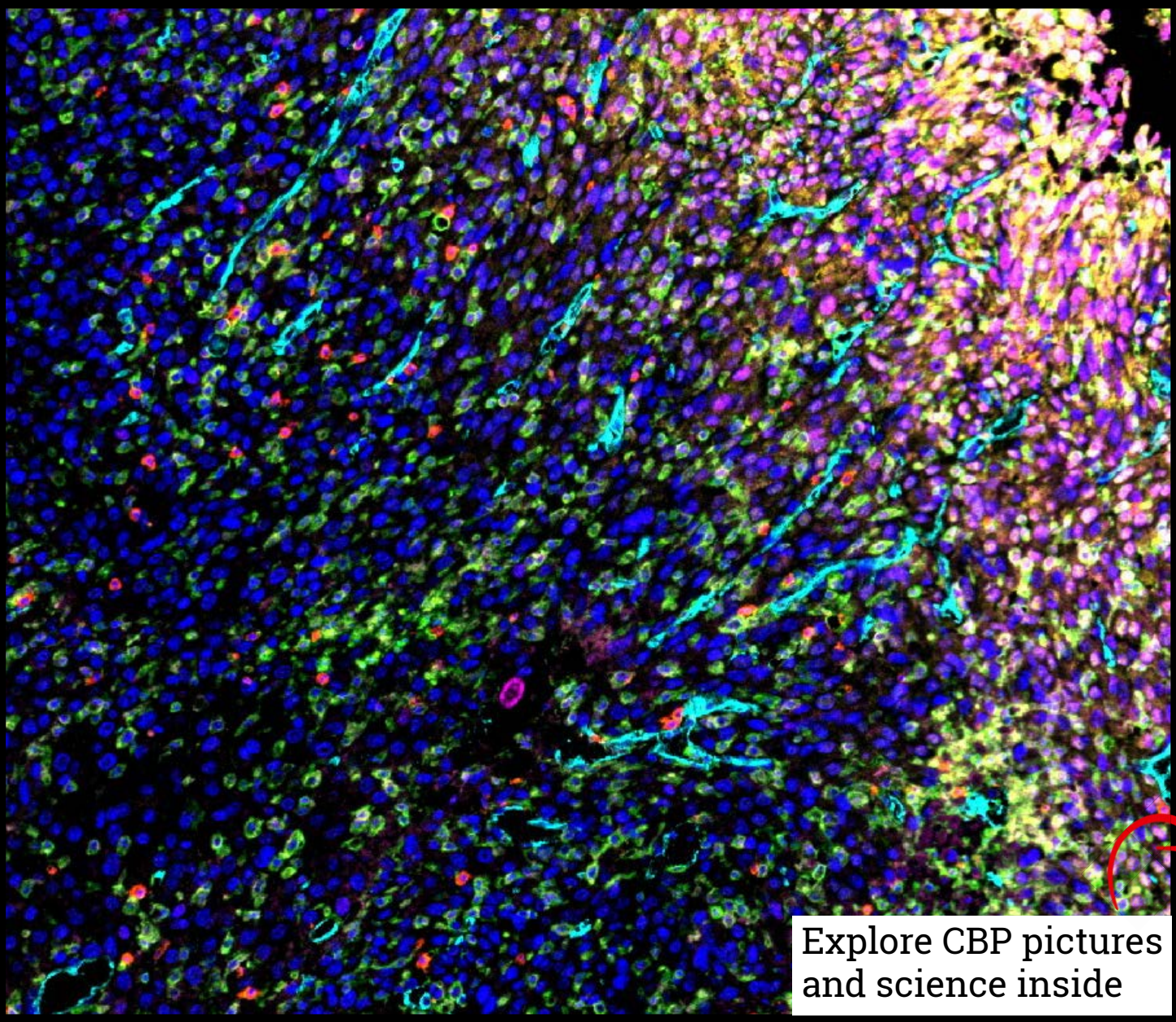
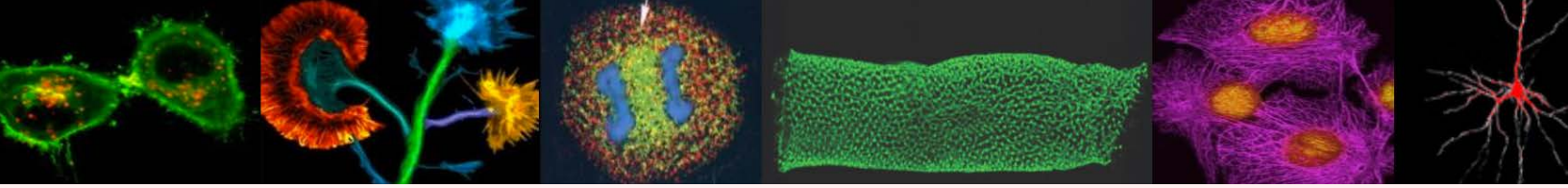
#3 in the Nation in NIH Funding



Explore CBP pictures and science inside

University of North Carolina at Chapel Hill
Department of Cell Biology and Physiology



Cell Biology & Physiology

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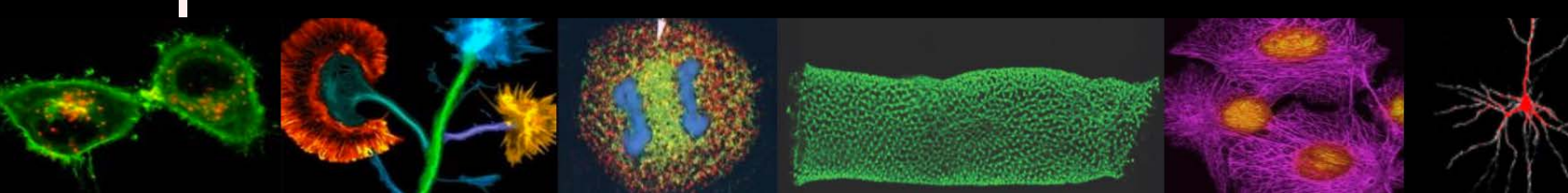


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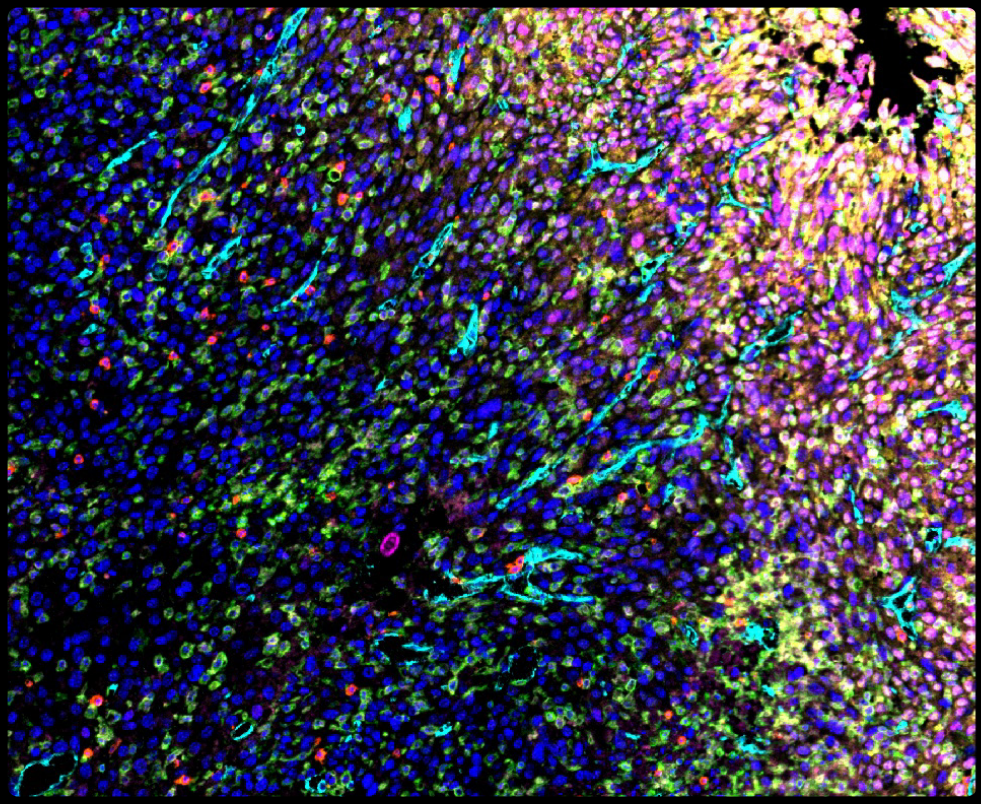
WRITE WHAT YOU LOVE ABOUT CBP
The Coffee Hours
The Community
My Cohort
Friendliness
Excitement about science
Social Events!!
CBP Life!
Spread Positive Vibes


ANIMAL MODEL SYSTEMS
SCIENCE EVERY

Under the Microscope



Imaging tumor stress

About this image

This image shows how the endoplasmic reticulum (ER) stress pathways (red) are specifically elevated in hypoxic regions of tumors (yellow). This reveals that the stress immune cells (green and red) experience in the tumor is spatially-defined, and that the ATF4-ER stress pathway is modulated by hypoxia - a finding that improves our understanding of why some cancer patients respond poorly to immunotherapy treatments.

Image credit: Andrew Kennedy Jr.

Mentor: Jessica Thaxton, PhD

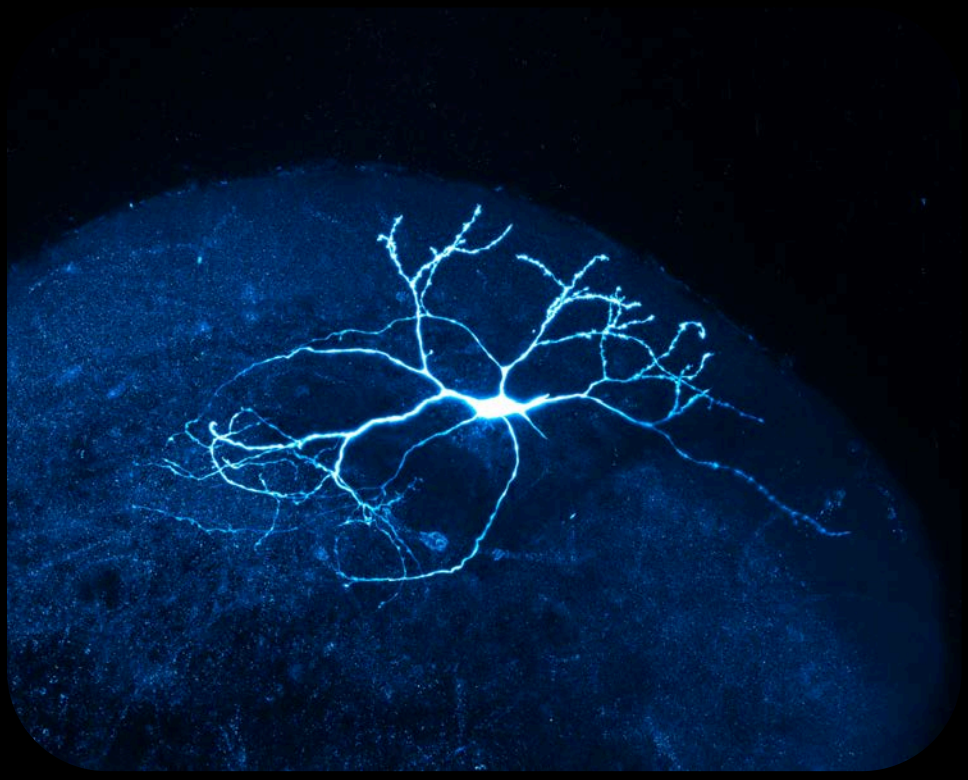
Picturing molecular age-related hearing loss

About this image

Age-related hearing loss is the most prevalent sensorineural hearing loss, affecting millions of people worldwide. The dorsal cochlear nucleus (DCN) is a part of the first central auditory structure to receive input from the cochlea, where fusiform cells (primary output cells in the DCN) send auditory signals to the rest of the brain. This image of a fusiform cell from an old mouse gives us insight into how these cells change their dendritic trees in response to age related hearing loss. During patch-clamp electrophysiological recording, we recorded the cell, and injected it with Lucifer-yellow dye. The cell (located in a brain slice) was fixed, stained with anti-Lucifer, and imaged on a confocal microscope. The image is pseudo-colored.

Image credit: Reginald J. Edwards

Mentor: Paul Manis, PhD



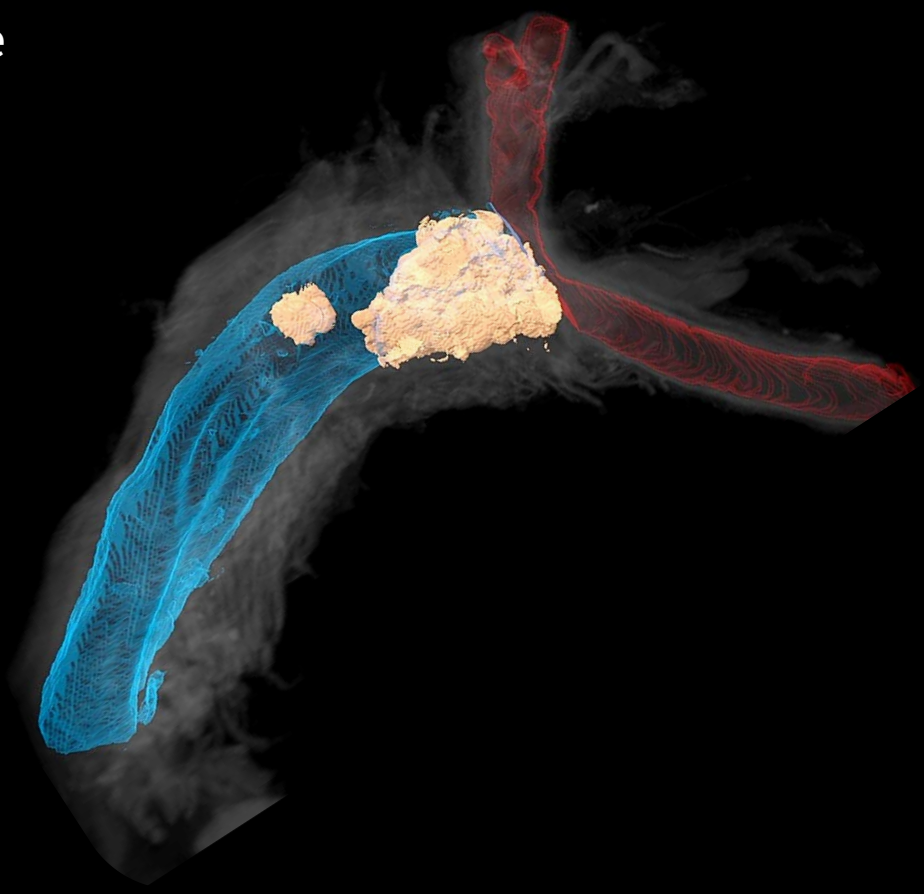
3D reconstruction of mouse arterio-venous fistula

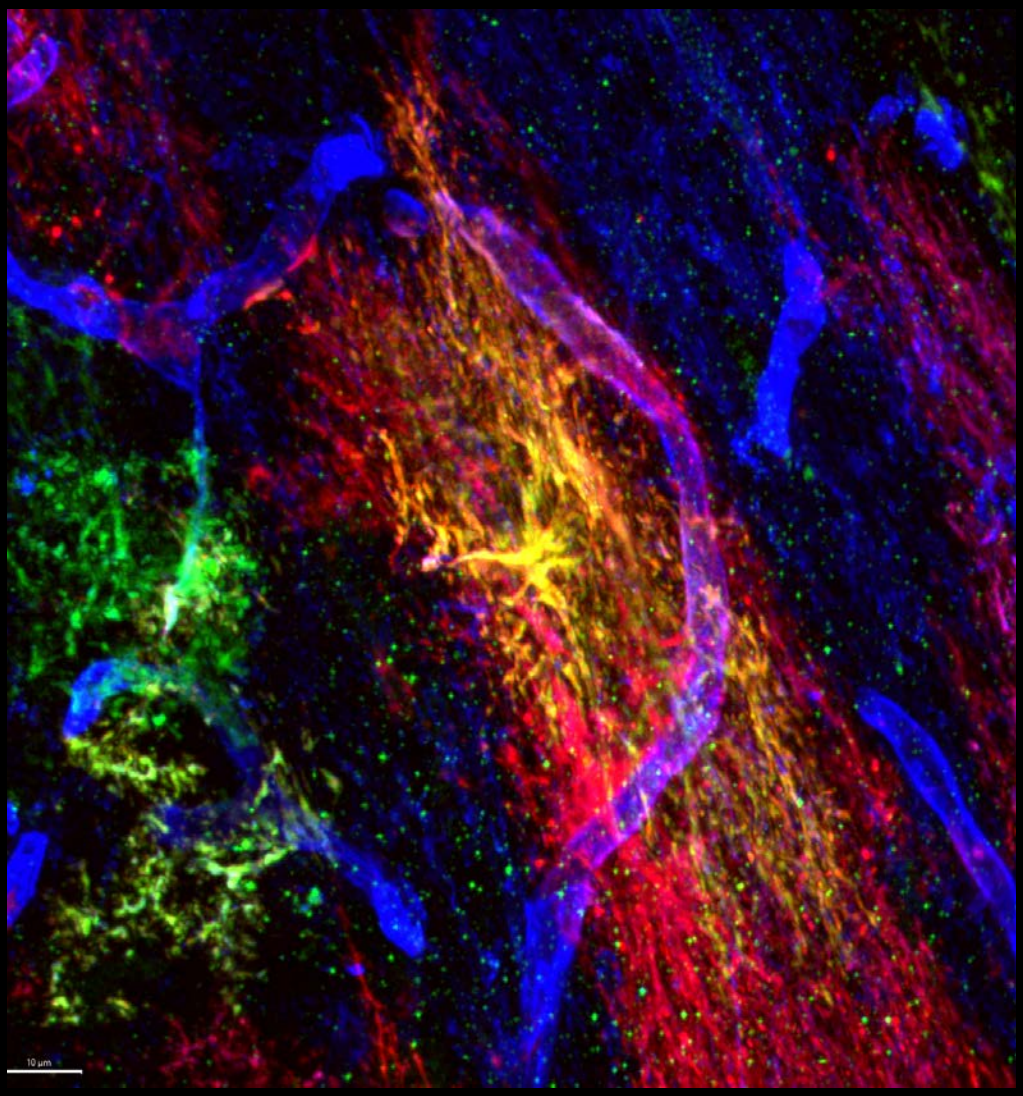
About this image

Arterio-venous fistula (AVF) surgery was performed creating an end-to-side fistula between the jugular vein and carotid artery of a mouse. Twenty one days after surgery, the fistula was harvested. The tissue was cleared with iDISCO and imaged by light sheet fluorescence microscopy (LSFM). Blue and red depict the venous and arterial arms of the fistula, respectively. White depicts the stenotic lesion formed in the venous arm.

In the Bahnson Research Group we are trying to develop therapies to improve the maturation of arterio-venous fistulae, which are necessary for hemodialysis in patients with kidney disease. We use LSFM to assess the effects of potential drugs to improve fistulae patency allowing us to assess the entirety of the fistula in 3D.

Image credit: Edward Moreira Bahnson, PhD





The endfeet of white matter

About this image

The blue is Aquaporin4, an astrocyte end foot marker that primarily localizes to the vasculature. The red and green are astrocytes sparsely labeled with multiple fluorophores via intracranial AAV injection. This image is one of the first to show that astrocytes in white matter regions of the brain have endfeet which encapsulate the vasculature. Endfeet in gray matter astrocytes are known to play important roles in contributing to the blood brain barrier and maintaining ion homeostasis. The existence of endfeet in white matter suggests that astrocytes in these region may share some of the same crucial functions.

Image credit: Katie Holmes

Mentor: Katie Baldwin, PhD

Researchers create gene therapy with potential to treat peripheral pain conditions

Appeared in UNC Health and UNC School of Medicine Newsroom

By Kendall Daniels Rovinsky, MA | December 24, 2024

Using technology first designed by Bryan L. Roth, MD, PhD, the Michael Hooker Distinguished Professor of Pharmacology, researchers at the UNC School of Medicine have engineered a molecular technology that can turn off pain receptors.

Pain is meant to be a defense mechanism. It creates a strong sensation to get us to respond to a stimulus and prevent ourselves from further harm. But, sometimes injuries, nerve damage, or infections can cause long-lasting, severe bouts of pain that can make daily life unbearable.

What if there was a way to simply turn off pain receptors? UNC School of Medicine researchers Bryan L. Roth, MD, PhD, the Michael Hooker Distinguished Professor of Pharmacology, and Grégory Scherrer, PharmD, PhD, associate professor of cell biology and physiology and the UNC Neuroscience Center, have just proved that it is possible.

Using a tool designed by Roth in the early 2000's, the labs have created a new system that reduces acute and tissue-injury-induced inflammatory pain in mouse models. Hye Jin Kang, PhD, an alumnus of the Roth Lab and now associate professor at Yonsei University in Korea, was first author on the research paper. Their results were published in Cell.

Brian Roth, MD, PhD

"What we have developed is potentially a gene therapy approach for chronic pain," said Roth, who is also a member of UNC Lineberger Comprehensive Cancer Center. "The idea is that we could deliver this chemogenetic tool through a virus to the neurons that sense the pain. Then, you could just take an inert pill and turn those neurons 'off', and the pain will literally disappear."

The Humble Beginnings of Chemogenetics

Neuroscientists have been on a decades-long endeavor to build a comprehensive "map" of the human brain. If every type of cell and every neural pathway could be identified, researchers could make large strides in neurological research – including the ability to turn regions of the brain "on" and "off" to parse out their functions or mimic drug therapy.

In the 90s, Roth, then professor of biochemistry at Case Western Reserve University (with secondary appointments in Psychiatry, Oncology, and Neurosciences), wanted to find a way to make new, powerful therapeutics that could stop diseases without incurring dissuading side effects. It was a tall order, pharmacologically-speaking. So, Roth decided to use an up-and-coming technique called "directed molecular evolution," which essentially uses chemically engineered molecules to speed up the evolution process in nature.

"What I realized, and what a lot of people realized, is, if you could make an engineered receptor that had some of the same signaling properties as a drug of interest, and if you could put it in a particular brain region or cell type, then you could mimic the effects of the drug," said Roth, who is now the project director of the NIMH Psychoactive Drug Screening Program. "We made some several attempts in the 90s, as did other people, without a great deal of success."

The Power to Turn Neurons "On" and "Off" at Will

Roth perfected the chemogenetic technology in 2005. With yeast as his model organism, he engineered an artificial protein receptor that could only be "unlocked" by clozapine N-oxide, a synthetic drug-like compound that had been rendered inert by removing all its therapeutic qualities.

The tool, which is also termed designer receptors exclusively activated by designer drugs, or DREADDs, acts as a molecular lock and key that can only be activated when an inert drug-like compound is introduced to the body. Once activated, the technology can turn neurons "on" or shut them "off," effectively giving researchers the ability to make highly selective changes to the nervous system.

The techniques were revealed to the scientific community in March 2007 in the Proceedings of the National Academy of Sciences. Since then, Roth's technology has been used by thousands of researchers worldwide to study the functions of neurons and develop new medications to treat complex neuropsychiatric conditions – from depression and substance abuse to epilepsy and schizophrenia.

Grégory Scherrer, PharmD, PhD

A Potential Gene Therapy for Chronic Pain

Every neuron in our body that is not part of central nervous system (CNS) belongs to the peripheral nervous system, or PNS. This division of the nervous system is responsible for relaying our five sensations to the CNS, allows our muscles to move, and aids in involuntary process such as digestion, breathing, and heart beats.

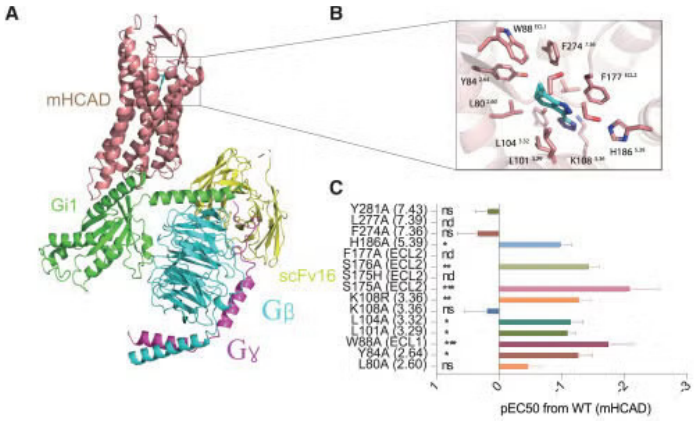
Relatively few studies have been done on the use of chemogenetics in the PNS, simply because of technical difficulty. The CNS and PNS are so intertwined on a cellular, chemical, and genetic level, that it is challenging for researchers to apply their technology solely to the PNS.

"Many of the genes that are expressed in the peripheral nervous system are also expressed in the central nervous system, particularly in the brain," said Scherrer, who is also an associate professor in the UNC Department of Pharmacology. "We had to perform a multitude of analyses and tests to isolate both a receptor and drug-like compound that only operate in the periphery."

However, after seven long years, the Roth and Scherrer labs found success. Researchers based their new system off of hydroxycarboxylic acid receptor 2 (HCA2), a type of receptor implicated in anti-inflammation. HCA2 receptors are expressed in the PNS and are usually activated by vitamin B3. Using mouse models, researchers altered the HCA2 receptors so that they could only bind to FCH-2296413, an inert drug-like compound that only acts within the PNS.

The chemogenetic system, termed mHCAD, is designed to interfere with nociceptors, making it more difficult for the sensory neurons to transmit pain information to the spinal cord and brain. To be more specific, mHCAD reduces their ability to fire off their electrical and chemical messages. A more intense, more painful stimulus will be needed to cause the perception of pain.

Although the technology is still far from human use, Roth and Scherrer have already thought about how the technology would best be delivered in the body: through gene therapy. Researchers successfully injected mHCAD into a mouse model using genetic technology created by colleague and gene therapy pioneer Jude Samulski, PhD, a distinguished professor of pharmacology at the UNC School of Medicine. The gene therapy leverages the infectious abilities of the adeno-associated virus (AAV), allowing researchers to deliver mHCAD into the pain neurons of interest.



Structure of mHCAD chemogenetic system in complex with FCH-2296413 (magenta), an inert drug-like compound. Credit: Kang et. al Cell (2024).

Future Uses for Chemogenetics in the PNS

In 2013, the National Institutes of Health formed a partnership between Federal and non-Federal partners with a common goal of mapping every human brain cell and every neural circuit through innovative neurotechnologies called the Brain Research Through Advancing Innovative Neurotechnologies® Initiative, or BRAIN Initiative.

Roth's chemogenetic technology has played a big role in the BRAIN Initiative. To date, tens of thousands of shipments of viruses and plasmids from the Roth lab have been distributed leading to many thousand publications. Now that the technology has expanded to the peripheral nervous system, researchers can better study the neurons that produce the perception of touch, temperature, body position, pain, and more.

"There are dozens of classes of PNS neurons that we don't fully understand," said Scherrer. "By using this new innovative tool, we can then define cellular targets that we can engage with to treat diseases. It's going to be an important tool to increase our knowledge in the somatosensory field and beyond."

Reference
Kang, H.J.., et al. Structure-guided design of a peripherally restricted chemogenetic system. Cell 187(26), 7433-7449.e20 (2024).

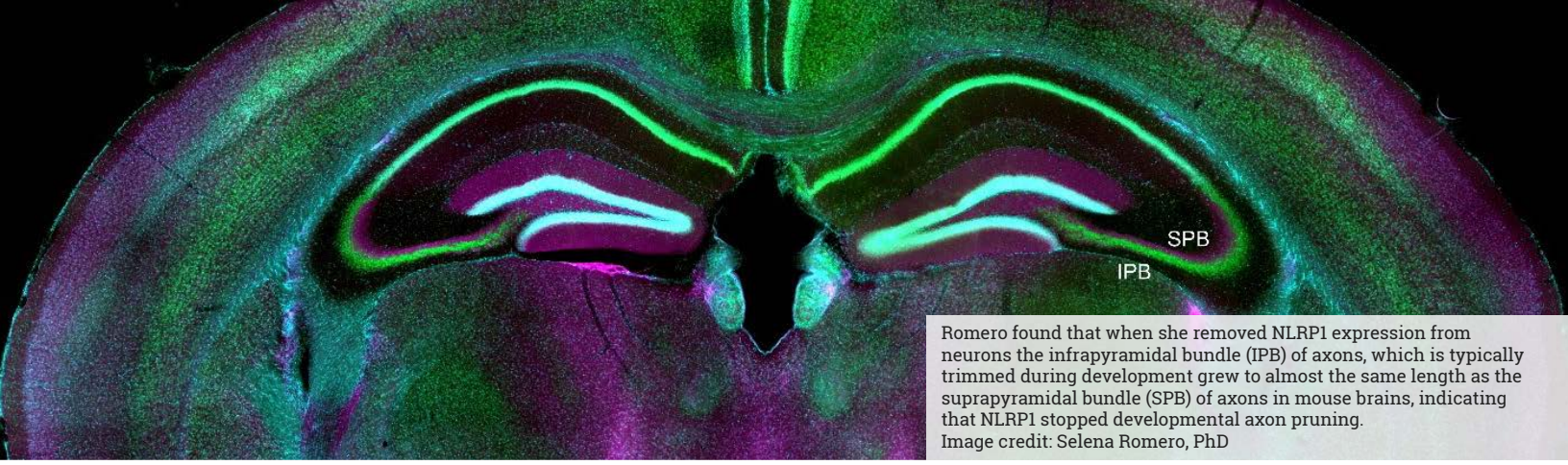
Read more about pain research and Grégory Scherrer's work in the below news stories.

The Washington Post: "The placebo effect can be good medicine, for pain and other problems"

National Geographic: "How you can change your body's threshold for pain"

The Guardian: "Painkillers without the addiction? The new wave of non-opioid pain relief"

Ace Lane, lab manager of the Scherrer lab, illustrated a custom magazine cover for the group's recent paper published in *Nature*. Although the cover was not selected, the paper won the title of paper of the year for CBP 2024. Read the paper, "Neural circuit basis of placebo pain relief" in *Nature*.



Romero found that when she removed NLRP1 expression from neurons the infrapyramidal bundle (IPB) of axons, which is typically trimmed during development grew to almost the same length as the suprapyramidal bundle (SPB) of axons in mouse brains, indicating that NLRP1 stopped developmental axon pruning.
Image credit: Selena Romero, PhD

The unexpected role of a pathogen-sensing immune protein in the brain

By Tiffany Garbutt, PhD | April 17, 2025

Trimming neuronal axons involves a distinct pathway and a rare pathogen-sensing immune protein that could have implications for Alzheimer's disease.

Neurons have the remarkable ability to kill parts of themselves without dying in a phenomenon known as axon pruning. During axon pruning, neurons trim unnecessary axons, long, threadlike projections from nerve cells that transmit electrical signals to other cells.

"Axon pruning fine tunes the connectivity and communications between neurons. Just think about the preciseness with which this system must consolidate one axon but not the other," said Mohanish Deshmukh, a professor in the Department of Cell Biology and Physiology and the Neuroscience Center at the University of North Carolina at Chapel Hill.

In an article published in EMBO Reports, Selena Romero, a scientist in Deshmukh's lab who recently defended her PhD, found that axon pruning shares much of the same molecular degeneration machinery as apoptosis, a programmed mechanism by which cells die. However, Romero found that there are distinct differences. In particular, axon pruning requires the unexpected use of an immune molecule called NLRP1 typically activated during pathogen infection.

Selena Romero, PhD

"It didn't make sense for the neuron to express this because our axon pruning model doesn't use viruses or any inflammatory stimulus," said Romero. Unlike apoptosis, axon pruning does not require the apoptosome complex to initiate degeneration. This suggested to Romero and Deshmukh, that axon pruning may occur through a different pathway.

"We started looking for other mechanisms cells use to activate caspases [the enzymes needed for degeneration] that are independent of the apoptosome," said Romero. They came across the inflammasome complex, which typically activates during immune responses.

She systematically knocked out the expression of the essential components involved in the inflammasome complex one at a time until finally, she found the lynchpin protein. When she removed NLRP1 expression, axon pruning did not occur.

How an immune protein got a new job in the brain

"NLRP1 belongs to a family of pathogen sensing proteins. This one is an outlier and very few pathogens can activate it. It's not the most well studied," said Deshmukh. NLRP1 activates in response to infections with anthrax and several viruses. It is also not a neuroimmune protein that typically interacts with the developing nervous system. "From our perspective, that is even more unexpected in that it is a bonafide immune molecule. What the heck is it doing in neurons in a nonpathogenic or diseased setting," said Deshmukh.

Romero reasoned that one advantage of utilizing the pathogen-sensing molecule NLRP1 for physiological axon pruning is that it may have evolved to quarantine potentially problematic axons to protect the body. If a virus infects distal axons in someone's fingertips, for example, the virus could retroactively travel through the spine and affect the central nervous system. Thus, NLRP1 may not only regulate physiological axon pruning but could also halt the spread of pathogens in the nervous system.

"The other thing is that we have far fewer proteins in our genome than we thought we did," said Deshmukh. When researchers started sequencing the human genome, they thought humans had 50,000 to 100,000 genes. Now, they know humans have only 20,000 protein-coding genes, just 1,000 more than the roundworm C. elegans. "We're going to use the same proteins for multiple functions. NLRP1 has one ability to detect a pathogen and cause degradation. Why not engage the same protein under physiological conditions," said Deshmukh.

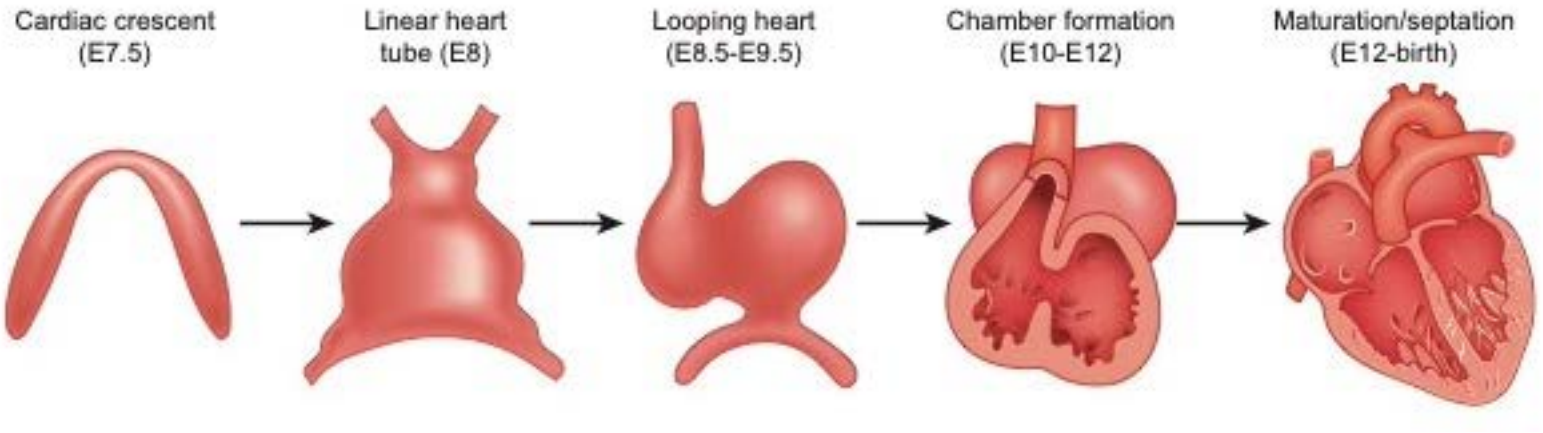
Mohanish Deshmukh, PhD

A potential therapeutic role in disease

NLRP1 may also have an unexpected role in Alzheimer's disease. Another group noted that loss of NLRP1 expression in neurons improved Alzheimer's disease outcomes in animal models. "Now that we've discovered the axon pruning function of NLRP1, it could very well be the case that there is unexpected hyperactivation of NLRP1 in Alzheimer's disease, and inhibiting it could be a good therapeutic target," said Deshmukh.

Romero and Deshmukh's findings show unequivocally that although apoptosis and axon pruning share many of the same molecular degradation events, they are two distinct pathways. Now they are on the quest to better understand those pathways and their roles in human health and disease.

Reference
Romero, SE., Geden, MJ., Basundra, R., et al. The NLRP1 inflammasome is an essential and selective mediator of axon pruning in neurons. EMBO Reports 26(7), 1724-1736 (2025).



Understanding the role of lipid modifications in cardiac development

By Tiffany Garbutt, PhD | May 12, 2025

CBP scientist Whitney Edwards won two awards to study how lipid modifications to proteins affect heart development and how gestational diabetes can disrupt this process, causing congenital heart defects.

Nearly one percent of every baby born, roughly 40,000 newborns, in the United States will have a congenital heart defect. "I always stress to people that congenital heart disease is not just a disease of babies," said Whitney Edwards an assistant professor in the Department of Cell Biology and Physiology at the University of North Carolina at Chapel Hill. The heart is dynamic and keeps developing as the child grows, requiring greater compensation for congenital defects and corrective surgeries throughout a person's lifespan.

To tackle this problem, Edwards is using both a basic research approach to understanding the fundamental role of a post-translational modification called prenylation on normal cardiac development and a translational approach to understanding its influence on congenital heart disease. She recently won two awards, an Additional Ventures Expansion Award and a SPLENDOR-NC Award to aid in her efforts.

Understanding the fundamentals

Prenylation is the process of adding a type of lipid called an isoprenoid to a newly made protein. Lipids make proteins hydrophobic, allowing them to traffic to and anchor into different organelles and cell membranes. Lipid modifications also assist in protein-protein interactions, helping to build important protein networks needed for different cellular processes. Prenylation plays a role in the development of many organs, but these lipid modifications regulate numerous critical proteins important for the growth of the heart.


Whitney Edwards, PhD

The Additional Ventures Expansion Award through the Additional Ventures Foundation will fund Edwards' efforts to explore the fundamental role of prenylation on heart development. The Additional Ventures Foundation is a nonprofit organization dedicated to advancing research for single ventricle diseases. Of congenital heart defects, single ventricle diseases are some of the most severe cases. Children with single ventricle heart defects have only one functional lower heart chamber instead of the normal two.

"A unique factor that we bring is that we're seeing prenylation is super important for heart muscle cell (cardiomyocyte) function and mechanics. Defects in cardiomyocyte development and function can lead to congenital heart defects," said Edwards. Through the award, she aims to understand how prenylation regulates proteins, identify which heart proteins are prenylated, and dig into the mechanism of how this modification affects protein functionality in the developing heart.

A new angle of studying congenital heart disease

Her second grant, the SPLENDOR-NC Award through the UNC Nutrition Obesity Research Center and the North Carolina Diabetes Research Center, takes a more translational approach. "I applied for this award because we were interested in studying congenital heart disease from a new angle associated with gestational diabetes," said Edwards.

Other research teams had noted in previous studies that lipids in the hearts of fetuses from moms with gestational diabetes were drastically different than those from moms without gestational diabetes. The enzymes involved in the mevalonate pathway, the key metabolic pathway that produces lipids used for prenylation, were also dysregulated in these fetal hearts. This sparked an idea in Edwards. If the enzymes in the mevalonate pathway are dysregulated during gestational diabetes, then that would disrupt normal protein prenylation in the fetal heart, impairing its development and function and ultimately leading to congenital heart defects.

"It's been known for a long time that there's a connection between altered maternal metabolism and fetal heart development, but how that happens and what's actually going wrong in heart development is not really clearly understood," said Edwards. With support from the SPLENDOR-NC Award, Edwards will determine if dysregulation of protein prenylation underlies congenital heart defects associated with gestational diabetes.

Traditionally, research on heart development has focused on gene expression. Edwards' research introduces a new framework to study cardiac development based on protein expression, post-translational modifications, and cellular environmental changes.

"We have very little understanding of how these lipid modifications are controlled and how they affect cardiac morphogenesis and heart function," said Edwards. "I am most excited that this research opens a whole new avenue of looking at heart development and congenital heart disease."

Lori O'Brien received an Innovative Science Accelerator Award

Lori O'Brien, PhD

Edited from the press release from the awarding institution | February 25, 2025

O'Brien will map the kidney nerve network from acute injury to chronic disease for the first time in a high-risk/high reward project.

Sympathetic and sensory neurons innervate the kidney, with sympathetic neurons playing key roles in regulating blood flow and fluid balance and sensory neurons sending critical information about physiological changes within the kidney to the central nervous system. Together, these neurons form an overall network and maintain physiological homeostasis within the kidney. Changes in the activity of these neurons can lead to kidney disease. However, scientists' knowledge of the role kidney nerves play in disease is primarily related to hypertension, highlighting a significant gap in the scientific understanding of other kidney-related disease states and an area that has been largely ignored.

Lori O'Brien, an assistant professor in the Department of Cell Biology and Physiology at the University of North Carolina at Chapel Hill, pioneered whole tissue imaging of the kidney to visualize neuronal kidney networks in 3D and understand kidney innervation under normal conditions. O'Brien predicts that neuronal network organization is significantly altered in kidney disease and parallels histological and functional changes.

She recently received an Innovative Science Accelerator Award from the Innovative Science Accelerator (ISAC) Program to map the spatiotemporal relationship of kidney innervation to disease state. The ISAC Award provides $100,000 in support over one year to small, innovative, high-risk/high reward projects with the potential to accelerate breakthrough discoveries in kidney, urologic, and hematologic research.

O'Brien plans to carefully map the kidney nerve network from acute kidney injury to chronic kidney disease to uncover for the first time how nerve organization and associations with a variety of kidney cell targets change over time. They will address whether an imbalance of sympathetic versus sensory innervation and thereby proper modulation of activity may drive disease progression. These data will provide the first whole tissue mapping of injury and disease progression with the ability to identify significant spatiotemporal changes to nephrons, immune cells, and vasculature that cannot be discerned from tissue sections.

"Our studies have the potential to shift our experimental and clinical approaches and consider how nerve-kidney associations impact disease," wrote O'Brien. "Modulating kidney nerves post-injury could slow or stop disease progression, or even promote repair, providing new therapeutic options, which are currently lacking."

Berfin Azizoglu received a Liver Scholar Research Award

Edited from the press release from the awarding institution | February 25, 2025

Understanding the influence of blood vessels on liver recovery may be the first step in developing better treatments for liver injury and solving the problem of why some drugs fail in the pharmaceutical market.

Berfin Azizoglu, PhD

The human liver naturally cleanses the body of most toxins, but this comes at a biological cost. Medication, dietary supplements, and even herbal remedies can be toxic and cause liver injury. Although the liver has mechanisms to recover, these mechanisms sometimes fail unpredictably, leading to one in three drug withdrawals from the pharmaceutical market and impeding the use of developed medicines. In such cases, a liver transplant is the only cure.

Berfin Azizoglu, an assistant research professor in the Department of Cell Biology and Physiology at the University of North Carolina at Chapel Hill aims to identify the factors that influence successful liver recovery to better predict outcomes and provide improved treatment options for patients who suffer from liver injury. Azizoglu recently received a Liver Scholar Research Award from the American Liver Foundation.

The award provides $225,000 over three years to support Azizoglu's unique research angle of focusing on the role and influence of liver blood vessels in liver injury and recovery. The precise role of blood vessels in liver recovery from injury is largely unknown. Liver blood vessels supply nutrients and oxygen to the liver but are also responsible for bringing in toxins. Injury response in blood vessel cells has the potential to be course shifting.

To uncover such potential, Azizoglu's team asks how blood vessels change in response to liver injury, and how those changes impact the course of recovery. By identifying the unexplored roles of blood vessels, Azizoglu's work aims to shed light on the potential ways vascular response can be manipulated to alleviate liver injury. The knowledge from studies supported by this award will benefit the advancement of treatments for patients with liver injury, with the long-term goal of minimizing acute liver failure and debilitating chronic complications.

Heather McCauley received a Junior Faculty Development Award

By Tiffany Garbutt, PhD | February 4, 2025

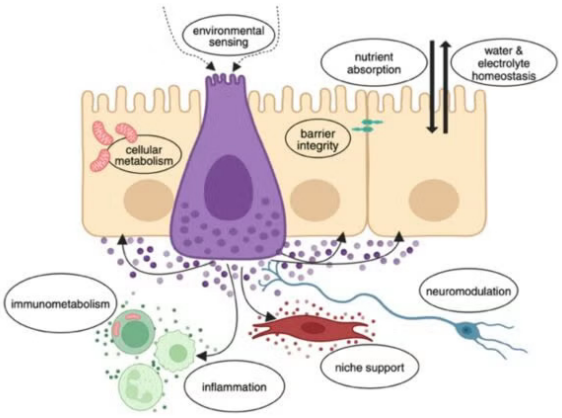
The UNC Provost's Office awarded Heather McCauley a Junior Faculty Development Award to create a new humanized mouse model that more closely replicates complex epithelial and immune cell dynamics in the gut.

Lining the intestines are rare hormone-producing cells called enteroendocrine cells that sense nutrients, gut microbes, and metabolites in the food we eat. These cells can even detect physical cues like how much our intestines stretch when we consume a meal. In response to these changes, enteroendocrine cells secrete a slew of hormonal peptides, metabolites, neurotransmitters, and cytokines throughout the body to prepare it for an influx of nutrients. But enteroendocrine cells may also play a central yet elusive role in gastrointestinal health.

Heather McCauley, PhD

Enteroendocrine cells are often dysregulated in many metabolic and gastrointestinal disorders but normalize with dietary changes. This leads many scientists to wonder if abnormalities in these cells are a contributing cause or consequence of gastrointestinal dysfunction. Heather McCauley, an assistant professor in the Department of Cell Biology and Physiology at the University of North Carolina at Chapel Hill recently received an R.J. Reynolds Junior Faculty Development Award from the Provost's Office to develop a powerful new humanized mouse model that more closely replicates intestinal physiology and function to help answer this question.

McCauley hypothesizes that enteroendocrine cells play a causative role in metabolic and gastrointestinal diseases by serving as the mechanistic links between diet, dysbiosis, and gut inflammation. "We anticipate that targeting enteroendocrine cells through dietary interventions or pharmacology may be an underappreciated avenue for prevention or treatment of all metabolic and inflammatory diseases with dietary risk," said McCauley.



Enteroendocrine cells (purple), nestled between epithelial cells in the gut, sense changes after a meal and serve as relay cells, sending key signals to underlying immune cells.

It is well known that enteroendocrine cells regulate their epithelial cell neighbors in the gut. McCauley proposes that enteroendocrine signaling may also regulate neurons, fibroblasts, and immune cells underlying the intestinal epithelium that are too far away to detect nutrient intake. If enteroendocrine signaling becomes dysregulated, immune cells in these areas may not receive the key messages needed to maintain gut health, resulting in gut inflammation.

The problem is that scientists have been unable to comprehensively replicate human immune cell dynamics in mouse models of gastrointestinal disease. Current research strategies are limited to in vitro modeling using human pluripotential stem cell-derived organoids (HIOs), which do not fully capture the complex multi-cell signaling landscape of in vivo gut physiology.

To solve this problem, McCauley's team plans to develop a new mouse model with a humanized immune system. They will then engraft HIOs with and without enteroendocrine cells into the mice. "This Development Award will enable our lab to develop this humanized mouse model and subsequent transplantation of HIOs to determine the impact of enteroendocrine cells on immune cell development, recruitment, and function in response to [gut] cues," said McCauley.

Awards & Honors

Faculty & Postdocs

Eva Anton, PhD

Brain & Behavior Research Foundation Distinguished Investigator Award

Jessica Cote, PhD

CBP Postdoc Trainee Award to attend the Analytical and Quantitative Light Microscopy Course at the Main Biological Laboratory

Mohanish Deshmukh, PhD

William R. Kenan Jr. Distinguished Professorship in recognition of outstanding contributions to the field and the UNC academic community

Grégory Scherrer, PharmD, PhD

4.6-million-dollar U19 grant from the NIH to develop novel non-addictive pain killers

Awards & Honors

Students

Jackson Patrick Bennett

Honorable Mention - NSF Graduate Research Fellowship Program

Proposal title: The relationship between intracellular pH, cell cycle progression, and genome stability

Mentor: Jean Cook, PhD

Kathleen Holmes

Honorable Mention - NSF Graduate Research Fellowship Program

Poposal title: Uncovering the complex morphological features and unique molecular properties of white matter astrocytes

Mentor: Katie Baldwin, PhD

Ashlyn Laidman

Honorable Mention - NSF Graduate Research Fellowship Program

Proposal title: Durotaxis-mediated collective cell migration during embryonic tissue patterning

Mentor: Mike Bressan, PhD

Andrew Scott Kennedy, Jr.

UNC 2025 Graduate Fellow Awards in Basic Science

Mentor: Jessica Thaxton, PhD

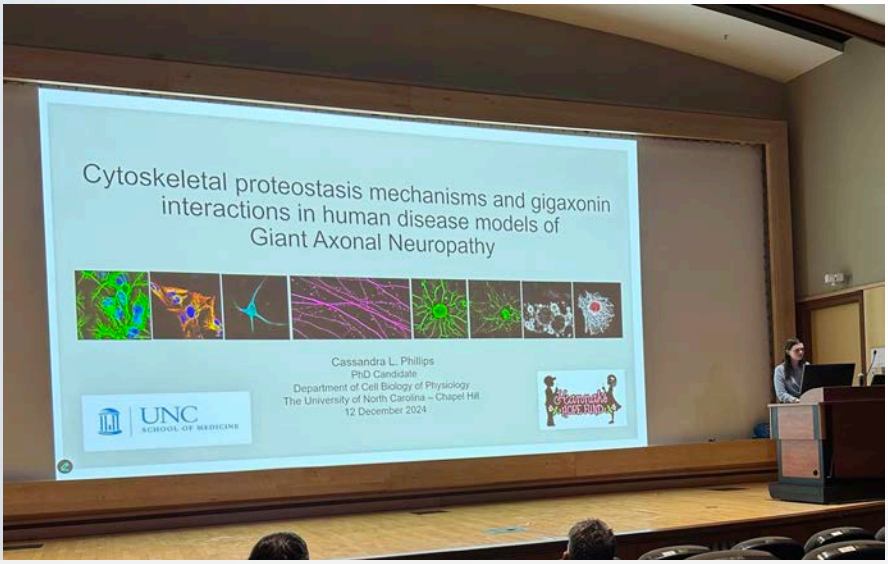
Cassandra Phillips defended her PhD on December 12, 2024

What was your research hypothesis or goal?

My dissertation work was focused on a rare pediatric neurodegenerative disease called Giant Axonal Neuropathy (GAN). Recent work from our lab and others has provided evidence to suggest that GAN biology is more nuanced and complex than initially suspected. Therefore, the goal of my work was to identify and investigate cellular and biochemical mechanisms that had not been previously examined in GAN and may contribute to the pathogenesis of the disease.

Can you summarize your major findings?

The primary objective of my dissertation was to delve deep into understudied mechanisms of GAN biology with the ultimate goal of contributing to more informed therapeutic targets for GAN. To that end, we demonstrated that stress-induced proteolysis mechanisms were altered in GAN patient cells, and that GAN patient lines with distinct genetic mutations exhibited varied expression and aggregation of intermediate filament proteins. We also showed that gigaxonin (the affected protein in GAN) constructs with individual motif deletions were able to function similar to wild type as E3 ubiquitin ligase adaptors, facilitating the proteasomal turnover of intermediate filaments. Further, we engaged in a comprehensive analysis of the gigaxonin interactome, detecting a significant number of associations with RNA-binding proteins, some of which are known to be critical players in neurodegeneration.



Cassandra Phillips, PhD gave a seminar presentation about her graduate in the CBP PhD Curriculum.

Cassandra Phillips, PhD posed after her defense with her PhD mentor, Dr. Natasha Snider.

What are you most proud of from your graduate career?

With support from my advisor (Dr. Natasha Snider), I was able to tailor my graduate training to fit my interests and career aspirations both inside and outside of the lab. I am proud of my involvement in both the Translational Medicine and ImPACT Scholars programs, enabling me to engage in invaluable clinical shadowing and industry internship experiences, as well as my work on uncovering GAN disease mechanisms to ultimately help identify and develop therapeutic candidates for GAN. I also sincerely enjoyed the opportunity to establish an iPSC differentiation pipeline for the lab, which I hope will help to facilitate and contribute to future projects on GAN.

What was your most memorable experience in CBP?

My most memorable experience during graduate school was a trip to Asheville during the fall that I went on with friends - it was truly amazing to see all the colorful leaves along the Blue Ridge Parkway and Graveyard Fields hiking trails. My most memorable experience as a graduate student was publishing my first paper as the first author - it was an important milestone to accomplish, and I was incredibly proud of all the hard work that went into the project, from both myself and the other authors.

What is your career goal and what are you doing next?

My future career goal is to transition into a biotechnology/industry position with a focus on advancing translational research for conditions with unmet therapeutic needs, particularly rare or orphan diseases. Currently, I am seeking a postdoctoral fellow position in the NYC area to continue my training and broaden my technical skills.

Priya Hibshman defended her PhD on December 17, 2024

What was your research hypothesis or goal?

The goal of my research was to determine how the MYC transcription factor orchestrates gene expression downstream of the KRAS-ERK MAPK signaling pathway to drive pancreatic cancer (PDAC) growth.

Priya Hibshman, PhD posed after her defense with her husband and daughter.

Can you summarize your major findings?

I found that despite the complex gene expression programs driven by ERK and MYC individually, including many other transcription factor targets of ERK, one third of ERK-dependent transcriptional alterations were also dependent on MYC. Genetic suppression of MYC caused a global shutdown of metabolic gene transcription, including glycolysis, amino acid metabolism, oxidative phosphorylation, nucleotide biosynthesis, and mitochondrial transport associated genes. In response, PDAC cells functionally upregulated autophagy to recycle cellular components as nutrient sources, possibly through TFEB-MYC antagonism. I also observed that, similar to ERK inhibition, compensatory signaling responses to MYC suppression-induced oncogenic stress may be mediated in part by Rho GTPase signaling. Lastly, I found that MYC regulates a diverse kinome comprised of protein kinases that contribute to PDAC growth and can be targeted therapeutically. Since MYC is currently undruggable, my findings provide a more comprehensive molecular portrait of MYC-dependent transcription while revealing potentially therapeutically exploitable mechanisms for treating pancreatic cancer.

Priya Hibshman, PhD posed after her defense with her PhD mentor, Dr. Channing Der.

What are you most proud of from your graduate career?

I am most proud of becoming a mom to my beautiful daughter while completing my PhD.

What was your most memorable experience in CBP?

I always enjoyed our annual CBP Research Days - particularly a few years ago at the NC Museum of Art :)

What is your career goal and what are you doing next?

I will soon be starting a postdoc position at UT-Southwestern in the lab of Carlos Arteaga. My eventual career goal is to work for a cancer-focused biotechnology/pharmaceutical company focused on oncology drug development R&D.

Stephen Serafin defended his PhD on February 28, 2025

What was your research hypothesis or goal?

The overarching goal of my research was to utilize proximity-dependent biotin identification (BioID) to identify regulators of adrenomedullin (AM) signaling within lymphatic endothelial cells (LECs).

Can you summarize your major findings?

I had two primary research projects in the Caron laboratory that fit under the auspices of my overarching research goal. The first project leveraged the power of BioID and primary LECs to illuminate the first AM-dependent VE-cadherin interactome. This interactome led to the identification of regulators of VE-cadherin trafficking and recycling as well as solidified a requisite role for VE-cadherin in reelin secretion. Of note, reelin was recently found to be a lymphangiocrine factor secreted from LECs that governs cardiomyocyte proliferation and is cardio-protective post-cardiac infarction, similar to AM.

The second project again leveraged BioID to identify the first receptor activity-modifying protein (RAMP) protein interactome. RAMPs are allosteric regulators of GPCRs and offer exciting opportunities for drug discovery through regulation of biased signaling. These studies identified MYO6, an actin-based molecular motor protein, as a proximal interactor of RAMP3-CLR receptor complexes. Using primary LECs, intracellular signaling assays, and a recently reported endogenous G-protein biosensor, we found that MYO6 regulates the spatiotemporal control of AM-CLR signaling which has broad functional lymphatic outcomes, including decreased junctional remodeling and proliferation as well as increased migration.

Stephen Serafin, PhD posed with his family after his defense.

Stephen Serafin, PhD posed with his PhD mentor, Dr. Kathleen Caron, and his family and friends after his defense.

What are you most proud of from your graduate career?

I am most proud of how productive I have been throughout my graduate career, which has culminated in nine publications, including three first author publications. Further, I expect to contribute to at least two additional publications this year, including another first-author research publication.

What was your most memorable experience in CBP?

My most memorable experience was the annual CBP Research Day, especially the one held at the North Carolina Museum of Natural Sciences. I enjoy the camaraderie of the event and the group celebration of all the incredible research and achievements accomplished by the department.

What is your career goal and what are you doing next?

I am transitioning to a postdoctoral fellow in the Caron Laboratory, where I will wrap up existing projects and launch new and exciting projects.

Welcome

Sumaya Addish

Mentor: Jimena Giudice, PhD

Jonathan Harrison

Mentor: Jimena Giudice, PhD

Annalee Schmidt

Mentor: Rob Dowen, PhD

Bailey de Jesus

Mentor: Bob Goldstein, PhD

Trevor Henley

Mentor: Mike Bressan, PhD

Kanesha Travis

Mentor: Berfin Azizoglu, PhD

Elliot Evans

Mentor: Katie Baldwin, PhD

Katherine Long

Mentor: Bob Goldstein, PhD

Xingren Wang

Mentor: Frank Conlon, PhD

Meredith Gillis

Mentor: Sarah Cohen, PhD

Violet Rowland

Mentor: Scott Parnell, PhD

Kavya Balasubramanian

Mentor: Shahzad Khan, PhD

Matheus Sadovsky

Mentor: Whitney Edwards, PhD

Taraneh Sadritabrizi

Mentor: Scott Parnell, PhD

New CBP PhD Curriculum Students!

Building community in cups of coffee

Interviewed by Tiffany Garbutt, PhD | May 1, 2025

Student services managers do more than simply manage the mountains of paperwork associated with graduate school. They create a community that supports graduate student success.

Student services managers serve as bridges between students, faculty, and academic administration, helping each group navigate complex institutional requirements and understand each other's perspectives and needs to ensure curriculum and student success. Dr. Zachary Williamson is the main administrator for the CBP PhD Curriculum and the new CBP biomedical master's program. He plays a vital role in supporting and tracking students' progress through different academic milestones. As a PhD trained scientist with a passion for mentorship, Williamson has also developed some key initiatives including weekly coffee hours to build a well-rounded academic community that fosters students mental, professional, and scientific growth.

What sparked that idea for coffee hours?
It came from my time at the University of Kentucky, where I ran professional development programs and had weekly coffee hours with students to help them navigate rotations and adjust to graduate school. It helped me catch any brewing problems early. The director of the postdoc office there also hosted weekly coffee hours as community building events. I was one of the regulars. It helped connect people across biology, chemistry, and physics— that were physically separated on campus—but all in a similar stage of life. When I started at UNC, I noticed that the students were craving a community. I thought coffee hours could be the first bricks we use to build that, and I also really love coffee.

What feedback have you heard from students about coffee hour?
There are about four or five students who I can depend on to be there and some have said that it's on their calendar. It's nice to know that the students look forward to it. I buy relatively cheap coffee and tea, so it's not the coffee, it's the community that drives them to be there. Other students know I'm going to be there and come because they need advice. They help each other as well. Someone might say I'm trying to run this experiment. I can't figure it out, and I'm just really frustrated. Other students may offer suggestions or just listen. Students troubleshoot or simply complain, because they're in a safe space with friends where everybody feels comfortable to air their grievances and help each other.

What professional development initiatives are you developing?
My goal is to not overlap with the Training Initiatives in Biomedical and Biological Sciences program at UNC but offer alternative professional development workshops that our students crave. The first one on organizational management skills this semester did well with 15 students attending. Upcoming workshops will focus on conflict resolution, having difficult conversations, and other soft skills for the job market. I plan to restart the series in the Fall.

In this live TV shot, Zachary Williamson, PhD appeared like an anchor on ESPN for a moment as he participated in the halftime show of a Kentucky Wildcats game.

Zachary Williamson, PhD posed with his wife, Caroline Smith, PhD, at the Puget Sound in Washington.

What do you wish students knew you could help with?
I'm a resource to make their lives easier. I can help them understand graduate school requirements and navigate professional relationships. I was my Principal Investigator's first PhD student, which was a unique challenge. I don't have all the answers, but I'm aware enough to know when I don't know the answer, and I have a wide network that I can point students in the right direction. Recently, I had a student who wanted to know more about being a medical science liaison and I connected them with on one of my friends in that role.

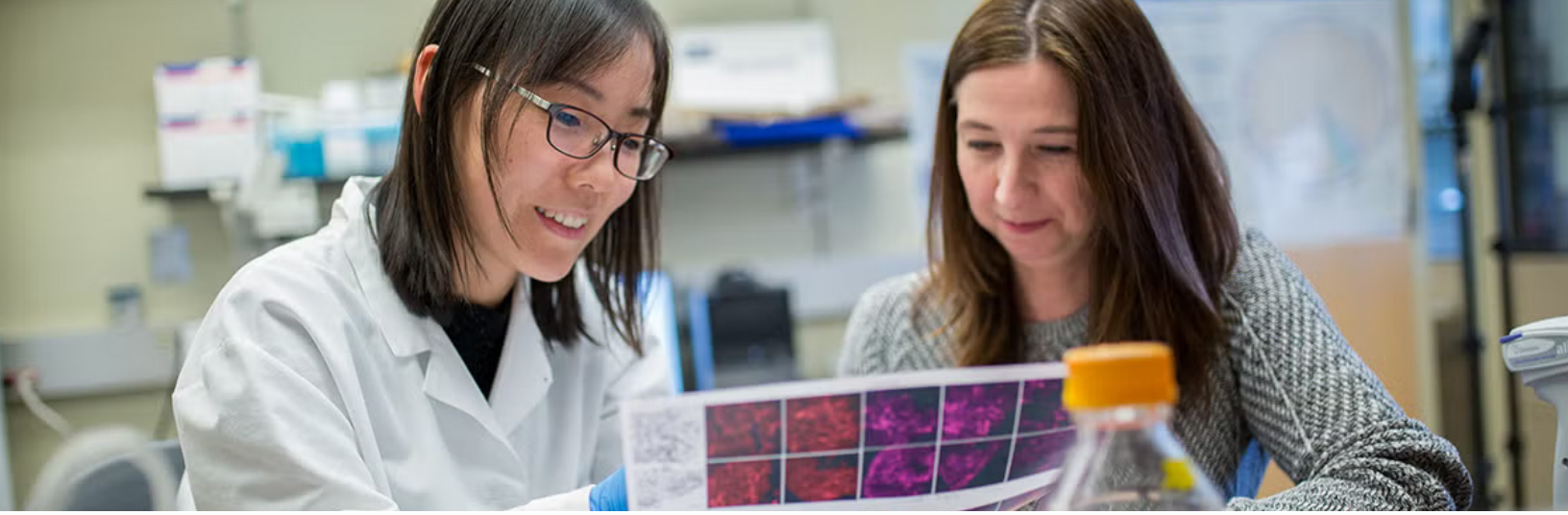
What did you do for your PhD?
I'm a structural biologist by training. My PhD is in biochemistry, and I used a lot of X-ray crystallography. I studied protein secretion in Mycobacterium tuberculosis. For my dissertation I studied a subset of proteins that are secreted through this system and how they're trafficked within the cell. I looked at protein structure and how individual residues interact with each other. The chemistry of living things and how living things use chemistry to accomplish tasks really interests me.

How has your PhD helped in your present role?
It's helps me empathize. I've gone through a lot of the same struggles or have close friends who have had similar experiences to our students. That's the primary thing.

What's a fun fact about you that others might be surprised by?
I've been on ESPN. I am a die-hard Kentucky Wildcats fan. I went to a basketball game and got picked to do the halftime entertainment. We played tic tac toe, where we had to make a layup before each turn. We ran from one corner of the court to the next and on one of those trips it timed perfectly that the camera cut to me behind the ESPN studio desk.

What has brought you the most joy or fulfillment from your role?
It's the students, and specifically seeing what coffee hour has become, having a group of students who regularly come and fit it into their schedule, and know that when they need a break, they have community they can come to.

This interview has been edited for length and clarity.



School of Medicine launches new 9-month biomedical master's degree

Appeared in UNC's The Well

By Tiffany Garbutt, PhD | April 10, 2025

The program, created through The Graduate School and the Department of Cell Biology and Physiology, features hands-on research experience.

Some students want to chase their scientific curiosity or bolster their experience before exploring career options. The new nine-month biomedical, non-thesis Master of Science in cell biology and physiology in the UNC School of Medicine will help them do that.

"This is the kind of program that I would have really benefited from as an undergraduate graduating from UNC with a biology degree and not certain of my career path," said Emily Moorefield, an associate professor in the medical school's cell biology and physiology department. Moorefield leads the committee of faculty and administrative personnel developing the new program.

Other master's degree programs in the School of Medicine are designed for students interested in entering specific health professions such as nursing or dentistry. Some biomedical sciences departments also offer opportunities to laboratory technicians to earn a master's degree on a case-by-case basis. The new MS program, launched in collaboration with The Graduate School, is the first at Carolina to offer a full generalized biomedical sciences curriculum to a cohort of incoming students.

The faculty and personnel who developed the new program have expertise in graduate and medical education, genetics, neuroscience, immunology, cardiovascular biology and other disciplines. (L-R back row) Kurt Gilliland, Jay Brenman, Zachary Williamson and Matthew Billard. Pictured and front: Emily Moorefield, Kristen Scherrer and Tiffany Garbutt.

"This program is for students who are questioning their career path, need a bit more time and information as to what career options are available, or didn't get the opportunity to do research as an undergrad," said Kristen Scherrer, an assistant professor in the cell biology and physiology department and director of graduate studies for the master's program.

The program provides students the unique opportunity to gain hands-on experience in translational research laboratories without requiring a final thesis project. "We have an interdisciplinary department with access to 90 different research labs," Scherrer said.

Students have options other than research, though, and will preview various biomedical career options in professional development classes.

"We want to inspire our students to chase their scientific curiosity and, after graduation, boost the economic and societal benefits of the biomedical research industry," said Kathleen Caron, department chair.

The biopharmaceutical industry in North Carolina grew by 43% in just three years and will require an estimated 8,000 new workers by the end of 2026. "Our goal is to train the next generation of scientists to meet the many needs of N.C.'s rapidly expanding biomedical industry," Caron said.

The program prepares students for medical and other health professional schools, doctoral programs and academic and industry careers. Faculty will support and advise students on how to achieve their unique career goals in the biomedical workforce.

The strength of the program is its educators. "We're real people who were once in their shoes trying to figure out what to do after undergrad. We care and genuinely want students to succeed," Moorefield said.

The program lasts just nine months, long enough for students to gain new skills and prepare for their future career goals without taking too much time. "Of course, they will get a great education," Scherrer said. "But the exciting piece is watching what they do next, and hopefully we help influence that."

An article about the new biomedical master's program also appeared in *The Daily Tar Heel.*

Brewing up research interest using beer cans

By Tiffany Garbutt, PhD | May 12, 2025

Doug Phanstiel's lab led the charge in developing in unique approach for sharing research facts with the public.

It tastes like blood orange and grapefruit. That's the flavor of the nonalcoholic seltzer at Steel String Brewery that represents Dr. Doug Phanstiel's lab from the Department of Cell Biology and Physiology at the University of North Carolina at Chapel Hill. Decorating the outside of the seltzer can are four carefully thought-out facts about the lab's research and a QR code to learn more.

Doug Phanstiel, PhD

"It was really hard to think of just four facts to put on a tiny little beer label when your dissertation is five years in the making," said JP Flores a bioinformatics and computational biology PhD student in the Phanstiel lab. Flores works part-time at Steel String Brewery in Carrboro, NC, and had an innovative idea for a new way to communicate science with the public. He would put research facts on the labels of beer cans.

"It's important for people to know what we do as scientists because science is funded by taxpayers, who may also be beer drinkers," said Flores. It's like eating a popsicle as a kid and reading the joke carved onto the stick at the end. It's a simple, yet effective way for consumers to learn something new where they are and doing what they already do for fun. The science needed to be clear, engaging, and understandable though.

"The idea is your audience is someone who's picking up beer and taking it back to rural North Carolina or to some other place in the state. We want to make sure that people who have these cans, can read them and have an idea of your research," said Flores. The lead brewer at Steel String Brewery agreed with the idea and soon the word began to spread. Up to 12 lab groups across different universities including UNC Chapel Hill, Duke University, and North Carolina State University joined Flores' efforts.

JP Flores

Flores received a civic engagement grant from Research!America to design and print custom-designed beer can labels with four research facts and a QR code for each lab. The grant also provided funding for a release party on April 5th, where researchers shared short presentations about their work with the public at the brewery. Leading up to the event, Flores hosted a science communication workshop to help each team distill their science into four effective research facts for their beer can labels.

The brewery also generated custom brews with fun names for each research team that broadly matched their work, such as Vector Nectar for a malaria-focused research team at NC State and Mycobrew for a bacteria-focused research team at Duke University. "The brewer was so excited because he uses CRISPR-engineered yeast to make beer. He said it would be so cool if you had a CRISPR lab with CRISPR facts on this beer made with CRSIPR-engineered yeast," said Flores. They did. The Phanstiel lab was the only team to receive both a custom beer and a nonalcoholic seltzer. "One is called Looopapalooza because we study chromatin loops and gene regulation. The other one is called Fold Skool Fizz and that's the nonalcoholic seltzer," said Flores. He personally designed the flavor profile for each.

On April 5th, Steel String Brewery hosted an event to celebrate the release of the custom science-themed beer cans. This picture is from a flyer advertising the event.

The release party was held on the evening of April 5th at Steel String Brewery and had a packed turnout. "Someone came to me after the event and said, 'I had no idea that this is what scientists do and it's wild because you guys are right down the street. I had no idea this was being done at UNC, and it makes me proud to be in the Carrboro/UNC community,'" reflected Flores. "That made me feel really good because the goal of the event was to show people what we do and to get them to appreciate science." His conversations with that individual and others that night surprisingly turned into questions about how the public can help scientists, particularly during this difficult funding time.

"With these projects in the future, what we're trying to do is connect with foundations, so that the proceeds can also go to foundations that benefit our research," said Flores. Steel String Brewery is still making and distributing the beers with custom-designed labels. They also plan to partner with other breweries for wider distribution across the state.

Flores said they are still accepting ideas from scientists in other labs who might interested in making custom beer can labels and they may have future events for representatives from those labs to present their work to the public at the brewery. He has also since received inquiries from research teams in other states and is working on assembling resources to help other scientists initiate similar outreach efforts in their state.

The Phanstiel lab group has two drinks, a pale ale called Loopapalooza and a non-alcoholic artisanal seltzer called Fold Skool Fizz. The images here show the custom labels with science-theme facts. There is also a zoomed in image of the QR code to learn more about their research.

Steel String Brewery's head brewer gave a presentation on the science of making beer.

During the release party on April 5th, representatives from participating labs gave public presentations about their research.

Teaching with purpose: Dr. Cocoa Dixon's path to educating future generations

By Tiffany Garbutt, PhD | April 7, 2025

Dr. Cocoa Dixon from Wake Technical Community College shared her inspiring journey into academia and her insights into teaching, leadership, and the evolving role of community colleges in shaping future professionals.

The Department of Cell Biology and Physiology's partnership with Wake Technical Community College continued with a presentation on April 7th from Cocoa T. Dixon, the associate department head of life sciences at Wake Technical Community College. Dixon shared with Cell Biology and Physiology faculty and students her personal journey into a teaching career and academic research administration and leadership.

Originally from Danville, VA where, as she joked, "a traffic jam is three cars" and after experiencing several tragedies at a young age, her story spoke of resilience, passion, and purpose. Although she initially thought she would enter the medical field, her long-standing interest in teaching guided her to her true calling. "Even as a kid, I played school with stuffed animals," said Dixon during her presentation.

She entered teaching through North Carolina's lateral entry program, earning her license via North Carolina State University's NC TEACH Residency program while teaching middle school science in Johnston and Wake counties. She later completed a Master of Science in Biology at North Carolina Central University, where she conducted prostate cancer research in partnership with researchers at Duke University. Dixon also holds a post-graduate certificate in Public Health Concepts from the University of North Carolina at Chapel Hill and a PhD in Educational Leadership, Policy, and Human Development from North Carolina State University. She is now a postdoctoral fellow at Old Dominion University, researching transfer pathways and workforce development.

She initially joined Wake Technical Community College in 2015 as an adjunct instructor and worked her way into a full-time teaching role and eventually into academic leadership. As a dedicated teacher, she carves time out to continue teaching courses. One of her proudest accomplishments as an academic leader is co-developing Wake Tech's Grow Our Own Teaching Fellowship, which creates a pipeline for faculty by offering qualified participants mentorship and funding for an advanced degree in science, technology, engineering, or mathematics (STEM), with the requirement that they teach a STEM course at Wake Tech after graduation.

During the Q&A, she offered practical advice for those considering community college teaching and clarified the requirements for an adjunct teaching role. She advised professors to experiment with different teaching modalities and active learning approaches to allow for more effective student engagement.

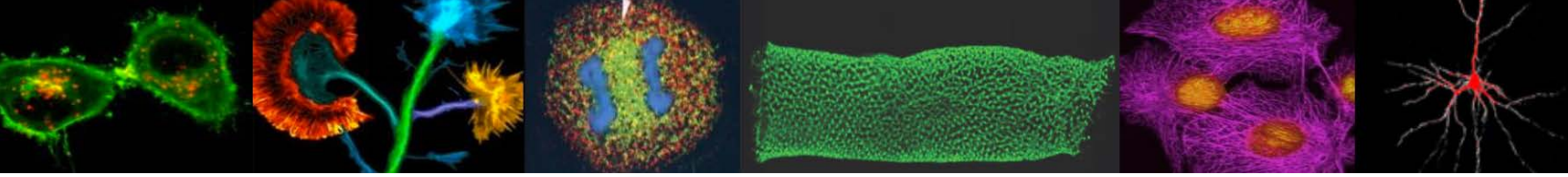
Dr. Cocoa Dixon and Dr. Natasha Snider are leaders in the new partnership between CBP and Wake Technical Community College.

Dr. Dixon shared her journey into teaching and academic leadership with CBP on April 7th.

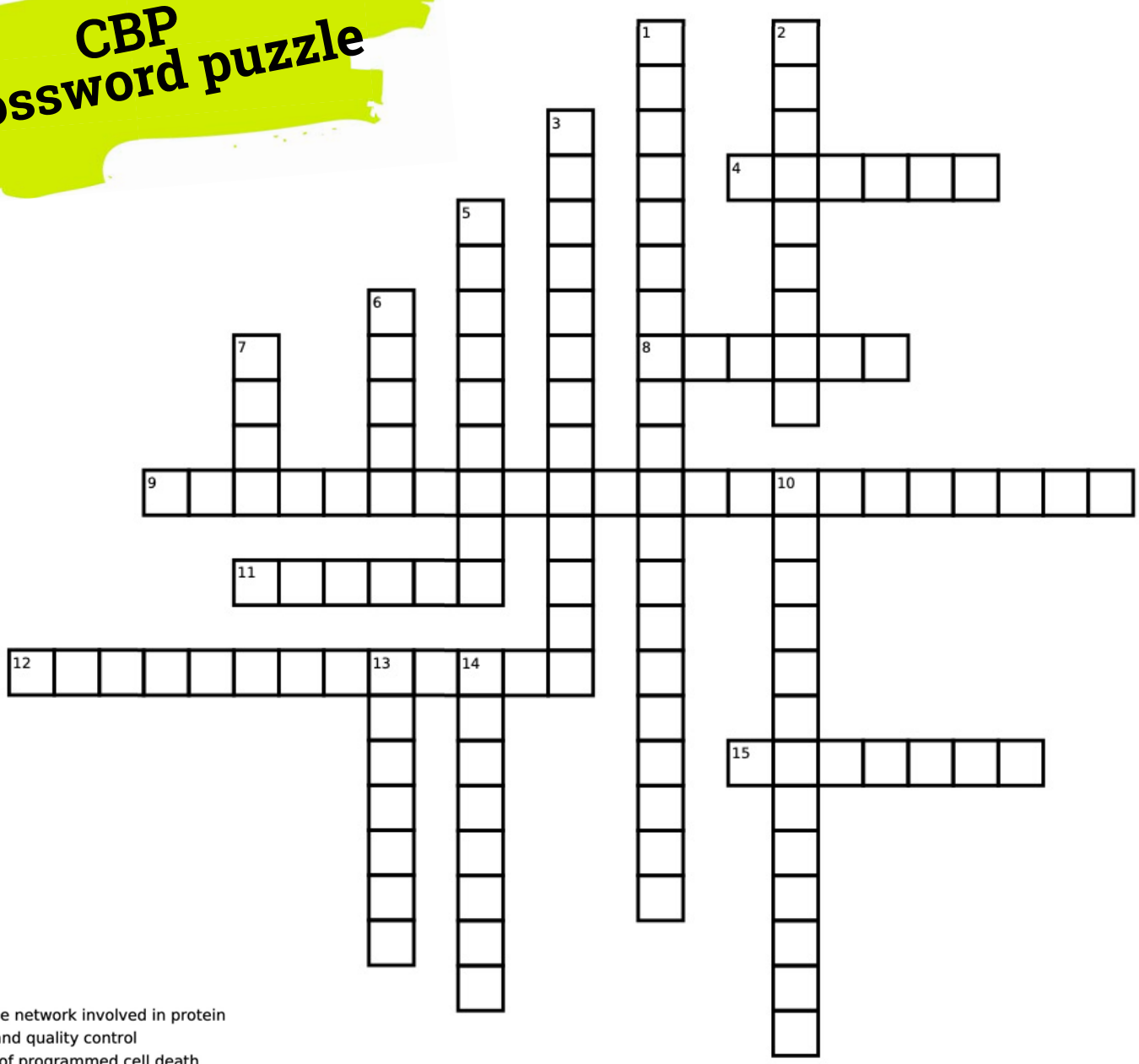
To those considering teaching at a community college, she advised preparing five key elements:

- Transcripts – with 18+ graduate credits in your discipline
- Teaching Experience – at least one year, even tutoring counts
- Teaching Philosophy – define your purpose
- Understand the Community College Mission – community colleges are for everyone
- Tailored Application Materials – align with the college's values

Her closing message: You don't need to have it all figured out. Keep moving forward—your path will reveal itself."



CBP Crossword puzzle



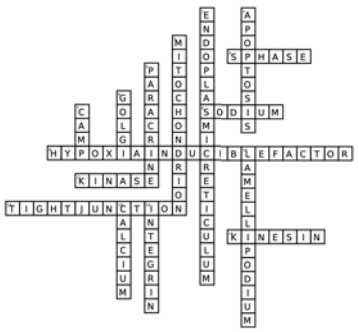
Down:

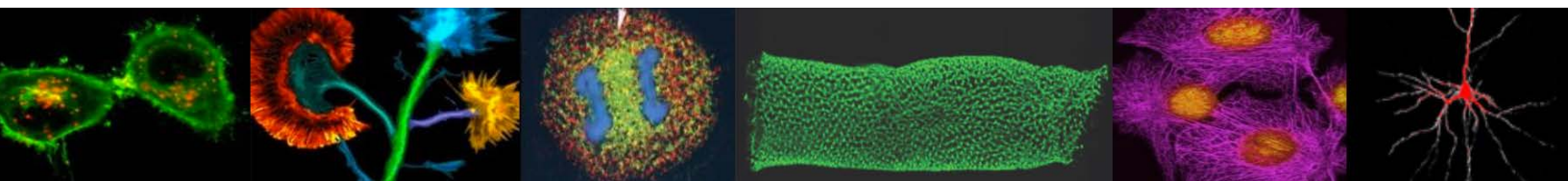
1. Organelle network involved in protein folding and quality control
2. Process of programmed cell death
3. Organelle responsible for ATP synthesis in eukaryotic cells
5. Type of cell signaling involving nearby but different cells
6. Structure responsible for packaging and modifying proteins before secretion
7. Short-lived intracellular messenger formed from ATP by adenylyl cyclase
10. Actin-based structure involved in cell motility
13. Ion whose intracellular release triggers muscle contraction
14. Transmembrane protein complex that

Across:

4. Cell cycle phase where DNA replication occurs
8. Gated ion channel essential for action potential propagation
9. Transcription factor regulated by hypoxic conditions
11. Enzyme that phosphorylates proteins in signal transduction
12. Cellular junction that prevents paracellular transport in epithelia
15. Motor protein that moves toward the plus end of microtubules

Answer key





Congratulations to the 2024 CBP departmental award winners!

December 16, 2024

Students, faculty, and staff from the Department of Cell Biology and Physiology gathered on December 11, 2024 to show appreciation for each other and celebrate another successful year of research and collaboration. The event included an array of food and desserts as well as Dr. Graham Diering's Grueling [and fun] Christmas Quiz, gingerbread houses, a photo booth, music, and camaraderie.

At the beginning of the event, Dr. Kathleen Caron, the CBP Chair, announced the annual departmental awards. These awards are given to faculty, trainees, and staff members nominated by others in the department in appreciation and recognition for their excellence throughout the year. The CBP Community is a success because of the countless contributions of so many, who generously apply their time and talents to fulfill the department's mission of leading the way in education, research, and service. Read the names of this year's award winners below.

2024 CBP Departmental Award Winners

Faculty Mentoring Award – Jimena Giudice, PhD
Recognition of outstanding mentoring to any of the following groups: junior faculty, postdocs, graduate students, and/or undergraduate students

Innovation in Teaching Award – Natasha Snider, PhD
Recognition of new and innovative teaching techniques proven to be useful in achieving the department's teaching mission

Publication of the Year Award – Grégory Scherrer, PharmD, PhD lab group for their article published in Natureand first authored by, Chong Chen, MD, PhD
Recognition of best scientific publication, showing a high degree of innovation, publicity, conceptual advancement, and prestige

Extra Mile for CBP Graduate Students – Kayla Mason (Conlon lab) & Sherry Hsu (Cohen lab)
Recognition of outstanding research endeavors, outstanding leadership abilities, and/or outstanding service to fellow students and curriculum

Extra Mile for CBP Postdocs and EHRA non-faculty – Sarah McLarnon, PhD (O'Brien lab) & Paul Risteff (Hooker Imaging Core)
Recognition of outstanding research endeavors, outstanding leadership abilities, and/or outstanding service to lab and department

Staff Excellence Award – Xi Yang (Snider lab) & Angela Quigley (CBP Admin Team)
Recognition of outstanding work performance and customer service skills; demonstrating dedication, cooperation, and a positive attitude

CBP Service Award – Stephanie Gupton, PhD
Recognition of exceptional service to the CBP department or curriculum, to the university, and/or to the surrounding community

The Chair's Award – Matthew Billard, PhD (CBP Director of Research)
Recognition of outstanding accomplishments and/or service to the cell biology and physiology department and community


CBP Holiday Party

We're here for you!

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If you would like to write an article for the CBP In the Loop newsletter, contact Tiffany Garbutt, PhD.

VISIT THE BELOW WEBSITE TO MAKE A GIFT

https://www.med.unc.edu/cellbiophysio/make-a-gift/funding-opportunities

OPPORTUNITIES TO GIVE

CELL BIOLOGY AND PHYSIOLOGY GIFT TRUST

This fund is a general fund to help support invited experts, informative speakers, and events that foster collaboration, professional development, and scientific growth.

MAREN TRUST FOR GRADUATE STUDENTS

The Thomas P. Maren Graduate Student Fund is intended to provide CBP Curriculum graduate students with opportunities to learn new skills and gain experience with emerging technologies.

CELL BIOLOGY AND PHYSIOLOGY POST-DOC FUND

This fund is intended to provide CBP postdoctoral trainees with funds to support travel expenses and registration fees for scientific conferences and specialized training opportunities or workshops.

STAY CONNECTED

Website

https://www.med.unc.edu/cellbiophysio

Social Media

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