

RESULTS & DISCUSSION

Editors-in-Chief: Laura Daniel, Ph.D., Lorena Infante Lara, and Kendra Oliver, Ph.D.

Faculty Advisor: Ashley E. Brady, Ph.D.

Welcome to the sixth issue of Results & Discussion, a newsletter sponsored by the Biomedical Research Education and Training (BRET) office, which is devoted to highlighting the research accomplishments and activities of our Ph.D. graduate students and postdoctoral fellows.

A highlight of our summer was hosting last June 1-2, our inaugural reunion event marking the 25th anniversary of the Interdisciplinary Graduate Program (IGP). We were thrilled to welcome nearly 200 alumni who attended events over the course of the two days with our faculty. The reunion was held in conjunction with the 2017 Annual Career Symposium, hosted by the BRET Office of Career Development, and featured 16 speakers who shared stories of their varied career paths since leaving Vanderbilt.

Alumni were invited to network with current students and postdocs, socialize at an evening alumni party over Southern-style appetizers, hear updates from the provost, deans, faculty and current students, tour campus, and attend departmental open houses. It was an exciting time, as old friendships were renewed and new connections were made.

This fall, we kicked off the new academic year by welcoming 78 new biomedical doctoral students to Vanderbilt University's School of Medicine. On September 1, the BRET office had the honor of hosting many of their families for our eighth annual Simple Beginnings Ceremony, in which each new student

receives a monogrammed white lab coat signifying the start of their formal scientific training. As in years past, we were overwhelmed by the generous contributions from Vanderbilt faculty, staff, alumni and parents of our students that make this event possible. Together, we look forward to watching these new students make new discoveries, mature as scientists, and contribute in myriad ways to the betterment of society.

Please let us know if you would like to learn about ways you can support us in our efforts to prepare the next generation of scientists. For more information, please visit our website or feel free to reach out to either of us directly. We would love to hear from you.



Roger Chalkley, D. Phil
Sr. Associate Dean for Biomedical
Research Education and Training
roger.g.chalkley@vanderbilt.edu



Kathleen L. Gould, Ph.D.
Associate Dean for Biomedical Sciences
kathy.gould@vanderbilt.edu

What's Inside

Trainee Research Highlights

by Teddy van Opstal, Page 2

by Heather McCartney, Page 3

by Sanjay Mishra, Page 4

by Leslie Sedgeman, Page 7

Alumni Profile:

Kayla (Boortz) Young, Ph.D.

by Kendra H. Oliver, Ph.D., Page 6

Faculty Spotlight: Vivian Gama, Ph.D.

by Lorena Infante Lara, Page 11

Upcoming Event Dates, Page 12

Recent Graduates, Page 12

Wrestling With Job Demands

by Laura Daniel, Ph.D., Page 5

BRET 2017 Reunion

by Jessica Mazerik, Ph.D., Page 8-9

by Paul Ruest, Ph.D., Page 10

Visit us at our website for more information:
<https://medschool.vanderbilt.edu/bret/>

Unusual Partners in Crime: Cross Talk in Bacterial Signaling

By Teddy van Opstal, Graduate Student

How do bacteria tolerate some of the toughest antibiotics we have in our arsenal? One mechanism bacteria are known to use to respond to a change in their environment, such as the presence of an antibiotic, is the activation of a two-component system (TCS). A TCS is comprised of a receptor that detects specific signals in the environment and its corresponding response regulator protein, which changes the transcription profile of bacteria. Because activation of a TCS can confer temporary tolerance to antibiotics, this system serves as a potential target for the development of antimicrobial therapies based on improving antibiotic effectiveness. Previous studies have shown that each TCS works independently of one another, not interacting with other TCS components. However, what if there was cross-talk between two different TCSs?

Vanderbilt graduates Kirsten Guckes, Ph.D. and Erin Breland, Ph.D., from the lab of Maria Hadjifrangiskou, Ph.D., recently published their findings in *Science Signaling* suggesting just this kind of cross-talk. Their work has focused on the cross-talk between the PmrAB and QseBC TCSs in uropathogenic (pathogen of the urinary tract) *E. coli* (UPEC) to promote tolerance to the antibiotic polymyxin B (PMB). Tolerance to PMB comes from a modification of the outer membrane lipopolysaccharide (LPS) by TCS signaling. They found that during ferric iron exposure, the TCS receptor (PmrB) is able to signal its own



Kirsten Guckes, Ph.D.
Former Graduate Student

response regulator (PmrA) and the QseBC TCS response regulator to generate UPEC tolerance to the antibiotic. These findings not only elaborate on a unique mechanism of TCS cross-talk, but provide a potential mechanism for bacteria to establish a quick, reversible antibiotic tolerance.

“This research may change the way we perceive

virulence and antibiotic resistance in bacteria and influence further research into antibiotic treatment and additional [effectiveness] testing”, says Breland. With further research into the TCS of different bacteria, it may be possible to choose the most effective antibiotics based on whether or not the bacteria harbor signaling



“This research may change the way we perceive virulence and antibiotic resistance in bacteria and influence further research into antibiotic treatment...”

Erin Breland, Ph.D.

Former Graduate Student

networks that trigger transient antibiotic tolerance when exposed to external nutrients such as iron. Currently, antibiotic resistance is tested by exposing different pathogenic bacterial strains to varying levels of a particular antibiotic. However, additional tests to determine whether certain environmental signals induce a temporary antibiotic tolerance through TCSs could play a huge role in understanding how to best utilize our limited stockpile of antibiotics.

This research was a joint effort by Guckes and Breland who both began the Interdisciplinary Graduate Program at Vanderbilt in 2012. Now, 5 years later, both graduates successfully defended their theses within 5 months of each other, but continued on to different career paths. Guckes has taken a post-doctoral research position at Pennsylvania State University in the Miyashiro lab, which works on quorum sensing (bacterial communication) utilizing the bioluminescent squid bacteria, *Vibrio fischeri*. Breland has started a Master's degree in Public Administration at American University with a concentration in management consulting. She chose to attend a university in Washington D.C. to have the best opportunity to transition into a career in government with a focus in biodefense organizations such as DTRA, BARDA, or Battelle. While in D.C., Breland also hopes to continue her work in scientific outreach and programming she explored as an intern at the Adventure Science Center in Nashville.



Erin Breland, Ph.D.
Former Graduate Student

Unraveling Autism Spectrum Disorder One Protein at a Time

By Heather McCartney, Graduate Student

For years, Autism Spectrum Disorder (ASD) has confounded researchers as a highly complicated disease involving both genetic and environmental factors. Patients exhibit an array of developmental and social interaction issues and a lack of understanding of the fundamental pathology of the disease has left clinicians with minimal treatment options and researchers with many questions.

Upon arriving at Vanderbilt University in 2014, Jason Stephenson, Ph.D., a post-doctoral researcher in the laboratory of Roger Colbran, Ph.D., Professor and Interim Chair of Molecular Physiology and Biophysics, was eager to jump into a new project that aimed to tackle one piece of the ASD puzzle. Two and half years later, he and his colleagues published a study in the *Journal of Neuroscience* providing the first causative evidence of the link between a specific mutation in the calcium/calmodulin-dependent protein kinase II (CaMKII α) protein and a neuropsychiatric disorder.

Prior to joining the Colbran Lab at Vanderbilt, Stephenson was a graduate student at Emory University in Atlanta, Georgia. There, he studied the expansive signaling network of a particular class of G protein-coupled receptors (GPCRs) that are misregulated in patients with a type of brain cancer called glioblastoma. Stephenson has been passionate about uncovering the molecular mechanisms of diseases since his experience working as an undergraduate researcher at Illinois State University on a protein in the Heme biosynthetic pathway. "As soon as I realized I could mutate a single amino acid in the enzyme and study how that changed the kinetics, I was hooked on science," Stephenson added.

The specific CaMKII α variant the Colbran lab identified was found in a young patient diagnosed with ASD. Although the CaMKII protein has been studied for years as a crucial component in various pathways important in learning and memory, there was no evidence for its role in ASD. CaMKII has been shown to be an abundant serine/threonine kinase that phosphorylates N-methyl-D-aspartate (NMDA) and alpha-amino-3-hydroxy-5-methyl-4-isoxazolepropionic acid (AMPA)



"I believe every piece of this puzzle will be important in terms of understanding the complexities of ASD and also in uncovering novel therapeutic strategies."

Jason Stephenson, Ph.D.
Former Post-doctoral Researcher

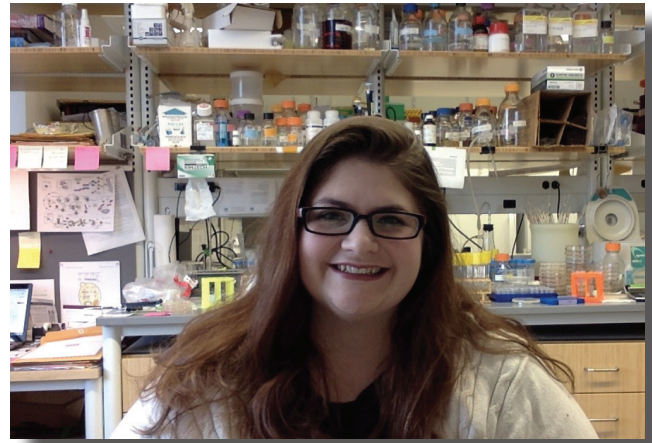
receptors. This phosphorylation is critical for sufficient excitatory synaptic transmission in neurons. Excitatory synaptic transmission, or neurotransmission, is the method by which neurons communicate with one another transmitting messages across portions of the brain. CaMKII also plays an important role in calcium regulation and interacts with a vast repertoire of CaMKII-associated proteins (CaMKAPs) that are crucial for downstream pathways impacting learning and memory. Stephenson wanted to understand how this particular mutation in CaMKII contributed to neuronal dysfunction at the biochemical, cellular, and behavioral levels.

When asked about the impact of the study on the ASD community, Stephenson said "I believe every piece of this puzzle will be important in terms of understanding the complexities of ASD and also in uncovering novel therapeutic strategies." In addition to supporting innovative research to develop new therapies, Stephenson is also very passionate about public awareness of ASD. "Scientists need to better

communicate their results to the public in an unbiased way. This is especially important with Autism, in terms of how the public views individuals on the spectrum and their behaviors." After completing his post-doctoral studies in May of this year, Stephenson made the transition to working as a Medical Science Liaison for Bayer Pharmaceuticals. At Bayer, Stephenson is responsible for disseminating fair and balanced scientific information, research, and education related to the treatment of multiple sclerosis. His passion for understanding the molecular basis of disease, along with an interest in drug discovery, made a role bridging the gap between scientists and medical personnel highly attractive to him. In addition to the strong mentorship and scientific training Stephenson received during his time at Vanderbilt, he considers his training in communication and presentation skills to be equally important in his new position. The most challenging part about his new job is the frequent travel; however, Stephenson still finds time to take his dog to the dog park, play his favorite instruments, and explore live music in Nashville.

One Notch Up on a Cure for Alzheimer's

By Sanjay Mishra, Graduate Student



Catherine Deatherage, Ph.D.
Recent Graduate Student

As a recent graduate from the Department of Biochemistry, Catherine Deatherage, Ph.D., has made her mark on the world by furthering the efforts to find a cure for Alzheimer's disease, though she hadn't originally envisioned that her life would happen that way.

Life as a scientist was not an enigma to Deatherage, as she grew up learning about biochemistry from her scientist father, who moved her family from Arizona to the suburbs of Maryland when he joined the National Institutes of Health. "It didn't necessarily make me interested in science," she recalled, "but it really helped to show what life was like for a scientist". Deatherage first thought she would become a medical doctor, but during her undergraduate studies at the University of South Dakota she became very interested in medical and clinical research.

Deatherage was on a National Cancer Institute fellowship when she began to look for graduate schools, and, not surprisingly, Vanderbilt was highly recommended by her then-mentor. She applied and was invited to interview, and the Interdisciplinary Graduate Program (IGP) captivated her. She remembered, "I didn't know what science I wanted to do, so the ability to have the [IGP] umbrella program was a really big draw."

Studying chemistry as an undergraduate, she didn't know much biology at the time. Deatherage recalled, "My biology experience was geared more towards conservation and ecology than microbiology. So, IGP gave me a lot of the stuff that I had never been exposed to!" Ultimately, she joined the lab of Charles Sanders, Ph.D., Associate Dean for Research, Professor of Biochemistry and Medicine, and the Aileen M. Lange & Annie Mary Lyle Chair in Cardiovascular Research, where she began studying the structure and the biochemistry of a signaling protein called Notch.

Notch regulates an evolutionarily conserved signaling pathway that is essential for normal cell development and maintenance, and is absolutely critical for the birth and death of nerve cells. Notch is "an incredibly, incredibly important protein," Deatherage highlighted. In order to become active, Notch needs to be snipped by an enzyme called gamma-secretase. This enzyme is a sort of double-edged biological sword because it also cuts other "integral membrane" proteins – proteins that weave through the membrane that surrounds cells – such as the amyloid-beta precursor protein (APP). Cutting APP releases a chemically "sticky" protein fragment called amyloid-beta, which gradually builds up as

neuron-killing plaques involved in Alzheimer's disease.

Lowering amyloid-beta levels by blocking the processing of APP is commonly thought to be the best strategy for preventing or treating Alzheimer's. So far, however, clinical trials have failed to deliver on this promise because gamma-secretase-blocking drugs, which are supposed to inhibit APP snipping, do not discriminate between Notch and APP processing. Blocking Notch signaling causes serious side effects like cognitive impairment and cancer. "If we could understand the structural and biochemical differences between these two proteins, then people who develop drugs for Alzheimer's disease would actually be able to make [them] specific to amyloid precursor protein and spare Notch," said Deatherage.

During her graduate career, Deatherage was able to show that notch and APP differ significantly in their membrane-spanning regions (published in *Science Advances*) and her research also revealed that unlike APP, Notch does not bind cholesterol. This finding should help with the development of drugs that specifically recognize the cholesterol-bound form of APP to treat Alzheimer's disease without the side effects associated with also targeting Notch.

Like any great work, Deatherage's publication also involved other researchers, including scientists from her lab and from the Center for Structural Biology. It was the collegiality and the spirit of collaboration that drove her the most. She remembers that during her Ph.D. work, she could go to any lab and sit and talk about what she was doing, something that, "Really shaped me as a scientist."

Looking back at her Vanderbilt experience she replied almost poetically, "You don't know what you have... until it's gone." While in Nashville, she used to visit local parks, take long walks on the greenways, and explore the city. Deatherage also writes novels and short fiction in her spare time (when she has any!), so she enjoys finding a coffee shop and writing a story. Most of the time, however, she is in her new lab at Yale University; a post-doc busy writing the next story in the search to find the cure for diseases like Alzheimer's.

Rethinking What It Means to Seek Help: Helping Trainees Wrestle with the Demands of the Job

By Laura Daniel, Ph.D.

Associate Director, BEST Consortium, BRET Office

David Sacks, Ph.D., HSP
david.n.sacks@vanderbilt.edu

Postdoctoral fellows and graduate students face substantial stress that is unique to their training. Fortunately, there is a psychologist on hand at the Vanderbilt Psychological & Counseling Center (PCC) whose role is to help them deal with these stresses.

To help spread the word about the support and services he offers, I spoke with David Sacks, Ph.D., HSP, Assistant Professor of Clinical Psychiatry, asking him about his background, his role, and the ideas he has for programs he would like to implement at Vanderbilt.

Early in his career, Sacks spent his spare time competing as an amateur wrestler and youth wrestling coach. He also volunteered as a counselor for troubled children and studied family relationships in youth sports. This spurred his interest in psychology. Following this



David Sacks, Ph.D., HSP, leading the ASPIRE Module, *EQ + IQ = Career Success* at the Spring 2017 session. Participants expanded their skills in conflict resolution, emotional intelligence, workplace communication, and building professional relationships.

experience, Sacks went on to receive his Ph.D. in Educational Psychology from Florida State University in 2003. After a three-year stint at Vanderbilt, he began working with medical students at Ross University in Dominica, teaching them how to perform under pressure. His background as a wrestler, coach, and youth sports counselor influenced his interest in sports psychology.

Sacks returned to Vanderbilt in 2013, but it was last year that he began a new position as Psychologist for Graduate, Professional Students and Postdoctoral Fellows; his focus is helping this population overcome the daily challenges they face, such as dealing with mistakes, impostor syndrome, fear of failure versus fear of success, and conflict resolution.

While these one-on-one consultation services are his primary focus, he also has begun to offer group services as well. For example, he collaborates with Kate Stuart, Asst. Director, BRET Office of Career Development, to offer an ASPIRE Module focused on helping students increase their emotional intelligence (known as EQ) to promote career-related success, called *EQ+IQ=Career Success*. This fall, he also rolled out a new program in conjunction with the Graduate School called *The Psychology of Peak Performance* which aims to explore common issues impacting graduate students and postdocs in a group setting. There will be four themes covered monthly and the location will rotate on campus. To learn more visit <https://www.vumc.org/pcc/workshops>.

Another goal is to offer his services to large labs where the whole group has ongoing meetings with him, just as a sports team would. He hopes this will facilitate enhanced performance in the workplace by dealing with topics such getting along with lab mates or overcoming toxic environments. He believes that these sessions will produce labs that have the best practices, and that this in turn will promote those behaviors in others. "I'd like to be somebody that PIs/advisors call... 'I'm having trouble with this student, what advice do you have for helping them?'" said Sacks.

One of Sacks' highest priorities is "helping people rethink what it means to seek help". If an athlete thinks they need to get stronger, they go to a physical trainer. "I'd like to say the same sort of principle holds true for mental health," Sacks said. "It's not sufficient to have average-level coping abilities. Postdocs and graduate students need higher-than-average levels of coping abilities and resilience."

Sacks is familiar with high-pressure positions and knows that pursuing extremely high standards can put one's mental health at risk. "I don't think the answer is to lower your standards. I think the challenge is to find a better way to relate to the gaps between the standards you set for yourself and where you are now."

Alumni Profile

By Kendra Oliver, Ph.D., Postdoctoral Fellow

Kayla (Boortz) Young, Ph.D., is living the dream in Seattle, Washington. Previously a **Commercialization Program Manager at Life Science Washington**, she ran a mentoring program for early-stage life science companies (medical devices, pharma, health IT, global health) that entailed identifying promising start-ups and pairing them with experienced mentors. She also oversaw educational bootcamp events for entrepreneurs. In this role, she was also instrumental in creating resources for entrepreneurs such as guidebooks, templates, worksheets, and pitch deck templates to help them in their journey to launch a new business. Young also sits on multiple angel investment screening committees where she evaluates the science for non-science-based investors. Recently, Young became the **Director of Operations at Phase Genomics**. We spent some time with Young exploring her experience in the life sciences entrepreneurial ecosystem.



How soon into your Ph.D. did you know you were going to work outside of academia?

I knew from the beginning that I would not go a traditional academic route. I started taking every class that BRET offered through the ASPIRE program as soon as they were offered. I knew probably between years 2-3 that I wanted to be at the interface of business and science. I love the entrepreneurial world and the idea of taking a product/tech/drug/device etc. from the bench to the market and all the steps in between.

Time in meetings/day
3-4 Hrs



What are your least favorite parts?

Meetings. We have so many meetings that don't always seem to have a much of a purpose.

What do you do in your free time?

My husband and I own a bar! So I help out with running that business. I work out and read. Spend time with my friends and my dog. Go out to eat! Seattle has a ton of amazing restaurants.



What was your research focus at Vanderbilt?

How stress affects insulin secretion, specifically by modulating the activity/expression of an enzyme that is exclusively found in islet beta cells.

Who was your mentor?

Richard O'Brien, Ph.D.



Time in front of a computer/day



What is the best part of your job?

The screening committee is my favorite part of the job. It's essentially like shark tank, and I get to be the resident expert in the biotech field. The investors are super smart and I have learned a ton in the ways of financing and fundraising for companies, what a good pitch looks like and what investors primarily evaluate to determine the quality of the deal.



Once you leave work, how many hours on a given week do you dedicate to work?

Not too many. Our environment is such that we can leave work at work and there very rarely are things so pressing that they must be done out of the office. However, I go to a LOT of events that are kind of part of my job, so if those count, I probably spend an additional 8-10 hours a week at events.

8-10 Hrs

Evolution of a Scientist

By Leslie Sedgeman, Graduate Student

Jennifer Wisecaver, Ph.D., knew from a young age that she was going to be a scientist. She grew up looking at plant cells, pond water, and skin through an old microscope her grandfather had. As a college student, she wanted to be a paleontologist until realizing she liked doing research in front of a computer better than outside in the field.

Wisecaver earned her Ph.D. in Ecology and Evolutionary Biology at the University of Arizona in Tucson. At the time, a key scientific advancement was taking place around her. She says “while I was in graduate school the cost of sequencing a million letters of DNA went from \$1,000 to ten cents, and I wanted to stay on top of this next generation sequencing wave by developing bioinformatics pipelines that could handle all the data.”

For her postdoctoral fellowship, Wisecaver came to Vanderbilt to work in the lab of Antonis Rokas, Ph.D., Professor of Biological Sciences and Biomedical Informatics. The lab had vast experience in fungal comparative genomics and she wanted to apply the principles of genomics learned in fungi to understand gene networks that control secondary metabolites in plants.

Unlike animals, plants are stationary, and therefore at the mercy of their surroundings. To adapt to changing environments, including pathogen exposure and stresses in temperature, salinity, and water availability, plants have developed the ability to produce a vast and diverse array of molecules called specialized metabolites (SMs). These SMs that plants use as chemical defenses against other organisms also pose enormous potential to uncover new medicines

and natural products for human use. However, hindering this effort is a lack of understanding of which genes participate in SM production.

Wisecaver and Rokas saw an opportunity to apply what they knew about fungal genetics to identify plant SM gene clusters. In fungal genomes, the many genes that produce SMs are physically clustered together. However, this did not hold true in plants. Instead, Wisecaver found that in response to various conditions, different genes are co-expressed and these genes often work together to produce a secondary metabolite.

This work overcomes a key challenge to studying plant genetics - that plant genes evolve constantly to adapt to environmental pressures - and provides a new framework and analysis tool for the field. Wisecaver says of her work, “We can’t leverage the tools we have developed for microbial genetics, so we need to invent new methods and tools that work [in plants]. My hope is that the co-expression network analysis developed in this paper is one such tool.”

These results were published last spring in the journal *The Plant Cell*. The article details the extensive analysis of gene expression data from eight different plant species in response to over 1,000 different conditions each.

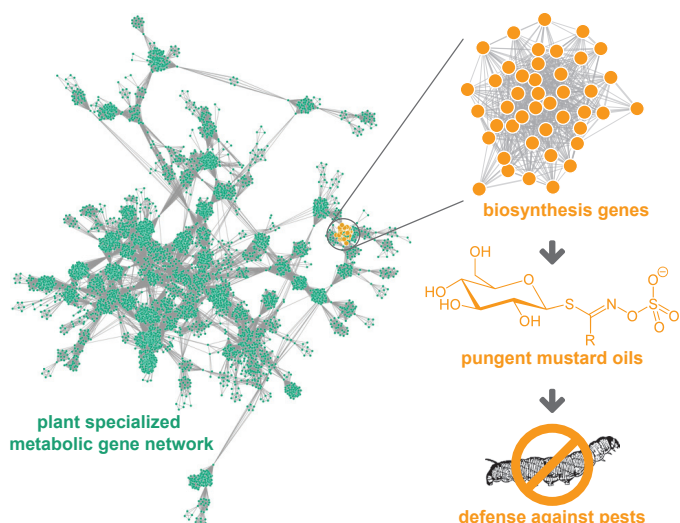
There’s still much more to learn by harnessing the power of bioinformatic approaches to analyze metabolic pathways. Wisecaver, now Assistant Professor at Purdue University, recently started her lab in the Department of Biochemistry where she is expanding the work she did as a postdoctoral fellow at Vanderbilt to other species.

Beyond the pharmaceutical, agricultural, and biotechnology applications of specialized metabolites, she says “I think this question is important because it helps us understand how these pathways have evolved and diversified, and what sorts of genomic, ecological, and evolutionary constraints are at work on species’ metabolism.”



“I wanted to stay on top of this next generation sequencing wave by developing bioinformatics pipelines that could handle all the data.”

Jennifer Wisecaver, Ph.D.
Former Post-doctoral Researcher



Gene Network Visualization; green dots indicate genes with the lines representing those that are likely related. Genes shown in orange make glucosinolates.

My Weekend at a Glance... Returning for the BRET 2017 Reunion

By Jessica Mazerik, Ph.D.

Department of Cell and Developmental Biology 2013, IGP Class of 2007

For almost a year, the chalkboard wall in my kitchen counted down to one trip that stood out amidst the many work trips and conferences filling the space – the first ever Vanderbilt BRET Reunion, an opportunity to network with Vanderbilt Alumni, inspire young graduate students, check in with my former lab, and visit old friends. When the invitation showed up in my email inbox almost a year in advance, I replied without hesitation; it set off an immediate flurry of planning amongst my former IGP friend circle and Tyska labmates. There was no question – we'd all be there, taking advantage of the opportunity to see each other, check in with the latest happenings at a school we cherished so much, and

explore the ever-changing city many of us hadn't visited in years.

Around 200 faculty and alumni turned out for the reunion. It was all we anticipated it would be, starting Thursday with the Career Symposium Networking Huddle event – a great opportunity to tell current graduate students and postdoctoral fellows about our career paths and how we navigated from training roles to our current positions. I was impressed with how many students, including those in early stages of their Ph.D. training, had thought about diverse opportunities beyond the bench. Their ideas included science communication, consulting, entrepreneurship, program management, and industry. Vanderbilt's BRET Office of Career Development and their ASPIRE Program have clearly inspired the future



The Cell and Developmental Biology Department reception. Jessica Mazerik, Ph.D., far left, reconnected with friends and former colleagues (left to right), Rebecca Latimer, Ph.D., (Cell and Dev Bio '12), Sean Schaffer, Sr. Research Specialist in the Cell Imaging Shared Resource, and Ashley Brady, Ph.D. (Pharmacology '03)



Networking Huddles were organized for the concluding event of the 2017 Annual Career Symposium and included alumni, such as Elizabeth Conrad, Ph.D., (Mol Phys and Biophys '15) who met and talked to current trainees about their career paths.

generation of trainees to embrace broad and creative career ideas, and I felt lucky to help contribute to that effort during the Huddles.

Immediately following, there was a reception that offered us a chance to talk to trainees, catch up with professors, and meet other alumni who had their own career stories to tell. New connections were made, business cards were exchanged, and I was pleasantly surprised at the unexpected chance to broaden my own career perspectives. Another alumnus who also works in the vision research field and I chatted about the challenges of studying human stem cell-derived retinas in dishes and possible ideas to overcome the limitations. While other alumni attended the Alumni Party on campus that evening, my Thursday evening wrapped up with my family, old IGP friends, and other Nashville friends and their families, at Pinewood Social, a hip new Nashville spot located downtown along the river.



A large crowd gathered at the BRET 2017 Annual Career Symposium Reception, which also welcomed returning Alumni to kick off the two-day reunion event. The career symposium drew 400 current trainees, and approximately 200 faculty and alumni turned out for the reunion event.

Friday was dedicated to reunion events, so I kicked off the day with a quick run around the iconic three mile “Vandy loop” that borders the edges of campus, enjoying the view of buildings and parts of campus I recognized from the past alongside new buildings and restaurants that were unfamiliar to me. Back on campus, I snuck in some time to chat with former committee members before the 9am reunion “Morning of Discovery” presentations. The talks highlighted the latest and greatest happenings at Vanderbilt, specifically with the IGP and CBP programs. I was excited to hear that since I left in early 2013, the ASPIRE program had been created to help trainees navigate paths to new careers after completing their training. The Provost, several deans, and current faculty gave updates on the state of graduate education at Vanderbilt interspersed with impressive Three Minute Thesis (3MT)-style research talks by current BRET trainees. After the morning session, facility tours were offered – friends who attended gave rave reviews. I took the lunch hour to check in on my husband and baby before attending the Cell and Developmental Biology reunion event with my former lab mates and current Tyska lab members. Between the reunion events and dinner with the Tyska lab,

I felt the need to reminisce in the Tyska microscope room, an area where I spent so many hours as a graduate student performing cell imaging assays on the TIRF scope. Spending time catching up with the lab was a perfect way to wrap up the reunion events. And, with the reunion planned for Thursday and Friday only, we were left with a whole weekend to enjoy and explore Nashville. I’m hoping for another BRET reunion in 5 years!



Friends reconnected at the 2017 BRET Reunion

My Reunion Highlights:

Thursday June 1, 2017

- Breakfast at Sweet 16th in the old neighborhood
- Career Symposium Networking Huddles
- Networking Reception
- Pinewood Social (with IGPers and others!)

**Other reunion participants attended the Alumni Party*

Friday, June 2, 2017

- Run around the “Vandy loop”
- “Morning of Discovery” talks
- Cell and Developmental Biology Dept Reception
- Tyska Lab reunion & dinner



Top: Former colleagues, Omari Bandele (Biochemistry '08), left, and Kristen Herring (Biochemistry '08), right, who returned for the BRET Reunion, visited along with Herring's husband over drinks and appetizers at the 2017 Career Symposium networking reception. *Bottom:* Current trainees got advice in a Networking Huddle at the 2017 Career Symposium.

Reconnecting at the Alumni Party



Members of the entering IGP class of 1996 shared stories and caught up with one another over food and drinks at the Alumni Party on Thursday evening, May 1, 2017, at the Student Life Center. *Left to right:* Kim Petrie, Ph.D., Michelle Becker, Ph.D., Ray Price, Ph.D., Jenny Busch, Ph.D., Tara Gower, Ph.D., **Paul Ruest, Ph.D.**, Melanie Ohi, Ph.D., Ashley Brady, Ph.D., and Wallace Sharif, Ph.D.

By Paul Ruest, Ph.D.

Department of Cell and Developmental Biology 2001, IGP Class of 1996

Attending the Alumni Party was one of the highlights of our reunion weekend celebrating the 25th Anniversary of the IGP. The BRET Office sponsored a great event, providing a relaxed environment that made me feel a part of the rapidly changing Vanderbilt community once again.

With a jazz quartet and a buffet of fried green tomato sliders and chicken and waffles, it was a comfortable way to reconnect with former classmates and faculty and recall old stories and memories. Reminiscing about our time in Nashville, both the great memories and the rough ones, made me realize how lucky we all were to have had the opportunities Vanderbilt gave to us. I found myself laughing with old friends like no time had passed, though it was rewarding to discuss what everyone is doing now and where their careers have taken them.

It was gratifying to see that the excellent education provided by the biomedical graduate programs at Vanderbilt has led my former classmates to successful careers in diverse fields, including government, biotechnology, consulting, and academia, just to name a few. Another wonderful part of the evening was sharing drinks with some of my mentors and professors, talking together as colleagues, and to see their pride in what we have all accomplished. Everyone has such busy lives with work and families – many of us with young children (I

brought five-year old twins for the weekend!) – so it was especially nice to take a moment away from our day-to-day to share some quality time together again. Personally, I hope that there will be another reunion in the not-too-distant future, and I will make every attempt to attend!



Alumni Party attendees mingle with one another. They came from as far away as Cambridge, MA; Seattle, WA; and the Max Planck Institute in Cologne, Germany. *Left to right:* Dario Gutierrez, Ph.D., Rachel Lippert, Ph.D., Amanda Vanhoose, Ph.D., Elizabeth (Meredith) Rhea, Ph.D., and Nora Sanchez, Ph.D.

Faculty Spotlight: Vivian Gama, Ph.D.

By Lorena Infante Lara, Graduate Student

Vivian Gama, Ph.D., Assistant Professor, has been a member of the Cell and Developmental Biology faculty at Vanderbilt for two years. The path that led her here, however, started quite far away. Vivian is a native of Bogotá, Colombia, and came to the U.S. to do her graduate studies at Case Western Reserve University and postdoctoral training at UNC Chapel Hill. I sat down with her to learn about what went through her head before making her decision to pursue a research career in the US, the job search process, and advice for trainees like myself.

What made you decide to stay in the U.S. versus going back to Colombia?

It was very clear from the beginning that the opportunities here were not available in Colombia. Not only was there not a lot of support for science at the time, but there was also a lot of bureaucracy. If you wanted to work in an area of medicine that directly and immediately affected the health of the population, there were excellent labs in Colombia, but the career I was really passionate about (cell death, cell biology, and stem cell biology) is focused on basic, fundamental scientific questions that did not receive significant financial support.

Can you give me a brief overview of your research?

We are interested in understanding the molecular mechanisms governing stem cell fate. In particular, we are looking at the role of the BCL2 protein family (my training was in cell death/apoptosis) in regulating pluripotency through novel roles in the mitochondria. We are also investigating how stem cells regulate the cell cycle and its molecular connection with mitochondria. I am lucky to have a wonderful group of graduate students who, with the support of highly motivated undergraduate students, are taking these ideas and uncovering new modes of regulation, which we believe will have implications for stem cell biology and neural development.

Why did you decide to come to Vanderbilt?

It was the overall quality of Vanderbilt and the quality of the students. Vanderbilt stood out for the support they provided to new faculty - especially the Department

of Cell and Developmental Biology. I thought that was outstanding. We also have a 4-year old son, and we wanted a family-friendly place where he could grow up with a small-town feeling and strong family values.

How did you navigate the negotiation process?

I come from a different background. In Colombia, you grow up thinking: be appreciative of what you are offered. There is some fear that if you ask for too much, then the offer won't be on the table anymore, and it's not really like that. When you are getting ready to interview for a job, I strongly recommend to get training and advice from mentors and senior faculty advisors. Look for connections between the work that you have done and the scientists at the prospective place of employment. How can you work together? Scientists want to work with colleagues who will enrich their environment. Do not just promote yourself; remember, science is a collaborative effort.



Vivian Gama, Ph.D.
Assistant Professor
Cell and Developmental Biology

What advice do you have for graduate students?

I believe that while graduate school is a time for learning and mastering a field, it is also a time for figuring out what you're going to do the rest of your professional life. It is crucial to work hard for your goals and also to enjoy the process. Foster relationships with your fellow students, mentors, and collaborators. These relationships not only will be fundamental in your future, but also will invigorate you and motivate you to continue improving and reaching higher goals.

What do you want to be when you grow up?

I imagine my life in a few years from now and it doesn't look that much different from what I'm doing now, so I'm hoping professionally to continue mentoring students. In my home country, people are just happy to get a job. You don't have the luxury of questioning, "What do I love, what am I passionate about?" I would like to make sure that students realize that being able to pursue goals and dreams is a privilege that few people in the world have. It is important to use this gift responsibly, always thinking of ways to give back to the country and to society.

Sep 1, 2017

Simple Beginnings

Dec 15, 2017

End of Semester Celebration

Jan 8, 2018

First Day of Spring Semester

Mar 12, 2018

ASPIRE to Connect

Mar 23, 2018

3 Minute Thesis Competition

Apr 12, 2018

Vanderbilt Postdoc Annual Symposium

Apr 20, 2018

First Year Lab Selection

Jun 1, 2018

BRET Annual Career Symposium

Congratulations to Our Recent Graduates!

April 2017-October 2017

Joe Alvin	Carissa Jones	Lisa Poole
Laura Armstrong	Christine Jones	Jillian Rhoads
Nathaniel Bloodworth	Lillian Juttukonda	Erica Shannon
Erin Breland	Daniel Kashima	Tim Shaver
Reid Bolus	Abigail Lind	Dingding Shen
Mallori Burse	Michael Litt	Chrystal Starbird
Adrian Cadar	Lisa Lojek	Matthew Stier
Bethany Carboneau	Alyssa Lokits	Kristen Syring
Shilpy Dixit	Holli Loomans	Nicholas Vierra
Franklin Echevarria	Nathan McDonald	Jennifer Watchmaker
Benjamin Fensterheim	Matthew McKenna	Alaina Willet
Michaela Fooksa	Amanda Johnson	Michelle Williams
Matthew Harlow	Patrick Mulcrone	Cara Wogsland
Brittany Hollister	Barbara O'Brien	Isaac Zike

RESULTS & DISCUSSION

BRET Newsletter
Issue 6, Fall 2017

340 Light Hall
Nashville, TN 37232-0301