MPB GSA NEWSLETTER

Spring 2013

The purpose of this newsletter is to serve as a resource for MPB students as we strive to get to know our department better.

Molecular Physiology & Biophysics
Graduate Student Association

Welcome New MPB Students!

Bethany Carboneau
Peter Kropp
Roxana Loperena
Christian Marks
Allison Norlander
Justin Paulson
Leslie Roteta

Clare Spielman
Kristen Syring
Nicholas Vierra
Carrie Wiese
Merla Huber
Andrew Gordon

PICTURED ABOVE: Student Lunch with Earl Sutherland Lecture Speaker, Dr. Michael S. Brown

Brown received an M.D. degree in 1966 from the University of Pennsylvania. He was an intern and resident at the Massachusetts General Hospital, and a post doctoral fellow with Earl Stadtman at the National Institutes of Health. He is currently Paul J. Thomas Professor of Molecular Genetics and Director of the Jonsson Center for Molecular Genetics at the University of Texas Southwestern Medical School in Dallas. Dr. Brown and his colleague, Dr. Joseph L. Goldstein, discovered the low density lipoprotein (LDL) receptor, which controls cholesterol in blood and in cells. They showed that mutations in this receptor cause Familial Hypercholesterolemia, a disorder that leads to premature heart attacks. Their work laid the groundwork for drugs called statins that block cholesterol synthesis, increase LDL receptors, lower blood cholesterol and prevent heart attacks. Statins are taken daily by more than 20 million people worldwide. Brown and Goldstein shared many awards for this work, including the U.S. National Medal of Science and the Nobel Prize for Medicine or Physiology. (Brown Bio-sketch) «»

UPCOMING EVENTS

May 15th : Student Invited Seminar Speaker Antonio Convit, M.D. of NYU. Professor and Director of Brain Obesity and Diabetes Lab (BodyLab).

May 31st : MPB Field Day 2:00-4:00pm on the campus athletic field (location to be determined)

Alumni Spotlight: Rachel Reinert

By Erica J Pruett

Although she has graduated from MPB, you may still see Rachel Reinert around the medical campus as she finishes her MSTP medical training. In this feature we catch up with one of our accomplished alumni to reflect on graduate training, career building, and work-life balance.

My thesis work was completed in Al Powers' lab. In my main project, we discovered that vascular endothelial growth factor A (VEGF) is critical for the development of islet innervation, although VEGF is not a direct signal to islet nerves. Instead, islet-derived VEGF is required for the formation of the intraislet vasculature during embryogenesis, and postnatally, nerve fibers travel along these capillaries in a VEGF-independent manner to reach islet cells. I defended in September 2012, then returned to medical school to finish my final two years in the Medical Scientist Training Program.

What would you like to see accomplished (professional or personal) in your five year forecast?

Since I am pursuing a medical residency, my next three to four years will be focused on finishing medical training, likely in internal medicine. My goal is to stay connected with biomedical research so I can smoothly transition into a postdoctoral fellowship project at the end of that time.

What is a typical day like for you now?

I am now a third-year medical student, so most of my days are spent in the hospital learning details of patient care. The days start much earlier and range from rounding with a team of doctors to assisting in surgery. I even got to see a coronary artery bypass operation this week, which was fascinating! We also have required lectures almost daily, and many lecturers try to incorporate the latest findings from biomedical research into their talks.

Aside from defending and graduating, what was a special memorable moment in MPB?

I'll always have fond memories of spending time with other MPB graduate students and post-docs at the annual retreats. After bringing home several ticks from a group hike one year, several of us decided to spend free time at the following retreats cooling off with margaritas at a nearby Mexican restaurant (discussing our latest research findings, of course).

How did your mentor most influence you and what was the best advice you received while in pursuit of your PhD (from your mentor or someone else)?

My mentor, Al Powers, constantly encouraged me to step outside of my comfort zone, so that my introverted personality did not hinder my development as a scientist. The most important thing he taught me was to seize opportunities: submit abstracts, apply for grants, volunteer for presentations, and attend meetings. Hard work will be rewarded, and maybe when you least expect it!

What advice would you give to graduate students facing the omnipresent "so what are going to do with a PhD?" inquiry?

The opportunities for careers following training in biomedical research are very broad, and the Vanderbilt BRET office provides excellent workshops for learning about different careers. I would recommend interviewing someone with a job that you'd like to have, and finding out what he or she did to get there.

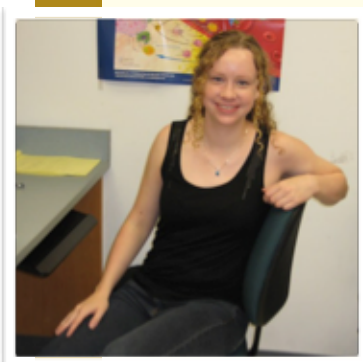
How has your free-time changed since graduating? Do you enjoy any hobbies?

Any free time I have is spent with my husband, Drake, and our two-year-old son, Liam. We love to visit the zoo any chance that we get. It's amazing to see how much little ones learn every day! «»

2013 Procession of Graduates

By Erica J Pruett

Congratulations to MPB's 2013 graduates! Our freshest Ph.D. degree recipients are pursuing a variety of post doctorate positions across the US. We wish them well as we catch up one last time to reflect on their experiences at Vanderbilt.



Emily Anderson, a graduate from the Hasty lab, is doing a post-doc at Indiana University School of Medicine in Indianapolis. Emily had many memorable moments during her doctoral training, but recounts, "I think that what I will remember the most about graduate school is the engaging discussions with fellow grad students, post-docs, and PIs about science, life, politics, etc. Through out the years, these discussions have challenged me to think outside of the box, allowed me to interpret data in novel ways, and have led to the development of many great friendships." In order to get excel in graduate school she passes along a few survival tactics: 1) Choose a PI, lab environment, and research that you love. You will spend a lot of time in the lab and will want to be happy while you are there. 2) Embrace your interests outside of the lab—they keep you sane! 3) If you can, have multiple projects. That way, if one doesn't pan out, you are not back at square one. Amongst the restaurants she'll miss, Emily doesn't hesitate to point graduate students down 21st Ave. to Sportsman's Grill advocating, "This restaurant has been our Friday afternoon hang out. There is nothing like a cold beer and some great friends after a long week!"

In describing Emily, her mentor Dr. Alyssa Hasty uses the word "purposeful" saying, "I am incredibly proud of Emily and everything she has accomplished during the past 4 years. I am excited to see what she will discover scientifically throughout her career. I have no doubt she will do amazing things!" Imparting a final word to her student Alyssa advises, "Continue to work hard on the scientific questions that intrigue you – the things that stimulate your curiosity. But at the same time, find balance in your life so that you can enjoy precious moments with family and friends."

Dr. Anne Kenworthy uses the word "engaged" to illustrate her graduated protégé Charlie. "Charlie's fundamental interest in understanding the properties of membranes led him to make a number of important discoveries that challenge current paradigms in our field. This is a tremendous accomplishment and speaks to his strong commitment to his research," expounds Dr. Kenworthy. The parting advice she sends Charlie is, "It's always tough to try to balance responsibilities at home with your science. Your future career choices depend heavily on your success as a graduate student and post-doc, so I would encourage you to make sure your research remains a priority as much as possible." Although Dr. Kenworthy didn't recall anything she might roast Charlie for, she discloses, "Charlie was a great person to work with and will be sorely missed."

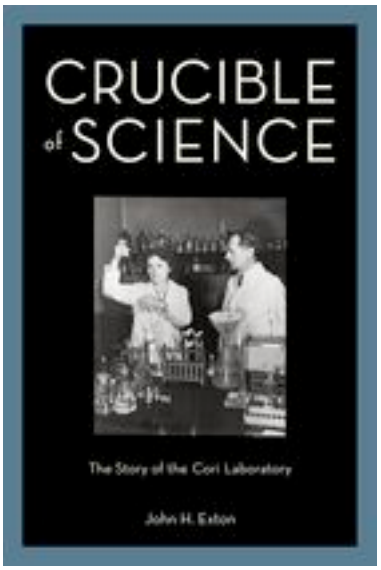
Charlie Day relocated from Vanderbilt to his post doctorate position in April. He is training in the lab of Dr. Mark McNiven at the Mayo Clinic. At Mayo, Charlie is examining the organization and dynamics of microtubules with a primary focus on understanding the factors regulating the positioning and length of primary cilia. He recalls an important graduate school moment that drastically changed the direction of his research and his career while listening to Dr. Ludger Johannes speak at a FASEB conference in 2009. "Up to that point I had been studying the diffusion of cholera toxin at the plasma membrane prior to endocytosis and had come to somewhat of a dead end in the project. At FASEB, Dr. Johannes proposed that tubular invaginations of the plasma membrane represented a novel class of endocytic vesicles for the uptake of bacterial toxins, including cholera toxin. In the course of my work I had seen these same structures (and not put a whole lot of thought into what they could be), but I knew enough to know that there were major inconsistencies between Dr. Johannes model and my observations. It was at this moment I began a major and very fruitful departure from studying cholera toxin diffusion to cholera toxin endocytosis." Charlie reminds grad students of a useful lesson, "One thing I learned is to never take anything for granted when learning a new experimental procedure." He went on to say this includes assuming a new protocol is flawless and overlooking unwritten technical nuances. "If I had taken the time upfront to directly test the protocol or find an experienced person to show me the technique I could have saved myself lots of time in the long run." The biggest life change experienced during the course of graduate school for Charlie and his wife was the birth of their two children. Charlie credits his spouse, "While it has been a tremendous blessing it was at times difficult to balance a family and graduate school. And I have to thank my wife and Anne for working with me so that I could balance work and family." Although Charlie no longer lives in Nashville, he will miss and recommends the "excellent Thai food" at the Smiling Elephant on 8th Ave. S to readers.

Dr. Marylyn Ritchie and Dr. Will Bush co-mentored Emily Holzinger. Will summarizes Emily as "scrappy" and discloses that, "Throughout graduate school, Emily developed a relationship with her academic sister, Carrie Moore. While Emily is the academic and age of life *older* sister, Emily assumed the role of *younger* sister. Emily often did whatever Carrie asked, included 'posing like a squirrel' at conferences all throughout the world." When asked what final word he'd like to convey to Emily, Will stated, "Enjoy!"

Jennifer Rojas will be moving to the west coast for her postdoctoral fellowship at UW Medicine South Lake Union, Seattle, WA. She recalls special memorable moments when she received confirmation of her Ph.D. and as her committee members congratulated her after she obtained her Ph.D. For new Nashvillians and graduate students entering the department, Jennifer exhorts to stay active by signing up to do activities with Outdoor Recreation at Vanderbilt and to stay persistent and passionate about your research.

Jennifer's mentor Dr. Kevin Niswender describes Jennifer as "tenacious" in her personality in and out of the lab. Dr. Niswender shares, "Jennifer's intensity belies her sense of humor--all you have to do is 'rattle her chain' a little and it will show up. Her petite nature also belies the fact that she drives an enormous monster pickup (it will make you chuckle to see her in it) and is an avid outdoorswoman." As a last offering of sage guidance Dr. Niswender wishes to engraft these words, "Continue to nurture your scientific curiosity and to think 'outside the box.' Also, laugh a lot."

Congratulations to Jeff Bonner on a successful defense! Jeff was a graduate student in Dr. David Wasserman's Laboratory. «»



CRUCIBLE OF SCIENCE BOOK SIGNING EVENT

@University Club, May 15, 5:30 – 7:00 PM

You may remember in our interview with Dr. John Exton, that he was in the process of writing a book. Please join us for a very special event – a book signing – in honor of his publication of "Crucible of Science" out just two weeks ago with Oxford University Press.

"Crucible of Science" is the story of a unique laboratory at Washington University in St. Louis, and of Carl and Gerty Cori, the biochemists who established it. Carl and Gerty met and married at medical school in Prague in the 1920s. After graduation, they immigrated to the U.S. to escape deteriorating conditions in Europe. Carl soon received an offer from Washington University to become Pharmacology Chair, and the couple settled in St. Louis. Not only did both Coris go on to win the Nobel Prize, the laboratory they established at the University has since produced some of the most outstanding scientists the U.S. has ever seen.

Six laboratory scientists also won Nobel Prizes; few, if any, laboratories can claim such an impressive record. The Coris themselves were instrumental in establishing the then new science of Biochemistry in the U.S. They applied chemical approaches to elucidating the transformations of compounds such as glucose in animal tissues and defined the enzyme catalysts that carried out those transformations. Both scientists were extremely rigorous in designing their experiments and interpreting the results, a habit that ensured their findings were above question.

This book examines the careers of both Coris and the other eminent scientists who trained in their laboratory. It notes the Coris' acceptance of women, Jews, and scientists from all over the world, unique during this time period. It analyzes those reasons why the laboratory was so successful in attracting the best trainees and producing premier scientists. Intended for scientists, science historians, and anyone interested in the history of science, "Crucible of Science" is a unique presentation of remarkable careers and personalities, examined within the context of the Coris' laboratory. «»

Faculty Spotlight:
Dave Piston, Ph.D.

Research Interests:

Dr. Piston's lab develops and uses high-resolution optical microscopy techniques for real-time analysis of biochemical processes in living cells and organisms.

The main focus of the lab is on glucose-induced insulin secretion from the Beta cells of the pancreas.

By Amy Elliot

If you wanted to be a "scientist" when you grew up, the necessary educational path and job requirements were clear (get a PhD in science); in fact, so was the job. However, when preparing for the stuff that comes after graduate school now, it seems a lot more complicated. An ever-increasing percentage of students and post-docs are seeking careers outside of academia and those who are successful on an academic career path have a wide variety of skills to bring to the table.

Fortunately, at Vanderbilt there are resources available to assist in gaining cross-disciplinary skills. The BRET Office works hard to provide information about alternative careers, including a seminar series on exactly that topic and a Symposium this August on Professional Skills for Industry Careers. If you have an entrepreneurial spirit, there is the Life Science Tennessee Graduate Alliance and the TechVenture Challenge in the spring, which provides a learning experience for commercializing technologies. There are also a number of ways to build teaching skills, including being a F.O.C.U.S. leader for IGP or mentoring rotating students.

While the possibilities outside of academia may seem more varied, many faculty members have a broad range of career activities. One such accomplished MPB Professor is Dave Piston, whose lab studies stimulus-secretion coupling and is interested in how intercellular communication and paracrine signaling regulate pancreatic insulin and glucagon secretion in Diabetes. Beyond his professorial duties, Dave has been awarded patents, sits on the Faculty Advisory Committee for the Center for Technology Transfer and Commercialization (CTTC), is a past President of the Microscopy Society of America, and wears numerous other hats with organizations both in and out of Vanderbilt. Take a look at the following interview for his perspectives on early careers.

Q. Why did you choose academia over a chance to work in industry?

A. I always intended to stay in academics for a while since I felt one could always move from academics to industry later in a career, but moving from industry back into academics was not really possible. I had done an internship at IBM and had opportunities to work there in the research division, which was a lot of fun and paid pretty well too. When I was in grad school, the stipends were lower than they are now (mine was the equivalent of $1,200/month in today's dollars) so being able to put money in the bank was important since I actually wanted to eat something other than Raman noodles during grad school. Industry also teaches you how to take projects across the finish line in a set amount of time, and I think that is an important skill in academics, where it is too tempting to keep working until something is "perfect".

Q. How do you manage relationships in the CTTC, companies, and academic realms?

A. Working with companies these days is getting harder because of all the new conflict of interest rules, but the important thing is to make sure you are going in the same direction. If we want a new instrument and the company wants to develop something in that area, then it is a great match and worth the extra paperwork. You always have to keep in mind that most new products fail, though, so you need to be doing the work for the right reasons (i.e., to get a new tool that is useful for your research, not to make money). Often, the company goals and the academic goals are not well aligned, and this just turns out to be a pain for everyone involved. I think it is important to recognize that early, and just say "thanks, but no thanks". I've been lucky enough to have some successful patents, but I can attest that a lot of the reason for their long term success has been the work that we needed to do with companies (in a true collaboration) to make the idea truly useful in many applications. I often tell people that while I have made some decent money this way, it always ends up being about $1/hour. The reason I have done it is for the fun of the work and the impact that its success has had on the other projects in the lab.

Q. Do you think in the current economic/job environment it is feasible for grad students and post-docs to be similarly accomplished in many things?

A. Actually, I would say it is not only feasible but even more important in the current environment. The more experiences you have and the broader your knowledge base, the more attractive you will be for jobs, and the better chance you will have of being successful in jobs that you have. It is not a matter of setting out to learn a lot of things, but instead of being open to new experiences when they present themselves to you. I learned what I needed to know by rolling up my sleeves and getting directly involved with things, and that is still a good way to go. Of course, I caution young people that you must not neglect your central research interests, you need real depth to go along with any breadth of knowledge you require. "A mile wide and an inch deep" is not a compliment in the research environment.

Q. What would you recommend for getting "the right" experiences for an interdisciplinary career?

A. Don't be afraid to try new things. I always tell people to post-doc in something as far away from their thesis work as possible. Moving outside your comfort zone is the best way to learn new things, immersion in a foreign language is a good example, but this works for everything.

Q. What do you think is most important for new grad students and early postdocs to think about when preparing for future careers?

A.

1. Be curious, the best results are those that are unexpected and you need to follow them.
2. Do not let others tell you how to think or what to expect.
3. If you can see yourself doing something other than research, then a pure research career might not be for you. That doesn't mean you shouldn't finish your Ph.D. or even do a competitive post-doc, the training you will get will be invaluable even if you don't end up doing pure research for your career. Anything you do will benefit from your rigorous research training, and the world desperately needs thoughtful, skeptical leaders in every field. «»

Edifying and Engaging Podcasts

MPB students stay sharp and inquisitive in a variety of forms. Many students supplement monotony with podcast subscriptions. Here are a few favorite (and free!) storytelling and science podcasts available on iTunes. *Warning--topics tend to infiltrate social gatherings.

We want to hear from you!

MPBGSA@vanderbilt.edu

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