GBS newsletter

Table of Contents

Greetings GBS students!

The 2017-2018 academic year has arrived. I'd like to take a moment to welcome all of our new Biomedical Sciences (BIMS), Biomedical Engineering (BME), Biology, and Chemistry graduate students to UVA! We are excited to welcome all new faces and brains to our biosciences community and eager to see where the next academic year takes us! As you begin your first year as graduate students, I'd like to leave you with a bit of information about what GBS is and how you might use this organization to enhance your graduate experience.

What is GBS?

The graduate Biosciences Society is a student-run group representing all graduate students doing biomedical research within, or in association with, the School of Medicine. As a student-run organization, GBS is comprised of a group of yearly-elected executives, committee chairs, and degree-granting department representatives (all of which are listed at the end of this message). Our mission is to provide academic, professional, and social activities and opportunities that complement your research and academic training.

What does GBS do and what's in it for me?

GBS organizes a number of academic, professional, social, and service activities throughout the year that all students are welcome to attend. We plan events that we believe will provide you with opportunities to develop professionally, meet other graduate students, give back to the community, and grow as a scientist. We hope you are able to take advantage of at least a few of these great resources during your time at UVA!

Our Academic Committee plans a series of academic events that include **faculty chats** and our annual **GBS Symposium** held each spring. During faculty chats, UVA biomedical research faculty share experiences, advice, and knowledge about a variety of different topics relevant to life as a graduate student and scientist (i.e., work-life balance, how to make the most out of your time at a conference, etc.). The GBS Symposium includes a poster session and a series of short research talks designed to showcase student research, and an awards ceremony to recognize some of our most accomplished students in science, service, and leadership. Each year, students also nominate and vote to invite and and host a scientist who will present a keynote lecture in their area of expertise.

The Professional Committee hosts a slew of professional development activities that include a yearly **Career Panel**, a **sponsored trip to the NIH Career Symposium**, **webinars** with representatives from various scientific organizations and companies, and **site visits** to local biotech companies and UVA's License and Venture Group. Our Career Panel is held in the late-winter/early-spring and features four or five scientists (usually UVA alumni) from various fields based on the professional interests of GBS graduate students. The professional committee also works throughout the year to compile written **informational interviews** with PhD's working in a variety of fields. These are published in our GBS Newsletter every few months. If you know of someone whose career may be of interest to GBS grad students, get in touch with Alex or Rachel (contact information below) to get an interview set up!

The Social, Service, & Outreach Committee plans social and volunteer events to provide opportunities to spend time with other graduate students and give back to the Charlottesville community. We are currently wrapping up our yearly **series of summer events** organized to introduce our new graduate students to current students and Charlottesville at large. It was a successful summer and I hope many of you enjoyed it as much as I did! During the academic year, **happy hours** are held regularly and many of them are co-hosted with other graduate student organizations to give you opportunities to meet graduate students from other programs at UVA. We also organize a few **volunteering events** throughout the year including cooking a meal for the Ronald McDonald house (using funds we raise through a bake sale), trail restoration in Shenandoah, and helping out a local science fairs.

How can I get involved?

Come to our next meeting! We hold Council meetings about once per month to review past events, plan our next events, and discuss any other issues or new ideas students may have. GBS loves new faces and ideas! If you have a suggestion for something GBS could be doing that we're not, we want to hear about it! You can also email me or anyone else involved with GBS with questions, concerns, ideas, or feedback.

That's all for now. Welcome to UVA and cheers to a stellar year to come! I hope everyone has a positive, safe, and fun start to the year. As mentioned before, please don't hesitate to contact us with any questions, concerns, thoughts or ideas!
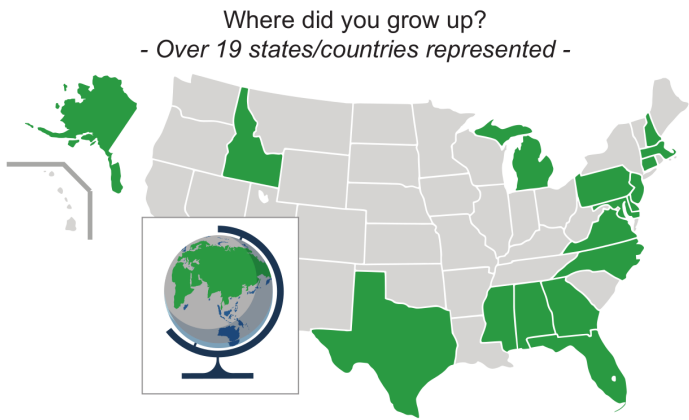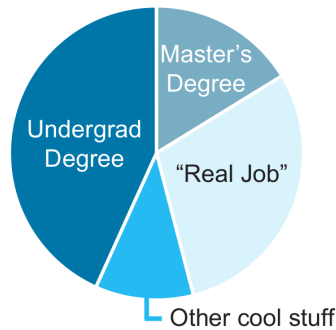
Sincerely,

Tori Osinski
GBS President 2017-2018
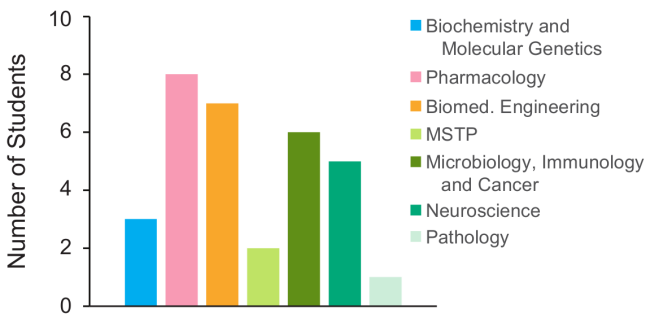
New Student Census
Compiled by M. Schappe

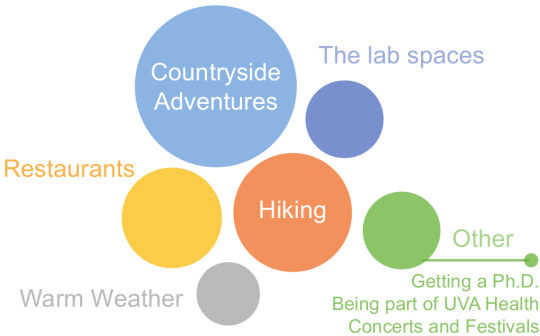We compiled some numbers about the incoming class of graduate students. Take a look:

Where did you grow up?
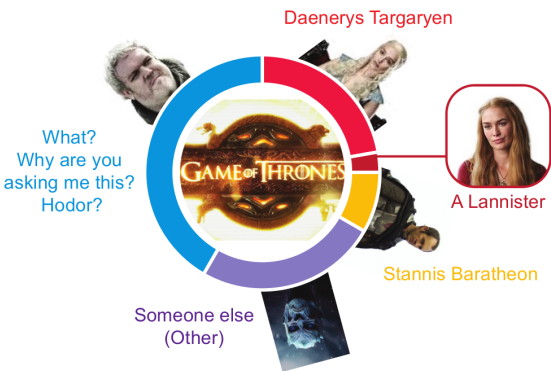*- Over 19 states/countries represented -*

What were you doing before you came to UVA?

Master's Degree
Undergrad Degree
"Real Job"
Other cool stuff

What Program/Department/Cluster are you with today?

Number of Students

- Biochemistry and Molecular Genetics
- Pharmacology
- Biomed. Engineering
- MSTP
- Microbiology, Immunology and Cancer
- Neuroscience
- Pathology

What are you most excited for at UVA?

Countryside Adventures
The lab spaces
Restaurants
Hiking
Warm Weather
Other
Getting a Ph.D.
Being part of UVA Health
Concerts and Festivals

Who is the one true Lord, Protector of the Seven Kingdoms?

Daenerys Targaryen
What? Why are you asking me this? Hodor?
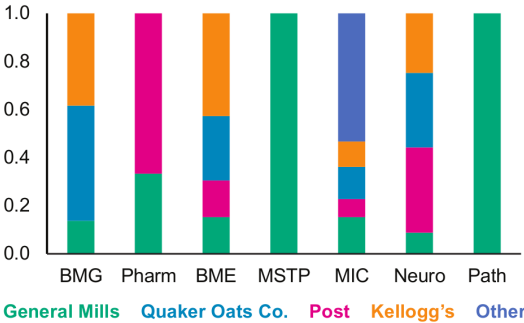A Lannister
Stannis Baratheon
Someone else (Other)

First Year Cereal Pantry
(size of box corresponds to favoritism)

## Probability of endorsing a ruler based on cereal manufacturer

General Mills | Post | Quaker Oats | Kellogs | Other

- Daenerys Targaryen
- Someone else (Other)
- Lannister
- What is this?
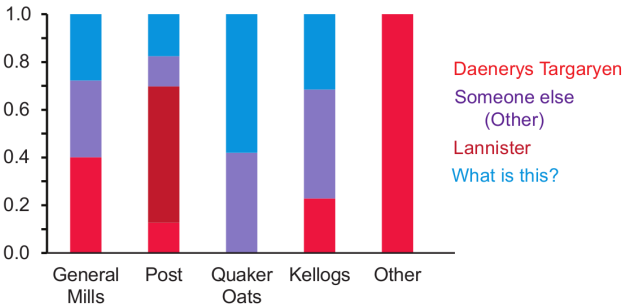
Probability of prefering a cereal manufacturer based on UVA program/cluster

BMG | Pharm | BME | MSTP | MIC | Neuro | Path

General Mills   Quaker Oats Co.   Post   Kellogg's   Other

Looking Forward to Fall Events
Compiled by Riley Hannan

Each fall, GBS hosts a variety of activities for new and old students to relax, network, and broaden their scientific and career horizons. We have put together an overview of fall events - stay tuned to newsletters and TWIG for dates and further announcements!
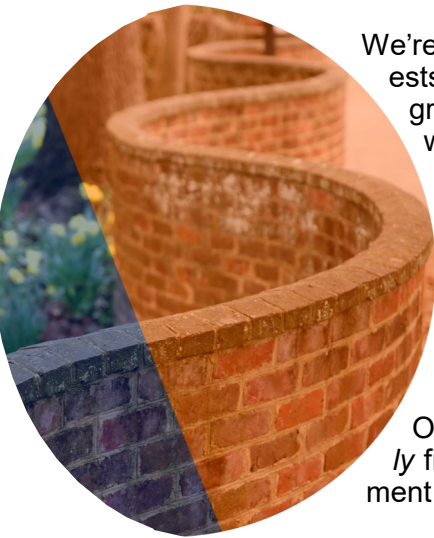
We're continuing our First Year Lunch series with two more lunches - Professional Interests on Aug 18th and the wonderful technicolor Tie Dye Party on the 25th. These are great opportunities to meet older grad students and expand that always-important network, to say nothing of a free and fun lunch.

The Social Committee has several events in the pipeline - BIMS and WIMS happy hours, trivia nights, bowling, and the annual GSAS Halloween Party are all coming up. With cooler weather we can look forward to a Cocoa and Cookies social as well! Volunteering opportunities that are approaching include fundraising, volunteering at the Ronald McDonald House, and organized trips to the Charlottesville-Albemarle SPCA.

Our Professional Committee is organizing career panels with people who *have actually* figured out what to do after graduation, and will be hosting additional skills development workshop(s) and a LinkedIn photoshoot as well!

For the Academic Committee, faculty chats are in the planning phase and more information regarding them should be available soon!

There are also events of note not directly organized by GBS:

The first year BIMS class will be hosting an Peter Reddien from MIT on OCT 25 for their annual invited lecturer. Dr. Reddien will give a talk on his lab's work understanding the processes of tissue regeneration at 4pm in the Pinn (Jordan) Conference Center, with a reception to follow.

The Science Policy Initiative (SPI) will be having a Lunch Seminar Series from August to November, with a symposium scheduled for Nov 6! See their section of the newsletter for more information!

SNAPSHOTS FROM THE SUMMER

Science Hot Topics

Why/How We Get Cancer

Podcast by Jeremy Shaw

In this podcast, I first turn our genome into a dictionary and our genes into words in that dictionary; I do this to help explain how misspelling errors, aka mutations, in our DNA can occur naturally. In part two, I use a car analogy (not my own creation) to explain how the DNA errors from part 1 can turn healthy cells into fast-growing, non-dying, cancerous ones. Finally, I briefly address a few other topics such as childhood cancers and cigarette smoke.

Part 1 Highlights:
To copy the same amount of information as our cells do when replicating it would be like copying 1350 dictionaries worth of letters and making only one mistake every 21 pages.

Mistakes made when copying a word in a dictionary could cause <u>no changes</u>, make a word <u>no longer make sense</u>, or <u>change the meaning</u> of a word. Similarly, when mutated, the function of our genes could have no changes, may no longer work, or may now work in a way they had never worked before.

Although errors are very rare, every time a cell has to divide, those errors can accumulate. Thus, cells that divide more have a greater chance of becoming cancerous. This is why the cells of the heart and neurons, which rarely divide, almost never become cancerous.

Part 2 Highlights:
Just like a car, your cells have things that control how fast they go/grow, where they go, and if they can stop. While a car has a gas pedal, steering wheel, and brakes, our cells have oncogenes, "migration genes", and tumor suppressors, respectively.

When you take the breaks out of a car, slam on the gas pedal, and steer the car into a new area nearby or far away, that is a similar to when cancer cells can no longer stop/die, grow out of control, and spread to other sites.

To hear the full story, feel free to listen to it or read the transcript and notes here!
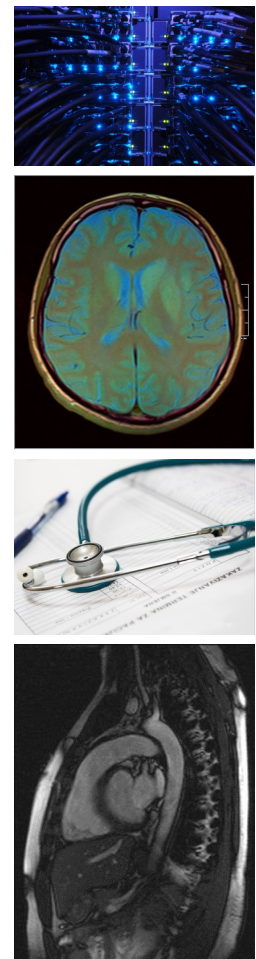
Okay, Google. Does this mole look weird?
Written by T.K. Phung

Imagine snapping a picture of a mole on your skin and uploading it to an app on your smartphone. Instantly, it tells you with confidence that your mole is benign. This is an imminent reality after a recent publication in *Nature* from a group of computer scientists, dermatologists, and pathologists at Stanford University [1]. Artificial intelligence encompasses the use of computers to perform tasks that generally require human intelligence such as visual perception. In the case with pathologists and dermatologists evaluating skin lesions, researchers used a deep convolutional neural network - a machine learning technique- to tackle this computer vision task. A neural network is trained to capture the highly complex, nonlinear relationship between the original input- in this case, the picture of the skin lesion- and the output- the diagnosis of the lesion annotated by a physician. With a set of patient images, the network can be evaluated by whether its diagnostic predictions for each image match that of an expert.

While companies such as Google have used neural networks to identify objects in photos and hand-drawn doodles [2], Esteva et al. trained their network with over 129,450 images of skin lesions to detect malignant melanomas and carcinomas. Training a neural network for a specific task requires a large dataset; however, applying the network's task to new patient data takes a matter of seconds making it an apt tool for scientists and physicians. IBM's Watson- the machine learning computer system that originally beat two prior champions in an episode of *Jeopardy*- has been further applied to diagnosing lung cancer treatments as well as more recently analyzing medical images to identify cardiovascular diseases [3]. With the adoption of electronic health records as well as the rise of telemedicine, applications for machine learning in medical decision-making seem boundless and extremely promising.

1. http://www.nature.com/nature/journal/v542/n7639/full/nature21056.html
2. https://quickdraw.withgoogle.com/
3. https://www-03.ibm.com/press/us/en/pressrelease/51643.wss

Habits of Highly Effective Grad Students: Faculty Chat with Dr. Chris Deppmann

Written By Nicole "Coley" McKenna

On July 21, the GBS Academic Committee hosted its first Faculty Chat of the year with Dr. Chris Deppmann! This talk seemed to come at the perfect time since the new school year is an ideal time to set new goals and habits for yourself. Before getting into his shortened lecture (Dr. Deppmann teaches a full course on this topic), he discussed some general tips. First, he suggested everyone should take interest in other people's research if you want them to be interested in yours. Although this may seem obvious, as your own project develops, it's easy to become laser-focused on your own work. This tunnel vision can become detrimental if it prevents you from receiving outside input! Second, Dr. Deppmann reassured everyone that the imposter syndrome is real, and you need to trust that people saw something that made them believe in you! Lastly, Dr. Deppmann gave some advice for training your brain to focus: start with small increments, 25 minutes of focus and a 5 minute break. Eventually you can work your way up to 50 minutes of focus and a 10 minute break. In addition to this training regimen, a change of setting or scenery can also do wonders for helping you key in and focus.

Now, here is what Dr. Chris Deppmann identifies as his "7 habits of highly effective graduate students:"

1. **Set big goals and take small steps to get there.** It is better to be over-ambitious and come up a little short than to set small goals that are easy to reach.

2. **Making big things granular (aka develop sub goals).** Turn the big goals from above into actionable goals that seem manageable.

3. **Know how much time you have and use it well.** There are 168 hours in a week, if you subtract 56 hours for sleeping, you have 50 hours for class/lab, 21 hrs for studying, and the remaining 41 hours for hobbies, fun activities, and taking care of yourself! It is also helpful to practice reverse scheduling. Schedule time for what you need to do and fill in the time around it.

4. **Perfect is the enemy of good (most of the time).** This is a tricky one, but Dr. Deppmann quoted the Pareto principle and Parkinson's Law to explain that there is a balance between productivity and perfection.

5. **Focus is the same as brilliant.** Eliminating distractions will help you stay focused for longer periods of time. Turn off notifications and only check your email a few times a day.

   Be responsive and responsible but get through emails fast. Try to keep your inbox at zero by using a decision tree to save emails elsewhere or delete them.

6. **Get up to speed and stay up to speed.** Use various websites to quickly learn a new area. Google Images, Google Scholar, Faculty of 1000, and RSS feeds are all helpful!

7. **Multitasking is for chumps.** Prioritize and work in sequence by blocking out specific times for specific tasks. Unplug regularly to think about your project and your priorities.

The Graduate Biosciences Society would like to again thank Dr. Chris Deppman for his excellent advice. Keep an eye out for his class "BIOL 8270 - Seven Habits of Highly Effective Graduate Students" and for future Faculty Chats hosted by the GBS Academic Committee!

It is understandable that many students focus on developing their technical skills and knowledge while in graduate school. However, it can be good to consider the broader context of your science in society. The March for Science and debates over the budgets of agencies like NIH and DOE, show the important relationship between science, politics, and government. More importantly, science policy directly affects us as students. Cuts in agency budgets reduce the number of grants given out and can limit the number of students that programs can support. Changes in programs like the BRAIN initiative affect what research is funded, while changes in programs like the NSF Innovation Corps program can even change education. These developments are guided by people working on "policy for science" and are meant to improve the research and technology capabilities of the US. On the other hand is "science for policy", where knowledge from research is used to guide policy decisions. This can range from setting regulations on pollutants to approving medical devices and pharmaceuticals to developing responses to disease outbreaks.

People with research backgrounds are essential to both sides of science policy whether that's helping to translate scientific results to policymakers or using their own understanding of scientific institutions to improve them for the next generation. You can get involved in science policy through many different fellowships meant for young PhDs like the American Association for the Advancement of Science's Science and Technology Policy Fellowships or the Presidential Management Fellows program. As a student or recent graduate, you could work in the National Academies' Christine Mirzayan Science and Technology Policy Graduate Fellowship Program. At UVA, we are lucky to have many alumni of these programs as professors and researchers who can help you navigate these pathways to work in science policy. The new Science Policy Initiative at UVA is a graduate student organization aimed at increasing awareness of career pathways in science policy, providing resources and professional development to STEM graduate students interested in policy, and acting as advocates for science. If you would like to learn more, we will be hosting a lunch seminar series during the fall as well as an all-day symposium on November 6. Check out our website for more information (SPIatUVA.org).

Interview with Hillary St. John

Hillary works as a Scientist at the Cystic Fibrosis Foundation Therapeutics Lab in the Boston area.
https://www.cff.org/Research/Researcher-Resources/Cystic-Fibrosis-Foundation-Therapeutics/

CYSTIC FIBROSIS FOUNDATION
ADDING TOMORROWS

What is your background in terms of education and experience? What progression led to your current position?
My undergraduate degree is a B.S. from St. Lawrence University where I was a double major in biology and chemistry. After undergrad I went straight into a PhD program at the University of Wisconsin - Madison and got my degree in biochemistry. I started what was meant to be a one year industrial post-doc at a start-up company in Madison and while I was there I got recruited to my current position.

How did you find your current position?
I was contacted by a recruiter on LinkedIn.

Why did you choose to take your current position?
I took my current position because it was an opportunity to do cool, translational research at a foundation that is making a real difference for people with CF. Additionally, from a personal perspective, it was an opportunity to move back to New England (where I am originally from).

What type of research is being done at Cystic Fibrosis? How is the research department organized (multiple divisions, only a few labs, etc.)?
I work at the Cystic Fibrosis Foundation Therapeutics Lab, which is just one part of the wide reaching work the CF Foundation is doing in 3 main areas: (1) Research (2) Care and (3) Support. More about what the foundation is doing and why can be found here: https://www.cff.org/About-Us/About-the-Cystic-Fibrosis-Foundation/Our-Mission/. The lab is about 30 people and is divided into 4 groups - Electrophysiology, Biochemistry, Molecular Biology, and Stem Cell Biology.

Could you describe a typical workday? What hours and tasks are typical?
I spend about 30% of my time analyzing data, planning experiments, attending meetings, etc. The other 70% of the time I spend at the bench. My bench work is about 50% tissue culture and about 50% molecular biology. The official work week is 35 hours, which is generous, but many people (especially higher level people with PhDs) work more than that. Sometimes I go in on the weekend, but it is not usually required. Usually if I am in on the weekend it is only for an hour or two.

What do you find most rewarding and/or challenging about your current position and/or career track?
It is very rewarding to work for a great non-profit that is making a real difference in people's lives. Knowing that what I am doing can make a difference is both rewarding and motivating.

Is doing a post-doc advantageous for your current position and/or career track?
I think that whether a post-doc is advantageous or not really depends on your skills, goals, and frankly a bit of luck. It is possible to get an industrial position with just a PhD; however, since so few post-docs go on to have their own labs, there are a lot of post-docs applying for the same positions and they have 3-6 more years of experience. If you can get a job you like with room to grow with just a PhD, great! But realistically, you more likely will need to do some sort of post-doc, at least for research positions.

What skills that you learned in graduate school were essential to you for acquiring your current position? What are some skills that you use now that were less emphasized or developed during your graduate career?
I think the best thing you can learn in graduate school is analytical thinking/problem solving and troubleshooting. In graduate school, I worked on bone and now I work on lung as a model system. The cell types, challenges, etc. have changed, but I can use the same toolbox of problem solving and analytical thinking to tackle both.

I am working on gene editing projects, so experience with CRISPR/Cas9 was essential for getting my current position. I think having some experience in a new/hot field (sequencing, CRISPR, etc.) can be very helpful.

During graduate school I had several collaborations and worked with others a lot, but it was usually just working with one other person on a project. Now, many of my projects are working with many people.

What is the next step in your career path? What are the future career opportunities for someone in your position?
I am not sure yet what my next step will be, but my current goal is to eventually move away from the bench (not entirely) and more into project management.

What advice would you give a graduate student interested in pursuing your career path?
(1) When I was in graduate school I was told over and over again to "network." Frankly, by the end I loathed that word, mostly because I felt like I didn't have as many connections as some. But networking doesn't have to be a "big thing." The boss during my post-doc is someone that I met at a conference. Also, your colleagues in graduate school make great connections as they move on to labs and companies around the country.
(2) Be patient. The job market can be tough and finding a good job or doing a post-doc can take time. Try not to get discouraged.
(3) Try to develop skills that are marketable. Knowing how to do western blots is great, but that won't help you stand out from the crowd.

Would you be able to speak to how your current company evaluates applicants? What is sought in applicants? Is there anything in a CV or resume that would jump out to an interviewer when interviewing for a position like yours?
I unfortunately cannot speak to this point since I have not be involved in evaluating or hiring for positions at my level.

Acknowledgements

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Any questions, concerns or opinions? Feel free to fill out our survey

or email Tori Osinski at vo3sc@virginia.edu