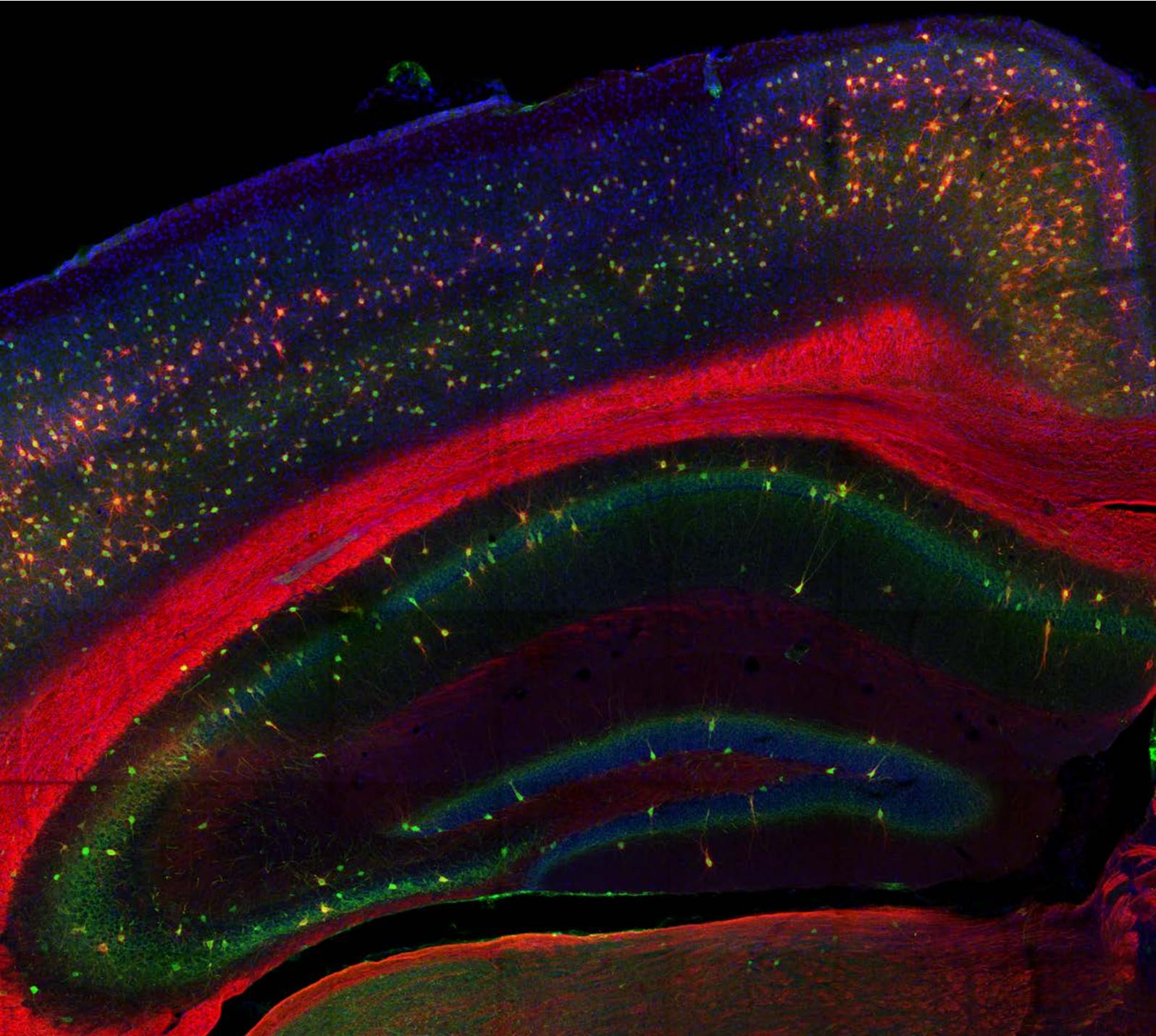




# THE GSCHRONICLES

*The Official Newsletter of the NIH Graduate Student Community*

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Visualising neurons and supportive structures in an Alzheimer's disease mouse brain  
Connie Mackenzie-Gray Scott (NICHD, Newcastle University)

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# Upcoming OITE Events

## Negotiating Offers and Making the Transition

Building 50, 1227  
Apr 9, 2019 1:00 – 3:00 pm  
FREDERICK Building 549/Room ERB  
Apr 23, 2019 11:30 – 12:30 pm

## Tips for Mentoring a Summer Intern and Leading a Summer Journal Club

Building 50, 1227  
Apr 10, 2019 2:00 – 3:30 pm

## Workplace Dynamics V: Diversity in a Multicultural Society

Building 50, 1227  
Apr 12, 2019 10:00 – 1:00 pm

## English Communication for Visiting Scientists

Building 1, Wilson Hall  
Apr 15, 2019 9:00 – 4:00 pm

## FELCOM: Careers in Contract Research Organizations

Building 49, 1A50  
Apr 16, 2019 3:00 – 5:00 pm

## Academics: Transitioning Successfully from Postdoc to Faculty

Natcher, E1/E2  
Apr 17, 2019 2:00 – 4:00 pm

## PhDs in the Real World

Grad Student Lounge  
Apr 23, 2019 4:00 – 5:00 pm

## Tips on Filling Out Your AMCAS Application

Building 40, 1201  
May 7, 2019 10:00 – 11:30 am

## 12<sup>th</sup> Annual NIH Career Symposium

Natcher Conference Center  
May 10, 2019 8:00 – 4:00 pm

## Baltimore: Making Career Choices

05C409A  
May 16, 2019 12:15 – 1:00 pm

## Baltimore: Holistic Self Care

BRC 03C227  
May 21, 2019 1:30 – 3:00 pm

## Management Boot Camp

TBA  
May 23-24, 2019 9:00 – 4:00 pm

## OITE Orientation for Graduate Students and Postdocs

Building 1, Wilson Hall  
Jun 04, 2019 8:30 – 10:00 am

## Speaking Up: How to Ask for What You Need in the Lab and in Life

Building 35, 610  
Jun 11, 2019 10:00 – 12:00 pm

## Essential Leadership Skills for Future Scientists and Health Care Professionals

Building 35, 620/630  
Jun 12, 2019 1:00 – 4:00 pm

## High School Summer Intern Orientation

Building 35, 620/630  
Jun 13, 2019 8:45 – 4:00 pm  
Building 10, Lipsett  
Jun 24, 2019 8:45 – 4:00 pm

## Planning a Successful NIH Summer Internship

Building 50, 1227/1328  
Jun 14, 2019 8:30 – 10:00 am  
Jun 21, 2019 8:30 – 10:00 am

## Tune In and Take Care: Managing Stress and Promoting Well-Being

Building 1, Wilson Hall  
Jun 18, 2019 3:00 – 5:00 pm

## Graduate School Overview: Much of What You Need to Know to Get In

Building 50, 1227/1328  
Jun 20, 2019 11:00 – 2:00 pm  
Baltimore: BRC 3C211  
Jun 25, 2019 9:00 – 11:30 am

## Ethics in Research Training for Summer Interns

Building 50, 1227/1328  
Jun 26, 2019 10:00 – 12:00 pm

## Summer Networking Event: Get Cool and Connected with Popsicles!

Building 50, 1227/1328  
Jun 28, 2019 1:00 – 2:00 pm

## **Be sure to attend the summer lecture series!**

Dr. Julie Segre Jul 02  
Dr. Michael Gottesman Jul 30

Register at <https://www.training.nih.gov/events/upcoming>

# The Art of Science Competition



The first annual Art of Science competition was a success! As scientists, much of our time is spent in the lab as we collect results, analyze data, and write reports. We find quantitative and qualitative truths about the world around us and develop solutions to difficult problems. In the process, we also generate aesthetics that can both communicate our results and capture the beauty of discovery. The goal of the competition was to capture some of those discoveries by our graduate student population. We had a total of 13 entries (see page 16).

Shown here are the finalists (in no particular order):

**The winning submission, as seen on the cover of this issue:**

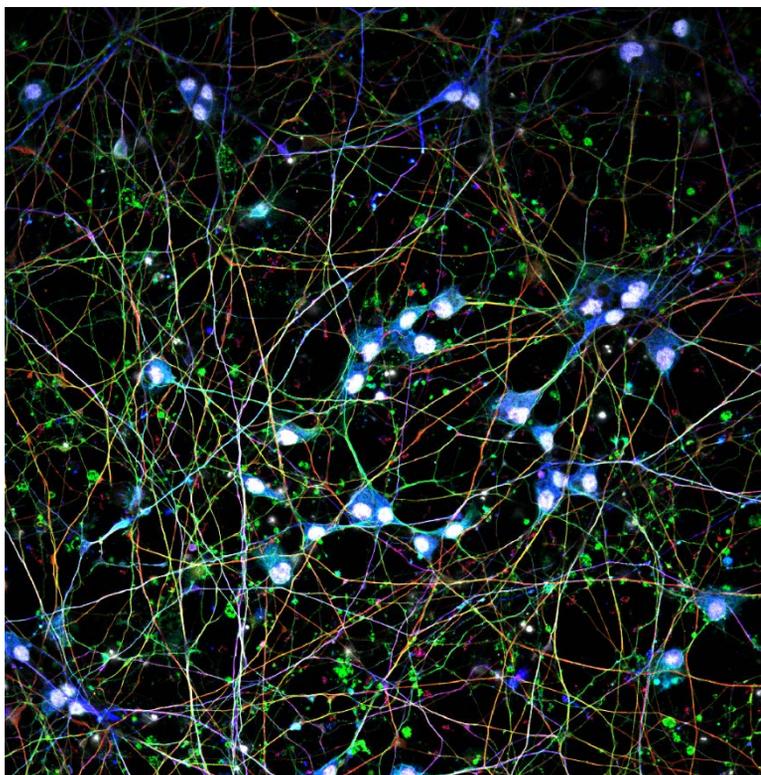
**Title:** Visualising neurons and supportive structures in an Alzheimer's disease mouse brain

**Name:** Connie Mackenzie-Gray Scott

**Advisor:** Chris McBain

**Institution and School:** NICHD, Newcastle University

**Description:** This immunofluorescence image shows a coronal section of the hippocampus and cortex, areas known to be compromised in Alzheimer's disease (AD). In blue is a dapi stain for cell nuclei, highlighting the cellular layers and structure in the hippocampus and cortex. The cells in green are a subset of inhibitory brain cells that express the Ca<sup>2+</sup> buffer parvalbumin (PVINs) and are known to be negatively affected in AD. PVINs are often associated and ensheathed by extracellular matrix components termed perineuronal nets (PNNs) (in red) which are thought to support the cells functioning.



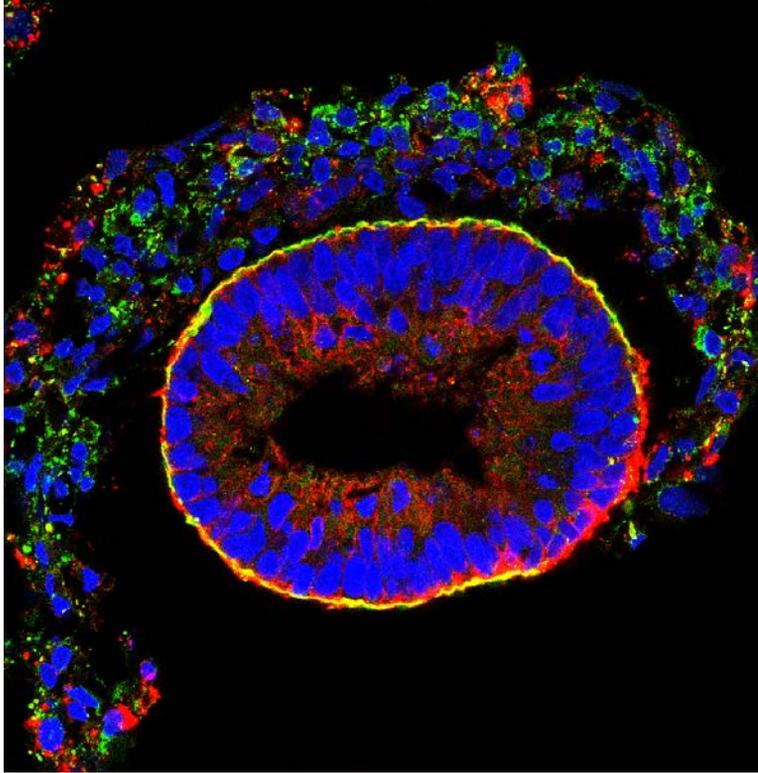
**Title:** Human touch in a dish

**Name:** Alec Nickolls

**Advisor:** Carsten Bonnemann

**Institution and school:** NINDS, Brown University

**Description:** Confocal micrograph of peripheral mechano-sensory neurons derived from human pluripotent stem cells. The sample is labeled with antibodies against neurofilament proteins: NF200 in red, peripherin in green, beta-III tubulin in blue, and nuclei in white. These neurons express stretch-gated ion channels allowing them to transform mechanical stimuli into electrical signals; the first step in the sensation of touch on the skin.



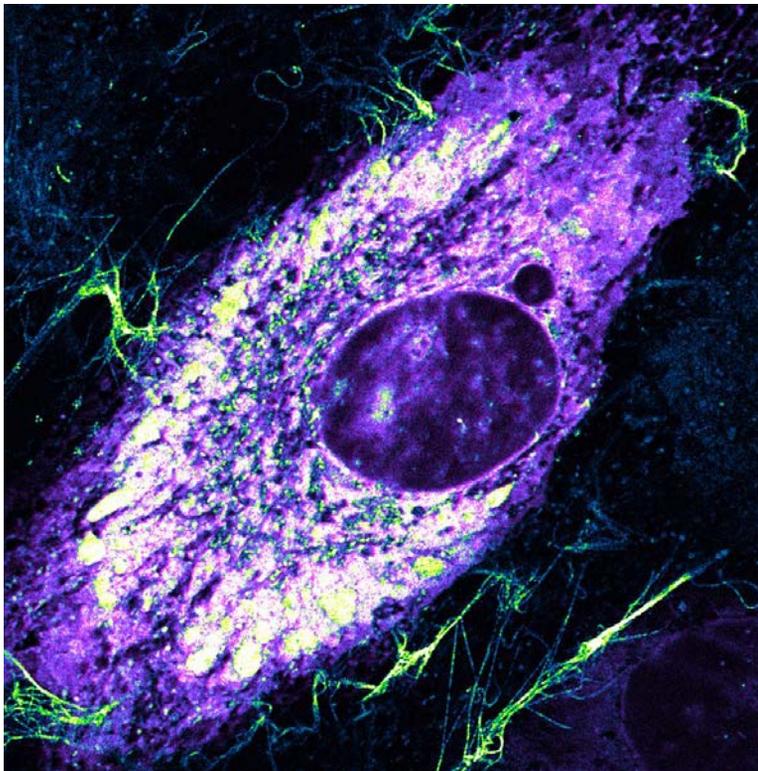
**Title:** A human embryoid body

**Name:** Alec Nickolls

**Advisor:** Carsten Bonnemann

**Institution and school:** NINDS, Brown University

**Description:** Confocal micrograph of a section through an embryoid body – a 3D tissue culture model of pre-implantation embryonic development, derived from human pluripotent stem cells. The sample is labeled with antibodies against the extracellular matrix proteins laminin (green) and dystroglycan (red), with nuclei in blue. These embryoid bodies grow to several millimeters in size and consist of an epiblast core (the part of the embryo that ultimately forms the human) and an extra-embryonic endoderm periphery (that forms the yolk sac after uterine implantation)



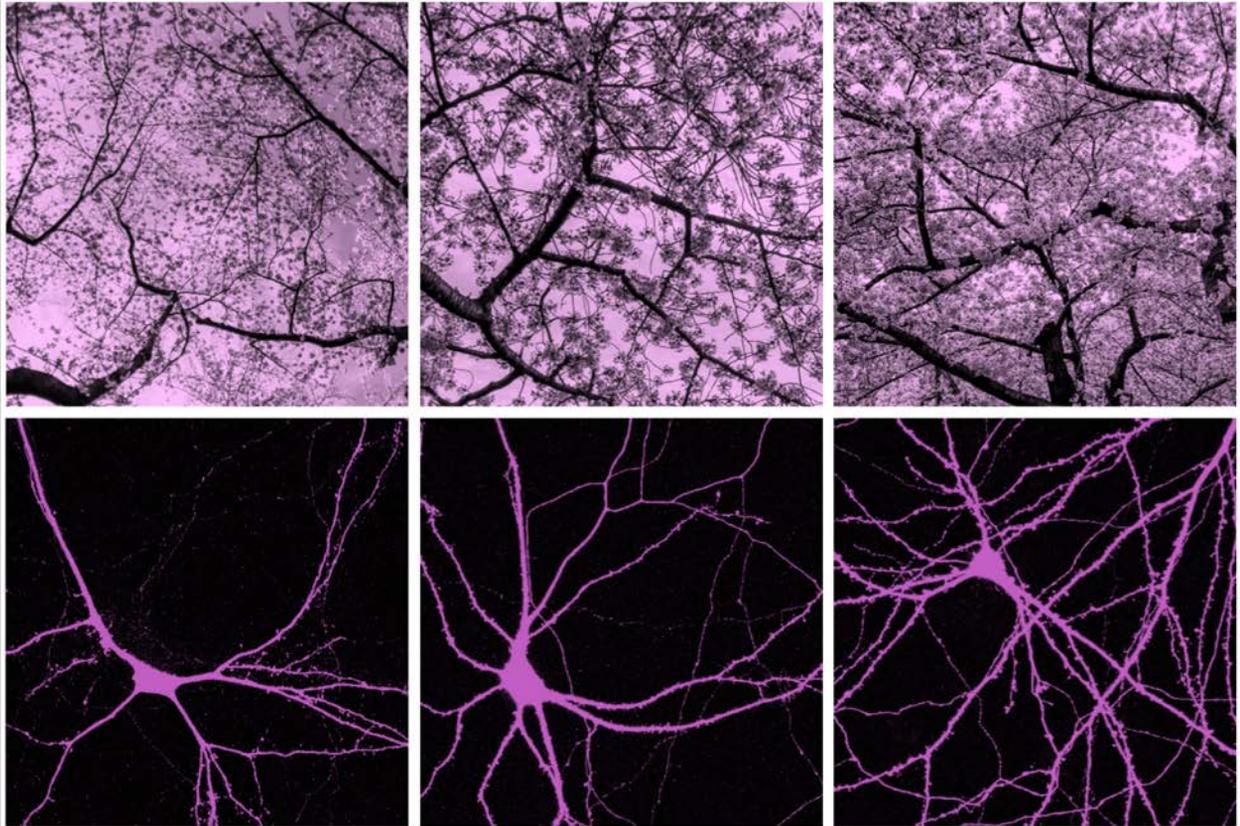
**Title:** The Makings of Bone

**Name:** Laura Gorrell

**Advisor:** Sergey Leikin

**Institution/School:** NICHD, RPI

**Description:** This is an image of an osteoblast secreting collagen (green) which is folded inside the ER (purple). Our lab is interested in the mechanism behind collagen quality control in order to identify new therapeutic targets for diseases affecting bone quality.



**Title:** Cherry Blossoms and Neurons

**Name:** Nathanael J. Lee

**Advisor:** Daniel S. Reich (NINDS)

**Institution:** NINDS, Georgetown University

**Description:** This is a combined image of photography and confocal microscopy, where the top and bottom panels consist of photos of the cherry blossoms, and confocal microscopy images of neurons, respectively. The petals and leaves on tree branches reminded me of the structures of dendritic spines on neurons.

# 2018 GSC Update



As your 2019 co-chairs, we are delighted to lead the Graduate Student Council (GSC) this year and we would like to take the time to highlight a few events designed to enrich the training experience here at NIH. We encourage all trainees to take some time away from the bench to network, socialize, and volunteer at the following events.

First, the GSC organizes mentor lunches (“**Finding Mentors and Building Networks**”) in which graduate students meet

with principal investigators in a group setting. During these lunches, graduate students discuss challenges in biomedical research careers and, often, the individual experiences of principal investigators. Similarly, our “**PhDs in the Real World**” series showcases alumni from the NIH Graduate Partnerships Program who have transitioned successfully into non-academic careers. We also host volunteer events at **Manna Food Bank** and the blood bank for those seeking to be more involved with the community. In addition, we hold a monthly **Graduate Student Seminar Series (GS3)** that provides graduate students the opportunity to share their research findings and practice their presentation skills. Finally, we encourage all to socialize with fellow graduate students at one of our networking and social events!

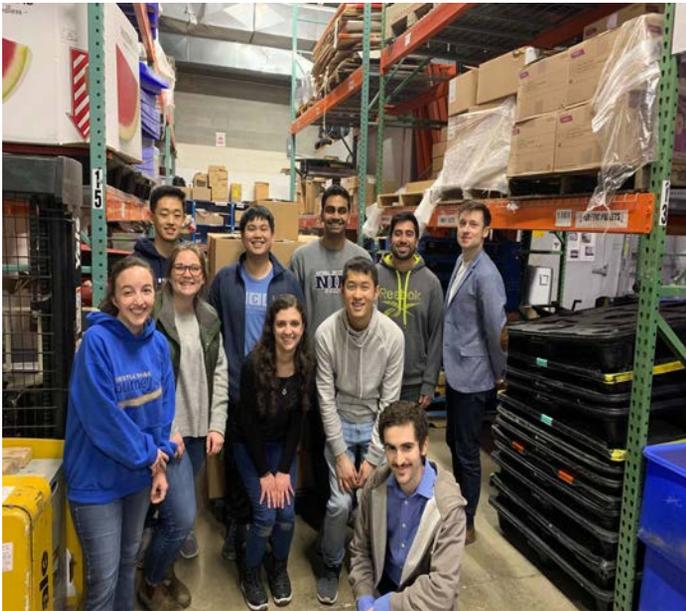
**Please do not hesitate to reach out to us** with any suggestions on how we can enhance the experiences of NIH graduate students. We welcome all to attend our monthly GSC meetings and GS3 seminars held jointly on the last Tuesday of each month from 5-6 pm in the graduate student lounge (Building 10, Room 1N263). For those looking to get more involved – there are many leadership opportunities within the GSC. These experiences will foster your personal and professional growth as a trainee and support the community of graduate students at the NIH.

Lastly, we would like to thank the 2018 co-chairs, Larissa Erben and Laura Gorrell, for their service and extraordinary contribution to the graduate student community. Furthermore, we would also like to thank the committees of the council who have worked so diligently to provide these valuable opportunities to the graduate student community. Please continue to keep up-to-date with what is going on in our graduate community through our monthly Newsletter and **The GSChronicles**. We hope to hear from you and meet you at our GSC events!

Sincerely,  
Your 2019 GSC co-chairs  
James Stamos & Albert Sek

The **Graduate Student Council** is made up of five committees, tasked with improving the lives of graduate students at the NIH. Here's an update on what the committees have been up to!

*\*If you want to get involved with the Graduate Student Council, we are still looking to fill some positions (see below). It's a lot of fun and a great resumé booster.\**



### **Community Service/Mentor/Outreach Committee (*\*new member needed\**)**

Looking for volunteer opportunities? Looking for mentors besides your thesis PI? This committee provides various volunteering opportunities and mentor/outreach events to both become a mentor or learn from senior PIs at the NIH. The main volunteering events hosted throughout the year involve volunteering at the Manna Food Bank, where we help pack up boxes of food that are distributed to communities in need. We usually organize these events once every two months, so keep an eye out for the next [Volunteer at Manna Food Bank event!](#) This committee also organizes [Mentor Lunches](#) as an opportunity to hear from top NIH PIs to gain from their experiences and words of wisdom about the role of science today. Recently we had our “Finding Mentors and Building Networks” event focusing on genomics and data science with NIH PIs Dr. Todd Macfarlan and Dr. Adam Phillippy. Be sure to attend the next event! Alongside this mentoring aspect, we also host our seminar series “[PhDs in the Real World](#)” where we bring in members from various career paths. These seminars are a great opportunity to learn about the many career options and fields for a PhD. Check out the article in this newsletter and be sure to attend the upcoming seminars!

*\*\*The GSC is looking for a new coordinator for the Manna Food Bank events. Please contact the GSC co-chairs to learn more information about the position at [GSCcochair@mail.nih.gov](mailto:GSCcochair@mail.nih.gov). \*\**

### **FAES Liaison**

Looking for a place to relax and escape the lab without leaving NIH? The Foundation for Advanced Education in the Sciences (FAES) provides educational and professional services as well as fosters a collegial environment for the NIH scientific community. They also help provide us graduate students with the amazing **Graduate Student Lounge in Building 10, Room 1N263**. If you haven't checked it out, be sure to go grab a free cup of coffee and take a break in there!! Email Phil Ryan to get PIV card access.

<https://www.training.nih.gov/gsc/lounge>

### **GS3 Committee**

Looking to gain some presentation skills or get peer feedback on your research? The Graduate Student Seminar Series (GS3) is a great opportunity. These informal talks given to other graduate students create an easy environment to get useful critiques on your presentation skills and to promote discussion on your research. Most recently we had Laura Gorrell share her CRISPR research on osteoblast cells, Shaimar Gonzales Morales discuss her research on her ECM remodeling mechanisms, and Jessica Schneller talk about treatments for methylmalonic acidemia. Be sure to join us for the upcoming talks!

#### **Upcoming Events: 5pm in the Graduate Student Lounge**

**April 30, 2019**

**Laura Abaandou**

**May 28, 2019**

**Allison Goff**

**June 25, 2019**

**Keith Schmidt**

**July 30, 2019**

**Dwayne Byrne**

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### PR Committee

Looking to stay connected with the other graduate students at the NIH? Looking to gain some writing experience? The Public Relations Committee helps advertise the various graduate students' events happening throughout the year. Be sure to keep up-to-date with all graduate student information and events through our networks: Visit the GSC website at <https://www.training.nih.gov/gsc>. Join our "Graduate Student Underground" Facebook and Google groups. The PR Committee also compiles [The GSCChronicles newsletter](#) articles written by graduate students, for graduate students! Please email [GSCcochair@mail.nih.gov](mailto:GSCcochair@mail.nih.gov) if you need help accessing these networks.

### Social Committee (*\*more members needed\**)

Looking to take a break from the lab or meet other graduate students at the NIH? The social committee helps organize various types of social events. These events have included local happy hours, movie & game nights, trivia competitions, sport watching/fantasy leagues, ski trips, camping and biking weekends as well as the Annual Summer BBQ event. We also interact with the various postdoc and postbac communities to promote fellow interactions. But our main goal is to help bring the graduate students together to make sure you know that you are not alone on the big NIH campus. The beginning of the year has already been busy with our big post symposium social hour, trivia nights, and events with VFC, including attending a Wizards Basketball game. Be sure to join in some friendly competition with the basketball bracket challenge and tune into our upcoming events!

*\*\*We are looking for more members to be a part of the social committee. This is a great way to meet your peers, make friends, and build your resume. Contact the co-chairs at [GSCcochair@mail.nih.gov](mailto:GSCcochair@mail.nih.gov) to learn more. \*\**

### Upcoming Events:

**Happening Now!**

**April 10, 2019**

**First week of May**

**March Madness Basketball Bracket Challenge**

**Trivia night @ Brickside**

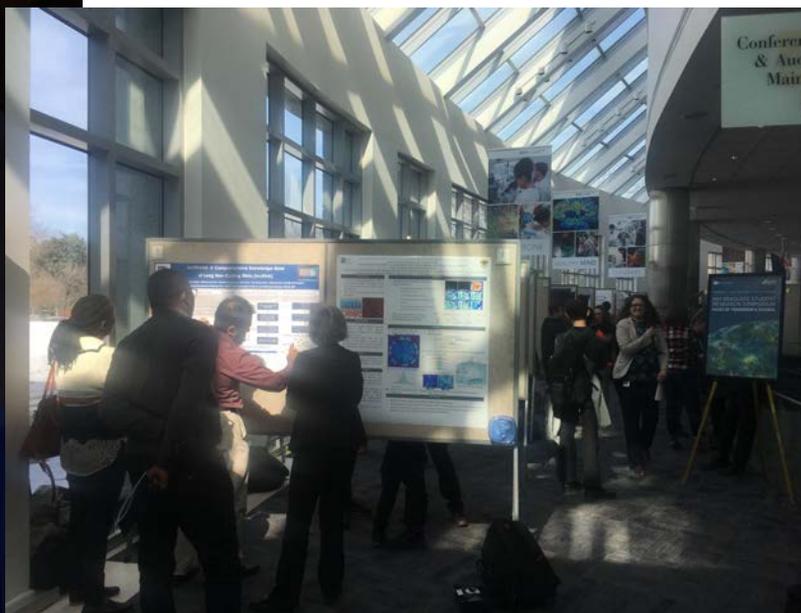
**Social event**

### Postbac Liaison

Looking to connect with your future colleagues/mentees? The GSC added a Postbac Liaison to help further connect the graduate students to other communities at the NIH. The Postbac Liaison helps the postbac representative coordinate co-sponsored events. Be sure to attend our upcoming events!

# 15th Annual Graduate Student Research Symposium

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The 15<sup>th</sup> annual NIH Graduate Student Research Symposium took place on Thursday, February 21, 2019 despite snowy and icy weather conditions that had occurred in much of the Bethesda area. Over 100 graduate students registered for the event that allows students to showcase the Ph.D. dissertation research they conduct at various NIH institutes. The day's events began with the third annual Elevator Pitch competition, which challenged participants to thoughtfully describe their research to a general audience in two minutes or less sans visual aids. First and second place winners from each of three groups of 10 competitors were selected by judges and advanced to the final round of the event. During the finals, judges selected Dilorom (Delia) Djalilova of NINR; University of Nebraska Medical Center as the first place elevator pitch winner. While Ashley Pitt of NIDDK; Johns Hopkins University was awarded second place.

OITE director Dr. Sharon Milgram provided the welcome address reminding the audience that wellness is instrumental for a successful career in science. Oral presentations immediately followed the welcome. Ashely Pitt (NIDDK; Johns Hopkins) spoke about presented research in the field of mitochondria which focused on the structural interaction of Tom40. Davide Ortolan (NEI; University of L'Aquila) presented work describing the use of machine learning based high content screening to generate iPSC-derived macular and peripheral retinal pigment epithelial cells *in vitro*. Alec Nickolls (NINDS; Brown University) presented research on transcriptional programming of human sensory neurons. Carly Starke (NIAID; Georgetown University) presented work detailing signatures of protective simian immunodeficiency virus CD8+ T-cells. Each oral presenter answered questions from the audience at the conclusion of their talks.

Two graduate student poster sessions were held in the afternoon. All graduate student poster presenters were eligible to be selected by judges as NIH Graduate Student Research Award (NGSRA) recipients. This year's winners included: Andrew Smith, Fayaz Seifuddin, Nicholas Ader, Nicholas Sciascia, Albert Sek, Rachel Smith, Xiaoyi Li, Delia Djalilova, Brendan Miller, and Dorian Cheff.

Dr. David Dinges delivered the symposium keynote address. Dr. Dinges has focused on studying how sleep and circadian rhythms influence human health. Through collaborations with NIH, NASA, the US military, FDA, FAA, and numerous additional organizations Dr. Dinges found that increased demand for late-night shift work has a deleterious effect on overall health and decreases productivity. The studies have also shown that the total amount of sleep per 24 hours impacts memory, while the effects for when people sleep do not show a significant difference on memory loss or retention. Dr. Dinges gave his final remarks following questions saying, "I never would have thought there were people who were differentially susceptible to sleep loss but the research shows these differences. So, get your sleep!"

The Graduate Partnerships Program (GPP) Graduation Award Ceremony took place during the final portion of the day's events. Dr. Michael M. Gottesman, NIH Deputy Director for Intramural Research, and Dr. Milgram presided over the graduation ceremony and presented over 30 GPP graduates with their completion certificates. Drs. Dale P. Sandler (NIEHS) and Chris Baker (NIMH) were also honored during the ceremony with the Outstanding Mentor Award.

The symposium was sponsored by support from the Office of Intramural Training and Education and chaired by the 15<sup>th</sup> Annual Graduate Research Symposium Committee. The committee includes: Dr. Phil Ryan, committee chair; Dorian Cheff, NCATS; Matan Cohen, NCI; Crystal C. Lipsey, NCI; Darian Lukasz, NIDCD; James Stamos, NCI.

# Student Spotlight



**What is your name, GPP program, and year in the program?** My name is Heather L. Rusch. I'm a 2<sup>nd</sup> year research fellow in the NIH-Karolinska Institute, Clinical Neuroscience program.

**How would you describe your experience in the program so far?**

Inspiring! To start, the NIH is the largest biomedical research institution in the world, and the Karolinska Institute (KI) is one of the world's foremost medical universities and home of the Nobel Assembly, which selects the Nobel laureates in Physiology or Medicine. The collaboration between the NIH and KI offers unparalleled opportunities for advanced training, access to innovative technologies, and networking with some of the world's leading scientists. In just 1.5 years, I've gained skills in advanced 7-tesla imaging acquisition and analysis, next-generation

sequencing, and exosome isolation and analysis. It's endlessly inspiring to know that I'm working to make discoveries that enhance the wellbeing of others. Plus, I get to live in Stockholm, Sweden part-time!

**Is there anything you would have changed since you first started?**

When I look back over the last 1.5 years, I certainly faced my share of obstacles. I set out to complete a very ambitious study in a limited timeframe. There were recruitment challenges, extended IRB delays, and MRI technical issues. After a year of deferments, I decided to table the study indefinitely. In retrospect, I wouldn't have changed a thing. These obstacles were not unique to me; they're ubiquitous in biomedical research. What is unique to me, was my response to them. I stayed positive, changed direction, and persevered; it also helped to have the support of people who believed in me.

**How do you deal with stress when experiments don't go as planned?**

I don't experience stress so much these days. I gently do what I can, call my mom for support, and let nature take care of the rest. This idea that we need to control everything is a grand illusion—and a great source of misery. I've realized that the more space I create between myself and these

impermanent, impersonal happenings, the more at peace I am.

**What words of wisdom would you give to students at the NIH?**

To succeed as a scientist, you must first learn to dance on the shifting carpet.

**Do you have a favorite spot on campus, why?**

My favorite spot is on the footpath across from the Natcher Conference Center. From the top of the hill you can see over most of the NIH campus; it is especially beautiful at sunrise and sunset. I walk this path daily to and from work and there are moments when I pause and think, "Wow, I'm so thankful to be a part of this awesome community!"

**What OITE resources have you found to be the most helpful to you?**

Years ago I asked a lab mate for an OITE recommendation to help revise my CV. I wanted someone who would cover my entire CV in red ink—a real straight shooter. Without hesitation he recommended Dr. Pat Sokolove, the Deputy Director. I made an appointment to meet with Pat, and I'd like to think it was mutual respect at first sight. Little did I know then, that she would become my confidant, mentor, and friend.

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**What hobbies or activities do you enjoy outside of work?**

Meditation, yoga, hiking, volunteering, and I recently became interested in medical herbology. I'm very fortunate that there is a seamless integration between my work life and the activities I naturally do for enjoyment. My NIH supervisors, Drs. Gill, Grillon, and Ameli give me enormous freedom to do research on mindfulness, lecture on its clinical implications, and meditate during work hours with patients. I'm truly grateful for their support. I also hike, volunteer, and do Iyengar yoga twice a week with my lab mates. My late father was a two time Olympic decathlon winner; he told me to find a job I love and I'll never work another day in my life. I can't say science never feels like work, but it's pretty close sometimes

**Is there any destination you dream to visit one day?**

Since I was 6 years old, I dreamed of trekking through India, Nepal, Bhutan, and Myanmar. I remember my father helping me create a topographical map of the region for a 2<sup>nd</sup> grade class project; it was so big it could barely fit in the trunk of the car. My affinity for this region has only grown with time—I'd love to travel like a simple pilgrim, meditate in the sacred temples, and

celebrate the rich cultural heritage, which is so foreign from my own.

**What are you working on now and what is the next phase of your career?**

I'm currently working to develop a blood test that can more accurately diagnosis military service members with posttraumatic stress disorder (PTSD) and identify biomarkers that change in response to treatment. I begin with the entire genome (~20,000 genes) and look for expression differences between participants with vs. without PTSD, as well as with distinct symptom clusters. Then I see how these gene expressions change with symptom reduction over time. So far, I identified 89 genes linked to a positive PTSD diagnosis and 20 genes linked to symptom reduction. The next step is to replicate and validate; we can't say much until then. For the next phase of my career, I'm interested in developing targeted treatments for individuals with PTSD, and for individuals predisposed to PTSD who are still asymptomatic. All beings deserve to be free from suffering; if I can further the research one step in this direction—I've succeeded.

# PhDs in the Real World

On a Wednesday afternoon in January, graduate students sat down to ask an industry scientist questions about the biotechnology careers, as part of the 'PhDs in the Real World' seminar series.

At this event, graduate students had the opportunity to meet with **Dr. Kevin Tosh**, a research scientist at Precigen Inc., a Germantown, MD-based biotechnology company that is focused on developing genetic and cellular therapies. Graduate students were delighted to learn that Dr. Tosh, too, had been a part of the NIH Graduate Partnerships Program and had graduated not too long ago.

The graduate students in attendance – approximately ten – developed an instant rapport with Dr. Tosh, who described his academic training and how it prepared him to work in the biotechnology industry. Graduate students greatly appreciated Dr. Tosh's frank and insightful responses to a range of questions on industry postdoctoral fellowships, work/life balance, and elements of a successful job search.

For many graduate students, this event presented an excellent opportunity to glean insights into the biotechnology sector and to develop further their career plans. Given the level of interest with this career series, the 'PhDs in the Real World' will continue to address diverse career options that are available to graduate students. In March, the series will feature Dr. Mohsin Khan (Consultant at Booz Allen Hamilton and NIH GPP Alumnus) and in April will feature Dr. Sunita Shukla (Associate Director for Regulatory at FDA and NIH Alumnus).



# GSC Year End Report

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Through the dedication of the Graduate Student Council (GSC) committees, this year has provided numerous opportunities to strengthen the graduate student community at the NIH. The Graduate Student Lounge continues to connect students through partnership program meetings, meditation sessions, GSC meetings, and additional council planned activities. The combined GSC and Graduate Student Seminar Series (GS3) are regularly attended and new ideas are being brainstormed to better the opportunities of graduate students to present their ideas and research with peers.

Our Social Committee continued to plan great events throughout the year with great turnouts. These events included Jazz in the Garden, an annual BBQ, bike rides, trivia nights, and social hours. The variety in events helped bring in new participation from graduate students. Events continue to be announced through the various communication methods, such as a monthly newsletter, Facebook group, and Google Calendar. Our Chronicles committee produced multiple *The GSChronicles* newsletters this year, giving an update on the various graduate student activities throughout the year. This year, we also made various updates and improvements to the GSC website.

The Community Service, Outreach, and Mentorship Committee continued to be more active with two new committee members. Many community service opportunities were offered to graduate students throughout the year, including Postbac Poster Day judging, Take Your Child to Work Day, NIH Blood Drive, and Manna Food Bank. The Community Service, Outreach, and Mentorship Committee continued and expanded the mentor lunches this year including a very successful “Finding Mentors and Building Networks” lunch with Drs. Gottesman. These lunches provided a great opportunity for graduate students and principal investigators to interact and develop relationships in an informal setting. We also continued “PhDs in the Real World”, a seminar series to expose graduate students to the wide variety of jobs they can pursue with a PhD. We held three sessions throughout the year, hearing from a variety of speakers from jobs in academia, government, and industry. These events helped bring new participation from graduate students.

Our Felcom Liaison has maintained active involvement with the NIH postdoctoral fellow council by regularly attending meetings and including graduate students in the Visiting Fellows Committee’s events. Additionally, some of our social committee social hours were planned in coordination with postdoctoral fellows. Our FAES Liaison has continued to keep us updated on insurance changes and has allowed us to be involved in the larger NIH community. We additionally created a new liaison with the Post-bac committee, as well as accepting a post-bac liaison at GSC meetings. Through this new collaboration we held multiple social networking and community events with the post-bacs. Finally, this year we initiated a new orientation specifically for individual partnership graduate students. We had a good turn out with seven new graduate students in attendance. We hope to continue these orientations with OITE in the future.

The Graduate Student Research Symposium was held for the second time in conjunction with the Graduate Partnerships Program recruitment week, allowing prospective students to see the wide range of research being done by graduate students across campus. This year’s Graduate Student Retreat held at the HHS headquarters in DC saw a significant increase in participation making it the most successful retreat in many years. The focus of the 2018 retreat was on science outreach.

As we end a successful 2018, we look forward to providing more opportunities for graduate students to be involved with the community in the coming year.

-Larissa Erben and Laura Gorrell

# Comics

Piled Higher and Deeper by Jorge Cham

www.phdcomics.com

THINGS YOU CAN DO IN ACADEMIA THAT WOULD GET YOU FIRED IN THE REAL WORLD:



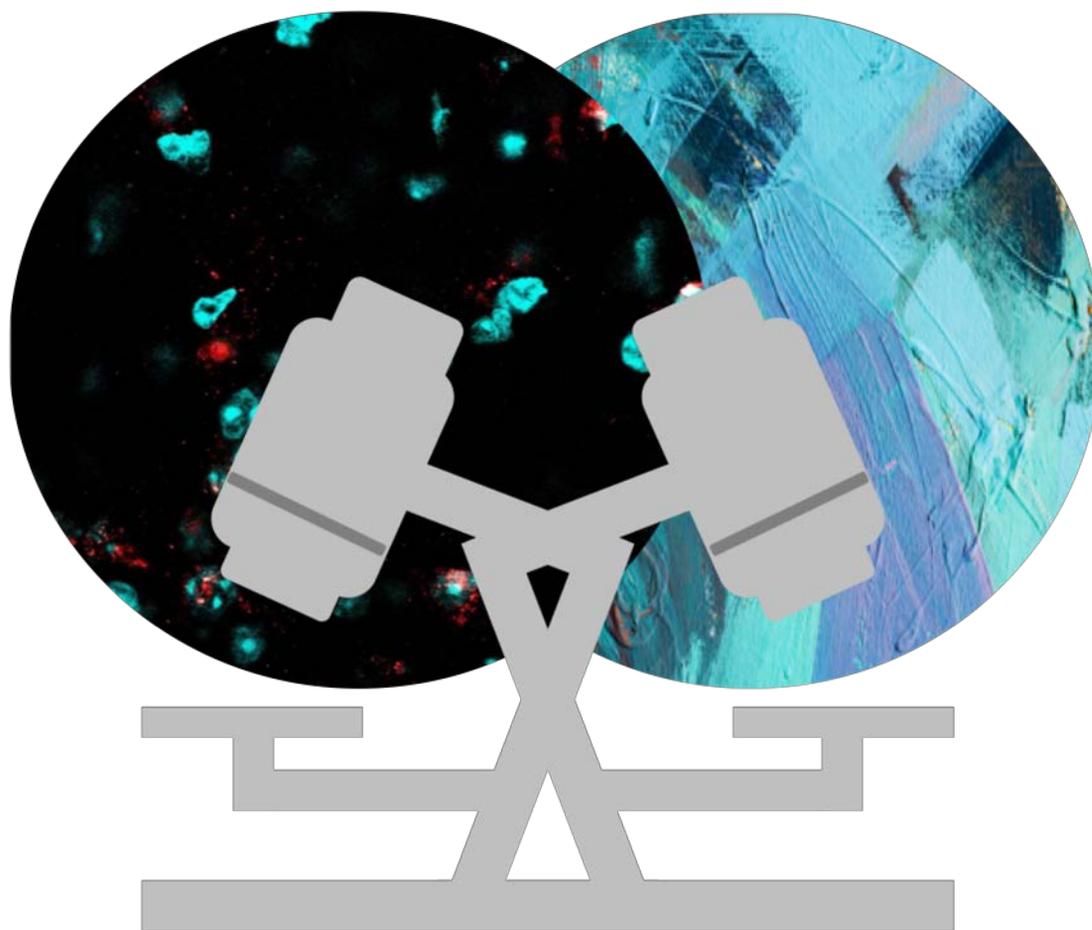
WWW.PHDCOMICS.COM

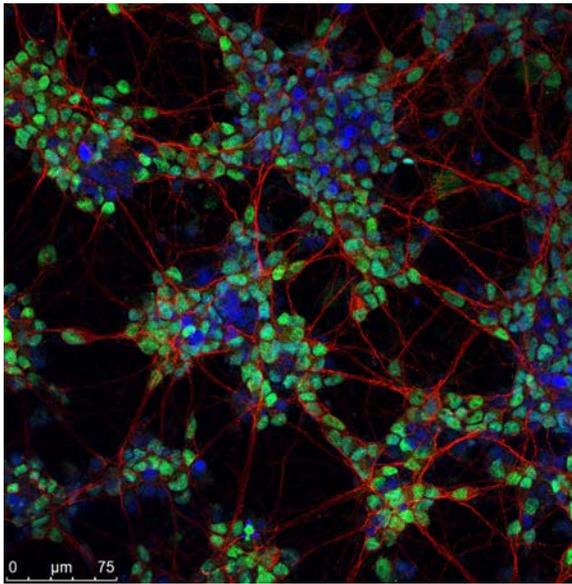


WWW.PHDCOMICS.COM

# The Art of Science

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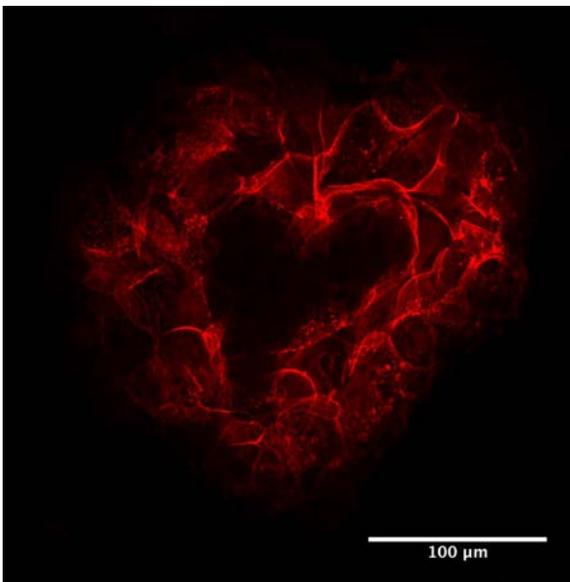
**Title:** The Motor Neuron Network

**Name:** Naemeh Pourshafie

**Advisor's name:** Dr. Kenneth Fischbeck

**Institution and School:** NINDS, GWU

**Description:** Human stem cells differentiated into motor neurons with dendrites and axons (red), HB9 motor neuron marker (green) and DAPI (blue).



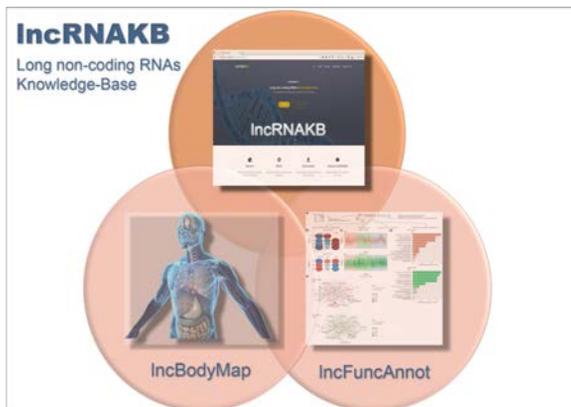
**Title:** Hepatocytes and Cholangiocytes: A Functional Love Affair

**Name:** Samantha Tilson

**Advisor(s):** Ludovic Vallier (University of Cambridge) and T. Jake Liang (NIDDK)

**Institution and School:** NIDDK/University of Cambridge

**Description:** Beta Catenin staining of a 3D co-culture of iPS-derived hepatocytes and cholangiocyte organoids. This image happened to have been taken on the day before Valentines Day which, given its shape, seemed quite serendipitous.



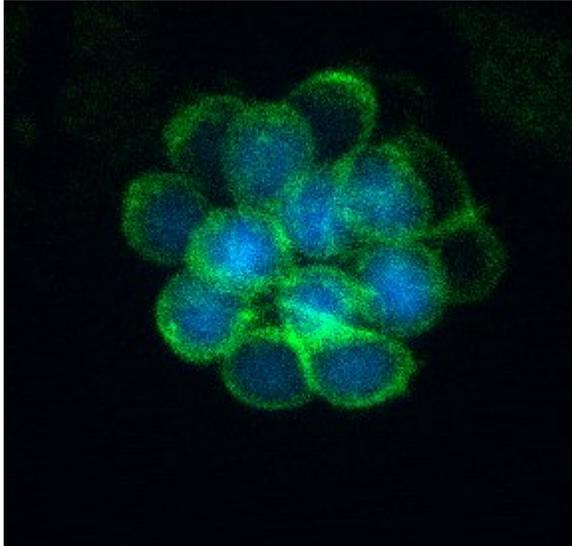
**Title:** Tri

**Name:** Fayaz Seifuddin

**Advisor:** Mehdi Pirooznia

**Institution and School:** NHLBI, George Mason

**Description:** This figure shows the utility of bioinformatics analyses and integrative genomics approaches to enhance biological research. It highlights the development of a web application knowledge-base on long non-coding RNAs (IncRNAKB) which integrates high throughput RNA sequencing data across the human body and uses bioinformatics tools to functionally annotate and characterize lncRNAs.



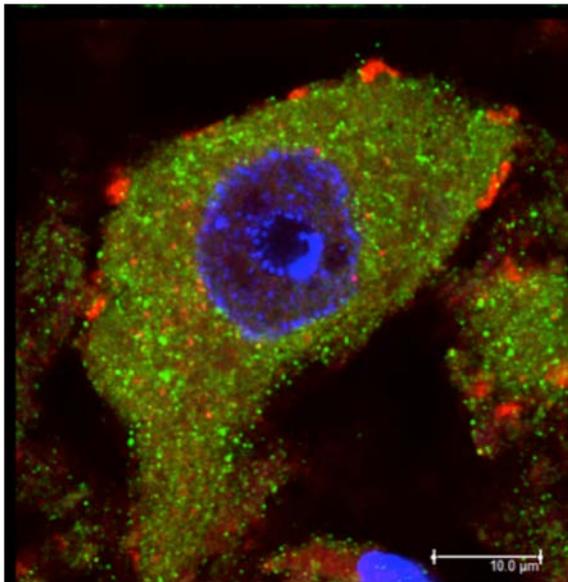
**Title:** Neomycin-Texas Red Distribution Within a Zebrafish Neuromast

**Name:** Daria Lukasz

**Advisor:** Katie Kindt

**Institution and School:** NIDCD, Johns Hopkins

**Description:** My project is examining susceptibility to neomycin in zebrafish hair cells. This image shows young hair cells labeled with DAPI, to be identifiable later in a study of how cell age correlates with neomycin resistance.



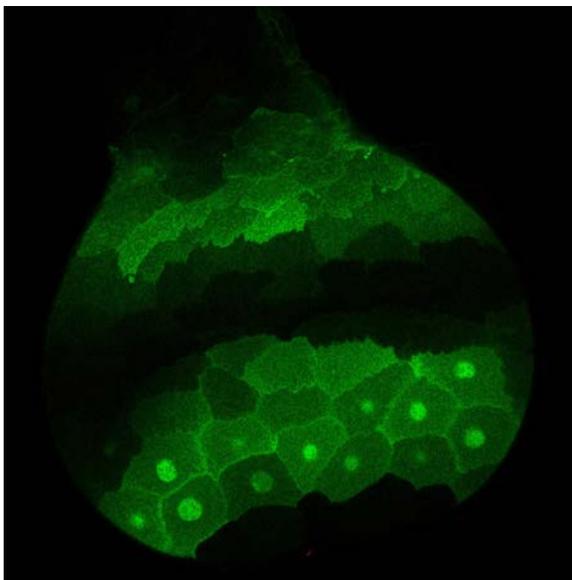
**Title:** The Green Galaxy

**Name:** Naemeh Pourshafie

**Advisor's name:** Dr. Kenneth Fischbeck

**Institution and School:** NINDS, GWU

**Description:** Adeno associated virus-mediated delivery of mircoRNA expression cassette (GFP) to mouse motor neurons, ChAT motor neuron marker (red) and DAPI (blue).



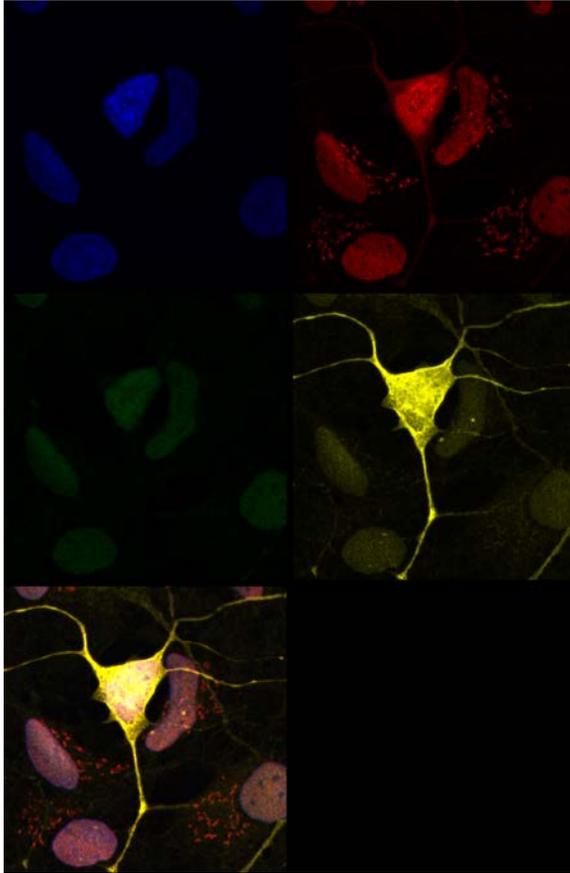
**Title:** To eat or not to eat

**Name:** Justin Rosenthal

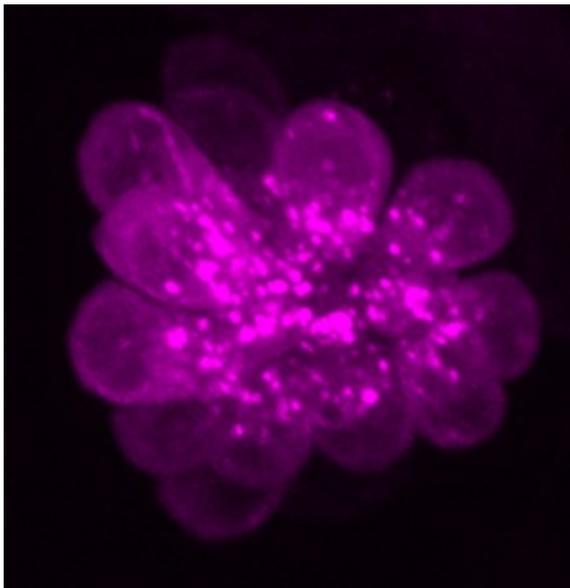
**Advisor:** Quan Yuan

**Institution and School:** NINDS, University of Maryland-College Park

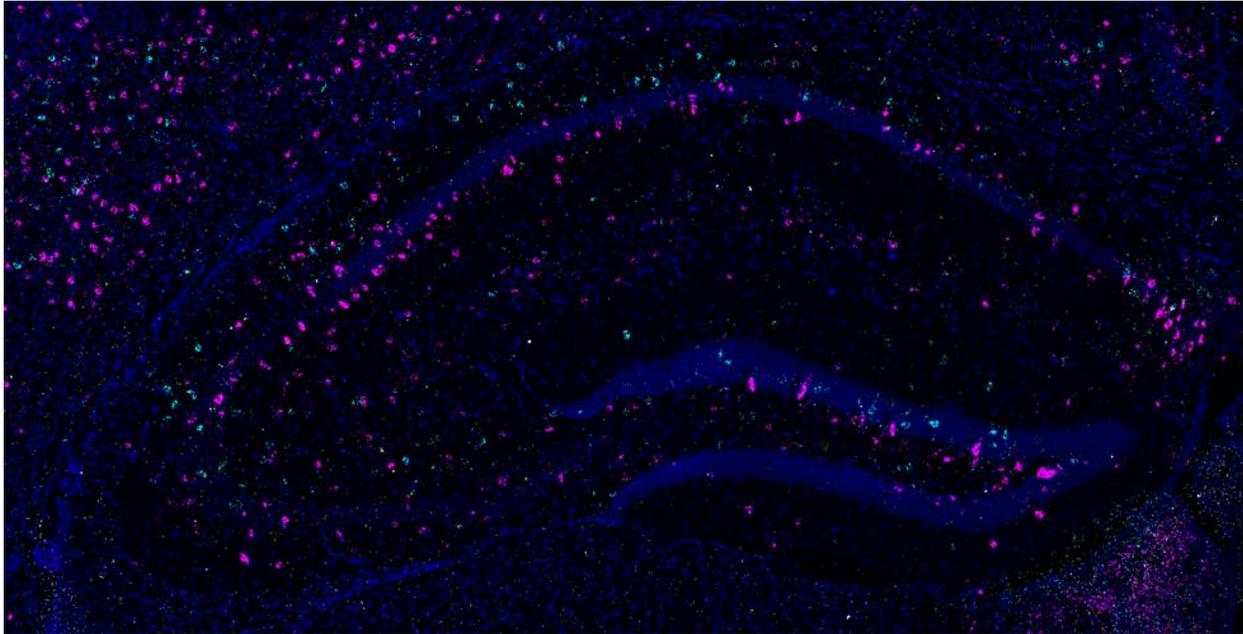
**Description:** Proventriculus of *Drosophila* larval GI tract (confocal image from non-specific autofluorescence).



**Title:** The Spinal Motor Neuron  
**Name:** Naemeh Pourshafie  
**Advisor's name:** Dr. Kenneth Fischbeck  
**Institution and School:** NINDS, GWU  
**Description:** A spinal motor neuron derived from human stem cells with dendrites and axons (yellow) and mutant protein aggregates (red) among undifferentiated stem cells.



**Title:** DAPI Staining of a GCaMP Transgenic Zebrafish Neuromast  
**Name:** Daria Lukasz  
**Advisor:** Katie Kindt  
**Institution and School:** NIDCD, Johns Hopkins  
**Description:** My project is examining susceptibility to neomycin in zebrafish hair cells. This image shows how fluorescent neomycin fills hair cells before killing them.



**Title:** Expression of Schizophrenia-related ERbB4 splice variants in the hippocampus

**Name:** Larissa Erben

**Advisor:** Andres Buonanno

**Institution and School:** NIDCD, University of Bonn

**Description:** The figure illustrates hybridization to a hippocampal section using a novel sensitive *in situ* hybridization fluorescent approach that detects, at a single cell level, small differences between alternatively spliced transcripts. The figure shows the expression of four differentially spliced isoforms of the Neuregulin receptor ErbB4, which is altered in the prefrontal cortex of schizophrenia patients, in hippocampal GABAergic interneurons. The panel is comprised of pseudo-colored hybridization overlays obtained with single probe-pairs targeting unique exon\exon junctions corresponding to either JMa (*white*), JMb (*magenta*), CYT-1 (*green*) or CYT-2 (*cyan*) ErbB4 isoforms.

# The GSChronicles Team

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## Want to contribute?

We are looking for content for the next Chronicles issue!

**Artwork:** Have a doodle, comic, or drawing?

**Creative Writing:** Write poetry, short stories, or essays and looking for somewhere to disseminate your work?

**Student Spotlight:** Introduce yourself to your fellow grad students by writing a short blurb about yourself and your experience at NIH.

**Research:** Have some cool research you recently published or presented?

Send your art, writing,  
publications, awards, and  
graduation announcements to  
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