Genetics & Epigenetics Newsletter 2019

THE UNIVERSITY OF TEXAS MDAnderson Cancer Center

Graduate School of Biomedical Sciences

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Genetics & Epigenetics 2019 Program Retreat

November 8-9, 2019

The San Luis Resort Galveston, TX

The greatest export of scientists: A child-like way of seeing the world

by **Michael Galko, PhD** Professor, Department of Genetics, MD Anderson

Childhood is often described as a time of wonder. I grew up on the Rhode Island shore in the seventieswell before helicopter parenting was invented.

It was a feral youth- with long stretches of time spent floating barefoot on a small rowboat on the tidal salt ponds of the Rhode Island shore. I spent day after day essentially doing one thing with my brothers and cousins- exploring and watching the world around us. We observed fish of many types; green crabs and blue crabs; seaweed; shorebirds; the pond itself, its tides and sand bars and shifting

channels. If asked then what I wanted to be when I grew up I probably would have invented something standard- but in reality I wanted what I already had-to spend my days interacting with and observing the world. What I enjoyed was simply looking at things and trying to understand them.

"Often, the scientific capacity for wonder infuses other aspects of our lives." As a teenager my family moved to Texas. My high school chemistry and biology teachers taught challenging classes that sparked my first interest in science. When I went to college I had no idea what it

might mean to be a scientist for a profession. I had a vague idea of becoming a marine biologist- it seemed like it might be similar to my youthful days fishing, swimming, and avoiding chores. Because I was starting to think about a life in science my collegiate cell biology professor recommended a thick book-"The Eighth Day of Creation" by Horace Freeland Judson. This history of the early days of molecular biology outlined, often through the correspondence of the participating scientists, the discovery of DNA structure and the experiments that unraveled the

central dogma of genetic inheritance: DNA > RNA
> Protein. I was fascinated by this new "indirect"
way of interrogating the world through experiments that could be interpreted as favoring or ruling out a hypothesis.

Laboratory courses in college got me even more excited by science. Looking down a proper microscope for the first time at various types

of cells was, simply put, a revelation. Just like fish or other animals, you could identify cells by the way they looked and how they grouped themselves with respect to their neighbors. There were square cells packed like bricks (epithelia), round cells that wandered alone (macrophages), and spindly cells that reminded of a tangled electrical power station (neurons). I was hooked and for the first time in my life I thought- here is something worth doingspending my days looking through a microscope and determining how these different cells behave and fit themselves to the microscopic world about them. It seemed like becoming a scientist

would allow a rare luxury- to continue looking at the world in wonder even as an adult.

When I think of my colleagues, my past students and postdocs, and myself, there are many

superficial qualities that distinguish us. How we grew up. Where we trained. Who originally inspired us to go into science. This has led to a diversity of scientific topics that inspire us- DNA

Illustrations by Melinda Soeung

Continued on page 11

From the Director's Desk...



When we think of what makes for a strong graduate program it is hard to know where to start - there are many qualities that make a difference. But, one essential element is the people who promote the scientific careers, as well as individual welfare, of our graduate trainees. Our students are in turn at the center of who we are, and make possible lasting research advances. G&E has a large faculty spread across multiple departments within MD Anderson and UTHealth. It benefits from

the amazing folks at the GSBS, as well as in other parts of our institutions, such as those who contribute as postdocs (e.g. who often engage in dayto-day mentoring of students), staff (e.g. enabling the organization of student events and travels), and those in administration (e.g. providing funding of our graduate school and its programs, and procuring visas).

An aspect of G&E that you will notice is the level of graduate student involvement in pulling together and running many educational events, from monthly student seminar series to major annual program retreats and symposia. We take this as a sign that we are on the right track, and would welcome newly arriving and curious trainees to reach out and participate in G&E scientific exchanges during their first and hopefully following years, as well as social and outreach events, with some such events being mentioned or highlighted in this newsletter.

Feel free to turn to one of us, or the G&E website or social media, to learn of our emphasis upon exploring fundamental biological questions. In brief, our laboratories address the mechanisms that drive cancer as well as other pathologies, or alternatively, that enable normal development or homeostasis. Because the G&E program stands out in applying multiple animal model systems, it has the potential to offer additional depths of insight, as well as fun through collaborations (e.g. we work with mice, primary or cultured cell lines, zebrafish, C. elegans/ nematodes, Xenopus laevis/ frogs, yeast, bats and more). In brief, we foster a collegial and interactive environment in which students develop their experimental reasoning, communication and networking skills, while they mature their core scientific knowledge.

While we live in a world where there are many opportunities for graduate students at an early stage, there may also be some uncertainties. For example, a sizable portion of incoming graduate students are curious about academics and at the same time other areas, such as biotech/ pharma, scientific policy, intellectual property and more. How does one prepare oneself, or decide between such multiple interests? While no one answer will suffice, the last sentence of the prior paragraph is what G&E aims and hopes to achieve while a trainee is with us. G&E

places emphasis on the regular mentoring of trainees through student committees, in combination with other experiences. For example, we encourage participation in national meetings and courses, as they expand one's network and will help place your contributions in the context of the field.

Finally, even with a strong environment and group of colleagues, so much of one's experience remains up to each of us as individuals. In our Texas Medical Center with its wealth of institutions, a rich array of potential collaborators awaits you, and as importantly, idea-providers that could enhance the impact of your research or otherwise further your training. While it may require your resolve to step away from one's comfort-zone on a weekly basis to attend lectures or read articles in diverse scientific areas, G&E will try to insist you do so. Such unexpected outside viewpoints, or perhaps new approaches introduced, will push your thesis work forward, or help you think about career stages following your time in graduate school.

We will end by thanking all those inside and outside of G&E who help make our community what it is – it takes a village! ;).

Pierre McCrea, PhD

G&E Program Director Professor, Department of Genetics MD Anderson Cancer Center

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Illustrations not credited are by Pranavi Koppula (except the plane).



New Students Joining the G&E Community



L-R: Tanner Wright (Dr. Mark Bedford), Melissa Frasca (Dr. Francesca Cole)



L-R: Frederick Robinson (Dr. Giulio Draetta), Ahmed Emam (Dr. Bin Wang), Jace Aloway (Dr. Richard Behringer), Raisa Reyes Castro (Dr. Swathi Arur), Mabel Perez-Oquendo (Dr. Don Gibbons)

Not Pictured: Han Bit Baek (Dr. Swathi Arur), Archit Ghosh (Dr. Kunal Rai), Diana Machado (Dr. Richard Behringer), Sreepadha Sridharan (Dr. Vidya Gopalakrishnan), Amber Thomas Gordon (Dr. Jan Parker Thornburg), Hanghui Ye (Nicholas Navin), Jie Ye (Dr. Jianjun Zhang)



Welcome New G&E Faculty!

Yejing Ge, PhD
Assistant Professor, Department of Cancer Biology,
MD Anderson
Research Interests: Understanding stem cell
lineage plasticity in skin wound repair,
cancer & aging.



Edwin Ostrin, MD, PhD

Assistant Professor, Department of General Internal Medicine, MD Anderson **Research Interests:** Lung premalignancy, lung cancer development, immune-tumor cell interaction.



Jun Wang, PhD

Assistant Professor, Department of Pediatrics, McGovern Medical School, UTHealth **Research Interests:** Molecular regulation of head and heart development, diseases and regeneration.



Wantong Yao, MD, PhD Assistant Professor, Department of Translational Molecular Pathology, MD Anderson Research Interests: Pancreatic cancer translational research: cancer biology, immunology & pathology.



Jianjun Zhang, MD, PhD

Assistant Professor, Department of Thoracic/Head & Neck Medical Oncology, MD Anderson **Research Interests:** Tumor heterogeneity and molecular/immune evolution of lung cancers and precancers.

Class of 2019

Hsueh-Ping Chao, PhD (Advisor: Dr. Dean Tang) Thesis: Integrative bioinformatic approaches to elucidating prostate cancer cell heterogeneity plasticity and treatment response Data Scientist, Pheramor/Business Development Assoc, MyBioGate

Kevin Farquhar, PhD (Advisor: Dr. Gabor Balazsi Thesis: The role of gene expression noise in mammalian cell survival *Position to be decided*

Aimee Farria, PhD (Advisor: Dr. Sharon Dent) Thesis: GCN5 loss impacts MYC-driven cancer in mice and human cells *Postdoctoral Fellow, MD Anderson (Dr. Sharon Dent)*

Rhea Kang, PhD (Advisor: Dr. Francesca Cole)

Thesis: Higher order chromosome organization and recombination dynamics of meiotic prophase I in mouse spermatocytes *Postdoctoral Fellow, MD Anderson Cancer (Dr. Francesca Cole)*

Uyen (Mimi) Le, PhD (Advisor: Dr. Ann Killary) Thesis: The role of tumor suppressor DEAR1 in the acquisition of mammary stem/progenitor cell properties *Research Laboratory Manager, Emory University School of Medicine, Atlanta, GA*

Kenneth Trimmer, PhD (Advisor: Dr. Swathi Arur) Thesis: Plasticity of C. elegans germline stem cells under nutritional and metabolic stress Postdoctoral Fellow, MD Anderson (Dr. Swathi Arur)



Sarah Wu, MD,PhD (Advisor: Dr. Elsa Flores) Thesis: Investigating the role of the p63 Isoform \triangle NP63 in lung stem cell populations and lung cancer

Anatomic Pathology Resident, Brigham and Women's Hospital, Boston, MA

Zhenna Xiao, PhD (Advisor: Dr. Li Ma) Thesis: Deubiquitinating enzymes promote cancer

Thesis: Deubiquitinating enzymes promote cancer progression and metastasis via regulating protein stability *Postdoctoral Fellow*

Yongming Xue, PhD (Advisor: Dr. Xioabing Shi)

Thesis: Role of P300 ZZ domain in chromatin association and histone acetylation Postdoctoral Fellow, MD Anderson (Dr. Cassian Yee)

Ruoji Zhou, PhD (Advisor: Dr. Dung-Fang Lee) Thesis: Modeling cancer using Li-Fraumeni syndrome patient-derived induced pluripotent stem cells *Position to be decided*



G&E Alumni Success





Valerie Reinke, PhD

Professor of Genetics, Yale School of Medicine PhD 1996 Advisor, Dr. Gigi Lozano valerie.reinke@yale.edu

Describe your current role and job responsibilities.

I am a professor in the department of Genetics at Yale University, in the

School of Medicine. I am a PI and run a lab focused on genetic and epigenetic regulation of gene expression in the germ cells of C. elegans. I also am a director of an NIH training program that directly supports 14 students annually, along with other students affiliated with the program. Finally, I am vice-chair of the department and am responsible for several departmental programs and initiatives.

What is your favorite GSBS memory?

I'm not sure I have one entertaining or pertinent memory of the GSBS in particular, except perhaps winning a poster award during a GSBS event, which I was quite proud of at the time! However I will say that one of the amazing things about the GSBS, that we all took for granted at the time, was how much the faculty and administration were committed to providing the best possible graduate education. With perspective, I can really appreciate how well-prepared my fellow students and I were for all that lay ahead!

Describe your career path since completing your Doctorate.

I have taken a pretty standard academic trajectory. I completed my PhD in 1996, but stayed in Gigi Lozano's lab for about 18 months as a postdoc while I figured out my next step. Then I took a postdoc position at Stanford in Stuart Kim's lab, where I was the first to adapt microarray technology - cutting edge at the time - to C. elegans. In the fall of 2000, I joined the faculty at Yale as an Assistant Professor, where I have stayed ever since. I received tenure in 2010 and became a full professor in 2016.

Which part of graduate school training has become your biggest strength at your current position?

It definitely was having Gigi Lozano as a role model. I learned firsthand from her that if the science came first, everything else would follow. I was pretty much a blank canvas, so I first had to learn from her the specifics about how to properly conduct an experiment, implement proper controls, and set rigorous standards and expectations for the quality of the work. But then I also watched how Gigi strategized papers and grant funding, and mentored lab members. I use so much of what I learned from these early observations every day in all the different aspects of my own career.

Which is you favorite hangout spot in Houston?

I would have to say that it was Chuy's or maybe Valhalla, the grad student pub on Rice Campus. Does that still exist? On Friday afternoons, they would have 25 cent beers, and we would sit on the lawn and drink swill and talk science.

With your experiences so far, what advice would you give to current graduate students?

One thing I tell students is that time is the enemy. At the beginning of graduate school, it seems like you have forever, but there's so much to do and time speeds by. Plan your experiments wisely, and keep in mind short term and long term objectives, both in the lab and for your career. Good organization is your best friend! You'll spend less time failing, more time progressing, and your attitude will stay more positive. Also, seek out the resources you need, both scientifically and personally. Grad school is hard, and we all need support at one time or other.



Erin (Williams) Lopez, PhD

Medical Science Liaison, Biofrontera PhD 2018 Advisor, Dr. Andrew Gladden erinwlopez@gmail.com

Describe your current role and job responsibilities.

I am a Medical Science Liaison (MSL). I provide medical & scientific support to healthcare professionals. I also serve

as liaison between clinical investigators and the company, and provide scientific support to managed market experts.

What was your transition from graduate School to Industry like?

I utilized my time during graduate school to not only finish my dissertation but prepare for the MSL role. This allowed a smooth transition into the MSL role since it is very different than graduate school. I prepared by networking with people currently in the role and discussing with them the knowledge and experience I should try to cultivate before I applied to the position.

What is your favorite GSBS Memory?

During my first year in graduate school, my class put together a table for Science Outreach night on chemistry. We taught everyone how to make ice cream utilizing the energy of ice melting to freeze the milk with salt. It was a great experience to see kids excited about science. The annual G&D (G&E now) retreats were also a lot of fun and something I look back on fondly.

Which part of graduate school training has become your biggest strength at your current position?

In my current role, I present to a wide variety of audiences with different scientific backgrounds, so having the ability to learn and practice presenting in graduate school was important. It made my presentation skills one of my biggest strengths when I obtained my MSL position and may have been one of the reasons I got the job in the first place!

What is your favorite hangout spot in Houston?

While I don't get a chance to go there frequently anymore, I loved hanging out at Valhalla with the other graduate students. Cheap beer and great conversation, what is not to like?

Did you have any internships/pre-professional experiences while at GSBS? If yes, please describe them in short.

I didn't have any formal internships or pre-professional experiences but I did network with a large number of people that were current MSL'ers. I also was able to shadow a physician doing Phase I and investigator initiated trials. Both of these experiences were critical to get my job.

G&E Alumni Success

With your experiences so far, what advice would you give to current graduate students?

If you want to transition to industry, don't wait until you are graduating to look for opportunities to learn about the job you want to do. Utilize all the time you have during graduate school and the resources available at your fingertips to help give you a head start. It may help circumvent a transitionary role and allow you to go straight into your dream job.



Avinash Venkatanarayan

Postdoctoral Research Fellow, Genentech, Inc PhD 2015 Advisor, Dr. Elsa Flores a.venkatanarayan@gmail.com

Describe your current role and job responsibilities.

I am Postdoctoral Fellow in the MAPK Signaling lab, in the Dept. of Discovery

Oncology at Genentech, Inc. where I lead my own independent research project. Most post-doctoral projects at Genentech are early discovery and target ID validation projects. Post-docs specifically pursue basic science projects to enable publications, which could eventually fit into the company's portfolio and drug pipeline. As a post-doc, I am trained to function independently and establish collaborations that cross functionally across departments and also with other postdocs. The postdoc program at Genentech is a highly competitive 4-5 year program that trains one to either go back to academia or pursue a career in industry.

What was your transition from graduate School to Industry like?

Mine was relatively smooth thanks to Genentech for continuing to promote a very academic and collaborative environment, and also because of my training at MD Anderson. A few things I've Iearnt in industry is that collaborations with other academic labs or even shared reagents/resources like Addgene are not available. We have to either make everything on our own or buy them. Thankfully, at Genentech we have an excellent infrastructure to make everything we need to accelerate your research. The second thing I thought was interesting was access to financial freedom. Since we do not depend on funding from external sources, we can buy/ outsource anything to support our research without any questions. The idea being "time is money. I've also started to understand that projects keep moving really fast and deadlines are key.

What is your favorite GSBS Memory?

I had an amazing time as a graduate student at GSBS. I have many fun memories, but one that still makes me laugh was a skit I was in during the entertainment session at one of the G&D retreats.

Which part of graduate school training has become your biggest strength at your current position?

At first, I was unsure what I had signed up for as graduate school seemed quite daunting. I was in the largest medical center surrounded by the brightest minds. I was trained as a developmental biologist using flies as a model organism. In fact, 2 out of my 3 rotations were in fly labs. But, I decided to take a risk and joined Dr. Elsa Flores' lab to work on mouse genetics and particularly to delineate the role of p63 and p73 transcription factors in human cancers. Dr. Flores was an amazing mentor, who always encouraged me to "think big" and ask the important questions and take risks. My thesis project was high-risk but I had the support of an excellent thesis committee which eventually resulted in

an excellent publication. A few things I learnt from my mentor, which I still try to practice and it's not easy, was to stay focused, motivated and never give-up. I did not take a very traditional approach in my post-doctoral career, but I took a risk to pursue very much academic research in industry with a hope that some of our discoveries could be translational and one day impact people's lives.

What is your favorite hangout spot in Houston?

I really enjoyed the food scene in Houston and used to write a Houston restaurant blog. Two places that make me remember my friends and lab members from graduate school are 1) Our happy hour trips to Valhalla at Rice University and 2) Hugo's Mexican Restaurant.

Did you have any internships/pre-professional experiences while at GSBS?

Unfortunately, I did not. I think an internship could be a great opportunity as it could help one find a post-doc position or even the next job, and it doesn't need to be limited to industry. It can be a training period with another university lab to learn or apply a new technique. Most SF Bay Area schools like Stanford, UCSF and UC Berkeley, encourage their graduate students to pursue internship opportunities in the summer. I think they increase the visibility for the students and also the program/ school.

With your experiences so far, what advice would you give to current graduate students?

My mentor, Dr. Elsa Flores, always stressed the importance of publishing in a good journal. I continue to believe that publishing is the key to visibility in the Biomedical field. It's important to really start drafting a story early and try to do only the most important experiments to answer the gaps. This process will definitely accelerate your timeline to graduation. It's important to have a productive training period and not necessarily a long one. Also, I continue to think of my role models at different stages of my scientific career. I was lucky enough to be mentored by highly-motivated women scientists from my Master's through my post-doctoral training. They helped me stay focused and motivated during times when your hypothesis fails and when you need to start all over again.



Sandeep Dayal, PhD Health Science Policy Analyst, NIH PhD 2004 Advisor, Dr. William Klein

sandeep.j.dayal@gmail.com

Describe your current role and job responsibilities.

I am a Health Science Policy Analyst in the Office of Scientific Program and Policy Analysis (OSPPA) at the

National Institute of Diabetes & Digestive & Kidney Diseases (NIDDK) at the NIH, focusing on kidney disease research. I manage a variety of projects critical for advancing NIDDK's mission, often through writing documents and materials for the lay public, Congress, the White House, professional societies, and the research community. My job functions include: writing/coordinating NIDDK's contribution to the President's Budget; responding to Congressional inquiries; coordinating production of NIDDK's annual report; monitoring legislation; and assisting the NIDDK Director when issues arise that require scientific expertise and analysis.

G&E Alumni Success

Sandeep Dayal, continued

Describe your Career Trajectory so far.

While at GSBS, I was planning for an academic career. However, early in my postdoctoral fellowship, I began to realize that academia wasn't the right path for me. I networked extensively to explore career options, and realized that science policy fits my strengths and interests (e.g., written and interpersonal communication, thinking broadly about the research enterprise, politics, strategic thinking). As a postdoc, I looked for every opportunity to gain as much experience as I could in non-scientific writing and leadership. These experiences greatly strengthened my CV; I applied for and was offered the position in NIDDK's Office of Science Policy. Importantly, networking was critical in the process--I might not have seen the job ad if a networking contact had not alerted me to it.

What is your favorite GSBS Memory?

Wow--so many great memories to choose from! I guess I'll cheat and list two. The first would be the G&D retreats! They were just so stimulating and so much fun. They gave us a chance to talk about our research, learn about latest scientific developments in G&D labs, and get to know the faculty better and in a different way. But it was also (of course) a chance to hang out with friends! So much fun. The second memory might be a cliche--it was the day I successfully defended my dissertation. My committee didn't make it easy, but I will never forget that feeling of pride and accomplishment when it was done. It was quite a thrill.

Which part of graduate school training has become your biggest strength at your current position?

I think the many opportunities to give talks--seminars, journal clubs, etc.in graduate school were critical for developing the communication skills that have been incredibly useful in my current position. Since leaving GSBS, I have met fellow scientists who trained at many other universities, and it's clear to me that few places offer the same opportunities that I had in the G&D program. Of course, a solid research background is really important for a career in science policy, but many places can also offer that. The opportunities outside of the laboratory in the G&D program at GSBS provided "transferable skills" that really gave me an edge in getting my job and excelling in the position.

What is your favorite hangout spot in Houston?

I really enjoyed hanging out at The Ginger Man--love that place.

Did you have any internships/pre-professional experiences while at GSBS? If yes, please describe them in short.

I didn't have any official internships, but I did gain a number of preprofessional experiences while at GSBS. I was the President of the GSBS Graduate Student Association, I visited local elementary schools to talk about science as part of an outreach effort, I co-founded a journal club, and I demonstrated cool science experiments to high school students as an MD Anderson goodwill ambassador. Looking back, I realize that my strong interest in these types of activities were hinting at an interest in policy. They also helped me gain policy and leadership experiences that were critical for developing my career.

With your experiences so far, what advice would you give to current graduate students?

A few pieces of advice. First, talk to everyone you can to help you figure out which career path is best for you. Second, take time out of your (admittedly busy) schedule to develop skills outside of the lab. For some career paths, publishing one extra paper or in a journal with a slightly higher impact factor is less important than demonstrating other transferable skills. Focus at least some time and effort in career development as soon as possible. Finally, have fun and make memories! Graduate school was one of the most enjoyable times of my life. Some of the people around you now will be your lifelong friends, colleagues, and network contacts. It's the people of GSBS,--students, faculty, and administration--that make it a truly special place!

Genetics & Epigenetics Annual Event Round-Up



G&E Monthly (GEM) Seminar Series

Launched in January 2019 by students Amelie Albrecht and Sydney Moyer, our monthly seminar series features two 20-minute seminars by students on their thesis research, with plenty of time for Q&A. GEM is the second Thursday of the month at noon (pizza served!). Students, faculty, postdocs & research staff are encouraged to attend. Rhiannon Morrissey and Amelie Albrecht are the coordinators now.

G&E Celebrates the Year of the Pig

In February, we celebrated the Year of the Pig with the Quantitative Sciences Program. Program lab members enjoyed a delicious spread of lunar new year treats, origami-making

and Chinese

Thanks to

Hieu Van and

Yingdi Ma for

planning this

fun event.

calligraphy.



Shuo-Ting Yen demonstrates Chinese calligraphy with Malcolm Moses



Organizers Hieu Van & Yingdi Ma celebrate the Year of the Pig

Genetics & Epigenetics Annual Event Round-Up



Students at lunch

G&E Spring Career Symposium

This year's annual spring symposium focused on career exploration and development. It was held in April at MD Anderson's Science Park campus in Smithville, Texas, home of the Department of Epigenetics and Molecular



December 2018 Directors Roundtable

hear the latest program news, ask questions, discuss any concerns, and mingle with each other and the directors.



L-R: Dr. McCrea, Dr. Chen, Safia Essien, Sydney Moyer, Jovanka Gencel Augusto, Odemaris Narvaez del Pilar, Sreepradha Sridharan

G&E Summer Ice Cream Social & Cookie Decorating Contest

G&E directors and students scooped at our annual ice



cream social in July. Event organizers pictured above with program directors.







Histone Riders Band

2018 Showcase

program suggestions,

Microscopy by Vanja Stankic, 2018 Showcase

Koppula, 2018 Showcase

G&E Arts Showcase

Each year, we put on an Arts Showcase to celebrate the artistic talents within the G&E program community, featuring visual arts, musical performance, poetry reading and culinary arts. The 2019 showcase will be September 10th (see page 11).

Gencel Augusto (co-chair), Amelie Albrecht and Jianji Chen, the allday, highly interactive event featured presentations and roundtables

with scientists representing diverse careers paths, plus opportunities to interact with G&E faculty.

Carcinogenesis. Organized by Alexandria Blackburn (co-chair), Jovanka

2019 G&E Career Symposium



Symposium organizers with Dr. Shadding



L-R: Dr. Behringer, Malcolm Moses, Dr. Galko, Dr. McCrea

Moses won the G&E People's Choice award (holding certificate). We thank our judges, Dr. Georgios Karras, Amanda Minogue & Rebecca Deen, and our emcee, Lisa Gower.

G&E Elevator

Students & faculty at career roundtable

Speech Contest

In May, G&E had its first elevator speech contest. 10 students gave lively 90 second speeches, in lay terms, about their research. First Place winner, Tanner Wright, represented G&E at the GSBS Graduate Student Research Day elevator speech finals in June. Malcolm

2018 G&E Retreat Round-Up



G&E Program Retreat 2018

The annual G&E retreat was held September 22-23, 2018 at La Torretta Resort on Lake Conroe. Program students, faculty and other trainees gathered together for

two-days of student talks, posters, and scientific and social exchange. Dr. Scott Armstrong, from the Dana Faber Cancer Institute gave the keynote address on Targeting Epigenetic Mechanisms in Cancer. The retreat also included scientific talks by students, giving them a chance to hone their presentation skills. Over 45 posters describing G&E trainees' research were on display encouraging stimulating scientific discussions and perspectives. The retreat also included an evening entertainment session that saw Dr. Georgios Karras lead his team to win a science version of the Taboo game. The entertainment wrapped up with a lively round of karaoke sung by students and faculty together. In the morning, we had a fun round of "Biology 'Field' Games" in-between scientific sessions. The retreat was organized by a student panel chaired by Sara Martin and Roxsan Manshouri with tremendous help and support from the G&E Directors, Elisabeth Lindheim and Becky Brooks. Check out the oral presentation and poster presentation winners in the Student Awards section on page 11.



Poster and platform winners with directors























Student Publication Highlights



G&E students from Giulio Draetta's lab, **Alex (Chieh-Yuan) Li and I-Lin Ho**, published their research in Cell Reports demonstrating how clonal complexity can be leveraged to identify a gene signature that predicts chemoresistance in pancreatic cancer. Using molecular barcoding (an inheritable genomic label), they demonstrate that in-vitro cultures and in-vivo tumors are maintained by a common set of tumorigenic cells that can be used to establish clonal replica tumors (CRTs) in mouse models. Using the CRTs, they identify a unique gene signature associated with chemotherapy resistant lineages. In theory, this study's output can be tailored to identify personalized medicine and therapy regimens to treat various types of cancer.

Seth, S, Li, C Y, Ho, I L, Corti, D, Loponte, S, Sapio, L, ... & Karpinets, T (2019). Pre-existing Functional Heterogeneity of Tumorigenic Compartment as the Origin of Chemoresistance in Pancreatic Tumors. Cell reports, 26(6), 1518-1532.

Rhea Kang, a G&E alumnus from the Cole lab, published her research in Nature Structural Biology. She used Hi-C on synchronized mouse spermatocytes in both early and late prophase of meiosis to reveal how chromosomes are reorganized to simultaneously support homolog pairing, synapsis as well as transcription at various sites. Results from her study provide evidence that chromosome associated cohesion complexes integrate into the chromosomal axis to serve as a platform form recombination by forming a stable loop array. The research also suggests the formation of 'hubs' of highly transcribed loci driven by transcription during pachynema. The study also lays down a detection strategy to define the physical parameters of homolog pairing as a cell progresses through prophase.



Patel, L, **Kang, R**, Rosenberg, SC, Qiu, Y, Raviram, R, Chee, S, ... & Corbett, KD (2019). Dynamic reorganization of the genome shapes the recombination landscape in meiotic prophase. Nature structural & molecular biology, 26(3), 164.



Alex Blackburn, a 4th year G&E student and Xenopus researcher from the Miller lab published her first author paper on congenital kidney and urinary tract defects in Genetics in Medicine journal. Using clinical data and loss-of function studies in Xenopus, her study revealed that pathogenic variants in *DYRK1A*, an important gene in kidney development, could induce intellectual disability-related congenital anomalies of the kidney and urinary tract. Results from her study endorse routine GU screening of individuals with *DYRK1A* variants to ensure optimized clinical management.

Blackburn, ATM, Bekheirnia, N, Uma, V, Corkins, ME, Xu, Y, Rosenfeld, JA, ... & Bekheirnia, MR (2019). DYRK1A-related intellectual disability syndrome: a novel association with congenital anomalies of the kidney and urinary tract. Genetics in Medicine.

G&E student **Jintan Liu** from Giulio Draetta's lab recently published his research in Nature Communications on the use of CRISPR/Cpf1 system to develop a multiplexed, high-throughput screening strategy that minimizes library size while maintaining gene targeting efficiency. Using AsCpf1, an orthologue of Cpf1, Liu et al. constructed the smallest whole genome CRISPR knockout library, the Mini-human, for the human genome that performs well compared to Cas9 libraries. The conventional Cas9-based pooled-libraries are more complex, therefore increasing costs and labor requirements. Therefore, this new multiplexed library has great promise in facilitating further advancement in gene editing technology.

Liu, J, Srinivasan, S, Li, CY, Ho, I-L, Rose, R, Shaheen, M, Wang, G et al. Pooled library screening with multiplexed Cpf1 library.



Dr. c P

Nature communications 10, no. 1 (2019): 3144.

Neeraj K. Aryal, a G&E alumnus from Dr. Guillermina Lozano's lab, published a first author paper in PNAS paper in 2018 uncovering the role of Dicer1 in metabolism and aging. Aryal et al. used a mouse model to demonstrate that posttranslational modification of Dicer1 regulates aging, infertility and metabolic disorders in mammals. *DICER1* mutations are associated with developmental diseases in humans, but not all Dicer1-associated diseases have *DICER1* mutations. Currently, Dicer1 phosphorylation is not being investigated in clinic. Therefore, this discovery has promise in improving understanding and therapeutic development of Dicer1-associated diseases.

Aryal, NK, Pant, V, Wasylishen, AR, Parker-Thornburg, J, Baseler, L, El-Naggar, AK, Liu, B, Kalia, A, Lozano, G, Arur, A. Constitutive Dicer1 phosphorylation accelerates metabolism and aging in vivo. Proceedings of the National Academy of Sciences 116, no. 3 (2019): 960-969.

G&E Student & Faculty Awards 2018-2019



Congratulations to our students for their outstanding accomplishments!

STIPEND SCHOLARSHIPS & FELLOWSHIPS

Andrew Sowell and Wade Huggins Professor and Fellowship

Aimee Farria (Dr. Sharon Dent)

Cancer Prevention Research Institute of Texas (CRPIT) Graduate Scholar Awards Pranavi Koppula (Dr. Boyi Gan) Sara Martin (Dr. Richard Wood)

NIH F31 NRSA Fellowship Danielle Little (Dr. Jichao Chen) Roxsan Manshouri (Dr. Don Gibbons) Lorena Maili (Dr. Jacqueline Hecht)

Schissler Foundation Fellowship Alexandria Blackburn (Dr. Rachel Miller)

Terry and Janet Klebe Fellowship Amelie Albrecht (Dr. Xuetong Shen)

SCHOLARSHIPS, AWARDS & RECOGNITIONS

Alfred G. Knudson Jr. Outstanding Dissertation Award (\$1000) Charissa Kim (Dr. Nicholas Navin)

American Legion Auxiliary Fellowships in Cancer Research (\$5000) Sydney Moyer (Dr. Gigi Lozano)

Andrew Sowell-Wade Huggins Scholarships in Cancer Research (\$5000) Hieu Van (Dr. Margarida Santos) Ruoji Zhou (Dr. Dung-Fang Lee)

Dr. John J. Kopchick Research Award (\$50,000 for one-year of research expenses, intended to provide pilot funding for innovative research projects) Pranavi Koppula (Dr. Boyi Gan)

Dr. John J. Kopchick Fellowship (\$7500 to student and \$7500 research support) Roxsan Manshouri (Dr. Don Gibbons) Sydney Moyer (Dr. Gigi Lozano) Rachel Dittmar (Dr. Subrata Sen) Lalit Patel (Dr. Michelle Barton)

Faculty of Natural Sciences Award, University of Puerto Rico, Río Piedras Mabel Perez-Oquendo (Dr. Don Gibbons) [for accomplishments at GSBS]

Gigli Family Endowed Scholarship (\$5000) Zhenna Xiao (Dr. Li Ma)

Gordon Conferences Sydney Moyer (Dr. Gigi Lozano), Discussion Leader

GSBS Graduate Student Research Day Alexandria Blackburn (Dr. Rachel Miller), First Place Post-Candidacy Poster Award Rhiannon Morrissey (Dr. Gigi Lozano), First Place Pre-Candidacy Poster Award

Linda M. Wells GSBS Outreach Award (\$1000) Rachel Dittmar (Dr. Subrata Sen) Scholarship for Excellence in Biochemistry and Molecular Biology at MD Anderson (\$3000) Melinda Soeung (Dr. Giulio Draetta) Tolkappiyan Premkumar (Dr. Francesca Cole)

Steve Lasher and Janiece Longoria Graduate Student Research Award in Cancer Biology (\$3500) Broppula (Dr. Boyi Can)

Pranavi Koppula (Dr. Boyi Gan)

Tzu Chi Scholarship Award for Excellence (\$1000)

Odemaris Narvaez del Pilar (Dr. Jichao Chen)

G&E PROGRAM AWARDS

G&E Retreat Awards (2018) Pranavi Koppula (Dr. Boyi Gan) - Second

Place, Post-Candidacy Poster Award Danielle Little (Dr. Jichao Chen) - Third Place/Tie, Post-Candidacy Poster Award Roxsan Manshouri (Dr. Don Gibbons) -Third Place/Tie, Post-Candidacy Poster Award Odemaris Narvaez del Pilar (Dr. Jichao

Chen) - First Place Platform Award Melinda Soeung (Dr. Giulio Draetta) - First Place, Pre-Candidacy Poster Award G&E Travel Awards

Safia Essien (Dr. George Eisenhoffer) Aimee Farria (Dr. Sharon Dent) Melissa Frasca (Dr. Francesca Cole) Jovanka Gencel Augusto (Dr. Gigi Lozano) Danielle Little (Dr. Jichao Chen) Lorena Maili (Dr. Jacqueline Hecht) Sara Martin (Dr. Richard Wood) Malcolm Moses (Dr. Richard Behringer) Sydney Moyer (Dr. Gigi Lozano) Odemaris Narvaez del Pilar (Dr. Jichao Chen)

G&E Student Service Awards Alexandria Blackburn (Dr. Rachel Miller) Jovanka Gencel Augusto (Dr. Gigi Lozano) Pranavi Koppula (Dr. Boyi Gan) Danielle Little (Dr. Jichao Chen) Roxsan Manshouri (Dr. Don Gibbons) Sara Martin (Dr. Richard Wood)



G&E Faculty Awards, Recognitions & Promotions 2018-2019

Swathi Arur, PhD Director, Genetics Society of America, 2019-2022 Gordon Research Conference in Developmental Biology, Vice Chair-2021; Chair-2023

Richard Behringer, PhD D. Dudley & Jody White Oldham Faculty Award, 2019

Francesca Cole, PhD President's Recognition of Faculty Excellence Award for Research, Anderson Cancer Wall of Science awardee, The University of Texas MD Anderson Cancer Center

Sharon Dent, PhD Named one of four Women in Science with Excellence (WISE) by BioHouston

Giulio Draetta, MD, PhD Named Chief Scientific Officer of MD Anderson, 2019

Michael Galko, PhD The Thomas Stull Matney, PhD, Endowed Professorship in Cancer Genetics, GSBS

Vidya Gopalakrishnan, PhD President's Recognition of Faculty Excellence Award for Research, MD Anderson

Michelle Hildebrandt, PhD Promoted to Associate Professor, effective September 1, 2019

David Johnson, PhD President's Recognition of Faculty Excellence Award for Education & Mentorship Advancement, MD Anderson

Ralf Krahe, PhD President's Recognition of Faculty Excellence Award for Education & Mentorship Advancement, MD Anderson

Gigi Lozano, PhD The Jack and Beverly Randall Prize for Excellence in Cancer Research EE Just Award, American Society of Cell Biology

William Mattox, PhD Named to Academy of Health Science Education, MD Anderson Cancer Center

Pierre McCrea, PhD The University of Texas System Board of Regents' Outstanding Teaching Award

Rachel Miller, PhD Junior Faculty Award, Society for Developmental Biolo

Junior Faculty Award, Society for Developmental Biology 78th Annual Meeting and Woods Hole

Nicholas Navin, PhD Dallas/Fort Worth Living Legend Faculty Achievement Award in Basic Research President's Recognition of Faculty Excellence Award for Research, MD Anderson

Richard Wood, PhD President's Recognition of Faculty Excellence Award for Research, MD Anderson

News & Announcements



Becky at her retirement party with students Melissa Frasca, Jianji Chen, Amelie Albrecht, and Aimee Farria with her 3 sons.

Becky Brooks Retires & Rebecca Deen Joins G&E

Becky Brooks, long-time Science Park Program Coordinator for the Epigenetics and Molecular Carcinogenesis Graduate Program, and for G&E since 2017, retired in January. We thank Becky for providing outstanding support during the 20+ years she worked with Science

Park students and coordinated their PhD program. Becky used to say that taking care of 'her' graduate students was the part of her job she loved the most. For six years, she and Elisabeth Lindheim managed the annual program retreats together. "I was very fortunate to plan and run retreats with Becky, and thank her for her fantastic, unflappable help. We were a great team", said Elisabeth.



Rebecca Deen, new G&E Coordinator at Science Park

New G&E Scientific Writing Course Directors

The G&E fall writing class focuses on writing scientific papers with a particular spotlight on writing a review in the area of the student's thesis research. In Fall 2019, Drs. Vicki Huff, Jan Parker-Thornburg and Siddharth Prakash take over from Drs. Richard Behringer and Rachel Miller who developed and taught the class the last few years. Of note, nine review articles started in their class have since been published in peer-reviewed journals.

Fall Events & Opportunities



G&E & Neuroscience Arts Showcase – September 10, 2019

Our annual Arts Showcase, held jointly with the Neuroscience Program this year, is September 10th at 4:00p in Onstead Forum. The showcase celebrates the artistic talents in our graduate program communities, and will feature a visual arts exhibition, musical performances, poetry reading and culinary arts. Organizers are Han

Bit Baek, Pranavi Koppula, Melinda Soeung, and Elisabeth Lindheim for G&E, and Jeanne Manalo, Iman Sahnoune, and Amanda Williamson for Neuroscience.

Adobe Illustrator Hands-on Workshop - September 26, 2019

Science Park graphics specialists, Joi Holcomb and Chris Brown, will give a hands-on Illustrator Basics workshop for G&E students in Houston on September 26th.



Travel Awards

G&E offers \$500 travel awards to students presenting the results of their research at conferences, or to students

attending a 'short course' at places such as Cold Spring Harbor Laboratory, Marine Biological Laboratory in Woods Hole, or The Jackson Laboratory. The application is on the G&E website. https://gsbs.uth.edu/genetics-and-epigenetics/financial-support.htm

Laptop Program

G&E has started a laptop program, providing a limited number of students with laptops to use while in the G&E program. We plan to grow the laptop program over time so that eventually all G&E students can be supported as needed.





Professional Society Student Memberships

G&E covers the annual membership fee for a scientific society of the student's choice.



G&E Annual Retreat – November 8-9, 2019 The 2019 G&E Retreat is November 8-9, 2019



(Friday to Saturday) at The San Luis Resort in Galveston, Texas. The retreat will feature student talks, poster sessions, keynote lecture, breakout sessions, and scientific and social exchange. All members of G&E program labs are invited, along with all first year GSBS students. The retreat organizing committee includes Hieu Van (Co-Chair), Rhiannon Morrissey (Co-Chair), Safia Essien, Dhruv Chachad, Dr. Michelle Hildebrand, Dr. Nidhi Sahni, Rebecca Deen and Elisabeth Lindheim. Visit https://www3.mdanderson.org/GE-fall-retreat/ for more information and to register.

Continued from cover: The greatest export of scientists: A child-like way of seeing the world

repair, cancer progression, developmental biology, oogenesis, epigenetics, and pain. But regardless of the specific focus of our work one constant for nearly all scientists is a retained capacity for child-like wonder at the world. Often, the scientific capacity for wonder infuses other aspects of our lives. This state of adult wonder is one of the wonderful (so to speak) things that scientists can regularly bring to their interactions with the non-scientists about us. The questions that scientists ask daily- How does this work? Why is this shaped this way? What happens if I....? are a way of sharing the basic scientific method with others. Asking these questions out loud is a great way to encourage others about us to continue to indulge, and to feel comfortable indulging, their natural curiosity about the world we all share.

Working with Caffeine in Houston

by Pranavi Koppula



If you've got that writing deadline for a paper, grant or the thesis fast approaching, but you find yourself slouched in your desk chair—just willing something to appear behind that menacing, blinking and ever-taunting text cursor, get out of the lab and head to a coffee shop to experience literary loquaciousness-induced, caffeineinduced creativity. With background noise levels of 70 decibels from clattering plates and the whirr of a coffee machine,

a coffee shop is the ideal level of semi-distraction that encourages the brain to come up with innovative ideas. Here's a list of Houston coffee shops that, aside from copious caffeine, have been rated well for a free, reliable Wi-Fi strength, friendly late operational hours, plenty of charging outlets and comfortable seating.

? -		Inversion Coffee House - 1953, Montrose Blvd, Ste A, Houston
<u> -</u>		Toute Suite - 2001 Commerce St, Houston
<u> -</u>		Paper Co Cafe - 1100 Elder St, Houston
<u> </u>		Agora - 1712 Westheimer Rd, Houston
<u> -</u>		Black Hole - 4504 Graustark St, Houston
<u> -</u>		Blacksmith - 1018 Westheimer, Houston
<u> -</u>		Mercantile - 3321 Stanford St, Houston
<u> -</u>		The Nook Café - 4701 Calhoun St, Ste 150, Houston
<u> </u>		Cavo Coffee - 3773 Richmond Ave, Ste 1F, Houston
<u> -</u>		Throughgood Coffee - 732 W 27th St, Houston
Legend	🧟 🚽	
	Wi-Fi N	nise Level Closing Time Pet Friendly

Peer Reviewed Restaurants

by Melinda Soeung



Science is a team effort. Therefore, take some time outside of the lab to go experiment the diverse food scene in Houston with your labmates! Here are some great restaurants nearby to have lunch or dinner that have been peer reviewed by your G&E colleagues!

Hu's Cooking

2502 W Holcombe Blvd, Houston, TX 77030 Hungry for some spicy Sichuan cuisine? Hu's Cooking is a great lunch/dinner spot with delicious food! Just remember to reserve a table a head of time if you are eating at peak hours because it is a very popular place!

Cooking Girl

2400 W Holcomb Blvd, Houston, TX 77030

Another great place for Sichuan cuisine! Cooking Girl has great food and atmosphere for a lab outing. Definitely try the ginger fish soup and other seafood items!

Fadi's Mediterranean Grill

Fadi's is a great place for Middle Eastern & Mediterranean food. The atmosphere is casual and there's a great lunch buffet with a huge variety of food to choose from!

Local Foods in Rice Village

2424 Dunstan Rd, Houston, TX 77005

A good place for healthy but delicious food. Their menu offers vegan and vegetarian options. Also, I highly recommend you try the vegan meatball sandwich that is currently only offered at their Kirby location!

Two illustrations on left by Pranavi Koppula Bowl image courtesy of 123RF

Hungry's Rice Village

2356 Rice Blvd, Houston, TX 77005

A nice place for weekend brunch, lunch, or dinner! There is a great selection of delicious food here with large appetizers that are great for sharing!

Betsy's at Evelyn's Park

4400 Bellaire Blvd, Bellaire, TX 77401

One of the hidden gems of Houston's food scene, Betsy's is a great place for brunch/lunch! Also, Betsy's is located in a beautiful park, so plan to have a picnic and do outdoor activities with your labmates as well!

Mai's Kitchen

3403 Milam St, Houston, TX 77002

Working in the lab late and you need a place that's opened past 9pm for a dinner break? Mai's Kitchen, located in Midtown, is opened until 3AM/4AM and serves good Vietnamese food!

