Genetics & Epigenetics Newsletter 2023



THE UNIVERSITY OF TEXAS MDAnderson Concer Center Houston

Graduate School of Biomedical Sciences

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Genetics & Epigenetics Retreat

October 27-28, 2023

Camp Allen Navasota, TX



Editor's Note: In the world of science fiction, from Isaac Asimov's sentient robots to Philip K. Dick's thoughtprovoking human-android interactions, intelligent machines have coexisted and often surpassed humanity usually in a dystopian world. Today, the line between fiction and reality has blurred as AI language models propel us into uncharted territory. With the development of high-throughput sequencing technologies and accumulation of big-data, we have been using AI-based algorithms in biomedical research for decades now. Then why have large language models (LLMs) created such a buzz? Language is the cornerstone of human civilization, and LLMs are pushing the boundaries of what AI can achieve in the realm of human-like text generation, reasoning, and problem solving. These sophisticated algorithms, fueled by vast amounts of data and powerful computational resources can comprehend, generate, and engage in conversation like never before. So, I asked the AI of the hour, OpenAI's ChatGPT, a couple questions and it had me intrigued. Below is my prompt:

How can I use ChatGPT as a researcher in Genetics?

GPT: As a genetics researcher, I can assist you by providing literature summaries, aiding in data analysis, generating research ideas, and keeping you updated on the latest advancements.

Remember that while I can provide information and assistance, I am an AI language model and not a substitute for domain expertise or human judgment. It's always crucial to verify and validate information from authoritative sources and consult with other experts in the field.

Large AI models like Open AI's ChatGPT and GPT-4 have taken the media by storm, demonstrating human-like performance in several academic standard tests. These tools are becoming increasingly more powerful, which some have found threatening,

The Geneticist's Assistant: Harnessing the Power of ChatGPT in Research

In conversation with Kunal Rai, PhD, Associate Professor, Department of Genomic Medicine. *Note: Some of these responses are generated by ChatGPT* Written by: Richa Nayak

> but it is an incredible resource, which can be used to our advantage. As researchers, we are trained to evolve and adapt to new concepts and think creatively. The AI revolution is one such situation in which we can learn and equip ourselves with this new technology. This is an especially great resource for early career researchers who are new to their field of research or for wet lab scientists who want to learn bioinformatics algorithms but don't know where to start. GPT can be used to generate logical workflows, summarize articles, aid in developing rational hypotheses, organize experimental plans, and more; the possibilities are endless. For non-native English speakers, this is a great tool to assist with scientific writing and communication. However, these technologies are continuously evolving, so it is always a good idea to cross reference and not fully rely on this as the main source of knowledge. It is important that researchers use these Chatbots responsibly and are made aware of ethical considerations. In biomedical research, we know that data and patient privacy is of utmost importance. While tasking LLMs with repetitive work to focus on important matters yourself is an efficient use of time and technology, proper usage training is needed. This suggests it's time to move from didactic teaching styles to more creative ways.

> There is concern that creative thinking may be affected if people start relying heavily on these technologies for idea generation. However, there is always a brighter side, as long as we are committed to doing science in a fair and transparent manner, we will continue to make great discoveries.

> You can read Dr. Rai's full interview and get a taste of what ChatGPT can do here (ie: a poem on cell function, identifying databases, and an opinion about introducing AI at GSBS):



From the Director's Desk...

Dear G&E Community:

The COVID-19 pandemic has had a lasting impact on all science communities, including our own beloved G&E. As directors, our main goal in the upcoming year is to rebuild the strong sense of cohesiveness and comradery that we enjoyed in G&E prior to the pandemic shutdown. Students continue to be excited by our program, and we are back to our previous size of ~50 students to 100 faculty - the perfect ratio to support mentoring and education of our next generation of biomedical researchers. All G&E scientific, career, and social events are now in person and are hosted at both North and South Campus to encourage total community engagement. We will continue to provide Zoom links for many events such as seminars but hope that the need for virtual attendance will fade to being an option of last resort. We have learned that inclusivity can be improved with virtual options, but community building is best strengthened by in-person engagement. Why is community building so important? We are social beings and spontaneous scientific and social discourse help to build trust amongst community members. We are much more likely to reach out for scientific, career, and personal help when we have established a relationship, and we need these relationships with our peers, near peers, and mentors to thrive and efficiently advance and communicate our research. Our recent G&E Spring Career Symposium in May was a terrific success (despite the scary early morning weather), and we co-hosted a fun social event with snow cones and games with the Quantitative Sciences program in June. We will continue to reach out to other programs to promote collaboration and connectivity such as we have enjoyed with our long-standing Art Showcase with the Neuroscience program.

I know we are all looking forward to our Ice Cream Social this summer and our flagship G&E Annual Fall Retreat on October 27 and 28 at Camp Allen. These events are designed and organized by G&E students to enrich their graduate research experience. To make attending G&E events easier, we have scheduled an event on the second Thursday of each month with lunch (thanks, Amy!) that will rotate between the GEM seminar, Faculty Insight, and Easy Science Club series. Please plan to attend as many events as possible to help yourself and build our G&E community.

The leadership of G&E takes your student needs and ideas seriously and strives to quickly address issues – don't be shy about bringing anything up at the Director's Round Table, via email, or at our G&E events. May science continue to inspire and surprise you!

Francesca Cole, PhD, G&E Director Rachel Miller, PhD, G&E Co-Director

G&E Program Resources

G&E offers a range of resources to support student growth both inside and outside the lab. G&E provides awards to 10-12 students for their outstanding service to our community. Recognizing various contributions such as program committee leadership, career development, research planning, and many more. G&E students can also receive support for one society membership per year, as well as travel awards for conferences or short courses and workshops. Additionally, the G&E library has over 35 books which cover a variety of topics including scientific writing, programming, biomedical sciences, and productivity. Books can be checked out for two weeks and are located at Amy Carter's (Program Manager) office in BSRB.

These are just a few available resources, more detailed information on these resources and others can be found here:



Upcoming Community Events



August

8/10 Faculty Insight Series8/11 Ice Cream Social

September

9/14 G&E GEM Student Seminar Series

October

10/12 Easy Science Club 10/27-10/28 G&E Program Retreat

November

11/9 Faculty Insight Series



G&E Program Director Francesca Cole, PhD

Associate Professor, Department of Epigenetics & Molecular Carcinogenesis, MD Anderson

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G&E Program Co-Director Rachel Miller, PhD

Associate Professor, Department of Pediatrics, McGovern Medical School at UTHealth Houston

Office: MSE R414 Phone: 713-500-6537 Email: rachel.k.miller@uth.tmc.edu

Congratulations G&E Graduates!

August 2022 to July 2023



Raisa Reyes Castro, PhD

Advisor: Swathi Arur, PhD PhD Thesis: "Role of Phosphorylated DICER1 in Tumor Progression" MD/PhD Student, University of Puerto Rico, San Juan, Puerto Rico



Dhruv Chachad, PhD

Advisor: Gigi Lozano, PhD PhD Thesis: "Unique Transcriptional Profiles Underlie Osteosarcomagenesis Driven by Different p53 Mutants" Postdoctoral fellow, Lab of Gigi Lozano, PhD, MD Anderson Cancer Center



Maxsam Donta, MS

Advisor: Pierre McCrea, PhD MS Thesis: "p120-catenin subfamily members have distinct as well as shared effects on dendrite morphology during neuron development in vitro"

MD/PhD Student, UTMB Health, Galveston, TX



Jovanka Gencel-Augusto, PhD

Advisor: Gigi Lozano, PhD PhD Thesis: "p53 dimers elicit unique tumor suppressive activities through a novel transcriptional program" Postdoctoral Scholar, Lab of Trever Bivona, MD, PhD, University of California, San Francisco, CA



Lana Al Hasani, MS Advisor: Wenbo Li, PhD MS Thesis: "Elucidating the Direct Role of m6A in the Human

Transcriptome" PhD Student, MD Anderson UTHealth Houston Graduate School



Advisor: Richard Behringer, PhD

Malcolm Moses, PhD

Cancer Center

Mabel Perez-Oquendo, PhD Advisor: Don L. Gibbons, MD, PhD PhD Thesis: "Regulation and Function of ZEB1 Acetylation in Lung Adenocarcinoma Progression and Metastasis" Administrative Postdoctoral fellow, Education & Training Dept., MD Anderson Cancer Center

PhD Thesis: "Genetic Regulation of Müllerian Duct Regression"

Postdoctoral fellow, Lab of Richard Behringer, PhD, MD Anderson

Tolkappiyan Premkumar, PhD Advisor: Francesca Cole, PhD

PhD Thesis: "Genetic analysis of crossover defective mouse spermatocytes reveals discrete crossover precursor intermediates" Postdoctoral fellow, Lab of SaraH Zanders, PhD, Stowers Institute, Kansas City, MO



Chang Sun, PhD Advisor: Gigi Lozano, PhD

PhD Thesis: "Functional Analysis of Daxx in Tumorigenesis of Pancreatic Neuroendocrine Tumors and Embryonic Development" Postdoctoral fellow, Stanford University, Stanford, CA



Yang Zeng, PhD

Advisor: Taiping Chen, PhD PhD Thesis: "Regulation of de novo and Maintenance DNA Methylation by DNMT3A and DNMT3B" To be determined

Welcome New G&E Students!



Chae Yun (Kate) Cho [2nd ARC] PhD Advisor: Kadir Akdemir, PhD Department of Neurosurgery, MD Anderson



Alejandra Davilavaladez MS Advisor: Rachel Miller, PhD Department of Pediatrics, McGovern Medical School



Shannon Erhardt PhD Advisor: Jun Wang, PhD Department of Pediatrics, McGovern Medical School



Jared Fradette MS Advisor: Don Gibbons, MD, PhD Department of Thoracic/Head & Neck Medical Oncology, MD Anderson



Emely Larios MS Advisor: Francesca Cole, PhD Department of Epigenetics and Molecular Carcinogenesis, MD Anderson



Haoyue Liu [2nd ARC] PhD Advisor: Florencia McAllister, PhD Department of Clinical Cancer Prevention, MD Anderson





PhD Advisor: Michael Galko, PhD Department of Genetics, MD Anderson



Julianna Quinn PhD Advisor: Jun Wang, PhD Department of Pediatrics, McGovern Medical School

Rocio (Renee) Rubiano MS Advisor: Margarida Albuquerque Almeida Santos, PhD Department of Epigenetics and Molecular Carcinogenesis, MD Anderson



PhD







Ruei-Liang Yan PhD Advisor: Georgios Karras, PhD Department of Genetics, MD Anderson



Xing-Han Zhang PhD Advisor: Georgios Karras, PhD Department of Genetics, MD Anderson



Brandy Walker McGovern Medical School

Mith V

Anderson



PhD Advisor: Rachel Miller, PhD Department of Pediatrics,

D'Shaunique Walters PhD Advisor: Lauren Colbert, PhD Department of Radiation Oncology, MD Anderson

PhD Advisor: Gigi Lozano, PhD

Department of Genetics, MD

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Sara Sanz Juste PhD Advisor: Blaine Bartholomew,

Department of Epigenetics and Molecular Carcinogenesis, MD Anderson

Amanda Solbach [2nd ARC] PhD Advisor: Sheng Zhang, PhD Institute of Molecular Medicine, McGovern Medical School

Anatomical, MD Anderson Samantha Mota





G&E Student & Faculty Awards & Recognitions 2022-2023



Congratulations to our students for their outstanding achievements!

STIPEND SCHOLARSHIPS & FELLOWSHIPS

American Legion Auxiliary Fellowship in Cancer Research

Nick Newkirk (Swathi Arur, PhD), 2022-2023 Llaran Turner (George Eisenhoffer, PhD), 2023-2024

Cancer Prevention and Research Institute of Texas (CPRIT) BIG-TCR Predoctoral Fellowship in Cancer Research

Sseu-Pei Hwang (Catherine Denicourt, PhD), 2023

Dean's Excellence Scholarship Ericka Humphrey (Yejing Ge, PhD), 2022-2023 Renewal

Dr. John J. Kopchick Fellowship Vahid Bahrambeigi (Anirban Maitra, PhD), 2023 Celine Kong (Jichao Chen, PhD), 2023 Renewal Ruoyu Wang (Wenbo Li, PhD), 2023 Renewal

GSBS Financial Assistance Scholarship Tanner Wright (Mark Bedford, PhD), 2023

GSBS Presidents' Research Scholarship Ruoyu Wang (Wenbo Li, PhD), 2022

Investing in Student Futures Fellowship Heather Tsong (Andrea Stavoe, PhD), 2023

John and Rebekah Harper Fellowship in **Biomedical Sciences** Ruoyu Wang (Wenbo Li, PhD), 2nd Year, 2022

Larry Deaven PhD Fellowship in Biomedical

Sciences Maria José Gacha Garay

(Jichao Chen, PhD), 2022-2023

Linda M. Wells GSBS Outreach Award Melissa Frasca (Francesca Cole, PhD), 2023

NIH F31 Fellowship

Rhiannon Morrissey (Gigi Lozano, PhD), 2020-2023

Rosalie B. Hite Fellowship Elena Huang (Dung-Fang Lee, PhD), 2023-2024 Renewal Vahid Bahrambeigi (Anirban Maitra, PhD), 2022- 2023 Renewal Elena Huang (Dung-Fang Lee, PhD), 2022-2023

Ruth L. Kirschstein National Research Service Award (NRSA)

Rhiannon Morrissey (Gigi Lozano, PhD) Renewal

Sowell-Huggins Fellowship in Cancer Research Hanghui Ye (Nicholas Navin, PhD), 2022-2023 Renewal

Terry J. Crow, PhD, Scholarship in Neuroscience Heather Tsong (Andrea Stavoe, PhD)

STUDENT AWARDS

3rd Annual THNMO Research Retreat Mabel Perez-Oquendo (Don Gibbons, MD, PhD), 1st place poster presentation

American Association for Cancer Research (AACR) Minority Scholar in Cancer Research Award Mabel Perez-Oquendo (Don Gibbons, MD, PhD)

AACR Early Career Hill Day Associate Member Advocate Llaran Turner (George Eisenhoffer, PhD), selected 2023 participants

ASM-TMC Annual MicroWorld Image Contest Sreeja Sridharan (Michael Galko, PhD), 3rd place

Biolmaging North America Professional Development Award Sreeja Sridharan (Michael Galko, PhD)

Genetics & Epigenetics Annual Retreat Poster Presentation, 2022

Jovanka Gencel-Augusto (Gigi Lozano, PhD), Post-candidacy - 1st place - tie Brant Gracia (Georgios Karras, PhD), Trainee/Postdoc- 1st place Ericka Humphrey (Yejing Ge, PhD), Pre-Candidacy- 2nd place Heather Tsong (Andrea Stavoe, PhD), Pre-Candidacy- 1st place Yiyun Lin (Nick Navin, PhD), Post-candidacy - 1st place - tie

Genetics & Epigenetics Annual Retreat

Platform Talk Competition Jeison Garcia (Blaine Bartholomew, PhD), Trainee/Postdoc Shucheng 'Anna' Miao (Don Gibbons, MD, PhD), People's Choice Award Rhiannon Morrissey (Gigi Lozano, PhD), 1st place - tie Nick Newkirk (Swathi Arur, PhD), 1st place - tie

GSBS Graduate Student Research Day Oral Presentation Skills

Llaran Turner (George Eisenhoffer, PhD), Pre-Candidacy PhD, MS & SMS, 1st Year - 1st place Heather Tsong (Andrea Stavoe, PhD), Post-Candidacy PhD, 2nd place

GSBS Graduate Student Research Day Elevator Speech Contests

Bhargavi Brahmendra Barathi (Jason Huse, MD, PhD), Pre-Candidacy PhD, MS & SMS, 1st Year - 1st place

GSBS Travel Award

Shannon Erhardt (Jun Wang, PhD) to attend the 12th Structural Birth Defects Meeting Diana Machado (Richard Behringher, PhD) to attend 9th International Symposium for

the Biology of Vertebrate Sex Determination Richa Nayak (Jichao Chen, PhD) to attend Cell Symposia- The conceptual power of single-cell biology 2023 Mabel Perez-Oquendo (Don Gibbons, MD, PhD) Sreeja Sridharan (Michael Galko, PhD) to attend an Off-Site Course Brandy Walker (Rachel Miller, PhD) to attend an Off-Site Course

Healthcare Innovation Challenge People's **Choice Awardee**

Llaran Turner (George Eisenhoffer, PhD), 2023

International Symposium for the Biology of Vertebrate Sex Determination Travel Award Diana Machado (Richard Behringer, PhD)

Shohrae Hajibashi Memorial Leadership Award Sreeja Sridharan (Michael Galko, PhD)

Society of Developmental Biology Travel Award Shannon Erhardt (Jun Wang, PhD), 2023

Texas Conference on Genome Repair Abstract Award

Melissa Frasca (Francesca Cole, PhD), Best Abstract Award

The Antje Wuelfrath Gee and Harry Gee, Jr. Family Legacy Award

Elena Huang (Dung-Fang Lee, PhD)

The Jackson Laboratory 64th McKusick Short Course on Human and Mammalian Genetics and **Genomics Scholarship**

Mith V (Gigi Lozano, PhD) to attend course

Trainee Grant Incentive Award Mabel Perez-Oquendo (Don Gibbons, MD, PhD)

NATIONAL ACADEMY

OF SCIENCES

G&E STUDENT SERVICE AWARDS

Vahid Bahrambeigi Richa Nayak Shannon Erhardt **Nick Newkirk** Majo Gacha Garay Sreeja Sridharan Dalia Hassan Heather Tsong **Ericka Humphrey** Llaran Turner Josh Lindenberger Ruoyu Wang Anna Miao Tanner Wright



Extended student awards here:

Faculty Awards & Recognitions 2022-2023

Swathi Arur, PhD Promoted to Professor

Presidential Honoree for Education and Mentorship Advancement at MD Anderson Cancer Center Commendation by the GSBS Dean's office for the directorship of the course on Foundations in Biomedical Sciences

Francesca Cole, PhD

President's Recognition of Faculty Excellence for Education and Mentoring D. Dudley and Judy White Oldham Faculty Award

Walid Fakhouri, PhD Promoted to Associate Professor

Editorial Board Member of Cleft Palate-Craniofacial Journal Section Editor for Genetics

Evangelia Koutelou, PhD Promoted to Assistant Professor (RFA)

Margarida Albuquerque Almeida Santos, PhD

Promoted to Associate Professor with Tenure

Jun Wang, PhD Elected Fellow, American Heart Association, 2023 Rick Wood, PhD

Elected Fellow, National Academy of Sciences, 2023

EMC faculty elected to NAS



Congratulations to Dr. Wood on being elected to the National Academy of Sciences! Dr. Wood is one of two G&E faculty to be elected to NAS, the first being Gigi Lozano, PhD, (elected 2017). His research established the foundations of the Nucleotide Excision Repair (NER) pathway. Defining several proteins and the step in which they are involved led to his discovery of the precise mechanistic pathway of UV-induced DNA damage repair. For his outstanding work, Dr. Wood has also been elected to the Royal Society, European Molecular Biology Organization (EMBO), the American Academy of Arts and Sciences (AAAS) and Texas Academy of Medicine, Engineering, Science and Technology (TAMEST).

Student Publication Highlights



Maxsam Donta, alumnus, Pierre McCrea, PhD, lab investigated and compared the p120-catenin subfamily, comprised of the four proteins p120-catenin, delta-catenin, ARVCF-catenin, and p0071-catenin, providing one of the first comprehensive comparative studies of these catenin's roles in dendrite morphogenesis. Using primary hippocampal neurons from rat embryos at embryonic day 18 and immunocytochemistry, they identified that these four catenin proteins have unique distribution patterns in developing neurons and play distinct roles in dendritic arborization and maintenance. Furthermore, their morphological investigation suggests both shared and specific effects of each catenin modulation of dendrite morphology could provide novel information regarding the onset and treatment for neurological disorders such as Alzheimer's disease, schizophrenia, and autism spectrum disorder.

Donta, M.S., Srivastava, Y., Di Mauro, C.M., Paulucci-Holthauzen, A., Waxham, M.N., and McCrea, P.D. p120-catenin subfamily members have distinct as well as shared effects on dendrite morphology during neuron development in vitro. Frontiers in Cellular Neuroscience. 2023 Apr 4;17:1151249.

Recent G&E alumnus **Malcolm Moses**, student from the lab of Richard Behringer, PhD, investigated regulatory regions of anti-Müllerian hormone receptor 2 (Amhr2) and Osterix (Osx) for Müllerian duct mesenchyme transcription during mammalian reproductive tract development, which was recently published in *Frontiers in Cell and Developmental Biology*. The Müllerian ducts give rise to portions of the female reproductive tract, which undergo regression in males to prevent the simultaneous differentiation of both male and female reproductive tracts, an important step of sex differentiation. Using a bacterial artificial chromosome (BAC) transgenic mouse containing Amhr2 or Osx loci, they identified two distinct genomic regions that direct Müllerian duct mesenchyme-specific transcriptional activity. These novel findings help to further define the gene regulatory network for Müllerian duct regression, an essential part of sex differentiation.



Moses, M.M., Mullen, R.D., Idowu, D.I., Maye, P., Jamin, S.P., and Behringer, R.R. A transgenic bacterial artificial chromosome approach to identify regulatory regions that direct Amhr2 and Osterix expression in Mullerian duct mesenchyme. Frontiers in Cell Development and Biology, 2022 Oct 12;10:1006087.



Ruoyu Wang, Lana Al Hasani, Erin Simpson, and Yi-Ting Chen, in the lab of Wenbo Li, PhD, recently published their research in *Nature Microbiology* in March of 2023. They investigated if and how an infection of SARS-CoV-2 affects chromatin architecture of the host. Using high-throughput chromosome conformation capture (Hi-C) 3.0 and chromatin immunoprecipitation (ChIP-seq), they identified host chromatin restructuring. Further investigation into host epigenome changes by Western Blot and CHiP-seq, after SARS-CoV-2 infection, revealed reduction of the active histone mark H3K27ac, supporting the conclusion that SARS-CoV-2 disrupts chromatin compartmentalization by alterations of chromatin modifiers. Furthermore, their 3D genome/epigenome maps provided a way to understand genes associated with either a delayed/ weakened innate immune response or an increased production of pro-inflammatory cytokines, often shown in COVID-19 patients with severe symptoms. Together this study presents an impact of SARS-CoV-2 infection on the host chromatin and provides novel experimental evidence that can be advanced to better understand COVID-19.



Germline aneuploidy is high in humans and is the primary genetic cause of infertility, pregnancy loss, and genetic conditions such as Down syndrome. Most germline aneuploidy is caused by defects in a DNA repair product called a crossover, which is produced during meiotic cell division. Mechanistically, very little is known about mammalian crossover pathways, thus impeding understanding of human crossover loss. To address this problem, recent PhD graduate from the lab of Francesca Cole, PhD, **Tolkappiyan Premkumar**, along with current GSBS students Ericka Humphrey and Melissa Frasca and alumnus Rhea Kang, characterized two repair steps and their genetic dependencies in mammalian crossover pathways. This study analyzed 12 single and double mouse mutants with fine-scale recombination assays to overcome the technical limitations associated with using this model. From this novel work, assays can be designed to isolate these recombination intermediates from mitotic and meiotic human cells to examine underlying causes of aneuploidy.

Premkumar, T., Paniker, L., Kang, R., Biot, M., Humphrey, E., Destain, H., Ferranti, I., Okulate, I., Nguyen, H., Kilaru, V., Frasca, M., Chakraborty, P., and Cole, F. Genetic dissection of crossover mutants defines discrete intermediates in mouse meiosis. In Press: Molecular Cell. 2023.





G&E Events Round-Up



G&E Retreat 2022

This year was the first in-person retreat since 2019, and to say that everyone was excited was an understatement. A few highlights include engaging poster sessions, creative costumes [found on page 11], and intriguing flash talks. The Retreat was held at Moody Gardens Resort in Galveston, TX.





Easy Science Club

Easy Science Club is a quarterly seminar event held in an informal setting, which is meant to help students gain confidence in communication skills. Each session focuses on a new topic; previous topics have included eliminating filler words, CV introductions, and non-scientific introductions.



Ice Cream Social

To celebrate summer, each year we host an Ice Cream Social, this year we featured Amy's Ice Cream. We had the pleasure of being served by our fantastic program director and co-director Drs. Francesca Cole and Rachel Miller.



Art Showcase

Each year G&E and Neuroscience Programs co-host an Art Showcase. Students and faculty from both programs can show off their artistic sides. A few highlights from this year are haiku poetry by Dr. Michael Galko, dance from Maria (Majo) José Gacha Garay and friends, singing by Maria Benavente, and others like paintings and photographs.



G&E Events Round-Up



Science Night

Science Night is an event put on by the Community Outreach Student Association, and all graduate programs are invited to participate. This year, the G&E table helped children create DNA bracelets of some of their favorite species.







Lunar New Year

This year celebrates the Year of the Rabbit. We participated in making mini-Chinese New Year clay dishes, origami, and a fun reaction game. Additionally, we got to enjoy traditional Lunar New Year food and refreshments.







Career Symposium

The Career Symposium is the second largest event put on by G&E each year. This year, it featured a great keynote presentation by Dr. Jianji Chen, a G&E alumnus. It also featured sessions on finances, advanced courses, scholarships, and internships in graduate school.

G&E Alumni Success



Alexandria Blackburn, PhD Associate Program Manager, Lonza PhD 2021 Advisor: Rachel K. Miller, PhD Please tell about yourself and your current job title/role.

My name is Alex Blackburn. I am a first-gen grad

student, have two amazing kids (Emery, 8, and Everett, 3,) and an equally amazing husband. I am an Associate Program Manager (PM) at Lonza, which is a contract development and manufacturing organization. We help companies develop and/or manufacture their drug product that will ultimately be used for clinical trials or commercially. As a PM, I am involved in the manufacturing start-up process and help lead a cross-functional group of people to manufacture cGMP gene therapies. My main task is to keep the project to the anticipated timeline while managing any risks and issues that arise during the process. Other aspects of the role include maintaining both the financial health of the program and the client relationship.

What motivated you to pursue a career in program management?

When I entered my PhD, I knew that I did not want to stay in academia. I explored other jobs you could get with a PhD very early in my graduate career and really had to evaluate what I enjoyed and what I excelled at. I also had to consider a career that made sense for me and my family. I am excellent at time management, organization, multi-tasking, and critical thinking, and I wanted a career where I could use these strengths to make a meaningful difference. After much consideration, I landed on program management.

Which part of the graduate school training has become your biggest strength in your current position, and was there something you wish you had learned?

Learning how to communicate with different audiences has been the most valuable skill. The G&E program is great at offering courses to help with your communication and presentation skills, so take advantage of them!

I wish I would have been told just how important soft skills are for positions outside of academia. I found that out from my own research and what feels like a million informational interviews with people who left academia. Informational interviews and various career symposiums (the postdoc career symposium is amazing!) also showed me how important it is to be able to sell yourself in your resume and in an interview. You did a lot in grad school, but how to translate that on paper to people outside of academia is not intuitive for most of us. Going to career events and just getting exposure to other opportunities outside of lab is vital if you want to leave academia.

What is your favorite aspect of your work?

The feeling you get after you have completed a successful batch for your program. I recently got to experience this, and it was the best! After months of planning and countless hurdles, knowing that you facilitated the manufacture of a gene therapy product that will be used to help patients in need is one of the best feelings ever!



Erin Atkinson, PhD, MS GC

Prenatal Genetic Counselor, Texas Children's Pavilion for Women, Baylor College of Medicine PhD 2021, MS 2023 Advisor: Bin Wang, PhD

Please describe your role and your key responsibilities/tasks.

As a prenatal genetic counselor, my key responsibilities are to counsel pregnant patients or patients planning on becoming pregnant about their genetic risks. For example, if a fetal anomaly is found on ultrasound that raises concern for a genetic condition, a patient would see a genetic counselor to discuss what the anomaly is, possible causes, and genetic testing options. Genetic counselors also provide psychological and emotional support during a session in order to promote informed choices.

Why did you choose to transition to Genetic Counseling after completing your PhD?

I knew I wanted to be working more directly with people after my PhD, but I also wanted to continue to work in the genetics field. In my PhD, I had been involved in a mental wellbeing initiative and found myself really wishing that there was a career that combined what I was working on for that project with my love of genetics and research. As it turns out, genetic counseling is exactly that!

How did having a PhD prepare you for this career?

My PhD background was helpful during my genetic counseling training. Having a foundation in genetics and knowledge of molecular mechanisms helped as I learned genetics from the clinical side. I think the critical thinking skills from my PhD are extremely helpful in genetic counseling.

What do you find the most rewarding about your position?

I love being able to support patients during a difficult and uncertain time and to use my scientific communication skills while continuously learning about new developments in genetics.

As a graduate student at the GSBS, was there anything that provided assistance in determining this career choice?

I think my involvement in student groups and graduate committees was extremely helpful in clarifying what roles I found rewarding and would like to include in my post-PhD career. It also helped with getting into the genetic counseling program, whose admissions processes are very competitive. I also found GSBS to be very supportive of my plan to pursue this career. I used the career center and connected with people involved in the genetic counseling program through people I knew at the Graduate School.

Any advice for someone who is considering continuing their education in a different area after completing their PhD?

Don't be afraid to explore and follow your interests! I couldn't have predicted that the "extra" things I did (committees, student organizations, etc.) would have led me to genetic counseling, but it ended up being perfect. As you go through your PhD, aask yourself which roles are your favorite. Is it doing experiments, planning projects, presenting science to others, working with people? Then, look and see if there is a job or career that focuses on those roles. I think this is a good way to figure out how you want to use your PhD.

G&E Alumni Success



Jovanka Gencel-Augusto, PhD Post-Doctoral Fellow; Bivona Lab at University of California-San Francisco PhD 2023 Advisor: Gigi Lozano, PhD

Please tell us about yourself and your current job title/role.

My name is Jovanka Gencel-Augusto. I am a PhD graduate from the GSBS, from the Genetics and Epigenetics program (and Cancer Biology as secondary concentration). I am currently a Post-Doctoral Fellow in the Bivona Lab at UCSF.

What motivated you to pursue this career path?

Since I learned being a scientist was a career path I could pursue, around the last year of high school, I have been interested in following the academic path. I had always been interested in understanding the molecular basis of diseases, and I knew I did not want to dedicate my career to direct patient care. However, I have always wanted to make an impact on patient care by studying the biology of diseases and finding vulnerabilities that can ultimately be targeted therapeutically.

What is your ultimate goal? Do you envision yourself running your own lab?

My ultimate goal is to run my own lab in a research-intensive institution, focused on some aspect of cancer research – to be determined!

What advice do you have for current graduate students considering this career pathway?

Always pay attention to the environment. First, you need a mentor that is not only a good scientist, but a good person. Second, make sure that the lab has a culture of supporting each other. Third, visit the city where you want to do your postdoc – do you see yourself there for the next five years?

Apply for fellowships BEFORE you start your postdoc. There are several funding opportunities for senior grad students (some are only available for people with up to ~1 year of postdoc experience), so take advantage of them! This is a good way to start your next career step with more flexibility to follow your own ideas. And never stop applying for grants – even if you don't get them, you will gain writing skills and a more concrete idea of your research plans.

Get a dog and/or a hobby if you don't already have one.

How did the transition from a graduate student to postdoc feel? What are some of the important differences in the kind of training?

I would say the major difference was moving to a new city and being away from family. In terms of science, I have moved to a new field – from studying p53 biology to studying oncogenes and mechanisms of resistance to targeted therapies in lung cancer. However, it is exciting to learn new topics and I do feel prepared - thanks to the amazing training I received at my PhD Lab (Lozano Lab) and the GSBS. The techniques and critical thinking skills you have learned are translatable to any topic you decide to study after graduating. I am enjoying my postdoc experience!

What are some things you wish you knew before you started?

I would say the main thing I would have liked to know is that I can negotiate my postdoc salary. If you can, do it when you have a written offer letter. The cost of living in San Francisco is so high that it's fair to ask.



Jianji Chen, PhD

Scientist I, Just Evotec Biologics PhD 2021 Advisor: Mark Bedford, PhD

Please tell us about yourself, and your current job title/role.

I am a protein biochemist by training. I received my MS degree in proteomics from the University of Minnesota. Then I came to the GSBS in 2016 and joined the Bedford Lab. After graduating, I worked at IDEXX and Nanostring as a senior scientist, and this year I started working as a Scientist I at Just Evotec Biologics.

How do you spend your time during a typical workweek?

The day-to-day depends on the company and the job. In my case at Just Evotec, I perform biomarker discovery. Our main tool is the application of liquid chromatography–mass spectrometry (LCMS) to identify biomarkers or drug targets. Half of my day I work in the lab, and the other half I spend in meetings and analyzing data.

How did you choose this career field?

The training in protein biology I got during my education, together with LCMS, was a unique combination and set the niche for me. Also, it depended on which jobs were in demand when I was in the job market.

What do you find most rewarding about the work?

At Just Evotec, we develop diagnostic tools for animal health and wellness. Our team is upstream of the production chain; we identify the biomarkers, and then they develop the antibodies. The direct application of my work is very fulfilling. The project I am working on is generating antibodies that are provided to cancer patients. I feel that I am doing something meaningful.

What are the toughest problems you must deal with?

The biggest challenge is the communication between teams. We need to work with people from different backgrounds, and we have to get to agreements to solve specific questions. Sometimes this can be difficult.

How much flexibility do you have in your job?

The flexibility varies depending on your position and the company. Right now, I have unlimited paid time off, I can arrange my day and manage my time with a lot of freedom, and I can work from home.

If things develop as you would like, what does the future hold for your career?

I imagine myself as a team leader in the biocharacterization team of this company. To achieve this goal, I will have to accumulate experience in this position.

If you were a grad student and had it to do all over again, knowing what you know now, what would you do differently?

I would start reaching out to people earlier and get prepared as early as possible for the job market. However, I think that there are some mistakes you just must make to learn. The key is to try again and don't give up. We are constantly learning.

Editors' note: Dr. Chen was the keynote speaker for the Career Symposium 2023. He gave us some tips and advice to apply for industry jobs and get the job you want. You can find his talk here:

https://gsbs.uth.edu/genetics-and-epigenetics/index.htm



Dean's Corner & New Faculty



Sharon Dent, PhD Dean *ad interim*; MD Anderson

UTHealth Houston Graduate School.

Department Chair; Department of Epigenetics and Molecular Carcinogenesis

Professor; Department of Epigenetics and Molecular Carcinogenesis

For almost a year now, I have had the honor of serving as the Dean *ad interim* of the GSBS. In both my role as Dean and as Chair of the Department of Epigenetics and Molecular Carcinogenesis at MD Anderson, I enjoy working with faculty and students to foster an atmosphere that enables scientific discovery and enhances education.

Science and education have been my passions dating back to my high school days. I went to college intending to become a science teacher, but when I had the chance to work in a lab as an undergraduate, I literally fell in love with research. As a firstgeneration college student, I had no idea that a career in scientific research was even possible. I was lucky to have a series of fantastic mentors in college, in grad school, as a postdoc and as a junior faculty member. Being Dean gives me a chance to 'pay forward' the commitment and patience of my mentors to our students.

What an exciting time to be a student and a scientist! For perspective, when I was in grad school at Rice University in the early-mid 1980s, a common rotation project was to purify a restriction enzyme from bacteria, which not only taught us principles of biochemistry, but also provided much needed resources for the lab and the department, as few enzymes were commercially available at that time. We have come such a long way since then in terms of technologies, reagents, and approaches. However, the fundamental tenets of graduate education are still the same, with an emphasis on sharpening critical thinking skills and developing rigorous scientific approaches to address impactful questions. All of us at the GSBS aim to help our students develop these skills, which are critical to success in all science-related careers.

How is success defined? I think each person has to decide that for themselves. For me, it is not only making new discoveries, but also helping others reach their full potential. I hope to give students and postdocs the opportunity to be seduced by an intriguing biological mystery, to generate an unexpected "gee whiz" result, to realize that they have just learned something that no one else yet knows, and to experience the sweet satisfaction of revealing that knowledge to the world.

I encourage you all to follow your passion, as that will help you through the hard times, when nothing seems to be working, no matter how many hours you spend in the lab or at the computer. When things finally do work, savor the joy. Also, do not discount unexpected outcomes. Often, those lead to the biggest discoveries. Finally, pay it forward and help others succeed. Not only will that lead to more discoveries, but it will also compound the joy you experience professionally and personally.

Sharon Dent, PhD, Dean ad interim

Welcome New G&E Faculty!



Chong Wu, PhD

Department of Biostatistics, MD Anderson **Research Interest:** Risk prediction, Pancreatic cancer, Alzheimer's, developing new data-driven methods **Accepting Students**



Nayun Kim, PhD Department of Microbiology and Molecular Genetics, McGovern Medical School Research Interest: Genome instability, chromosomal rearrangements, yeast



Shih-Han Lee, PhD Department of Genetics, MD Anderson Research Interest: Gene expression regulation, RNA processing, non-coding RNA, Cancer Biology Accepting students; PhD only



Yuan-Hung Lo, PhD Department of Molecular & Cellular Oncology, MD Anderson Research Interest: Organoid Models, CRISPR/Cas9, Genome-editing, Adult Stem Cells, GI cancers Accepting students



Julio Alcantara Montiel, PhD Department of Hematopoietic Biology &

Malignancy, MD Anderson **Research Interest:** Molecular states of leukemia, antigen specific T cells evolve, single cell

John Tainer, PhD



Jihye Yun, PhD Department of Genetics, MD Anderson Research Interest: Intestinal cancer, dietary factors, tumorigenesis Accepting students

Student Association Highlights

By Caitlynn Barrows, Community Outreach President



GSBS Community Outreach is an organization dedicated to bringing science to the local community. We have two major events that we execute each year. The first is Science Night, an event geared towards teaching elementary-aged children science concepts through kid-friendly experiments. This year, Science Night was hosted at the Cooley Center and served more than 200 children and their guardians. Each program and student group at the GSBS assisted this year by hosting their own booth with a unique experiment. The second event we are hoping to restart post-Covid is Summer Biomedical Academy. This program services rising juniors and seniors in college. We also help teach high schoolers advanced scientific concepts and provide college planning sessions to guide them as they move into STEM fields. In addition to these two events, we volunteer at smaller events throughout the year. Recently, our volunteers participated as judges in a virtual science fair. Not all our outreach events are necessarily geared towards science: we kicked off our outreach events this year by volunteering with the Houston Arboretum for their annual Halloween event the "ArBOOretum," and our volunteers staffed the petting zoo area.

GSBS Community Outreach is seeking more coordinators. This is an active role in which individuals help with planning and executing our events. We are also seeking more volunteers for our events. If you are interested in a coordinator role or want to check if you are on our volunteer list, please email us at: gsbs_outreachprogram@uth.tmc.edu





Meet Your Editors & Recommendations

On The Bookshelf



You can see the full list of recommended books here:



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Co-Editor Richa Navak Pre-Candidacy Department of Pulmonary Medicine, MD Anderson

Restaurant Recommendations

American Killen's Barbeque Barnaby's Nancy's Hustle The Wing Boss Fish Company Taco at Galveston Hungry's Nobies Backstreet Café Tiny Champions Corkscrew in Old Town Spring

<u>Vegan</u> Mo' Betta Brews

Indian Aga's Resturant Saravana Bhavan (Vegetarian) Musaafer Oporto Pondicheri

Italian Coppa Osteria Marmo

Latin Barcelona Taste and Tradition Madrid (MAD) Costa Brava Hugo's Caracol

Tex-Mex Doña Leti's El Tiempo Greek

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Ramen Jinya Ramen

Sichuan Cooking Girl

Chinese Hu's Cooking

<u>Asian</u> Kura Revolving Sushi Bar Izakaya Wa! Wanna Bao

Globally Inspired Traveler's Table Squable

Dessert The Chocolate Bar



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