our focus on the
SCIENTIFIC PROCESS

Hypothesis • Experiment • Analysis • Conclusion

THIS ISSUE OF HYPOTHESIS CELEBRATES
ALL PHASES OF THE SCIENTIFIC PROCESS.
In these pages, you’ll read stories about individuals in all stages of discovery — from students at the very start of their graduate education, to alumni with years of experience who have started the scientific process countless times but find it no less exciting each time around. No matter where you are in your own journey of scientific discovery, you just might see a part of yourself in one of these stories.
Dean’s Message

This edition of Hypothesis focuses on the Scientific Process.

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our focus on the
SCIENTIFIC PROCESS
Everyone, at every age, engages in the scientific process. Whether we acknowledge it or not, we are all scientists; some of us, perhaps, take it a bit more seriously. A toddler may hypothesize that a well-timed temper tantrum at an overly long wedding ceremony will elicit a favorable response of removal from at least one of the dependent variables — the toddler’s parents. A developmental biologist may hypothesize that a specific Hox gene product controls cardiomyocyte cell fate determination via interaction with a discrete transcriptional regulatory element. Whoever the scientist is, the process of discovering our world includes four distinct and necessary steps — formulation of a hypothesis, experimentation, analysis of results and conclusion.

Although all of us utilize the scientific process, it takes considerable time, effort and experience to engage in the process effectively. Development of competencies that allow students to effectively utilize each step of the process is a principal focus of master’s and doctoral degree programs in the life sciences. Each step in the process has its own challenges for students. Analyzing data with appropriate statistical methods and drawing sound conclusions from the data can be learned through courses and mentorship. Simply running a western blot can be challenging for all of us at times. Fortunately, experience and our lab mates can help us with techniques.

But what about the hypothesis? The hypothesis is different. Unlike statistics, there are no online resources to formulate your hypothesis for you. There are no voluminous manuals or published methods to help you “run” a hypothesis. Yet, the hypothesis is research’s cornerstone. A well-formulated, concise and testable hypothesis is the foundation of high quality research. The hypothesis is a synthesis of current knowledge in the field, ability to effectively develop testable and controlled experimental designs, and understanding and employment of innovative methodologies to carry out experiments. It requires an understanding of the potential experimental outcomes as well as potential research obstacles throughout the scientific process. The hypothesis envisions and encapsulates the entirety of the scientific process into a single statement. It is the entire research plan, and it is the beginning. It is the statement that embodies the passion and commitment for research. It is the beginning of discovery.

I hope you enjoy reading and learning about our school in this edition of Hypothesis.

Joseph X. DiMario, PhD
Dean, School of Graduate and Postdoctoral Studies
ASKING QUESTIONS

Ashmita Baral in Dr. Carl White’s lab space.
ASHMITA BARAL
FIRST-YEAR STUDENT

As early as middle school, Ashmita knew she wanted a life engaged in the sciences. During her undergraduate studies at Berkeley, she sought out work in the immunology lab of Dr. Gregory Barton, where she spent time looking at TLR2 receptors in mice. As she participated in lab meetings, she was fascinated by the types of questions her lab mates were asking; she quickly learned to love the problem-solving aspect of lab work and the collaborative nature of the profession.

“There are such different questions I could pursue in different labs, and that feels like such an opportunity.”

“What really drew me into pursuing this career was watching scientists interact and critique each other’s work. They brought in logic and new perspectives to answer a collective question,” she said.

After completing her undergraduate studies, Ashmita became a research associate in Dr. Steve Finkbeiner’s neuroscience lab at the Gladstone Institute, which is part of the University of California, San Francisco. As part of a large lab of 30–40 people, she worked closely with Dr. Nicholas Castello, with whom she had weekly one-on-one meetings. During those regular check-ins, Dr. Castello brought excitement and enthusiasm about their most recent experiments. “We would always be talking about how to tackle the next problem,” Ashmita said. “One idea would lead to the next, until we had all new questions to pursue — it was so useful to have those meetings for regular updates and new inspiration.”

Dr. Castello also provided crucial advice and guidance on career options and applying to graduate school. As she approached the next phase of her career, Ashmita knew that she wanted to combine her research backgrounds in immunology and neuroscience. She began searching for a place where she wouldn’t have to abandon one discipline for the other. During her interview with SGPS, several professors explained the unique nature of the Interdisciplinary Graduate Program in Biomedical Studies, particularly how multiple labs often collaborate across disciplines. Ashmita had finally found the program that could meet her needs.

“I am currently rotating in an immunology lab, but plan to rotate in neuroscience next. I am grateful for Rosalind Franklin University’s interdisciplinary focus as well, so the school really was a perfect fit for all of my interests.”

Still at the very beginning of her graduate studies at SGPS, Ashmita describes herself as “in the discovery phase” — trying to find a project that presents the most exciting problem. As she searches, she is already learning all new lab techniques, from flow cytometry to T cell differentiation, to cell sorting.

“Though I am enjoying my first rotation, I’m looking forward to seeing how different labs operate as well. There are such different questions I could pursue in different labs, and that feels like such an opportunity,” Ashmita said.

What Ashmita finds most exciting is the opportunity to forge her own project, rather than finding a way to fit herself into someone else’s work. With her new colleagues at SGPS, she is confident in her ability to find a question she can pursue for life. 🤚
FORMULATING AN EXPERIMENT

MD/PhD student Salvatore Aiello in the Biological Resource Facility.
SALVATORE AIELLO
SECOND-YEAR MD/PhD STUDENT, PHYSIOLOGY AND BIOPHYSICS

Though he enjoyed his undergraduate research at the University of Michigan Extracorporeal Life Support Lab, Salvatore Aiello felt a bit like a cog in a machine, surrounded by 50 undergrads working under surgical residents. That experience allowed him to embrace a smaller, more engaged campus for the next phase of his career.

Sal joined RFU in the Biomedical Sciences program, which influenced his decision to pursue a combined MD/PhD degree. With the opportunity to continue summer research going into the M1 year, and the M1A year structure allowing for research along with the heavy workload, Sal worked extensively in the field of cardiac arrest with Raúl Gazmuri, MD, PhD ’94, director of RFU’s Resuscitation Institute. The lab’s smaller structure gave Sal the opportunity to review the data after experimentation and actually discuss what it meant, rather than simply reporting results. This gave him a much deeper understanding of the project as a whole, and began his journey toward the creative, independent mindset necessary for a life of academic research.

“From kindergarten through M2, you live your life in a simple state of receiving concepts, figuring them out and then testing your understanding — but the PhD program is completely different.”

The biggest adjustment for Sal was the dual nature of PhD training: formulating an experiment that involves physical processes and acquiring techniques, while also seeking out papers and figuring out what he needed to learn on his own. During the first few months, he would read 3–5 papers a day, not knowing what might turn out to be relevant. He realized that he had to become a new type of student.

“How do I take this forward? What knowledge do I seek, and how do I use it? It’s a new skillset to develop, with new mental strategies,” Sal said. “The process is longer and more winding. Research is trial and error, in experiments and in learning how to be productive in your days.”

One of the most important tools for a productive researcher is a creative mindset, which is why Sal led the Medical Humanities Club at Chicago Medical School and is now involved with Art from the Benchtop at SGPS. “I think that’s part of the fun of research — the creative aspect, developing experiments, exploring the work,” Sal said. “That same part of your brain is triggered while making or interacting with art. It’s an important outlet, and something I’ve done my best to push for as part of the RFU community.”

Sal hopes to carry that imaginative mindset forward to a career in academic medicine. Having attended a few physician-scientist conferences, Sal can already say that being a physician researcher “takes a unique form of passion, or a strong indulgence in delayed gratification.”

But the challenges haven’t daunted him. Sal has benefited from observing his mentor as Dr. Gazmuri balances clinical practice and lab work, bringing knowledge from both to enhance each other. Having found a home in the scientific community, Sal hopes to bring that creative, collaborative, student-at-heart mindset to a long life in discovery.
GETTING GOOD DATA

Ted Peterson conducts research in the microbiology and immunology lab of Dr. Joseph Reynolds.
TED PETERSON
THIRD-YEAR STUDENT, MICROBIOLOGY AND IMMUNOLOGY

As a young medical student at CMS, Ted Peterson was torn between clinical practice and the fascinating world of basic science research. Because his undergraduate research mentors weren’t involved in clinical science, he was forced to do his own sleuthing to reconcile both interests. He found his solution in the combined MD/PhD program and Dr. Joseph Reynolds’ microbiology and immunology lab.

Ted feels he flourishes in the combined degree path because his mentor trusted his work ethic and gave him a large degree of independence. “Dr. Reynolds recognized early on that I worked very well without a lot of oversight or direction. That’s not the case for everyone, so I’m grateful for the opportunity to explore my PhD in that manner,” Ted explained.

As he developed his project, Ted eventually had an epiphany about Dr. Reynolds and his entire committee. “You get to a point where you’re not scared of them anymore; you realize that they’re actually there to help you succeed,” said Ted. “It’s all about the science and your growth. That realization was my research ‘eureka’ moment — that they were all on my team.”

Dr. Reynolds, a proud team member, is exceptionally pleased with his mentee’s work. When asked about his student’s research, he wrote, “Ted is asking very important and fundamental questions regarding how T lymphocytes develop in the thymus. Ted’s research touches on a variety of disease conditions, including immunodeficiency, autoimmunity and cancer. The identification of the cellular and molecular events underlying T-cell development will have broad implications, not only for disease but for also advancing our understanding of immunity.”

More than that, Dr. Reynolds is grateful for Ted’s presence in the lab and the opportunity to mentor such a hardworking, collaborative student. “Ted’s work ethic and understanding of his research topic are outstanding,” Dr. Reynolds continued. “Seeing his growth over the years in the SGPS program has been one of the most rewarding experiences of my career.”

Ted’s collaborative mindset has served him well. As he approaches graduation, Ted would like to encourage young graduate students not to be afraid to bring ideas to their mentors, especially at the beginning. “You might be waiting to be fed what approach to take or what to do — but don’t dampen your creative impulses,” said Ted. “You will be shut down occasionally, but talking about those ideas and why they might or might not work is the way that you grow scientifically. Advocate for yourself!”

Entering the home stretch of his doctoral work, Ted above all else wants to thank his family. “It can be difficult to be in this program with a family. I have a wife and two kids. But at the same time, that aspect of my life has been hugely beneficial. They’ve been supportive and given me an outlet outside my work and research. Some people get buried in grad school, but they’ve kept that from happening. I couldn’t have done it without them.”

“I really like the anticipation in building the hypothesis, figuring out the best approach.... But when you get good data and complete it, that’s the best feeling.”
Wren Michaels can see her research taking shape as she analyzes her data in the lab of her mentor, Dr. Michelle Hastings.
During her search for the right graduate program, Wren Michaels received vital advice from her undergraduate PI: A smaller school will get you more face time and a better connection to everyone in the lab. With this in mind, Wren discovered the tight-knit research community at SGPS, and was particularly taken with the Interdisciplinary Graduate Program in Biomedical Sciences (IGPBS). The opportunity to explore a variety of research options seemed like the perfect fit for her interests in microbiology, cell biology and anatomy, and physiology.

“I knew I loved science and roughly what I wanted to study, but I had only been in one lab previously. I wanted to explore,” Wren said. “I wanted to see different types of research, different labs and different mentorship styles. The rotations really appealed to me.”

Wren was recruited as a Distinguished Graduate Scholar, a merit-based program designed to recruit prospective students with outstanding academic credentials and research backgrounds. During her first year, she took full advantage of the IGPBS program, rotating in three different disciplines to find the right fit for her interest in cystic fibrosis. Eventually, Wren forged her own path with a dual mentorship, working with Dr. Michelle Hastings in cell biology and anatomy as well as Dr. Robert Bridges’ physiology lab.

The experience has been extremely helpful for both the project and for Wren’s personal development. Researching across two labs has increased her communication skills and given her broader knowledge of both fields. She is particularly grateful to have seen and learned from two different mentorship styles.

Despite the distinctions she received during recruitment, Wren struggled initially with finding her voice in the lab. “My first few years, I dealt with a lot of imposter syndrome, coming directly from undergrad,” Wren explained. “But if you’re given enough freedom by your mentor, with support and guidance as needed, you will learn more about your specific field and gain confidence in discussions with your PI.” Wren particularly encouraged students to build confidence in their ability to act independently, to speak up and take risks. “Don’t be too afraid to make mistakes — you learn from them as well.”

That boldness has certainly paid off: In the past year alone, Wren was awarded a trainee fellowship from the Cystic Fibrosis Foundation and won an outstanding poster award at the 2019 Annual Meeting of the American Society for Gene and Cell Therapy.

As she dives into her fifth year at SGPS, Wren is now working hard at the data analysis phase of her thesis. “It’s been my favorite part thus far; I’m building on everything I’ve done previously,” Wren said. “I’ve found the data analysis less stressful — all the work is in place, and now you are putting together the full story of all your efforts. When you see it all starting to take shape, that’s really exciting. I’m writing my first paper, and that’s been a goal of mine since starting research in undergrad. I’m almost there!”

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Clockwise from top left: ASRC 2019 keynote speaker Karin Schon, PhD (center), director of the Brain Plasticity and Neuroimaging Laboratory at Boston University School of Medicine, with ASRC board members (l-r) Salvatore Aiello, Wren Michaels, Valentina Olivera, Tim Cheung, Katherine Wolf and Rachel Chudoba. Alumnus Sidharth Mahapatra, MD '09, PhD '07, addresses students and faculty during the SGPS Pathways Taken event. Abbas Baghdaadi, SCPM '21 (far right), and Dr. Mahwash Siddiqui (second from left), receive awards for their presentations at ASRC 2019 from SGPS Dean Joseph DiMario and RFU Provost Dr. Nancy Parsley. MD/PhD student Salvatore Aiello (center) asks a question during Congressman Brad Schneider’s campus visit. The academic year kicked off in August with fun and games at the annual SGPS picnic.
Clockwise from top right: Tianhao Xu, PhD '19, accepts the Dean’s Award for Outstanding Achievement in Research from SGPS Dean Joseph DiMario. The Graduate Student Association received the Commitment to Research Award at RFU’s Student Leadership Awards ceremony in April. Graduate students Max Loh (left) and Sarah Mustaly attend the university’s 4th Annual Women in Science and Healthcare Symposium.
Graduate student Max Loh (right) discusses her research while gaining valuable presentation experience as an ASRC participant.

DPM/PhD student Tim Cheung presents his research poster to a judge during the 2019 All School Research Consortium.

Graduate student Max Loh (right) discusses her research while gaining valuable presentation experience as an ASRC participant.
The All School Research Consortium (ASRC) embodies the interprofessional educational philosophy at our university, where researchers and future healthcare professionals present their recent research discoveries and share ideas on how research addresses healthcare challenges to ensure better patient outcomes.

**SALVATORE AIELLO, ASRC CO-ORGANIZER**

Coming into graduate-level training, there is difficulty making the transition from undergrad. Students are asked to learn a high volume of material at a rapid pace. This is specific to coursework. Research for most students is an extracurricular activity. They are carving out time from sleeping, studying and Netflix bingeing to participate in research. First, they must identify a principal investigator (PI) who is conducting research that they find interesting. Once the student finds a place in a lab, they must do a tremendous amount of background reading to get caught up with the topic and understand how their research fits into the broader context. Then, whether the student is doing hands-on research or something more removed, like chart reviews, there is a learning curve period. Their work may take a painstakingly long time, only for them to realize it’s incorrect or not what the PI intended.

After improving efficiency and completing the data collection, the write-up is next — arguably, the most difficult part of the process. The student must figure out what the results actually mean, and often they rely on the guidance of a PI to compile figures or diagrams. Finally, the student brings all of this hard work and knowledge to events like RFU’s ASRC or scientific conferences, where they must be able to present the work to audiences who don’t have any of the background knowledge. This too is very challenging, to present an organized and simplified version of the research while maintaining the overall significance of the work.

For students at RFU, ASRC is a crucial event because it is student-organized. Students engage at all levels of planning, from contacting the keynote speaker, to serving as peer reviewers for the oral presentations, to arranging poster boards. While most conferences are specific to certain professions or areas of research, ASRC is not restricted to one area; student research from different schools and fields can be found at the same table, which allows students to admire their peers’ work. Through ASRC, students experience firsthand that the scientific process transcends professions and creates a community of mutual respect while fostering interdisciplinary collaboration.

SGPS Dean Joseph DiMario addresses attendees at the 2019 ASRC award ceremony.

ASRC brings together trainees from all five of RFU’s colleges and schools for a day highlighting their research. This year’s event featured the work of more than 130 registrants.
The annual “Art from the Benchtop” show, presented by the Graduate Student Association, brings the art and love of science out from the laboratory for everyone to see. In doing so, the images transition from analytic scientific assessment to emotive conceptual art.

Students and faculty enjoy the reception and “Art from the Benchtop” exhibit that closed out this year’s All School Research Consortium.
The exhibited artwork featured images captured during the scientific discovery process of RFU students and research associates.

Rachyl Shanker, "The Bed Nucleus of the Stria Terminalis." Rachyl is in the CMS Class of 2020, and was working under the mentorship of Joanna Dabrowska, PhD, when she created this image.

Jessica Centa, "Little Green Monsters." Jessica is a fifth-year graduate student working under the mentorship of Michelle Hastings, PhD.

Andrea Cardenas, "Astrocyte Nucleus." Andrea is a Laboratory Technician in the laboratory of Eugene Dimitrov, MD, PhD.

Nicole Ferrara, PhD, "Amygdala-dependent Mechanisms of Memory Modification." Dr. Ferrara is a Postdoctoral Research Associate in the laboratory of J. Amiel Rosenkranz, PhD.
BUILDING A NETWORK

“...what I’ve really enjoyed about being a postdoc is the freedom to prioritize my interests.”
Nicole Ferrara, PhD
Postdoctoral Fellow, Brain Science Institute

DR. NICOLE FERRARA’S RESEARCH HAS ALWAYS FOCUSED ON THE AMYGDALA — HER DISSERTATION EXAMINED THE SENSORY CONTRIBUTIONS UNDERLYING MEMORY MODIFICATION, PARTICULARLY HOW SENSORY EVENTS CONTRIBUTE TO MEMORY MODIFICATION, AS WELL AS HOW THESE EVENTS MAY BE ENCODED THROUGHOUT AN AMYGDALA-CENTRIC NEURAL CIRCUIT. THESE PROCESSES HAVE THERAPEUTIC RELEVANCE FOR TARGETING ORIGINAL MEMORIES TO REGULATE FEAR RESPONSES.

Her research interests brought her to the School of Graduate and Postdoctoral Studies, where she became a postdoctoral fellow in the lab of Amiel Rosenkranz, PhD, director of RFU’s Brain Science Institute. But Nicole had no idea just how well this new community fit her goals. “When I got here, I found a collaborative and supportive environment for students and postdocs as well as faculty,” she said. “As I interviewed, I realized this community was multidimensional, with opportunities for outreach, teaching and leadership roles within the lab.”

Nicole is especially grateful for Dr. Rosenkranz’s support. “While I was really drawn to his lab for the science, he is also just an excellent mentor. He’s very invested in all his students,” said Nicole.

Dr. Rosenkranz’s centering, encouraging influence on the lab allows for better, more engaged research. “He presented me with opportunities for not only grant writing, but also book chapters and other publishing opportunities,” Nicole explained. “I have a strong interest in outreach events, and he has staunchly supported the organizations that I was part of in the past, encouraging me to continue as a postdoc.”

Nicole’s outreach is an important foundation for her work. As part of the American Association of University Women, she organized “Brain Awareness Week” within the greater Milwaukee area. She is active in Women in Learning (WIL), an organization promoting women in the fields of learning theory, behavior, memory and neuroscience. She also participated in the Engaging Girls in STEM initiative, and supports the success and development of women in the scientific community at every stage of the process.

That community is what truly motivates Nicole as a lifelong researcher. “I connect with people I find inspirational in the field, whether that is grad students, postdocs or faculty — reading their work, initiating conversations and attending events where they are featured,” she said. “The people I worked with for my doctoral work, at conferences, at organizations like WIL — we’re all invested in each other’s research and career trajectories.”

Nicole’s advice on building a strong scientific network? “Identify what you want to do, and then talk to people who can make that happen.”

Nicole is grateful that SGPS values more than just bench work, prioritizing a multidisciplinary approach to research. “You have mentorship, writing, lab skills, presentation opportunities, continuing education — what I’ve really enjoyed about being a postdoc is the freedom to prioritize my interests. I get to talk through my triumphs and difficulties with people I admire and respect; people that, even if they don’t have the same background, are supportive, provide perspective and keep me motivated within science.”

Nicole has completed her doctoral work and entered a new phase of her scientific journey. When asked to map her current position in the scientific process, she put herself squarely in the hypothesis category. “While I had some overlapping interests such as fear and stress in the amygdala during my doctoral work, the approaches and behavioral aspects I’m currently studying are so different that I’d consider myself back at stage one,” Nicole said. She is developing research ideas and learning many new techniques, all while making headway on initial projects. “I have enough pilot data to go to certain conferences and give a small talk, but in terms of my larger question as an independent researcher, I’m very much back at the beginning.”
“More often than not, the hypothesis is wrong, so we’re always moving forward to find out what was wrong and what we learned. That’s the process that I love.”
According to Dr. Beaman, this legacy of research and mentoring began with childhood wonder. “I’ve always been interested in life. I grew up in the mountains of Colorado, and even as a child, I started studying the world around me,” Dr. Beaman said. “As an undergraduate, I was a wildlife biology major — then I found that people were more interesting than fish.”

Following his interest in life and how humans function, Dr. Beaman traveled to Ohio State University to earn his doctorate, then to Yale, where he was a postdoctoral fellow in the Department of Pathology. As he followed the scientific process in labs across the country, Dr. Beaman’s mind was always churning around one question: “Why does this do that? Why does anything work the way it does?” His infectious desire to understand a phenomenon and share that knowledge with others has motivated Dr. Beaman through three decades of research at SGPS.

“More often than not, the hypothesis is wrong, so we’re always moving forward to find out what was wrong and what we learned. That’s the process that I love,” Dr. Beaman explained.

At this stage of his career, Dr. Beaman says he finds the greatest excitement in encouraging new ideas from students in his lab. “My current student is interested in cardiovascular disease — but my lab works on cancer and reproduction. Both of those have to do with vascularization, so we’ve developed a project that matches her interests.” Finding connections based on student insights, Dr. Beaman’s lab is now looking at vascularization in heart disease, pregnancy and even in tumor growth. Allowing for those new ideas to guide the research is one of the most fulfilling parts of scientific discovery. “Student ideas are fresh and novel, bringing in new thought to the lab. It helps me to use their enthusiasm and their different angle on the research to grow,” he said.

Every time he mentors a new student, Dr. Beaman feels he learns as much or more than they do. “Sometimes I think they haven’t really learned anything from me — I just give them a chance to go forward and pursue their questions. I keep them out of the weeds.”

Dr. Beaman’s ultimate goal is to provide the necessary tools for the next phase of their training. As his students develop into lifelong learners, he hopes they share that same sense of wonder that first piqued his curiosity in the mountains of Colorado.
A COLLABORATIVE PROCESS

“...I highly encourage students to expand their knowledge base and network as much as possible. You really don’t know who has the seeds of a great idea.”

Dr. Beth Stutzmann in her laboratory, where she studies the early neuronal pathology that develops in Alzheimer’s disease.
Beth Stutzmann, PhD
Associate Professor and Director, Center for Neurodegenerative Diseases and Therapeutics

IN HER MANY ROLES — AS AN ASSOCIATE PROFESSOR OF NEUROSCIENCE, MENTOR FOR SGPS GRADUATE STUDENTS, DIRECTOR OF RFU’S CENTER FOR NEURODEGENERATIVE DISEASES AND THERAPEUTICS, AND CHIEF SCIENTIFIC OFFICER OF NEUROLUCENT INC. — GRACE “BETH” STUTZMANN, PHD, IS IN THE MIDST OF A WHIRLWIND OF COLLABORATIVE RESEARCH PROJECTS. SHE HAS SPENT MORE THAN 20 YEARS APPLYING ELECTROPHYSIOLOGICAL APPROACHES TO INVESTIGATING PATHOLOGICAL BRAIN CONDITIONS, EMPHASIZING NEURODEGENERATIVE DISORDERS AND BRAIN INJURY. BUT DR. STUTZMANN DIDN’T ALWAYS KNOW THAT THE LIFE OF ACADEMIC RESEARCH WAS FOR HER.

“I had a slower evolution toward research — I didn’t graduate from college knowing this was what I wanted to do,” Dr. Stutzmann said. “I was just pursuing my general interests and taking advantage of opportunities as they arose.”

Even after exploring other avenues like industry and business positions, Dr. Stutzmann always came back to academic science. Like the scientific process itself, her journey was never perfectly linear — but that winding progress helped shape the collaborative nature of her lab, providing unexpected opportunities for both herself and her students.

“One of the biggest areas of growth for my students and my lab has been the collaborative extensions we’ve made in seemingly unrelated departments or disparate labs,” said Dr. Stutzmann. “That has brought such depth and validity to our science; I highly encourage students to expand their knowledge base and network as much as possible. You really don’t know who has the seeds of a great idea. The cases that are most exciting, our new bits of research, are from labs that don’t have obvious ties to what we’re doing.”

Dr. Stutzmann’s research investigates effects of calcium signaling dysregulations associated with AD on neuronal physiology, synaptic transmission and histopathology. Her lab uses transgenic mice expressing human mutations that cause familial AD, and employs a vast array of techniques, from in vitro electrophysiology and 2-photon calcium imaging to molecular biology and in vivo approaches. She is always looking for new opportunities to collaborate on complex research questions, both within and outside the university.

“I just love the discovery, the challenge — trying to understand a neurological function from genes to behavior. Deep down, I feel like our science is providing a really novel insight into some important mechanisms. It might not be quite mainstream, but we feel confident it’s highly relevant, and we will stick it through.”

Instilling that same level of resilience is one of Dr. Stutzmann’s highest priorities in mentoring students. As a mentor, she has observed how many graduate students will, at some point during their studies, encounter a catastrophe or calamity that really challenges them or rattles their commitment to the field. But — even more importantly — students almost always persevere. Watching their growth and grit gives her great hope for the next generation of scientists.

“You can’t ever lose your resilience in this field. If you feel you’re right, you stick with it,” Dr. Stutzmann said. “Don’t avoid engagement, thinking you aren’t good enough or smart enough. It’s a trial-and-error process, so don’t be afraid to get up, dust yourself off and do it again.”

BEGINNING AGAIN

In her role as a highly sought-after mentor and collaborator in the RFU community, Dr. Stutzmann relishes the chance to look at the scientific process with fresh eyes. “It’s always good to be reminded of how important it is to start with a blank slate and think critically,” Dr. Stutzmann explained.

“When you’ve been through the process over and over, you can be tempted to jump ahead a couple of steps. Working with grad students really grounds you; it forces you to think through each step carefully and thoroughly. In that process you uncover aspects of the scientific process you may have skipped over, thinking you have done this a thousand times. Students keep you grounded in the fundamentals.”
“It means so much to see how my research incrementally paves the way toward better therapeutic strategies for our rare disease patients.”

Dr. Jeffrey Huang at the Children’s Hospital of Orange County in California, where he is the founder and lead scientist of the Center for Advancing Rare disease Editing (CARE).
It was a very intimate, small-town feel; if you needed a reagent or some help in the lab, you could ask anyone in the hallway," Dr. Huang recalled.

He had the distinction of being Dr. Marr’s very first graduate student. Seeing how Dr. Marr built up his lab from scratch, formulated his work and chose his lab members was hugely formative. “He had excellent characteristics as a mentor; he trusted me with a great deal and was always willing to empower me,” Dr. Huang said. “Dr. Marr entrusted me with processing invaluable human Alzheimer’s brain specimens, performing stereotactic neurosurgical procedures on an Alzheimer’s mouse model and purifying live viral vectors for Alzheimer’s gene therapy studies.” What particularly impressed Dr. Huang was how Dr. Marr cared about every part of his student’s well-being. “He checked on my comfort level in the lab and whether my hours were okay. He kept his office door open during work hours and responded quickly. I’ve tried to emulate that personal connection, making sure everyone in my lab feels valued,” said Dr. Huang.

Those mentorship lessons are always fresh in his mind while training young interns in CRISPR genome editing. “I find myself circling back to Dr. Marr’s example, trusting and empowering my students and interns. Early on, it was harder for me to let go — I was hovering a little too closely, not providing the freedom Dr. Marr gave me. Students learn best when you take the training wheels off.”

In the midst of training young scientists, developing mouse models and improving patient care, Dr. Huang is also building the Center for Advancing Rare disease Editing (CARE). CARE will serve many functions: generating, characterizing and treating animal models of rare pediatric diseases, and using CRISPR editing to address deficiencies in existing treatment. As he builds, Dr. Huang looks back at how Dr. Marr assembled his lab as a reference for this new project.

“It consumes my every waking moment right now. Putting together the right team is my main concern, finding the people who will grow and build with me,” Dr. Huang said. CARE will be one of the first centers of its kind, bridging the interface between health care and research. Dr. Huang continues to ground his translational research with the help of a physician mentor, Dr. Raymond Wang, who connects him with patients at the Children’s Hospital of Orange County (CHOC). “With his help, I get to see my research’s impact on the patients whose diseases I am modeling,” said Dr. Huang. “That human connection shows you exactly what you’re working for every day.”

The most rewarding part of Dr. Huang’s current research is his ability to see the translational ties at CHOC.

“It means so much to see how my research incrementally paves the way toward better therapeutic strategies for our rare disease patients.”

Dr. Huang finds strength in designing models of patients’ genomic mutations, sculpting them from the inside out. “I see the preclinical mouse models as the closest thing on this earth to the patient in the exam room. I find joy knowing I’ve created something unique, exploring therapeutics safely and ethically, as I search for a way to help them.

“There’s a lot of bureaucracy in the healthcare system, and it moves at a snail’s pace at times,” Dr. Huang added. “But knowing that the greater goal is improving children’s health — there’s no gray area there. These kids deserve the best.”
Evangelos Ntrivalas, MD, PhD ’05, is now a clinical immunologist at the Memorial Sloan Kettering Cancer Center in New York City.

“We strive as scientists to explain to our peers the importance of our work; if you don’t describe it appropriately, it may be lost in translation.”
“Learning how these diagnostic tests are created, knowing from scratch how the whole process happens — it helps me help my patients. I think it has huge value for all combined degree students to know the entire process from bench to bedside,” said Dr. Ntrivalas.

After earning his PhD in 2005, he entered Dr. Kenneth Beaman’s fellowship program to become a certified clinical immunologist. Dr. Ntrivalas is grateful to Drs. Beaman and Gilman-Sachs for modeling excellent mentorship, as well as how to maintain connections and be collegial with others in the field of research. “Dr. Sachs will still consult with me on flow cytometry, and we serve together on committees outside RFU at various scientific associations,” Dr. Ntrivalas said. “Whenever I am back in Chicago, I always visit. We have kept a professional, friendly relationship for 20 years and counting!”

Dr. Ntrivalas is now a clinical immunologist at the Memorial Sloan Kettering Cancer Center in New York City. Drawing on both his clinical and research training, Dr. Ntrivalas has 15 years of experience developing and validating immunoassays, diagnosing autoimmunity, immunodeficiency and tumor immunologic diseases. He has gone through the stages of the scientific process countless times, but finds himself drawn most to the conclusion phase.

“I have always found the discussion part of the publication the most fascinating,” Dr. Ntrivalas explained. “You have finished your experimental approach, hopefully your data supports your hypothesis, and now you are discussing why this outcome is important. I love the discussion section. We strive as scientists to explain to our peers the importance of our work; if you don’t describe it appropriately, it may be lost in translation.”

For graduate students daunted by the conclusion phase, Dr. Ntrivalas encourages them to be excited, not intimidated. “You’ve done the work! Now you’ve reached the ultimate purpose — presenting to the scientific community.” The conclusion is a necessary and compelling component of life in research. It is the way that every member of the community connects, learns and grows together. With that knowledge, Dr. Ntrivalas offers this advice: “Be enthusiastic, positive and persistent about showing the value of your data. Don’t be scared — you will encounter tough questions, but those will help you understand and better defend your work.”

“SGPS helped me a great deal through the Art of Scientific Presentation course, taught by Dr. Eric Walters,” Dr. Ntrivalas said. “It was the first time I looked closely at this aspect of science. Don’t make it boring — make it exciting! You know the value of your work — advocate for it. This has helped me in numerous presentations in my career. What you put into the presentation is your soul — your full self.”

Dr. Ntrivalas learned the importance of a compelling research narrative while attending a meeting for the American Society for Reproductive Immunology with Dr. Gilman-Sachs. He submitted and successfully presented a poster, but was mistakenly entered into the oral abstract presentations as well. When his name was announced, he was immediately put on the spot. “I was shocked. ‘Oh no, I don’t have any slides,’ I thought. ‘It was just a poster presentation!’ But Dr. Gilman-Sachs simply said, ‘Well, can you present without them?’ And that’s what I did! It turned out it was a mistake by the organizers, but the presentation actually went quite well even so,” Dr. Ntrivalas recalled. “I’ll always remember how my mentor encouraged me to take the plunge, and how the risk paid off despite the fear.”
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Dr. Wendy Rheault
Appointed University President and CEO

Wendy Rheault, PT, PhD, FASAHP, FNAP, DipACLM, was appointed president and CEO of Rosalind Franklin University on July 1. She had served as the university’s interim president for the first half of 2019. A national leader in health professions education reform, Dr. Rheault is the first woman president in the institution’s 107-year history.

“I am proud and humbled to lead our university in its next phase of excellence and growth,” said Dr. Rheault. “I look forward to working with the Board of Trustees and many dedicated colleagues to advance the team approach to health care and research.”

In an announcement to the university, the Board of Trustees cited Dr. Rheault’s deep institutional knowledge, her vision for RFU and insight into the challenges and trends facing the next generation of healthcare practitioners and biomedical professionals.

Dr. Rheault has served the university for 38 years in numerous faculty and administrative capacities. She was instrumental in the adoption and development of RFU’s pioneering model of interprofessional education. In her role as interim president and previously as provost, she worked closely with the university’s deans and vice presidents in developing academic priorities, providing strategic direction and ensuring academic accountability. She has led the alignment of institutional priorities, including how the university trains its students and recruits and develops staff, with national goals for improving health and regional workforce needs.

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PUBLICATIONS and PRESENTATIONS

PUBLICATIONS


BOOK CHAPTER


LETTER TO EDITOR PUBLICATION


PRESENTATIONS


Chudoba R. October 2019. “Inhibition of corticotropin-releasing factor (CRF) neurons in the oval nucleus of the bed nucleus of the stria terminalis does not affect anxiety-like behavior but inhibits stress-induced startle sensitization in adult male rats.” Society for Neuroscience Annual Meeting, Chicago, IL.

Ferrara N. October 2019. “Brief social isolation increases social interaction and cortical drive of basolateral amygdala activity.” Annual Meeting of the Pavlovian Society, Vancouver, BC.


Fresquez AM, White C. July 2019. “Calcium entry controls macrophage speed.” MD/PhD National Student Conference, Copper Mountain, CO.


Loh MK. October 2019. “Participation in multi-dimensional support based research program enhances low income Latino high school students in the pursuit of higher education and STEM professions.” Society for Neuroscience Annual Meeting, Chicago, IL.


Olivera V. March 2019. “Cellular substrates of fear discrimination in dorsolateral bed nucleus of the stria terminalis (BNSTdl), the role of oxytocin receptors.” RFUMS All School Research Consortium, North Chicago, IL.

Olivera V. October 2019. “The expression and distribution of oxytocin receptors in the dorsolateral bed nucleus of the stria terminalis (BNSTdl) and their interaction with GABAergic system.” Society for Neuroscience Annual Meeting, Chicago, IL.


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Names in bold indicate current/former SGPS graduate students or postdocs.
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