“If I have seen further it is by standing on the shoulders of giants.”

— Sir Isaac Newton
Dear colleagues,

Our September newsletter is dedicated to our summer students and their mentors. We want to celebrate the diverse ideas and efforts that our summer students contribute to our Radiology Department, Stanford’s School of Medicine and the broader community. We also want to thank our Radiology trainees, faculty and staff who invested time and effort to organize student programs, develop student projects and serve as guides and teachers for our summer students. And we sincerely thank our generous sponsors, who are making our summer student programs possible and successful.

Our newsletter provides reflections from our summer students about their experiences at Stanford. We will learn about insecurities and fears while stepping into a new world, how some questions or comments can be unintentionally hurtful, how immersion in research experiences can be challenging and exciting, and how positive feedback and a successful conclusion can have a major impact on a student’s life and career choices. We sincerely thank our summer students to share their thoughts and giving a voice to others who may feel the same.

To expand this conversation, I invite you to visit the inspiring talks below, which raise intriguing questions about academic pursuits and life in general, such as: What is the difference between success and mastery? What defines an intellectual? How can we increase our luck? It is a pleasure to see an increasing number of people embarking on a quest for answers to these questions. We are all grateful for the opportunity to learn from each other!

Heike E. Daldrup-Link
Associate Chair for Diversity
Department of Radiology

https://www.ted.com/talks/sarah_lewis_embrace_the_near_win?referrer=playlist-the_line_between_success_and_f#t-491016


https://www.ted.com/talks/tina_seelig_the_little_risks_you_can_take_to_increase_your_luck
“Go ahead and tell us a little bit about yourself,” my mentor said to me. I internally began to panic as four people swiveled in their chairs to face me. What do I say? It was such a simple question...yet I couldn't put the words together to form a coherent sentence. I had trouble accepting a large part of who I am. As an Asian American, I had a hard time finding a place where I belonged. When I visit my relatives, my American accent is indication enough that I’m an outsider. However, in the US, my appearance, alone, is enough for people to form their own judgments. But as a member of the lab for the past 10 weeks, surrounded by the most understanding, supportive, and diverse individuals, I was able to feel the sense of belonging that I usually only feel when surrounded by my family. It was the environment of acceptance and light-heartedness that gave me the sense of belonging and eventually, acceptance.

“Be yourself and just have fun. Don’t try to become someone you’re not. Just be you and speak up and be excited,” my mentor once said to me to calm my nerves before a presentation—one that ended up being the best presentation I'd ever given. Originally, I thought I'd leave Stanford having acquired the skills necessary to prepare me for a career in research. But I also learned that by embracing my identity wholeheartedly, not only was I able to push my limits, I was also able to accomplish more. Different is good. Different is unique and by embracing these differences, we all become more.

Rachel Huang

Home Institution: Johns Hopkins University
Host Stanford Lab: Stoyanova Lab
Walking into the Canary Center for the first day of my internship, I thought, “Who do I want to define myself as this summer?” I knew because of who I am, others may perceive me as inept or undeserving of my place there. I knew I would deal with microaggression and sexism. I knew I would deal with the inability to relate. I tried not to allow it to foster regret or insecurity. Often throughout my life, I have spent time reminding myself that forces such as affirmative action did not grant me the experiences that I have as a woman of color. I have always worked hard to be successful and to be granted opportunities. I have set myself apart from others. However, being in an environment in which one’s integral component of their identity is diminished can foster insecurity. Being a black woman in a field that is predominantly composed of a specific demographic can take a toll on one’s self-confidence and ability to perform at their best.

As a black woman, often I am aware of my own social surroundings more so than others, because of this, we spend a significant portion of our daily lives socializing and reflecting on our behavior and our interactions with others. We want to feel as though we belong in a place that may not have always been welcoming to people who look like ourselves. One of the first questions I received was: “So how did you get into the program?” One of the first statements I received was, “wow, how did you get your hair to do that?” I wanted to snarky reply, “I put water in it to make it curly. Just water.” However, I didn't. I answered the questions, composed: “I was selected” because I was. It became prevalent to me that the rumors regarding diversity in STEM were true. The Canary Center itself is not a force that breeds microaggressive rhetoric, still, I couldn't escape, the questions and the exclusion. I began work in the Gevaert Bioinformatics lab at the Stanford School of Medicine. Immediately, I delved into the world of science. Research and intellectual progression are blind to color and are blind to gender. One can engage with information and learning, because knowledge does not segregate and knowledge does not discriminate.

I was assigned to my very own post-doc, Dr. Hong Zheng, who would guide me and teach me mechanisms of research as well as tools for learning coding languages. Her patience and her willingness to put in time into my progression was admirable. Her successes and her knowledge were impressive to me. I consider her to be one of the first female mentors I've had in the STEM field. I believe after 10 weeks were completed that I was able to be challenged and to be successful without fear of marginalization. I felt as though I was able to feel like I belong, with my mentor challenging me and inspiring me, I was able to gain valuable experience, free of ridicule due to the color of my skin.

Irmina Benson

Home Institution: Wesleyan University
Host Stanford Lab: Geveart Lab
After finishing my first year of medical school at the University of Alabama in Birmingham, I had a basic understanding of the field of radiology. In a search for furthering my understanding and appreciation for the field, I joined Dr. Daldrup-Link’s lab research on the effectiveness of PET/MR in the local pediatric population. I gained a breadth of knowledge involving the intricacies of imaging during my time at Stanford, and was fortuitously given the chance to observe many of the scans that would be used in the research that I was involved in. There was an incredible diversity in the patient backgrounds in the Bay Area, and I had the exciting opportunity to speak with and for a Hispanic family during their daughter’s imaging scan. As a son of two Hispanic parents involved in improving healthcare access to Latino populations in Birmingham, I was excited to do so in a way that is unique to my goals as a physician-scientist. While at Stanford, I saw the humanizing side of research, where my work in the lab directly affected the lives of the patients in front of me and future patients with similar afflictions.

Jordi Garcia-Diaz

Home Institution: University of Alabama School of Medicine
Host Stanford Lab: Daldrup-Link Lab
Diversity means more than just the differences in our cultures and our ethnicities. When I think of diversity I also think of the diversity of our experiences that make us who we are. These experiences are not evident by the color of our skin or our last names. It requires digging deeper. If you looked at a profile of me you’d see my name, age, date of birth, MCAT scores, Step 1 score, and where I went to college and medical school; however, these are not the experiences or numbers that make me who I am or that inspired me to dream. The numbers that fueled my passion and dedication are the numbers that I could not bubble into an application. I am the 5th child of a family of 7 children and 2 parents. My two parents immigrated into this country 36 years ago and in that time have been unmotivated to find stable jobs, learn English, or integrate successfully into the United States. My father resorted to illegal means of making money and landed in jail 2 times before I was 6. My parents relied on state aid to raise my siblings and I, and words like welfare and food stamps were part of my lexicon from a very young age. My mother had my youngest and only brother when she was 39; he was born with Klinefelter’s Syndrome, meaning he has 1 extra X chromosome that delays his mental and physical development. I realized at a young age that life had given me some challenges: the first challenge was my ability to dream beyond my circumstances. I had to fight feelings that I was unworthy of the opportunities before me and battle against the statistics of those who try to escape poverty but are unsuccessful.

I am proud to say I will be applying into residency for Diagnostic Radiology this year and will fulfill my life-long dream of becoming a physician. This is a great achievement and I am very proud of myself; however, this achievement along with others that may come in the future, are meaningless if it means that I attend residency, obtain a prestigious job, and then forget. Forget where I came from, how I got here, and forget to give back. I have been given so many challenges in my life and struggles at a young age, but most importantly, I have been given the strength and ability to see myself beyond my circumstances. Because I have been given this, I know that much is expected of me as a member of my community, and I am expected to give back to those who also have challenging numbers.

Imilice Castro Paz

Hometown: Riverside, CA
Home Institution: Stanford University School of Medicine
Host Stanford Lab: Dr. Terry Desser & Dr. Daniel Rubin
When I came to Stanford, I can admit that I felt a huge case of imposter syndrome. I was chosen to be a part of a small cohort for the summer, but I still felt I was not as brilliant as the other students around me. Luckily, I was placed in the Daldrup-Link lab this summer, and I adjusted well to the atmosphere and the research. While working on a diversity project, I was able to interview faculty members in the radiology department, and I learned that even well accomplished faculty can still feel imposter syndrome at times. While I was curious to why this may be, I realized that I was in a similar situation. From that point on, I was able to finish my internship knowing that I was here for a reason and that I was just as good as everyone else. I feel this is something all faculty members should own about themselves. We are all placed where we are now for a greater purpose. You may not see it immediately, but with time, you will know what that purpose is.

Kensley Villavasso

Home Institution: Xavier University of Louisiana
Host Stanford Lab: Daldrup-Link Lab
I, Lilly Zhou, am a prospective Computer Science major in the Artificial Intelligence track. This summer I was interning at the Radiological Science Lab (RSL) at the Lucas Research Center at Stanford as a software researcher. I worked to develop a mixed-reality system that utilizes object tracking cameras and Microsoft HoloLens to project a 3D “hologram” of images from a preoperative breast tumor MRI onto a patient. My project aimed to improve surgeons’ ability to determine the location of tumors during surgical operation. During the internship, I was amazed to see the broad spectrum of ways computer science can be integrated into many different fields including surgery and medical imaging. If one is interested in both healthcare and computer science, like myself, the good news is they do not have to choose between the two because it is by all means possible to do both. One important thing I learned during my time there is that not all life saviors necessarily need to go to medical schools. One can also make their own unique impact on other people's lives by building things and solving problems outside the hospital buildings.

Lilly Zhou

Home Institution: Stanford University (Rising Sophomore)
Host Stanford Lab: McNab Lab
My name is Akshay Jaggi, and I am a rising senior at Stanford. I major in Biology (Honors Track in Computational Biology) with a double minor in Linguistics and Computer Science. I’m also on a competitive Indian dance team on campus called Basmati Raas (pictured below). I am interested in applying natural language processing and machine learning to improve medical diagnostics. This summer, I worked with Dr. Sandy Napel on further developing digital phantoms for image feature quantification standardization. I completely reworked an approach to the problem that I developed last year. This summer, I certainly learned that you’re never too deep down a path to reevaluate your decisions and develop a new approach. That new approach may require much extra work, but, if the outcome is a project you’re more proud of, then the work is worth it. A mindset that will hopefully be useful during graduate work I pursue in the future.

Akshay Jaggi

Home Institution: Stanford University
Host Stanford Lab: Sandy Napel Lab
A setback is not a failure if it is temporary: Trudge through difficulties to reach success

I have always been passionate about academic medicine and have hoped to find opportunities to practically apply this desire to help advance the field. Clinical research allows this very ambition to be possible, but it always seemed so broad and intimidating to me, especially as an undergraduate student. However, after my summer in the Daldrup-Link lab, it appears that research is not only accessible, but also manageable with the right opportunities and mentors. Each researcher in the lab, especially my mentors Dr. Anne Muehe and Dr. Daldrup-Link, has taught me what it means to be a researcher and a physician. I've had opportunities to marvel at new devices for nanoparticle labeling, observe a porcine knee surgery, learn the basics of cell culturing, create artistic medical figures by hand, write a review paper, and to be bold. Each member of the lab has continually encouraged me to be confident in my work, even when I make mistakes. When I found myself constantly editing and re-drawing my figures on Photoshop or stumbling to present at a lab meeting despite days of preparation, I felt utterly defeated. Despite these frustrations, I was always told the same thing at the end of every meeting: “Good job!” Those words have motivated me each day to wake up at 7:00am and to have a researcher’s will to trudge through difficulties to reach success. I have also gained an invaluable understanding of an academic physician’s role in promoting scientific discoveries. These new perspectives have made each day at the lab more fun than the last, and I hope to continue developing my passion and skills to become a physician scientist!

Jessica Tseng

Home Institution: University of California, San Diego
Host Stanford Lab: Daldrup-Link Lab
I thought Murphy's Law's association to research was just an exaggeration: The gravity of science, ultimately, is its tendency to bring complex questions down to Earth. Only when responsible for a summer project of my own did I realize that my previous naivety knew no bounds. Research, after all, is full of problems. This summer, I've been able to demystify what was once a fancy word. “Research” isn't a puzzle that I assemble piece by piece. Rather, it is put together and taken apart, talked about, modified, and then reassembled some more. A single misplaced piece has the potential to not only tumble an enigma down, but to also metamorphose it to become a better version of itself.

Learning what research is about meant modifying what is the best way to “do” science. Inductivism is attractive in theory, but I've surmised it hardly works. This is perhaps the greatest learning experience that I will carry with me: research hardly works. This summer has been heuristic, and Mr. Murphy and I have become good friends. As I pursue research, I'll allow time for his law to do its job – the most fruitful conclusions are left in its wake.

Samvardhini Sridharan

Home Institution: University of California, Davis
Host Stanford Lab: Willmann Lab
As a Persian-American high-schooler with a unique opportunity to work with Dr. Spielman in Radiology, I have acquired a keen sense of what ‘clinical research’ means now. This was never a topic in any of my studies at Leland, and would have most likely never been much in my vision of my future. I understand now the challenges of translational research, how ‘what-if’ queries can lead to new insights and how something as mysterious as ‘amplified MRI’ could affect everyday life. Over the last two summers, I got a special glimpse into how Radiology research works, how working at the Lucas Center led me to many interesting people and ideas, and how this work could become my future. As a result of my experiences and interactions with a lot of cool people at Lucas, I have decided to focus my college to a ‘pre-med’ line of studies. I would like to mention those who were so kind to help me; Drs. Tom Brosnan (thank you Tom for your mindfulness chats), Ashok Theruvath, Anne Muehe, Dan Spielman, Samantha Reyes, and Mehdi Razavi. Thank you to everyone at Lucas as well; it is a rich and wonderful environment.
Never have I felt so at home within a scientific community. As a first-generation scholar from Central California, I was fortunate to be funded by the Amgen Foundation to conduct summer research under the Radiology Department at Stanford. A microbiologist and bioinformatician by trade, my project challenged me to explore biophysics as I modeled the uncaging mechanisms of nanoparticle drug carriers. As a member of the Amgen Scholars Program and Stanford Summer Research Program (SSRP), I experienced the life of a graduate student for two months as I was immersed in science, evening seminars, workshops, and GRE prep. My passion for translational research was amplified by my short-time in the Airan lab, solidifying my decision to pursue a graduate degree in biophysics. Thank you to Dr. Airan, my mentor Sunmee Park, the Radiology Department, and my SSRP family for making my summer 2018 filled with many laughs, learning experiences, spontaneous adventures, and amazing memories.

Brenda Yu

Home Institution: University of California, Merced
Host Stanford Lab: Raag Airan Lab
I had the amazing opportunity this summer to work with Stanford Radiology building artificial intelligence tools for the analysis of deep brain structures such as the thalamus within MRI images. Coming from a background in theory, I was extremely excited to apply deep learning methods to a real task in the medical community that has the potential to generate new insights into devastating neurodegenerative disorders. Through working with professors in the department as well as spectacularly talented graduate students and fellows, I was able to make progress towards my goal of being able to automatically detect regions of the brain frequently affected by diseases such as Alzheimer’s. However, working with Stanford Radiology taught me something more fundamental to my life and career; I learned what it truly means to be a scientific investigator. Science as a whole greatly outweighs the sum of its success—it is about living a lifestyle that facilitates sincere inquiry alongside rigorous scrutiny and documentation. It is about waking up early to watch brilliant presentations, staying late into the night in pursuit of knowledge, treating failures with the same excitement as triumphs, and never failing to learn from diverse situations. Thank you RSL!

Matthew Dardet

Home Institution: Stanford University, B.S. Candidate in Mathematics
Host Stanford Lab: Rutt Lab
Canary CREST Program

Canary Cancer Research Education Summer Training Program
The Canary Center at Stanford is a world-class research center dedicated to early cancer detection. To train the next generation of interdisciplinary scientists, we offer a unique summer research training opportunity for undergraduate students, namely, the Canary Cancer Research Education Summer Training (CREST) Program. Funded by the National Cancer Institute (NCI), the program offers a 10-week research experience in one of our state-of-the-art labs. Each participant is matched with a faculty mentor who helps them craft a research project. Senior scientists and postdoctoral fellows assist the faculty in supervising and mentoring the students. Participants work in a dynamic lab environment on challenging projects that involve a broad range of research techniques. Additionally, students learn about the field of cancer early detection (from in vitro diagnostics to in vivo molecular imaging) through specially-designed short classroom sessions, as well as participate in professional development and career seminars. The program culminates with a symposium, where students present individual posters on their research projects in front of their peers, faculty and lab mentors, and other Stanford scientists.
More information can be found here: https://canarycenter.stanford.edu/canarycrest.html

SMASH Rising Program at the Canary Center at Stanford

To create greater diversity in science, the Canary Center at Stanford has started a new collaboration with SMASH, the signature STEM education initiative of the Kapor Center's Education focus area.

The SMASH Rising Program at the Canary Center is a 7-week research internship program for students from underrepresented communities entering their first or second year of college. Students work on a scientific research project under mentorship of a professor and various researchers at the Canary Center. They also participate in professional development activities to gain essential workplace skills and build their network.

With this initiative, we aim to empower brilliant underrepresented students by exposing them to cutting-edge cancer research and technology development, training them in hypothesis testing and experimental design, building their problem-solving and critical thinking skills, and giving them access to resources and social capital to help them pave a successful career path.

More information can be found here: https://canarycenter.stanford.edu/smash-rising-program.html
SSRP-AMGEN Scholars Program at Stanford

The SSRP-Amgen Scholars Program is a fully-funded research-intensive residential program that takes place on Stanford's beautiful campus for a nine-week period. Participants are matched with a member of Stanford's distinguished faculty and work in one of our state-of-the-art research facilities. Each participant works with both a faculty member and a lab mentor to craft a research project. The lab environment provides challenging projects and involves a broad range of research techniques that are feasible within the nine-week period. The program culminates with a research symposium, where students present individual talks and posters on their summer projects in front of their peers, faculty, lab mentors, University administrators, and general public.

https://biosciences.stanford.edu/current-students/diversity/programs-for-students/ssrp-amgen-scholars-program/

Stanford Summer Sessions:

The Stanford Summer Session program is open to both national and international students and provides high-achieving and ambitious students a transformative educational experience at a world-class university. By combining challenging academics with a rich array of extra-curricular programming, Stanford Summer Session successfully shares the University's culture of innovation, academic excellence, and global responsibility.

https://summer.stanford.edu/

A comprehensive list of over 20 student programs can be found here: https://oso.stanford.edu/programs/

Explore the Stanford Campus:

Spend an hour with a student guide exploring the highlights of Stanford's beautiful campus. A great introduction for first-time visitors and tourists. Tours are free and take place seven days per week except for some periods of closure.

https://visit.stanford.edu/tours/index.html

A second option is a state-of-the-art Engineering Quad (EQ) tour with an enthusiastic student guide.

https://visit.stanford.edu/tours/seq.html

A third option is Discover Stanford, a two-part program designed to help high school juniors and seniors explore the programs, places, and people that define Stanford's commitment to undergraduate education within the setting of a world-class university.

https://visit.stanford.edu/tours/prospective.html
Check this out:

The U.S. Department of State's Benjamin A. Gilman International Scholarship grant program enables students of limited financial means to study or intern abroad:

https://www.iie.org/programs/gilman-scholarship-program
I've totally got this.