

Where are they now? USC's stem cell master's program alumni

Tiffany Mays

A PhD student studying cancer biology at Northwestern



USC alumna Tiffany Mays is equally adept at playing the flute and pipetting into a flask. So it's only fitting that Mozart influenced one of her first forays into research.

"My first science experience was through the American Museum of Natural History in New York City where I did a program for high school students after school," said Mays, who will soon defend her thesis as part of USC's master's program in stem cell biology and regenerative medicine. "My project was on the morphological diversity of the North American starling, and I chose the project because I was performing the Mozart concerto 'Magic Flute' at the time. I read that Mozart had a pet starling, and so I decided to combine both interests into one."

This early research experience confirmed that science was her calling. For her undergraduate degree, she chose to attend USC, where she majored in human biology with an applied physiology focus and minored in health care studies, and performed research about how cells grow and divide in the lab of Matthew Michael at the USC Dornsife College of Letters, Arts and Sciences.

After taking the course MEDS 380 Stem Cells: Fact and Fiction, she decided to pursue more clinically focused research in the lab of David Cobrinik at Children's Hospital Los Angeles. She studied genes that affect a childhood eye cancer called retinoblastoma.

From Francesca Mariani, MS Program Director:

In this newsletter, we highlight graduates of USC's master's program in stem cell biology and regenerative medicine. Our accomplished alumni have pursued many paths—ranging from biotech industry jobs to teaching careers, and from PhD programs to professional degrees in medicine, dentistry, and law. Forty-one master's students graduated as part of the Class of 2022, and we are delighted to welcome them into our vibrant, diverse, and growing community of alumni. For more information, visit scrm.usc.edu.



As an undergraduate, Mays also continued to play the flute as a member of the Trojan Marching Band. She not only enjoyed front row seats to every football game, but also made lifelong friends and traveled the world.

After graduating, Mays completed USC's one-year master of science program in stem cell biology and regenerative medicine. She joined the lab of Unmesh Jadhav, and studied the role of a gene known as *EZH2* in colorectal, breast, and prostate cancer. She continued this project through the master's program's optional second research year, which culminates in a formal thesis project.

"Unmesh really had an emphasis on learning the material, reading the papers, and thinking of your own ideas," said Mays. "That helped me figure out how I can think as a scientist and solve problems."

During the master's program, Mays also pursued a summer internship at Krystal Biotech, which is developing gene therapies to treat rare diseases.

After defending her master's thesis, Mays will pursue her

PhD in the Driskill Graduate Program in Life Sciences, studying cancer biology at Northwestern, where she was awarded a fellowship from the Graduate School for her research interests, strong background, and exceptional promise as a scholar. She will also have the option of simultaneously earning a master's degree in clinical investigation to understand the intersection between translational and clinical research, and a certificate in

management for scientists and engineers through the Kellogg School of Management. One day, she hopes to start her own lab and biotech company. She might also pursue an MD with a specialty in pediatric oncology.

“Long-term,” she said, “I want to feel that I’m going to have an effect on somebody and impact their life in a positive way.”

Natasha Raj-Derouin

An MD pursuing a specialty in reproductive endocrinology and infertility



When Natasha Raj-Derouin (née Natarajan) was doing her medical school rotations at Columbia University in New York City, she was thrilled to find a subspecialty that incorporated lessons from the master's program in stem cell biology and regenerative medicine at USC.

“What’s been really great is that there is a subspecialty within OB-GYN called reproductive endocrinology and infertility or REI, and it’s a field that has a huge basis in basic science,” she said. “A lot of the work we do has to do with embryology and an understanding of stem cell biology, to help fertilize embryos *in vitro* and then implant them into a patient.”

Raj-Derouin first fell in love with stem cell research when she was taking AP Biology at Beverly Hills High School. As a prize for winning a writing competition hosted by Cedars-Sinai Medical Center, she was awarded the opportunity to work in the UCLA lab of Jianyu Rao, who was studying how green tea affects stem cells.

As an undergraduate at USC, Raj-Derouin took the course MEDS 380 Stem Cells: Fact or Fiction. Before long, she joined Gage Crump’s stem cell lab and co-authored a study in *Frontiers in Developmental and Cell Biology* about how zebrafish regenerate arthritic joints.

She went on to pursue USC’s progressive master’s degree in stem cell biology and regenerative medicine, before entering medical school at Columbia University.

When the COVID-19 pandemic interrupted her clinical rotations for three months, she worked as a volunteer with postpartum women who had been sent home from the hospital immediately after giving birth.

“Women were being discharged right after they had a baby without getting the full explanation of postnatal care, because the hospitals were in a place where they were really trying to keep beds open,” she said. “So I would call women postpartum and just check up on them to make sure they had the information they needed, and that none of their symptoms were alarming enough that they should go back to the hospital. So that was a way to both help out, and stay in touch with patients to continue learning.”

As a medical student, she also conducted clinical research exploring if different oxygen levels experienced by IVF embryos affect live birth rates.

In June, she will begin a four-year residency in OB-GYN at Kaiser Permanente in Los Angeles, with plans to pursue an additional three-year fellowship in REI. Eventually, she intends to practice medicine in an academic setting in California, where she and her husband have family in both Los Angeles and the Bay Area. In addition, she hopes to pursue research about how to enable same sex couples to have biological children, get involved in medical education, or advise about ethical, regulatory and legislative issues related to the rapidly evolving field of REI.

“It was great to find this field where I can be a physician and create long-standing relationships with patients, and where I can still think deeply about the science and try to be creative,” she said. “So it’s cool to be able to feel like I get the best of both worlds.”

Nelson Poliran, Jr.

A dentist in rural New Mexico



When he started practicing dentistry in the rural town of Hobbs, New Mexico, Nelson Poliran, Jr., experienced a culture shock after spending several years in the master's program in stem cell biology and regenerative medicine at USC, and the DDS

program at UCLA.

"It's definitely a different lifestyle, but I'm very open-minded to experiencing this area of the U.S.," he said. "I just wanted to know what the other side of this American lifestyle and culture is like."

Raised in Monrovia, California, Poliran was born in the Philippines and immigrated to the U.S. at age 4. His parents obtained nursing degrees from Pasadena City College (PCC), inspiring Poliran's lifelong interest in health care. Poliran attended Monrovia High School and PCC, and then transferred to the University of California, Riverside, where he majored in cell, molecular, and developmental biology.

After graduating, he explored his interdisciplinary interests. He enrolled in art and sculpture courses and played cello in the orchestra at PCC, while working as a math and science tutor for an after-school program for middle and high school students in Rosemead.

"The students are really smart at that age and very curious," he said. "And that's why I wanted to go back and get a master's to figure out if teaching, the PhD route, or the medicine route was right for me."

Poliran also knew that California was a frontier of stem cell research, and that USC's master's program would provide an opportunity to contribute to a field with the potential to change lives.

During the master's program at USC, one of Poliran's most transformative experiences was volunteering in the lab of Yang Chai, director of the Center for

Craniofacial Molecular Biology and associate dean of research at the Ostrow School of Dentistry of USC.

"Working or volunteering in Dr. Yang's lab made me think about all the different ways we could go about restoring teeth, as well as other craniofacial structures," said Poliran. "I've always considered dentistry as a career in the long term, because you're working with your hands. There's a lot of artistry. There's a lot of focus on the patient. You're changing lives. So all those things resonated with me."

Equally intrigued by the prospect of earning a DDS and a PhD, Poliran entered a dual degree program at UCLA. However, by the time he completed his DDS degree in 2021, his clinical experiences had convinced him that dentistry was his calling. He decided not to pursue his PhD, and to become a general dentist with Aspen Dental in Hobbs. This corporate practice offered exposure to more complex cases than Poliran expected to see in a larger city, where patients are more likely to keep up with their regular dental checkups.

Poliran enjoys working with a diverse patient population, which includes everyone from oil company employees to farmers. Approximately half of his patients are Spanish speakers, and many others are German speaking Mennonites. He's also been able to speak Tagalog with a number of Filipino patients.

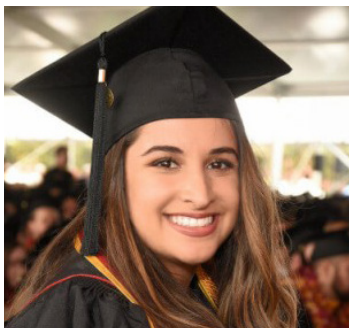
"This is the reddest of all the state counties," said Poliran. "Mask mandates aren't really a thing here. I have to always tell my patients, 'Please wear masks if you're in our office.' It's a 'sir' and 'ma'am' culture. I wouldn't have this experience in the city."

In the years ahead, Poliran would like to experience other regions of the U.S., before returning to Southern California and owning a private dental practice.

"I've lived in California almost all my life, and I miss the city a lot," he said. "But I'm very open, and I'm not fixed in one place. I've even considered Alaska and Maine. There are many opportunities, and I just like trying to see what else is out there."

Anika Gidwani

A law student at the University of California, Davis



During an undergraduate summer internship at the company Pharmacyclics, Anika Gidwani was more intrigued by legal than scientific questions—even though she was pursuing a bachelor's degree in neuroscience and progressive master's degree

in stem cell biology and regenerative medicine at USC.

"I wanted to know: how do we take this information and use it to help people?," said Gidwani, who also interned at Amgen in San Francisco. "At Pharmacyclics, I remember talking to my boss about it, and he said, 'If this is something you're interested in, you should talk to our general counsel about how clinical trials are set up here.' That made me realize that law is what I was the most interested in, but within an arena where I could be involved in science."

Growing up Saratoga, California, Gidwani looked to her mother as a role model of a scientist with a career that doesn't involve doing experiments in a lab. Her mother earned a master's degree in biochemistry and started her career as a scientist in the biotech industry, before transitioning into regulatory affairs for companies including Gilead Sciences, Abbvie, and Allogene Therapeutics. Meanwhile, her father worked as an engineering consultant for tech companies.

Not long after arriving at USC, Gidwani took an elective called MEDS 335 Human Development: From Stem to Sternum. The course convinced her to pursue a progressive master's degree in stem cell biology and regenerative medicine at USC.

"Regenerative medicine and stem cells are the future of medicine, and where the biotech industry has the most opportunity for growth and for making that technology accessible," she said. "In addition to intellectual property, there are huge bioethical questions that people don't have the answers to, because we're on the cutting edge of science, and the

law is so far behind where we are scientifically. So how do we modernize the law and make it encompassing of where we are as a society and will be in the future?"

Through the master's program, she took the course SCRM 515 Bringing Stem Cells to the Clinic, which addresses the business, legal, ethical, manufacturing, and regulatory aspects of moving stem cells or related products into clinical practice. One of the course's guest speakers worked at the USC Stevens Center for Innovation, the University's technology licensing office, and ended up offering Gidwani a job.

"I worked there throughout my master's program," she said. "My job was finding licensing partners at biotech companies who would be interested in USC research."

At the same time, as a member of USC's mock trial team, Gidwani noticed that many cases involved witnesses with technical or scientific expertise.

By the time she graduated from USC, she had settled her ambitions on law school, and was accepted into the JD program at the University of California, Davis.

Initially, she had insecurities about not having pursued a more typical law school major, such as political science or business. But she began to recognize her bioscience background as one of her best advantages.

"Being a scientist has always given me a certain level of problem solving skills," she said. "I'm able to synthesize information, concisely repeat it back, and plan and think and use evidence to support a conclusion. I also know how to read deeply difficult material like a scientific paper, and come away with the takeaway."

In the future, she hopes to launch her legal career as part of a life sciences practice group at a law firm.

"There are so many amazing firms all throughout the country that do a lot of work in the biotech and tech sphere," she said. "And every aspect of developing a drug and taking it to becoming a therapeutic requires the law."

Rekha Prakash

A biotechnology teacher at Roosevelt High School



As an LAUSD biotechnology instructor at Roosevelt High School, Rekha Prakash works two short miles from USC's Health Sciences Campus, where she earned her master of science degree in stem cell biology and regenerative medicine.

"I teach biomedical sciences," she said. "It's not a regular biology class. This is totally career technical education. And when they finish it, they're ready for college or a career."

Prakash planned to become a physician or physician's assistant, but discovered a passion for teaching while serving as an instructor in a cadaver lab at Sri Ramachandra University in Chennai, India, where she earned a master's degree in medical anatomy.

In 2011, Prakash began her career by volunteering at the USC Norris Comprehensive Cancer Center in the lab of Preet Chaudhary, who is a Professor of Medicine, the Bloom Family Chair in Lymphoma Research, Chief of the Nohl Division of Hematology and Center for Blood Diseases, and Director for Bone Marrow Transplant. She contributed to papers about cancer immunotherapy in the journals *Scientific Reports* in 2019 and 2018 and *Blood* in 2016, while earning her master of science degree in USC's stem cell biology and regenerative medicine program.

After graduating, she accepted a job as a research associate at Cedars-Sinai. Before long, she was offered a position as a biotechnology instructor for LAUSD at Reseda High School, and she leapt at the opportunity to return to teaching. Currently, she works as a biotechnology instructor at Roosevelt High School, serving the Boyle Heights community.

Prakash teaches an innovative curriculum that not only imparts "hard skills" such as lab techniques and scientific reasoning, but also builds "soft skills"

needed for interviewing and applying to jobs. To give the students hands-on experience, the curriculum integrates internships and invites educational partners from biotech companies and universities.

In 2020, Prakash partnered with her alma mater to launch the USC Stem Cell Scholars Program, sponsored by the Amgen Foundation. Through the program, 10 local high school juniors, nominated by LAUSD teachers, received one-on-one mentorship from USC graduate students and postdocs, who kicked off the program at the USC's stem cell research center, and then adapted it to an online format due to the pandemic. In 2021–2022, her biotechnology program partnered with CIRM Bridges to Stem Cell Research and Therapy at Pasadena City College, giving her students an extensive hands-on stem cell experience.

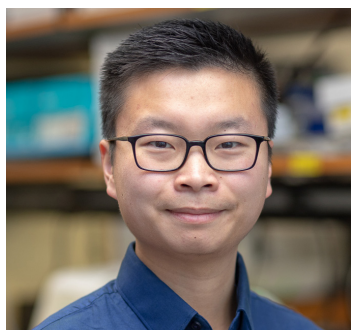
More recently, Prakash has stepped into some educational leadership roles as well as a member of the instructional leadership team at Roosevelt High School, and as a curriculum developer with LAUSD career technical biotechnology courses. She also serves as a teacher leader in Roosevelt's medical and health sciences pathway, along with peer mentoring.

She's also an advisor for the Roosevelt chapter of California Health Occupation Students of America (Cal-HOSA), the state-wide student club that prepares health care student leadership. Recently, she was awarded the 2021 Community Protector Hero in Education and 2022 Sal Castro Award for her civic engagement, youth leadership, education around social justice, and advocacy for equity and access to college and career pathways.

"I love being with the students, especially," said Prakash, who is also the mother of two children. "Some of the LA unified students don't know anything about biotechnology or research, and I feel a satisfaction when these kids come back and say, 'Yes, Ms., I got into UC Berkeley or UC Santa Cruz.' And some of them are really successful as physician assistants, speech therapists, and what not. So I'm so glad to nurture that passion within these kids."

Kevin Liu

A PhD student studying cancer biology at Stanford



After years of New York City's snowy winters, Kevin Liu was ready for sunshine. So Los Angeles' perfect weather was a motivation for pursuing his undergraduate degree in health promotion and disease prevention, and master's degree in stem

cell biology and regenerative medicine at USC.

"It was going to be either Florida or California," he said. "When it was time to commit to a college, Miami was humid and hot, and I just couldn't see myself there. And then I ended up coming to California, which was more moderate in terms of the climate."

Liu's parents moved to New York City from Taishan in Guangdong Province in South China. When Liu was 2 years old, his biological father passed away from liver cancer. Although Liu was the only child of his widowed mother, he lived next door to his cousin, who is like a younger sister to him. Growing up together, they played badminton and had snowball fights.

By high school, Liu had developed a penchant for medicine and science. He researched water quality after Hurricane Sandy, and volunteered at Weill Cornell Medical Center. He loved biology—the only class where he never found himself checking the clock.

"Everything I learned, I could see it relating to my own body," he said. "Especially when we learned about different organ systems, that was really fascinating."

Inspired, Liu enrolled in USC's pre-med program as a first-generation college student. He volunteered at California Hospital Medical Center, and joined the cancer research lab of Min Yu, associate professor of stem cell biology and regenerative medicine. Before long, he began spending all his free time in the lab, and enrolled in USC's progressive master's degree program in stem cell biology and regenerative medicine.

In 2020, he served as a co-author on a *Cancer Discovery* publication, in which the Yu Lab identified key characteristics of breast cancer cells with a propensity to metastasize to the brain.

After graduating with his bachelor's and master's degrees, Liu accepted a research job with Lay Teng Ang and Kyle Loh at Stanford University—where he could continue to enjoy the California sunshine.

"I lived in LA. I lived in New York," he said. "And San Francisco was a good mix of both, where it's a faster pace than LA, but you have the sunny weather."

At Stanford, he worked to differentiate stem and progenitor cells with the goal of replacing cells lost to bladder cancer. He also served as co-first author on a study about using stem cells to generate human artery and vein cells, accepted by the journal *Cell*. He then applied to Stanford's PhD program in cancer biology.

"Once I heard that I got into Stanford, I immediately accepted that offer the same day," he said. "I love the weather here. It's not as hot as LA, but it's also not as cold as anywhere on the East Coast."

As a PhD student and Cui Scholar Fellow, Liu is a member of Max Diehn's lab, which uses patient blood draws—known as "liquid biopsies"—to detect and understand cancer metastasis.

Liu enjoys life at Stanford. He frequently drives into San Francisco to explore neighborhoods and cuisines, and spends time with his Japanese Chin dogs, named Loula and Kenzo, that "bring so much joy," he said.

Whether his future leads him to a career in academia or in the biotech industry, Liu is immensely passionate about the liquid biopsy field.

"In the future, my main goal is either going to be early cancer detection or understanding cancer metastasis," he said. "With every experiment I do, I can see the translational science—how my one experiment today can make a difference for patients in the long run."

Clare Yarka

A Scientist at Instil Bio



Most people who have Clare Yarka's job title—Scientist at Instil Bio—also have a PhD. But Yarka entered industry after earning her master of science degree in stem cell biology and regenerative medicine from USC, and never looked back.

"I was super deliberate about each step," she said, "but I was also given incredible opportunities."

Science runs in her family. Her parents were petroleum geologists, and her grandfather was also a geologist and Vice Chancellor of Syracuse University. Growing up in Denver, Yarka remembers taking road trips where her parents would read aloud from the *Roadside Geology of Colorado* and *Roadside Geology of Utah*.

"I was constantly barraged with geology," Yarka said.

Naturally, she rebelled and declared a biology major at the University of Notre Dame. The course load was challenging, and Yarka jokes: "I was one of the biology students that probably should have dropped it and become a business major, just because my grades weren't spectacular. But I was stubborn about it, and I knew it was what I was passionate about."

She became even more passionate about her chosen major when she joined the retinal regeneration lab of David R. Hyde, who studies how zebrafish regenerate lost neurons as a model for ocular or neurodegenerative diseases. Asking questions and designing experiments came naturally to her, and she knew that she belonged in research.

Hyde encouraged her to apply to PhD programs, but she wasn't accepted into any. Undeterred, she took a job as a research tech studying cellular signals in the lab of Lea Goentoro at Caltech, before being accepted into the master's program in stem cell biology and regenerative medicine at USC.

During the master's program, she met her first role models in the biotech industry through the course SCRM 515 Bringing Stem Cells to the Clinic. She also met patients while working in Stephen Gruber's lab at the USC Norris Comprehensive Cancer Center.

"I was translating a lot of their genomic surveys from Spanish, so I got this patient connection," she said. "And that's what flipped the switch for me: how can I be working in research, but also be directly impacting patients? I lost the desire to get my PhD, because I didn't want to get further away from making this impact, I wanted to get closer."

Inspired to help develop clinically relevant therapies, she applied to a research associate position at Kite Pharma, and got the job. She worked with the team to file six INDs—investigational new drug applications—to get permission from the Food and Drug Administration to start human clinical trials for cancer immunotherapies.

She was promoted to Senior Research Associate, and then to Associate Scientist. After Kite Pharma was acquired by Gilead Sciences, it became obvious that there wouldn't be an opportunity to buck the traditional requirement of having a PhD in order to be promoted to the next level: Scientist.

"I definitely met that ceiling very concretely," she said. "So that's when I left to join Instil Bio."

In September 2020, Yarka started her job as a Scientist at the cancer immunotherapy company, which is still in an early phase of its growth. Between work and wedding planning—she's getting married in Park City, Utah this fall—life is busy, but she loves the fast pace at Instil Bio and finds it similar to Kite's early days.

"I thrived in this early phase at Kite, and I knew I was jumping into that type of environment at Instil," she said. "It's extremely aggressive timelines. The priorities change at the drop of a hat. So it's benefited me to be really flexible, and to say, 'Yes, that's fine. You can put me on a different project.' It's only ever helped me."

Class notes: Master's program alumni

Class of 2021

Raniah Abualjis
DDM student
Western University of Health Science's College of Dental Medicine (accepted)

Evan Butlig
Lab Assistant
Samarasinghe Lab
UCLA;
PhD student, Basic Medical Sciences
University of South Alabama (starting Fall 2022)

Anastasia Dzilno
Clinic Coordinator
Vista Center for the Blind and Visually Impaired

Connor-James Fausto
Research Lab Technician
Lindström Lab
USC

Olivia Laveroni
Life Science Research Professional
Jerby Lab
Stanford University School of Medicine

Jeremy Liu
Lab Operations Specialist/Quality Control Analyst
Kite Pharma

Tal Rosen
PhD student, Programs in Biomedical and Biological Sciences
Min Yu Lab
USC

Class of 2019

Carina Seah
MD/PhD candidate
Huckins Lab and Brennand Lab (Yale)
Icahn School of Medicine at Mount Sinai

Jade Tassey
PhD student, Craniofacial Biology Program
Evseenko Lab
USC

Class of 2018

Ciara Mimms
MD candidate
St. George's University

Class of 2015

Lauren Ishida
Primary care pediatrician in Hawaii

Class of 2022



Photo by Tadiwanashe Mkaratigwa

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Joel Smith
Senior Associate Vice President
for Health Sciences Advancement
Joel.Smith@med.usc.edu
stemcell.keck.usc.edu/support

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