



# KGI Annual Report

2020-2021



Innovators Start Here

## Transforming in a New World: Keeping Morale High in Our Community While Helping Others on a Local and Global Scale

The 2020–2021 academic year marked a time of transition as our KGI students, staff, and faculty shifted to online learning due to the COVID-19 pandemic. While this transition was challenging for some, staff and faculty went above and beyond to ensure that students received the support they needed academically and personally. In some cases, students got creative with Zoom rooms to allow more bonding time to build the camaraderie that naturally develops in an educational setting.

Beyond the disruptions to the education system, COVID-19 presented enormous challenges regarding financial stability and mental, physical, and emotional well-being. Yet, our KGI community came through repeatedly—not only for one another but also for the larger community, whether helping people locally or creating products to help people on a global scale.

Our WITH YOU Fall Giving Campaign exceeded its goal to raise funds to help KGI students overcome challenges brought on by the pandemic. We were able to support the financial needs of struggling students and provide invaluable funding that reduced the cost of their education.

Recent graduate and current alumnus Christian Makkar, PPC '20, MS '21, facilitated meaningful personal interactions with patients while conducting his thesis at Hollywood Presbyterian Medical Center and Emanate Health Inter-Community Hospital. When COVID-19 first started, and patients could not have visitors, this social support was priceless.



CASSIDY MIRJAH-JABLONSKI, MS '22

Student Cassidy Mirjah-Jablonski, MS '22, delivered masks and hand sanitizer to houses in her community when the pandemic began. She also volunteered at a COVID testing site at Dodger Stadium and currently

volunteers as a scribe, where she fields many questions related to COVID.

When it comes to assisting worldwide, Dr. Matt Croughan, former director of KGI's Amgen Bioprocessing Center, wrote *COVID-19: A Guide to Home Healthcare* about his experience contracting and recovering from the virus to help others in his situation. Additionally, KGI Dean of Research Dr. Larry Grill and

his team have worked for years to produce low-cost vaccines for developing countries and are now working to adapt the vaccine for use against COVID-19.

Our KGI community is also helping others in many ways that extend beyond efforts directly related to the pandemic. Cecile Maria Vazquez, PPC '21, MS '22, has provided numerous workshops for local teens and parents on developing lifelong healthy habits, integrating nutrition and fitness. Harsha Ohri, MBS '21, received a Women in Bio Founders Scholarship for her



HARSHA OHRI, MBS '21

demonstrated leadership in helping other female scientists and providing accessible healthcare around the world.

KGI students, staff, and faculty also stepped up to the plate to foster greater diversity on

the KGI campus and provide better healthcare to underserved populations. KGI partnered with ATUM to offer two \$50,000 scholarships to Black, Latinx, or Native American students in our Master of Engineering in Biopharmaceutical Processing program.

Dr. Monique J. Williams was hired as the Founding Program Director of the Master of Science in Community Medicine program. This program will prepare community medicine practitioners and leaders to work in underserved communities to improve health, prevent illness and injury, and detect treatable conditions in the early stages. Cynthia Agu, PharmD '23, worked with Student Government's Cross-Cultural Global Diversity Chair Maria Melville, MS '21, to coordinate a series of events for Black History Month.

We also recognize that diversity goes beyond race and ethnicity. To that end, we try to recruit and enroll students from a broad array of backgrounds, including non-traditional students such as Jason Tate, MSGC '22; Tamerisa Dyer, MSGDA '22; Nicole Choy, MSGC '21; and Angie Aceves, PharmD '25. This enriches our campus environment and the medical field as a whole.

KGI continues to be a leader in innovation as groundbreaking faculty research projects receive recognition in the medical community. Associate Professor Dr. Kiana Aran published a paper on a novel biosensor called the EV-Chip, a prototype portable, low-cost reader for detecting and quantifying exosome biomarkers of cancer and other aging-related diseases.

Professor in Bioprocessing Dr. Hu Zhang published two papers on 3D printing hydrogels and wave bag bioreactors. Biopharmaceutical Sciences Professor Dr. John Krstenansky and colleagues presented a webinar for the Forensic Technology Center of Excellence on characterizing emerging synthetic opioids.



DR. BARBARA BAILUS, PHD

Assistant Professor of Genetics Dr. Barbara Bailus became Chair of the Scientific Advisory Board for the Foundation for Angelman Syndrome Therapeutics, a volunteer organization dedicated to finding a cure for Angelman

syndrome (a rare genetic neurological disorder) through research, education, and advocacy.

Finally, at KGI we have forged powerful partnerships with leaders in the biopharmaceutical industry. KGI and Pall Corporation have embarked on a research project to optimize plasmid DNA purification, which could ultimately help with vaccine development and gene therapy.

These partnerships are enriching KGI's curriculum as well. In the spring of 2021, we launched our first course in our Certificate in Applied Genomics—made possible through a grant from Amgen—which will help working biotech professionals adapt to advances in genomics technology.

We have partnered with City of Hope to launch a second joint master's degree—the Master of Science in Regulatory Affairs—to provide students with translational and applied experience in regulatory affairs for all FDA-regulated product classes throughout the product life cycle.

As you can see, the pandemic has not slowed us down in any way. If anything, it has strengthened our resolve when it comes to drawing upon the latest technological advances and the great minds here on campus to solve the most pressing health issues facing us today.



Sheldon M. Schuster  
President, KGI



James F. Widergren  
Chair, Board of Trustees, KGI





# Students Transform their Pathways to Success

## From India's Biopharmaceutical Processing Industry to KGI's MEng Program: Aishani Yadav's Journey



AISHANI YADAV, MENG '22

Prior to enrolling in KGI's Master of Engineering in Biopharmaceutical Processing (MEng) program, Aishani Yadav, MEng '22, was already well-equipped for a successful career in biopharmaceutical processing. In

addition to having a bachelor's in Zoology and a master's in Molecular Microbiology from the University of Delhi in India, she had more than two years of industry experience under her belt.

However, she still felt that she could explicitly use more formal education toward the biopharmaceutical processing industry.

"My degrees were in general science, so they didn't focus much on the engineering aspects of bioprocessing," Yadav said. "Unfortunately, we don't have many programs in India which integrate both these principles. The programs we do have are very competitive to get into because we have a huge population."

Thus, Yadav began searching abroad for relevant programs. She learned about KGI's MEng program through Biocon Academy, a program created in collaboration between KGI and Biocon, India's largest biopharmaceutical company.

This three-month program provides industry-oriented training programs to biotech students, leveraging Biocon's industry experience with KGI's subject expertise. The main goal is to bridge the gap between academic knowledge and its practical application in industry scenarios. This was crucial for Yadav, who was looking to transition from a purely academic environment to an industry-oriented one.

As a result of her participation in Biocon Academy, Yadav landed a job at Dr. Reddy's Laboratories in the biopharmaceutical industry, where she worked for nearly three years before enrolling at KGI.

However, her transition to KGI has not been without its challenges. As an international student, she had difficulty obtaining her visa, though she was able to get it on an emergency basis by the end of the year.

Additionally, the pandemic made it difficult for her to adjust to life in a new country and a new field of study.

"The entire education for my first semester was online, so I missed a lot of lab classes along with

interactions with classmates that you typically get in a campus environment," Yadav said. "However, things have improved greatly since I've come here."

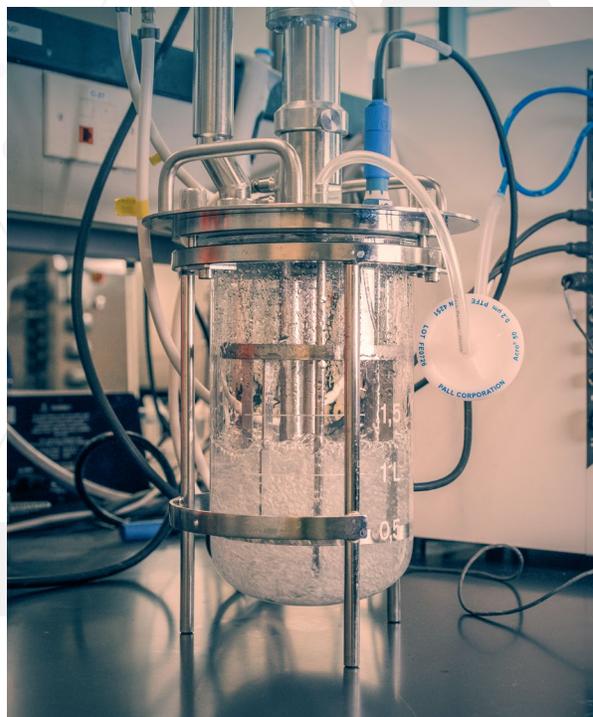
Yadav is looking forward to having in-person classes in fall 2021. Additionally, she has appreciated the support of her program director Dr. Sue Behrens and faculty advisors—particularly Dr. Hu Zhang, Dr. Saurav Datta, Dr. James Sterling, and Dr. Michael Koeris.

One highlight of her first year was the Team Master's Project, where she learned how to use computational fluid dynamics for bioreactor characterization.

"We used simulation techniques and software to characterize parameters for a bioreactor, which is something I hadn't done before," Yadav said. "One thing that I have enjoyed is learning new techniques and tools to perform calculations more efficiently. Professor Sterling introduced me to software called Mathcad. All of these online tools have opened my horizons."

Sterling appreciates Yadav's willingness to learn new skills.

"It was a real pleasure teaching Aishani this past academic year," Sterling said. "I taught some challenging bioprocess engineering coursework, and she was a member of an advanced Team Master's Project that I co-advised as well. I was impressed with how she mastered the work even though we were teaching online during the COVID-19 pandemic, and she was in India for much of the time."



## Argentinian MSTM Student Tali Kiperman Masters Challenging Course Material While Learning the Language



TALI KIPERMAN, MSTM '22

For many students, transitioning to all-online classes—especially for fields of study that are typically more lab-oriented—was a significant adjustment. However, for Tali Kiperman, MSTM '22, taking

online classes for her first year at KGI gave her a considerable advantage as an international student from Argentina who was still mastering English.

“Before starting at KGI, one of my biggest fears was the language because, in Argentina, Spanish is the main language,” Kiperman said. “I speak English and successfully passed my proficiency test, but it’s not the same as being in a class with everybody who speaks English as their main language. But because the classes were recorded on Zoom, I could watch them slowly, and if I missed something, I could rewind.”

This helped her when it came to learning both the course material and the language. Now, Kiperman is better equipped for her second year in KGI’s Master of Science in Translational Medicine (MSTM) program as more classes will be held in person.

Kiperman was initially drawn to the MSTM program because it drew upon her passion for cancer research, specifically leukemia. She already had some experience in leukemia research as an undergraduate in Argentina.

The MSTM program combines KGI’s academic expertise with City of Hope’s state-of-the-art tools and facilities, providing students with applied research experience and an in-depth understanding of translating basic research into medical products. So far, Kiperman has had a great experience in the program.

“It’s been amazing to have faculty members who are knowledgeable about what’s going on behind the scenes in the industry,” Kiperman said. “Every professor is top-of-the-line. They know so many things beyond what they are teaching in their lectures.”

In particular, Kiperman has enjoyed her classes with Professor of Practice in Translational Medicine Dr. Anastasia Levitin and Professor Dr. Animesh Ray in Advanced Biotechnology and Molecular Biotechnology.

“Dr. Levitin is an excellent professor and explains everything well,” Kiperman said. “Dr. Ray is amazing as well. I appreciate how he’ll go back to a difficult concept and try to explain it differently, so it’s easier to understand. Some of these concepts are challenging, especially when we’re discussing new discoveries. But he makes it interesting.”

After completing the MSTM program, Kiperman plans to pursue her PhD to prepare for a research career. She hopes to eventually have her own lab where she can continue to conduct cancer research.

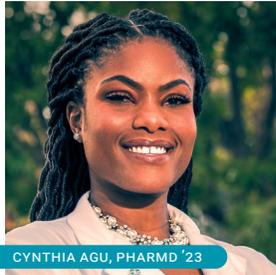
“Tali started her graduate journey during the pandemic and has remained poised and driven through it all,” Admissions and International Student Advisor Catharyne Magro said. “I am excited to see her growth throughout the next year of her program as she moves towards graduation.”

“

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## Cynthia Agu Shares Journey from Healthcare Administration to Clinical Healthcare



CYNTHIA AGU, PHARM D '23

For Cynthia Agu, PharmD '23, clinical healthcare runs in the family. Her oldest sister is a pediatrician, her brother is a nurse, and her other sister is a nurse practitioner.

As an undergraduate, though, Agu resisted

this path. Instead, she chose to pursue a healthcare administration degree from Cal State Long Beach and a job in the field after graduation. Soon, though, she found that she craved more patient interaction. Eventually, she began to consider a career in pharmacy.

“You still get that management experience and you can help patients,” Agu said. “I was also interested in learning how drugs interact with the body and to see how they affect patients.”

She had to go back and take all of her science requirements, as healthcare administration only involved business healthcare classes. Her sister then recommended that she apply to KGI's School of Pharmacy and Health Sciences.

Here, Agu learned more about the many diverse career paths for a pharmacist. She gained exposure to roles in industry—where people are involved in the creation of drugs, clinical trial coordination, and ambulatory, or outpatient care, which is used to proactively manage chronic conditions, prevent serious illness, and improve overall population health. She also discovered that pharmacists do far more than simply take orders from doctors.

“Pharmacists play a role in making sure that patients are compliant with their medication, determining if an interaction may occur based on a patient's drug history, and deciding how to adjust if patients are experiencing side effects,” Agu said. “A pharmacist can make their way into pretty much any field in healthcare because drugs are used everywhere.”

Currently, Agu is considering pursuing a career in either ambulatory care, hospital pharmacy, or industry.

“In industry, it would be amazing to see your drug being marketed to people and lengthening life,” Agu said.

One of the most valuable lessons that Agu has learned so far at KGI is how to work effectively in teams. She already had some experience with

teamwork, as she played basketball in high school, but she feels that KGI has taught her specifically how to manage group projects with different personality types and how to navigate conflict.

“I'm definitely learning a lot,” Agu said. “It's really important career preparation because even right now as an intern at CVS, I'm still working with other people.”

Agu is actively involved in California Pharmacy Student Leadership conducting research with six other students and presenting at the American Society of Health-System Pharmacists, a national conference. Last year she worked with another pharmacy student to coordinate events for Black History Month with Student Affairs.

This past year, Agu worked with Maria Melville, MS '21, to coordinate another series of events for Black History Month. Events included a weekly movie night where everyone came together to partake in an Afrocentric classic in the Black community, a Newsletter Highlight featuring Black KGI students, Virtual Black Jeopardy (all prizes and gifts came from black-owned businesses), and a Reflection Information Session, where attendees reflected on those who paved the way for African Americans and Black people to have the rights that they have today.

“I really appreciate the fact that KGI took the time to acknowledge Black History Month and that when I first approached Student Affairs about organizing something, they were so open to it,” Agu said. “I would love for everyone to join each year.”



## KGI Student Tamerisa Dyer, Mother of Five, Returns to School After 25-Year Hiatus to Pursue Career in Genomic Data Analytics



TAMERISA DYER, MSGDA '22

After being out of school for 25 years—raising and homeschooling her five children during the interim—Tamerisa Dyer, MSGDA '22, is entering her second year in KGI's Master of Science in Human Genetics and Genomic

Data Analytics (MSGDA) program.

Dyer graduated from UC Davis in 1994 with a bachelor's degree in genetics. She then took time off to raise her children.

"At one point—when the youngest was a baby—I also had a high schooler, a middle schooler, an elementary schooler, and a toddler," Dyer said. "Those days were organized chaos."

Dyer also spent eight years as a high school biology and chemistry teacher. Once her children had left home—save for the youngest, now a high school freshman—Dyer decided to pursue a graduate degree.

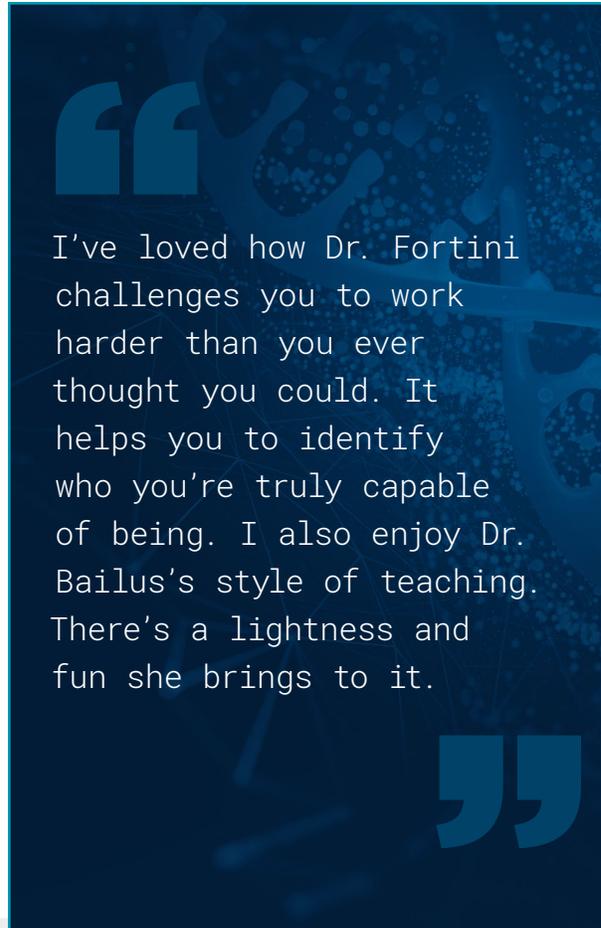
Initially, she explored genetic counseling and interviewed for KGI's Master of Science in Human Genetics and Genetic Counseling program. While visiting KGI, MSGDA Program Director Dr. Barbara Fortini spoke to Dyer's group about the MSGDA program.

"I honestly couldn't get the program out of my mind," Dyer said. "It sounded very intriguing. Ultimately, that was the program I ended up deciding on because it was so fascinating to me how it opened up all these worlds of possibilities."

After being away from school for so long, Dyer was eager to dive back into academics and get as much as possible out of the KGI experience. She has particularly enjoyed classes with Fortini and Assistant Professor of Genetics Dr. Barbara Bailus.

"I've loved how Dr. Fortini challenges you to work harder than you ever thought you could," Dyer said. "It helps you to identify who you're truly capable of being. I also enjoy Dr. Bailus's style of teaching. There's a lightness and fun she brings to it."

Another highlight for Dyer has been mastering programming languages like Python. Before attending KGI, she had never felt comfortable with technology.



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"Overcoming that self-doubt was powerful and exciting for me to do," Dyer said. "It helped me to grow as a person."

Currently, Dyer is considering a career in research and development.

"Twenty years ago, I wasn't that interested in research," Dyer said. "But now I'm starting to be intrigued by the idea of being part of a team making cutting-edge discoveries. That realization wouldn't have been possible without this program."

Dyer is especially drawn to cancer research—an area of particular significance to her—as one of her children was born with a brain tumor. Through Bailus, Dyer has learned more about rare diseases and would be excited to work in that area as well, as she sees many parallels between her own experience and those of families where children have been diagnosed with rare diseases. She appreciates how genetics testing has facilitated so many advancements in recent years, bringing hope to families.

"As a mom, those moments where hope was given to me were so important and kept my family moving forward," Dyer said.

## From Third-Grade Dropout to KGI's Genetic Counseling Program: Jason Tate's Journey



JASON TATE, MSGC '22

For KGI student Jason Tate, MSGC '22, the road to acceptance into KGI's Master of Science in Human Genetics and Genetic Counseling (MSGC) program has not fit the traditional student mold. He dropped out of school

at the beginning of third grade with a plan to be homeschooled, but that didn't last long.

Tate, a Kentucky native, comes from a lower socioeconomic background. When his mother had to go back to work, his parents tried to keep up with his homeschooling, but it became too difficult for them to juggle everything.

"This was a case of what's known as educational neglect," Tate said. "I did not have any formal education between the third grade and when I earned a general education diploma (GED). My parents are good people. They just lost control of things."

For Tate, what spurred him to continue his education was not a single turning point or person, but rather a series of experiences.

"I worked a lot of terrible jobs in factories," Tate said. "At one point, I was working in an automotive casting facility where I was shaving hot metal off of aluminum transmission housings, and I was thinking, 'Man, there has to be something better.'"

After Tate earned his GED, he enrolled at a local community college, taking night classes while working full-time. At first, he struggled with even basic academic courses.

"I was taking remedial math," Tate said. "I'd never learned how to write an essay, so in English 101, I turned in an essay that was one big block of text. It took me a while to figure everything out, and I still struggle with some things, but eventually, I got there."

Tate believes that his ability to overcome these hurdles comes from curiosity and a genuine love for learning. Eventually, he transferred to a state school and got a bachelor's in psychology.

"At some point, I put the idea of pursuing a career in clinical psychology on the back burner—too much subjectivity and uncertainty for me," Tate said.

He then met his wife, whose parents both have PhDs in human genetics from Johns Hopkins.

"As a first-generation college student, this was a different world for me," Tate said. "I learned a lot about genetics through them. As I began to look more into a career in genetic counseling, it seemed like the ideal marriage of all the things I liked about psychology with some of the more substantial parts of science."

This revelation inspired Tate to apply to KGI's MSGC program. What appealed to him about KGI was the emphasis on diversity.

"I had interviewed at other schools, and they felt very rigid and academic," Tate said. "But after interviewing at KGI, along with looking at the current class profile and noticing all the people from different backgrounds—including older students and non-traditional students like me—I felt very welcomed."

Now, Tate is paying it forward as he helps prospective students navigate the application process for genetics counseling programs, posting about his experience and answering questions on his Instagram profile. This includes writing a proper resume/CV, preparing for interviews, standardized tests, and national matching services.

"My process was a long, confusing journey," Tate said. "The genetics counseling profession is so niched that it's hard to find information about it."

Thus, he started sharing information for applicants to help them navigate this uncharted territory and bypass some of the learning curves that he had to overcome.

"Jason is a wonderful and intelligent individual—incredibly thoughtful, with genuine kindness," MSGC Program Director Ashley Mills said. "He is someone I respect a great deal and learn from with every interaction. Jason is a gifted and humble person who will continue to have great successes in life. He is an incredible addition to our genetic counseling program and family."





# Faculty Conduct Transformative Research

## Dr. Kiana Aran Develops EV-Chip Technology and CRISPR-SNP-Chip



DR. KIANA ARAN, PHD

In the spring of 2021, KGI Associate Professor Dr. Kiana Aran and collaborators had two papers published in different journals highlighting their novel research.

Aran and her team first introduced the CRISPR-Chip technology in 2019. Now, just two years later, she has expanded on its application to develop CRISPR-SNP-Chip, which enables detection of single-point mutations without amplification in sickle cell disease and amyotrophic lateral sclerosis (ALS).

“The field of CRISPR-based diagnostics is rapidly evolving due to CRISPR programmability and ease of use,” Aran says. “However, the majority of CRISPR-based diagnostics platforms are still relying on target amplifications or optical detections. The reprogrammability of CRISPR combined with optics-free highly scalable graphene transistors will allow us to bring the diagnostics power of the CRISPR to its full potential. The ability to detect single-nucleotide polymorphisms (SNPs) is at the core of human health genetics, but detection of SNPs is also very important in pharmacology and agriculture, and is a driving force in evolutionary change such as mutations conferring resistance to antibiotics. Eliminating the need for amplification and optics will make SNP genotyping readily accessible.”

Aran led the research team responsible for the work described in the paper “CRISPR-based Transistors for Amplification-free Electronic Detection of Single Point Mutations,” published in the journal *Nature Biomedical Engineering* on April 5, 2021. It was a collaborative effort between Cardea Bio, KGI, UC Berkeley, UC Irvine, Vilnius University, and CasZyme.

The SNP-Chip technology is an extension of the previously reported CRISPR-Chip™, a technology that is capable of detecting large insertions and deletions. It earned a spot on the cover of *Nature Biomedical Engineering* in June 2019.

With graphene transistors, the authors utilized a few versions of CAS enzymes and gRNA designs and monitored various different electrical signals obtained from graphene transistors to construct a new version of CRISPR-Chip™, which ultimately enabled SNP detection without amplification. The newly developed CRISPR-Chip set, called SNP-

Chip, is another major milestone in reshaping nucleic acid-based detection methods.

“Merging a diversity of CRISPR-Cas biology with electronics via Cardean Transistors opens up a whole new range of possibilities for diagnostic applications,” said Dr. Virginjus Siksnyis, founder and chairman of the CasZyme management board; professor at Vilnius University, Lithuania; and co-author on the paper. “Using the Cas9 orthologue for SNP detection is just the tip of the iceberg.”

In this article, the utility of SNP-Chip was validated for testing SNP mutation in samples obtained from patients with sickle cell disease and ALS. In both of these clinical models, the platform was able to discriminate healthy from mutated genes within the whole human genome without amplification and a simple swapping of gRNA to target desired DNA sequences, indicating the ease of platform reconfiguration for different DNA targets.

SNP-Chip has the potential to greatly impact medical diagnostics and basic research as it can dramatically reduce the time and cost of SNP genotyping, monitor the efficiency of gRNA designs, and facilitate the quality control process involved in CRISPR-based gene editing.

“SNP-Chip’s digital, direct, rapid, and accurate SNP analysis will revolutionize the screening for genetic mutations,” said Irina Conboy, PhD, professor of bioengineering at UC Berkeley and co-author on the paper. “This new technology will inform the discovery of processes underlying disease and aging and will enable faster, more effective clinical translation.”

Amplification-free detection of a target gene with single nucleotide mismatch specificity has the potential to streamline genetic research and diagnostics. Furthermore, it would provide





more flexibility for biosensing applications previously confined to a laboratory setting.

In addition to the first paper, a month later in May, a paper titled “Rapid and Electronic Identification and Quantification of Age-Specific Circulating Exosomes via Biologically Activated Graphene Transistors” was published in the peer-reviewed journal *Advanced Biology*.

The paper reports a novel biosensor called the EV-Chip, a prototype portable, low-cost reader for detecting and quantifying exosome biomarkers of cancer and other aging-related diseases. It demonstrates the EV-Chip’s clinical potential to evaluate human liquid biopsy samples through rapid, label-free identification of known biomarkers CD63 and CD151. The publication resulted from a collaboration between Cardea Bio, Inc., KGI, the Keck Science Department, and UC Berkeley.

“Modern clinical advances have extended the bounds of the human lifespan, revealing a new class of health issues related to the aging process, such as cancer and inflammatory and degenerative diseases,” said Aran. “Through our EV-Chip, scientists will be able to use the EV-Chip for biomarker discovery and unlock a new source of diagnostic biomarkers and therapies to combat these diseases more effectively.”

The EV-Chip has high-specificity antibodies that bind to one or more exosome biomarkers of interest embedded into a Cardean Transistor chip. It can be functionalized to detect virtually any exosome biomarker. When a plasma-derived exosome sample is added, the one-molecule-thick, biocompatible graphene transistor detects antibody binding events and sends digital feedback to a small device that can connect easily to any computer and return results within an hour. The whole setup is small and simple to use, making it well-suited to a physician’s office or biological lab.

The EV-Chip stands to offer a degree of precision and real-time, direct quantification of exosome biomarkers not possible with other technologies, which involve large sample sizes, lengthy incubation periods, and chemical labeling. These methods also require vast expertise to run highly technical instruments and

complete complex procedures at a central lab, which has created a bottleneck in discovering biomarkers of cancer and other aging-related diseases.

In the paper, the authors demonstrated the EV-Chip’s capabilities by using it to analyze two exosomal surface markers, CD63 and CD151. CD63 is a biomarker for cancer and viral infection, while CD151 is a cancer biomarker with prognostic and diagnostic value in tumor metastasis<sup>1</sup> and generally increases with age.<sup>2</sup> The EV-Chip quantified the CD63 with remarkable sensitivity, four to five orders of magnitude greater than a commercially available ELISA kit. Similarly, when used to measure CD151 in young and old subjects, the technology detected age-related changes as reliably as standard methods. Overall, the results demonstrate the EV-Chip’s potential to usher in a new era of powerful, non-invasive point-of-care diagnostics and prognostic tools to manage aging-related diseases.

“The talented scientists who contributed to this chipset development and paper have given the world a new technology with the potential to radically accelerate the discovery and use of new exosome biomarkers,” said Michael Heltzen, CEO of Cardea Bio. “Advances enabled by the EV-Chip will further our understanding of intercellular communication and cellular biology that will help us gain a new degree of insight to important areas such as cancer and other age-related diseases.”

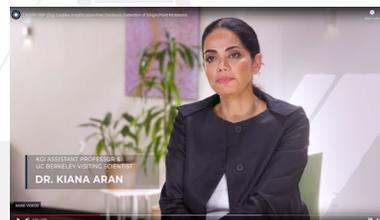
The EV-Chip is a Cardean chipset variant that utilizes the Cardean Transistor to detect live molecular signals. Others include Cardea’s CRISPR-Chip™ technology, which detects large nucleic acid insertions and deletions, and its newer product version, the SNP-Chip, which detects single-nucleotide polymorphisms.

#### References

1. R. Sadej, A. Grudowska, L. Turczyk, et al. *Lab. Invest.* 2014, 94, 41.
2. E. Eitan, J. Green, M. Bodogai, et al. *Sci. Rep.* 54 2017, 7, 1342.

#### LEARN MORE ABOUT DR. ARAN'S RESEARCH

[kgi.edu/aran-video](http://kgi.edu/aran-video)



## KGI Professor Dr. Larry Grill and Team Producing Low-Cost Vaccine for Developing Countries



DR. LARRY GRILL, PHD

For the past 11 years, KGI Dean of Research and Research Professor Dr. Larry Grill and his team have worked on producing low-cost vaccines for developing countries, primarily focusing on animal

diseases that significantly impact smallholder farmers in Africa. Because getting human vaccines approved in the U.S. typically takes 10 to 15 years, Grill had never considered pursuing this route.

However, with the emergency use authorization brought on by the COVID-19 pandemic, Grill is now working to adapt the vaccine for use against COVID-19. This vaccine is distinct from the COVID vaccines currently on the market in that it is derived from plant viruses.

Plant viruses do not cause diseases in humans, but your immune system will make antibodies if a plant virus comes into contact with these viruses. As such, viruses from plants can train your immune system to respond appropriately to foreign invaders if the plant virus is “costumed” with a surface protein that looks like a pathogen.

To take advantage of this feature, Grill and his team changed the outside surface of the plant virus to resemble a real pathogen. Using a virus coat protein fusion, they added the genetic information from a SARS-CoV-2 spike protein to the surface of a Tobacco Mosaic Virus (TMV).

The TMV fused coat proteins are taken up by the APCs (antigen-presenting cells) and displayed on Class II MHC molecules. The Class II molecules interact with the CD4+ (“helper”) T cells to trigger an appropriate cellular immune response.

“Your immune system detects the virus and makes antibodies against the SARS-CoV-2 spike protein,” Grill said. “As a matter of fact, the data that we have shows that memory cells would be ready for the SARS-CoV-2 virus for at least a few years.”

Additionally, they can continue to grow the TMV vaccines in plants, allowing them to produce large amounts of what Grill calls “decorated viruses” in the sense that a pathogen surface protein has been added to the plant viruses.

“Injectable pure material costs less than 15 cents a dose, so when you’re talking about developing countries, that’s pretty important,” Grill said.

To date, Grill and his team of KGI researchers—which includes Kelvin Phiri, Karen Paco, Grace Wakabayashi, Elena Gonzales, Marie Osire, Jose Mendez, Bonnie Blackman, and Jenny Johnston—have done the bulk of their work vaccinating cattle in Botswana.

“They have a lot of cattle there,” Grill said. “In fact, they have more cattle than humans, and cattle are very important to their economy.”

Cattle in Botswana have been afflicted with Lumpy Skin Disease (LSD), resulting in reduced milk production, sterility in bulls, damage to hides, and death from secondary bacterial infections, which in turn leads to severe nutritional and economic losses.

After fusing several LSD coat protein peptides to the TMV coat protein to create a vaccine, Grill and his team began vaccinating cattle. Botswana Vaccine Institute assisted with the trials as they collected serum samples every two weeks to check the antibody response.

The results were encouraging, showing that the cattle produced specific antibodies until around day 14 of the trials. “At this point, there’s no more virus in their body, so they stop making antibodies,” Grill said. “At the same time, they save the memory cells that are protective against the LSD. So now when they’re challenged with the actual LSD virus, they respond very quickly because they have all the right antibodies, and these cattle are not affected by the disease.”

In April 2020, Grill and his team shifted their focus to designing and producing low-cost COVID-19 vaccines. They are working with Botswana Vaccine Institute and the Botswana government to secure funding to build a facility in Botswana and produce the vaccines.

Their goal is not to compete with the big pharma vaccine companies, but rather to produce a low-cost vaccine for developing countries. Compared to vaccines produced in the U.S. and Europe, this vaccine is very affordable to develop.

Production plants are grown in growth rooms, leaves are harvested 8–10 days post introduction, and the TMV vaccines are purified via a simple precipitation step. Additionally, the virus is very stable and, unlike some current COVID vaccines on the market, such as the one produced by Pfizer, it doesn’t appear to need to be stored at extremely cold temperatures

(which can be problematic when transporting the vaccine to developing countries). In addition to cost and ease of production, Grill sees other advantages.

“The Johnson & Johnson and AstraZeneca vaccines use viruses that actually replicate in your body,” Grill said. “If people are immunocompromised, it can be problematic. However, our virus cannot replicate in humans.”

Thus, Grill’s vaccine may be safer for immunocompromised individuals. While they haven’t started human trials, they have begun conducting trials with mice.

“In our first set of animal trials, we found that the mice make good antibodies, but we don’t know whether these antibodies can neutralize the virus,” Grill said. “So we’re now conducting another set of trials with the J. Craig Venter Institute in San Diego. If it’s successful, then our plan is to go to Botswana and build a facility in hopes that we can actually finish it in time to protect people against COVID-19. But if it does take longer, we know this is not the last pandemic.”

Another benefit of this vaccine is that it can protect against many different strains at once because they are not limited to using one protein.

“We can put many different proteins into the plants because it’s the same cost to make the vaccine,” Grill said.

Grill appreciates his KGI research team—including Phiri, a post-doc from Zimbabwe who has worked with him for many years—for the passion and commitment they bring to the endeavor.

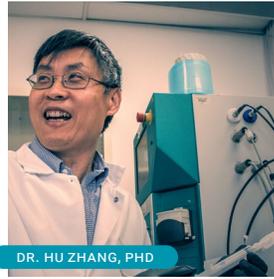
“These students work in my lab because they enjoy it, and they really understand what we’re doing,” Grill said. “I don’t have to explain—for example—how to genetically add the sequences to the plants because they already get it. They really get excited about the work.”

#### LEARN MORE ABOUT DR. GRILL’S RESEARCH

[kgi.edu/grill-research](http://kgi.edu/grill-research)



## KGI Partners with Pall Corporation to Optimize Plasmid DNA Purification



DR. HU ZHANG, PHD

KGI has entered into a new partnership with Pall Corporation, a global supplier of filtration, separation, and purification products. KGI and Pall have embarked on a research project on the optimization

of a method for plasmid DNA purification.

Plasmid DNA is expressed in a microbial host, producing a template for the production of subsequent medicines, such as the messenger RNA for COVID vaccines. Additionally, the plasmid DNA could be utilized on its own as a precursor for gene therapy.



“The plasmid DNA is essentially a building block that could be used in the manufacture of these pharmaceuticals,” said Peter Levison, Executive Director of Business Development for Pall, who is responsible for developing strategic partnerships such as the one with KGI. “The students prepare the microbial cells that have produced the plasmid DNA, but now they’ve got to extract it from the cell and purify it to an acceptable level.”

KGI faculty and students conducting the research are Principal Investigator and Professor of Bioprocessing Dr. Hu Zhang, Co-Principal Investigator and Assistant Professor of the Amgen Bioprocessing Center Dr. Saurav Datta, and Research Assistants including Jialiang (Kingston) Huang, Cindy Saliba, and Jeeda Al-Taki from KGI’s Master of Engineering in Biopharmaceutical Processing program. In addition to Levison, Pall employees involved are Leticia Reyes-Regis, Mike Mitchell, Chris Tseng, Kenneth Lee, Andria Balogh, Julie Pressman, and Bivi Mendez.

Pall provides the technological solutions and financial support to accomplish this goal, while the students work on optimizing the methodology. In addition to having skilled KGI students and faculty invested in this project, benefits from this collaboration also come to Pall in the form of strengthening relationships with KGI.

The project helps KGI to establish a robust platform for plasmid DNA purification. Additionally, KGI students gain an enhanced understanding of how a

number of Pall's products work, as well as hands-on experience working with a global biotech leader. Such a project would benefit them both in obtaining careers in their field and thriving at these careers.

"Hopefully they learn some of our approaches, and they've now got access to Pall associates, whom they can reach out to as they progress on their careers," Levison said. "As the students progress, we will maintain contact with them and offer support if they want advice and opinions."

According to Zhang, the hands-on training and education students gain from this project will be a valuable asset to any company they end up working for within the field.

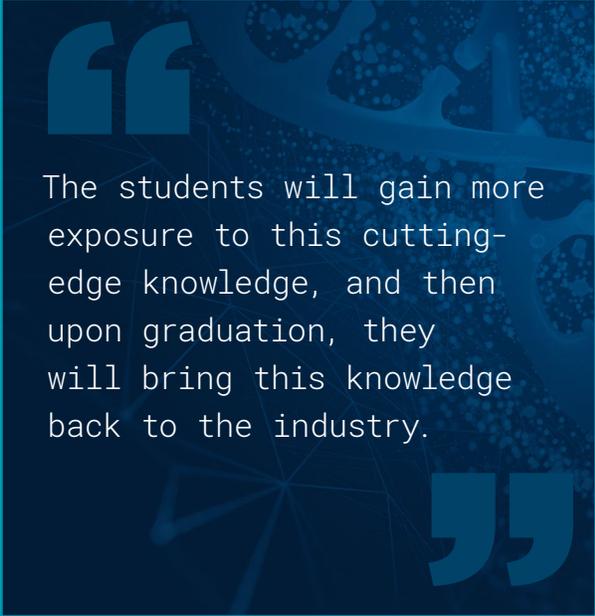
"The students will gain more exposure to this cutting-edge knowledge, and then upon graduation, they will bring this knowledge back to the industry," Zhang said.

Now—after building everything from scratch—the students will determine how robust the template is over the next few months.

"The most challenging part is performing the analytic techniques with plasmid DNA and determining how to help people quantify the correct amount of plasma DNA and the purity," Zhang said.

Currently, they are testing three different kinds of filters for the purification process, with each type tested four or five times. Having access to these materials is another way in which the partnership benefits KGI.

"Teamwork is critical, and I'm pleased to say that a solid team has formed with KGI," Levison said. "This bodes well for future projects."



The students will gain more exposure to this cutting-edge knowledge, and then upon graduation, they will bring this knowledge back to the industry.

## Dr. Jim Sterling and Research Team Find New Detail in Cell-Surface Coat Structures



DR. JIM STERLING, PHD

A team consisting of KGI Professor Dr. Jim Sterling, Western University Professor Lyna Luo, and postdoctoral scientists Wenjuan Jiang and Wesley Botello-Smith have discovered important

physical mechanisms that cell surfaces utilize to provide innate immunity. Their article was published on March 4 in *The Journal of Physical Chemistry* under the title "Ion Pairing and Dielectric Decrement in Glycosaminoglycan Brushes."

The work applies advanced molecular simulation methods to model a cell-surface coat known as the glycocalyx, which is prominent at our bodies' mucosal surfaces. The model is a simplified representation of the glycocalyx—known as a "brush"—consisting of an array of long, linear sugar molecules (called glycosaminoglycans or GAGs) tethered at one end. They are highly negatively charged and are free to float in a salt solution.

"In biology, there are many cell and tissue interfaces that look like these highly charged brushes," said Sterling. "Studies have shown a voltage difference between a brush and the salt layer that helps it remain neutrally charged. Our work quantitatively shows how the brush voltage depends on the specific salt and how both the GAGs and salt ions compete for water."

Sterling established this partnership with Luo following a presentation of Luo's work on molecular dynamics simulations at the annual KGI Research Symposium in January 2019. Their simulations are known as "all-atom" because every atom's motion, including those in water, is tracked over time.

"When Jim asked if we could simulate GAGs, I wasn't sure because the focus of our work has been on membrane-bound proteins," Luo said of the initial budding partnership. "So, it took some research to find that there were indeed some good new models for carbohydrates that we could apply to contribute to understanding how these sugars might affect human health."

One of the most challenging issues for the research team was finding appropriate atomistic models for the negatively charged GAG sulfates that pair with the salt cations.

“

In biology, there are many cell and tissue interfaces that look like these highly charged brushes. Studies have shown a voltage difference between a brush and the salt layer that helps it remain neutrally charged. Our work quantitatively shows how the brush voltage depends on the specific salt and how both the GAGs and salt ions compete for water.

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“These pairing interactions are critical if we are to simulate GAG brushes accurately,” said Luo. “Another challenge related to the nature and role of polarization of the molecules, so we also implemented recent advances known as Drude-polarizable force field models. We have characterized which of our results are model-independent and which are sensitive to the model we are using.”

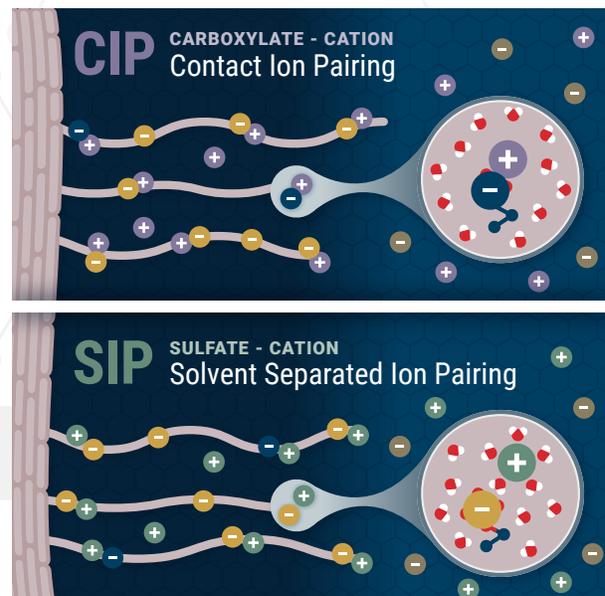
Previous studies have shown that cell-surface sugars are negatively charged, so they attract not only cations but also many proteins involved in the innate immune system that have positively charged domains, including cytokines, growth factors, and defensins.

“In analogy to protein-purification technology, we have come to view the glycocalyx as a sort of cation-exchange stationary phase that captures or elutes innate immune molecules under different salt conditions,” said Sterling.

The research by Sterling and Luo’s team already has implications for other researchers around the world. Professor Megan Lord from the University of New South Wales stated, “My group studies the GAG molecules discussed in this paper, and this contribution provides some fundamental biophysical insights that will affect our own research.”

Sterling hopes to expand their current work to characterize such interactions by building on the GAG-salt models presented in the paper.

“We hope that this work and new perspective can be applied to the development of therapeutics that target the glycocalyx as a multivalent innate immune surface.”



# Alumni Transform their Career Paths

## Alumnus Christian Makkar Delivers Compassionate Care to Hospital Patients During COVID



CHRISTIAN MAKKAR, PPC '20, MS '21

When it comes to practicing medicine, so many skills cannot be taught in a textbook. One of these skills is empathy—something recent KGI graduate Christian Makkar, PPC '20, MS '21, strengthened while conducting his

thesis at Hollywood Presbyterian Medical Center and Emanate Health Inter-Community Hospital.

Makkar's thesis—for KGI's Master of Science in Applied Life Sciences program with a concentration in Clinical Research—focused on improving the quality of care that hospitals delivered to patients and the discharge process.

Throughout this experience, though, he has worked with staff in both hospitals to deliver something that is not quantifiable but equally valuable—connecting with patients on a humanistic level through interactions that go beyond offering standard care. From September 2020 through February 2021, Makkar was at Hollywood Presbyterian, where many patients are from marginalized communities.

"It enhanced my ability to relate to other people's perspectives," Makkar said.

Experiencing moments of connection was particularly crucial when COVID-19 first started, and patients could not have visitors. Thus, Makkar and the nurses were the only forms of social support that patients had.

Sometimes, even a seemingly small gesture can go a long way. This principle was particularly evident at Emanate Health Inter-Community Hospital, where much emphasis is placed on fostering interpersonal connections with patients.

"For example, if a patient is really craving Sonic hamburgers, the nurses will go out and get the burgers," Makkar said. "Small actions like that emphasize that we care for you; you're not just a collection of signs and symptoms. Even in a hospital setting, you should feel comfortable and relaxed. Through this project, I've become a more personable, empathetic healthcare provider."

Through his KGI experiences, Makkar has learned the importance of connecting with his classmates outside of school.

For his long-term goals, Makkar plans to become an orthopedic surgeon.

"My aunt and grandmother both had musculoskeletal injuries," Makkar said. "I want to give people the ability to walk and empower them because sometimes when you have a broken bone, you don't have self-sufficiency. This is my way of giving people their body back. Before I started at KGI, I had no idea I was going to evolve into the person I am today. And it was a collective effort—all of KGI stepped in. They really make sure you're growing into a person who gives back to society and makes the world a brighter place."

## PPA Alumna Stephanie Rodriguez Offers Hope and Encouragement to PA School Applicants



STEPHANIE RODRIGUEZ, PPA '20

For students on the pre-medical track, the prospect of potentially not getting accepted into medical school can be daunting. Stephanie Rodriguez completed KGI's Postbaccalaureate Pre-PA Certificate (PPA) program in

May 2020 and offers hope from the other side.

Not only will she be attending her first choice—the Physician Assistant (PA) Program at George Washington University's School of Medicine—but she was awarded a competitive merit-based scholarship. Now, she has been meeting with KGI students in this year's postbaccalaureate program to offer support and encouragement.



"It's been really nice to give back from my perspective because when I was in their position, I felt scared about the next step," Rodriguez, PPA '20, said.

For Rodriguez, Joon Kim and Elba Muñoz—Director and Assistant Director of KGI's PPA and Postbaccalaureate Premedical Certificate programs—did an exceptional job helping her navigate the application process, mainly when it came to interviewing prep.

"Having that one-on-one opportunity for all those practice interviews taught me how to interview properly—what questions to expect and how to talk about yourself in a manner that is interesting and intriguing but also not too flamboyant or arrogant," Rodriguez said. "It was also great that we got to fine-tune our resumes as well, and I felt a lot more confident about my answers."

Kim consistently had students practice their elevator pitch, even taking an extra step by giving feedback and sample responses that a potential medical school program director might provide for such a pitch.

"He would give us tough questions and see how we would answer," Rodriguez said. "All that individual attention made a huge difference."

When it comes to her long-term career goals, Rodriguez is most drawn toward neurology, but she is also open to working in surgery or cardiology, as she's shadowed in both of those fields. Currently, she is working as a medical assistant for a neurologist who specializes in hearing disorders.



“It's been really nice to give back from my perspective because when I was in their position, I felt scared about the next step.”

## Nicole Choy Embraces Personal and Professional Uniqueness in KGI's Genetic Counseling Program



NICOLE CHOY, MSGC '21

Until they enrolled in KGI's Master of Science in Human Genetics and Genetic Counseling (MSGC) program, Nicole Choy, MSGC '21, had always felt out of place in the field.

"I think there is a homogeneous expectation of what a genetic counselor is," Choy said. "The field is made up of 90% white women, and there's even a meme amongst genetic counselors involving cardigans and statement necklaces. Some women can totally rock that, but that's not me. The more genetic counselors that I followed on Twitter, the more I recognized that I didn't look like them or fit that mold."

What drew Choy to KGI was the strong support system in terms of offering mentorship and facilitating connections and the encouragement of diversity.

"I feel that KGI's program is really supportive of being your own person and developing your unique role within the field of genetic counseling," Choy said.

Born and raised in Hawaii, Choy received their bachelor's in Molecular Biology and Biochemistry from Chapman University with a minor in Religious Studies. After doing an internship in cancer research, they decided that a career devoted to lab research wasn't for them.

"Since high school, I had wished there was a job where I could talk to people about genetics," Choy said. "Then during Christmas break my senior year of college, I was on LinkedIn freaking out because I didn't know what options I had with a bachelor's degree in Biochemistry, and as I was looking at jobs, genetic counseling came up."

The more research Choy did, the more appealing genetic counseling began to sound as a career path, and they found a shadowing opportunity at a hospital in Orange County.

"I tried to get as much exposure to the field as I could, and the more I learned about the different avenues for genetic counselors, I saw how it really aligned with my passions," Choy said.

Choy feels grateful for the support and encouragement of MSGC faculty, particularly Associate Program Director Emily Quinn—who helped with their

thesis—and Assistant Director Melissa Randall Chan, who gave them the case study.

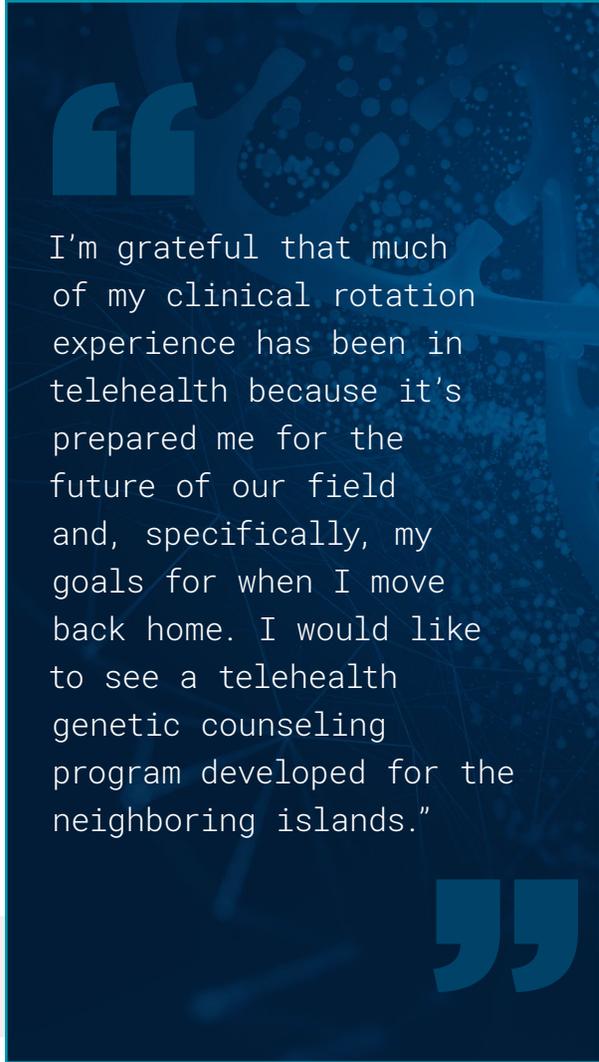
“Emily has been really wonderful,” Choy said. “I’m very grateful that I can tell her anything in terms of pressure points in the program, and she’s provided so much unconditional support. Melissa is another resource I’ve really been able to connect with. I think she sees the genetic counselor in all of us before we are able to see it—like she already views us as colleagues.”

In general, Choy feels that Quinn, along with Program Director Ashley Mills, has been very attentive to their feedback and concerns.

“All of the anxieties I had about coming to a new program are alleviated by the fact that if an issue was brought up to them, they would do everything in their power to make that adjustment as soon as they could,” Choy said.

Choy grew up in Oahu, the main island and metropolitan area of Hawaii, which has access to hospitals and specialized services including genetic counseling. The neighboring islands, by contrast, have basic healthcare services but are significantly limited in terms of specialty services. However, telehealth has greatly improved access, particularly in underserved and rural communities.

“I’m grateful that much of my clinical rotation experience has been in telehealth because it’s prepared me for the future of our field and, specifically, my goals for when I move back home,” Choy said. “I would like to see a telehealth genetic counseling program developed for the neighboring islands.”



Choy’s long-term goal is to continue their thesis research with the native Hawaiian population, investigating ways to improve access to and awareness about genetic services.

“I also want to develop my own counseling style and improve my confidence in a clinical setting,” Choy said.

One of the challenges of being a genetic counselor is having difficult conversations in a limited amount of time. Thus, Choy’s goal is to educate patients on a counselor’s role so they have clear expectations, while delivering tough news with empathy.

## Personal Tragedy Fuels KGI Alumnus Jabre Millon's Desire to Help Others as a Doctor



JABRE MILLON, PPC '18

As a 16-year-old, KGI alumnus Jabre Millon, PPC '18, had dreams of becoming a doctor and joining the Olympics. He was a committed student and track and field star, and though his parents were divorced, he still had a strong

relationship with his father, whom he saw regularly.

Then his whole world changed when he received a knock at the door from his uncle, announcing that his father was dead. He would soon learn that his father had been entangled in a domestic situation, murdering Millon's stepmom and her boyfriend before getting shot by the police after he refused to drop his weapon.

Simultaneously coping with his father's loss, this news (which put his father in a new light), and the nonstop media coverage that followed proved to be a perfect storm. Millon lost all interest in school and athletics.

Eventually, though, he got back on track, attending the University of La Verne for two years, followed by the University of Southern California (USC), where he competed in track and field.

"Ultimately, what happened with my dad is something that I'll have to live with the rest of my life, so being able to accept and move on from that has played a huge role in where I am and who I am today," Millon said.

During this time, two events played a pivotal role in Millon's ability to work through his emotions. One was opening up to a sport psychologist at USC, who showed him the healing power of talking about your feelings with others.

The other was volunteering at a hospital, where he brought water and blankets to patients and—most importantly—connected with them by engaging them in conversation. This fueled his desire to help others through the medical profession.

After graduating from USC in 2015, he applied to medical school but didn't get in. This ultimately worked out for the best, as he eventually applied to KGI's Postbaccalaureate Premedical Certificate (PPC) program so he could become a more competitive applicant, starting in 2017.

At KGI, Millon felt that the collaborative work environment and opportunity to take entrepreneurial

classes helped to further his growth and the mentorship of PPC directors Joon Kim and Elba Muñoz.

"I didn't have a lot of mentorship before KGI and did the medical school applications process on my own the first couple of times, so having the resources and Joon and Elba there to walk me through every step of the process was very helpful," Millon said.

One of his biggest challenges at KGI was the semester-long collaborative project, but it was ultimately informative as it taught him how to collaborate in high-pressure situations. He learned how to judge when it was appropriate to step up and take control, and when to step back and take direction.

Now, Millon is two years away from graduating from the University of Nevada, Las Vegas (UNLV) medical school. At UNLV, he has been involved with the community, mentoring local pre-meds and high school students and volunteering at the Boys and Girls Club.

He hopes to potentially go into orthopedic surgery or interventional radiology. For those just entering medical school, Millon recommends going in with positive expectations.

"I think medical school is awesome," Millon said. "People look at me like I'm crazy when I say that, but it's ultimately what you make of it. Also, one test is not going to define your future. Take time to appreciate the small things in life and spend time with your friends and family."

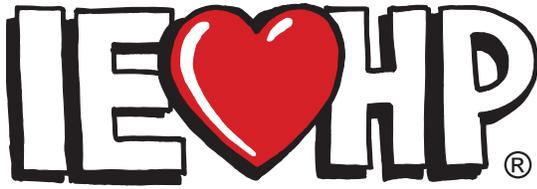
Millon says that his tragedy has helped him put everything in perspective and shaped his desire to give back to others.

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# Expanding Opportunities through Transformative Partnerships

## IEHP and Keck Graduate Institute Partnership Delivers New Healthcare Analytics Course



A Public Entity

### Inland Empire Health Plan

Inland Empire Health Plan (IEHP) partnered with KGI to develop and deliver a one-semester graduate-level course, Introduction to Healthcare Analytics, designed to help IEHP Team Members transition into a professional role as a healthcare analyst.

An essential role in the health plan's operation, a healthcare analyst communicates with data science and other information technology experts to obtain needed data resources. The healthcare analyst also applies technical solutions to serve internal and external clients' information and data needs.

KGI's partnership's need came after the health plan had more open analyst positions than qualified candidates. To support the health plan's workforce, KGI proposed to become IEHP's educational partner and collaborate to educate their existing staff to take on these more technical roles.

"We were looking to get more into corporate education—and, as their educational partner—we could provide their existing workforce with additional skills so they can concentrate their resources in other areas as opposed to hiring, which is traditionally very costly," said Beth Walkenbach, KGI director of corporate partnerships.

Before the partnership was established, IEHP was in the process of constructing an additional building on their campus that would become a designated training and education center. Additionally, IEHP and KGI already had established common interests, partnerships, and natural synergies, complementing the partnership's establishment.

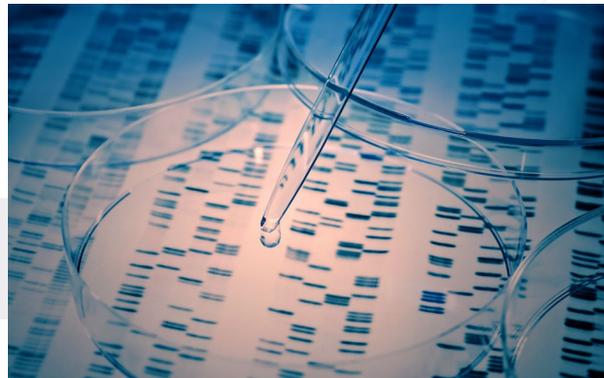
"This partnership allows for new opportunities and professional growth for many of our IEHP Team Members," said Jarrod McNaughton, IEHP chief executive officer. "Our Team Members are truly the heart of the health plan, and it is a privilege. We are so grateful to the leadership team at KGI

for jumping in and offering resources to help our Team Members soar to new heights."

The initial course for Introduction to Healthcare Analytics had 22 students. The course was delivered using a blended approach, outside of regular working hours and in a virtual environment.

"We hope that after the course, the students have such a positive experience with KGI that they are interested in taking more classes with us," Walkenbach said. "If the partnership goes well, ideally we can expand this course into a full certificate program in healthcare data analytics that would be usable for other organizations as well, but it would be great to have IEHP's guidance on the development of that certificate program."

### KGI Launches Certificate in Applied Genomics to Train Life Sciences Professionals in the Latest Genomics Developments



The life sciences technology industry is undergoing a sea of change as advances in genomics technology move rapidly from the research lab into clinical settings and drug development. Genome sequencing over the past few years has led to a greater understanding of how differences in our genome can lead to human disease, prompting the development of new technologies in both diagnosis and treatment.

In December 2019, biotechnology company Amgen supplied KGI with a \$1 million grant to establish a Center for Training in Applied Genomics. A vital component of this grant was to create an educational model for training the existing workforce at companies such as Amgen in the skills and knowledge they need to capitalize on these advances.

KGI's new Certificate in Applied Genomics will do just that—teach working professionals to:

- Describe current methods and challenges for interpreting DNA and RNA sequencing
- Use genome editing as a therapy
- Demonstrate knowledge of existing bioinformatics programs
- Manipulate genome-wide datasets to conclude relevant to clinical needs
- And more

“As the life sciences move more towards gene and cell therapy and precision medicine, an understanding of genomics is going to be necessary for anyone who has a position within the life sciences and biotechnology industry,” said Beth Walkenbach, KGI director of corporate partnerships. “For anyone who’s been out of school for the last 10 years, this is new information. Thus, these courses are aimed at providing established professionals in the life sciences industry with a basic knowledge of genomics so that they can be conversant on the cutting edge of biotechnology.”

The certificate is part of KGI’s executive education initiative to get working professionals up to speed in the latest biotechnology developments.

## KGI Expands Biopharmaceutical Industry Fellowship Program



KGI’s School of Pharmacy and Health Sciences 24-month Biopharmaceutical Industry Fellowship Program provides hands-on training to Doctor of Pharmacy (PharmD) graduates in drug discovery, development, and commercialization, ultimately helping fellows build a successful career in the biopharmaceutical industry. This year, KGI has expanded the program, partnering with Ascendis Pharma (Oncology Clinical Development and Pharmacovigilance Regulatory Compliance), Pharmacyclics (Medical Affairs), Abbott Diabetes

Care (U.S. Medical and Scientific Affairs), and Ortho Clinical Diagnostics (Medical Device Development).

Since KGI began the fellowship program in 2018, all graduates have successfully landed industry positions—often with the company they work with during the program. For example, when KGI partnered with Profusa during the 2019–2020 academic year, fellows Taylor Noriega and Chloe Nguyen both obtained Manager positions with Profusa in Medical Affairs.

A valuable skill set that fellows bring to the companies is leading and delivering key projects, often offering an innovative approach. When developing clinical trials for Profusa, Noriega recognized the need for an app that would provide physicians with key information about the patients while preventing the company from knowing the patients’ identity.

“Taylor created her own app with no coding experience,” said Bernard Tyrrell, KGI’s associate dean for pharmacy and industry relations and professor of practice for administrative sciences, who runs the fellowship program. “She talked to the right people and got the whole thing pulled together, and it worked out really well.”

Another fellow, Kaylee Miu, landed an assistant director position with AbbVie Pharmaceuticals immediately after completing the program.

“That was pretty significant, especially with a big company like AbbVie, which normally doesn’t bring new hires in at that level,” Tyrrell said.

The fellowship program is not exclusively offered to KGI graduates but is open to all PharmD graduates across the nation. Tyrrell believes this increases the respectability of the program, and for the KGI graduates who do end up getting a fellowship, it’s more meaningful than if they had only been competing against their cohorts.

Although fellows spend the majority of their time working directly with the companies on various projects, the program still has an academic component where students complete curriculum and work under a KGI professor who acts as an academic preceptor.

Because fellowship programs are not intended to make large profits, it’s essential that both the fellows and the companies are fully benefiting from the experience. Tyrrell meets with fellows regularly to ensure that the companies are providing quality training and education.

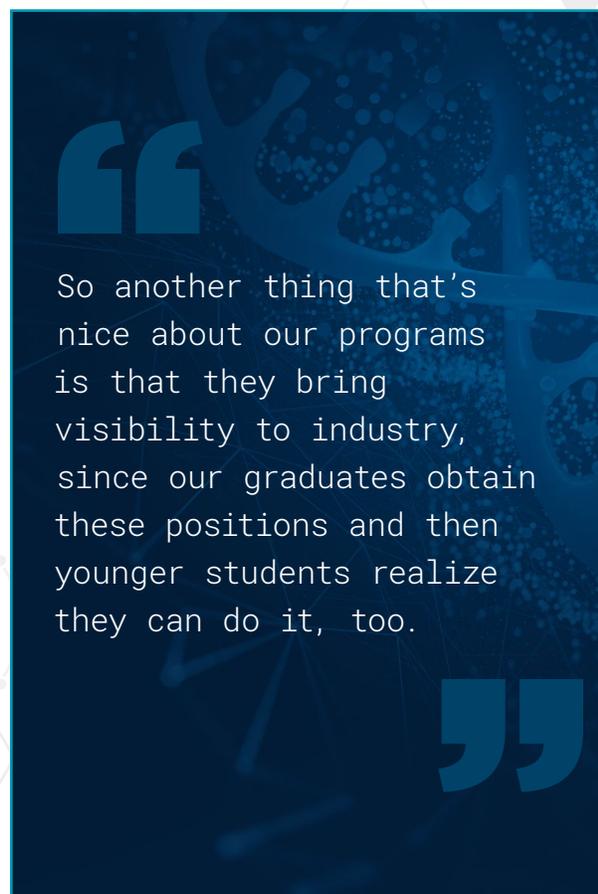
Tyrrell also serves as Coordinator for the Medical and Clinical Affairs (MCA) Certificate for KGI PharmD students. The certificate program is designed to offer students a competitive edge when applying for fellowships and industry positions as they explore

strategic approaches to problem-solving in medical and clinical affairs, learn clinical research design and strategies, and pursue a variety of job opportunities available throughout the pharmacy program.

In 2019 and 2021, at least 60% of KGI's MCA students landed an industry position. It was difficult to obtain good numbers and feedback for the class of 2020 due to the COVID-19 pandemic. Even then, almost 40% successfully obtained a position.

Overall, both the certificate and the fellowship programs expose PharmD students to a variety of pharmaceutical professions—including industry positions.

"Most pharmacy schools have less than one percent of their graduates go into industry," Tyrrell said. "When I graduated many years ago, I was the only student out of my class to go into industry, and I went to work directly with Eli Lilly. So another thing that's nice about our programs is that they bring visibility to industry, since our graduates obtain these positions and then younger students realize they can do it, too."



“  
So another thing that's nice about our programs is that they bring visibility to industry, since our graduates obtain these positions and then younger students realize they can do it, too.”

## Corporate Relations Board Facilitates Opportunities for KGI Students Through Team Master's Projects, Fellowships, Industry Talks, and More



One of the hallmarks of a KGI education is offering real-world experience and industry connections through partnerships with major companies in the biopharmaceutical industry such as Amgen, Genentech, and Gilead Sciences. To this end, KGI's Corporate Relations Board (CRB)—an organization of industry professionals—facilitates and strengthens these industry connections by advising KGI on best practices and industry trends, providing industry opportunities to KGI students and alumni, promoting KGI to professional and personal networks, and supporting KGI through charitable personal and corporate giving.

During the 2020–2021 academic year, KGI's collaboration with the CRB resulted in seven Team Master's Projects (TMP), three Fellowships, six Industry Talks featuring a CRB member or a new contact introduced to KGI by a CRB member, and \$7,200 in philanthropic gifts.

Formally known as the Advisory Council, the CRB underwent a rebranding as it went from providing guidance primarily for the Henry E. Riggs School of Applied Life Sciences to supporting the entire campus, as KGI has expanded into multiple schools.

The interconnectedness between KGI and the CRB helps when it comes to scheduling events and providing services that are beneficial for KGI students and faculty—particularly when it comes to the Industry Talks.

"These industry professionals have an advantage because they know what the students are doing at KGI," said Beth Walkenbach, KGI's director of corporate partnerships and co-lead of the CRB's Executive Committee. "Thus, as opposed to other



talks given by industry professionals, we engage more in these talks, and these particular individuals are able to speak to the KGI experience.”

Additionally, having KGI faculty and staff engaged with CRB working committees has helped both KGI and industry leaders to better meet their respective needs. For example, an industry leader contacted the Experiential Education and Employment committee looking for students with both a PharmD and PhD.

Bernard Tyrrell, KGI’s associate dean for pharmacy and industry relations and co-lead of the Experiential Education and Employment committee, was able to assist, adapting his existing PharmD Fellowship program to accommodate the need for this specific lead.

Other ways that the CRB has benefited KGI this year include participating in Career Services events such as resume reviews and an event where, following their summer internship, students develop posters to explain what they’ve accomplished for a particular company. These posters are then evaluated by KGI faculty and staff as well as CRB members.

“We have a number of people very interested in providing mentorship and engagement to our students,” Walkenbach said.

Overall, the partnership between the CRB and KGI is a symbiotic one in the sense that CRB is attuned to current industry needs and can inform KGI on how to develop their talent pipeline to meet these needs, which will in turn benefit the industries by providing a pool of strong leads to draw from.

“It’s been a very positive experience, and we’re grateful for the involvement of everyone,” Walkenbach said. “These industry leaders are aware that KGI is an innovative place, and they’ve been supportive of us as we change and adapt.”

## California State University Establishes Admissions Pipeline with KGI



Seeking to provide access to high-quality medical education, KGI and the California State University (CSU) are creating a pipeline for qualified CSU graduates to enter KGI’s Master of Science in Community Medicine (MSCM) program that could lead to a medical degree.

“This is an exciting new partnership that will both provide CSU’s brilliant and diverse students additional avenues to pursue careers in medicine as well as help to alleviate one of the nation’s biggest challenges,” said Fred E. Wood, CSU’s interim executive vice chancellor of Academic and Student Affairs.

This pipeline will address the healthcare crisis and shortages in physicians and other healthcare workers in California and the United States.

CSU is the largest and most diverse university in the nation, with a high proportion of the student body who are first-generation college students from underserved or underrepresented communities.



“KGI and CSU recognize the importance of diversity in the medical professions,” said Dr. David Lawrence, KGI dean. “It is critical that we provide access to top-notch medical education, regardless of income and connections.”

KGI will tailor its admissions process to recruit local students who come from the communities with the greatest needs.

Lawrence said: “Who we recruit, where we recruit them from, and how and where we train them is critical in encouraging doctors to practice in the communities that need them the most.”

KGI launched the MSCM program in fall 2021. The first cohort received full tuition waivers.

The two-year online MSCM program will prepare students as skilled community medicine practitioners to work in the safety net community clinics, federally qualified health centers, public health departments, Native American healthcare systems, private healthcare systems, non-governmental organizations, and industries that serve those communities.

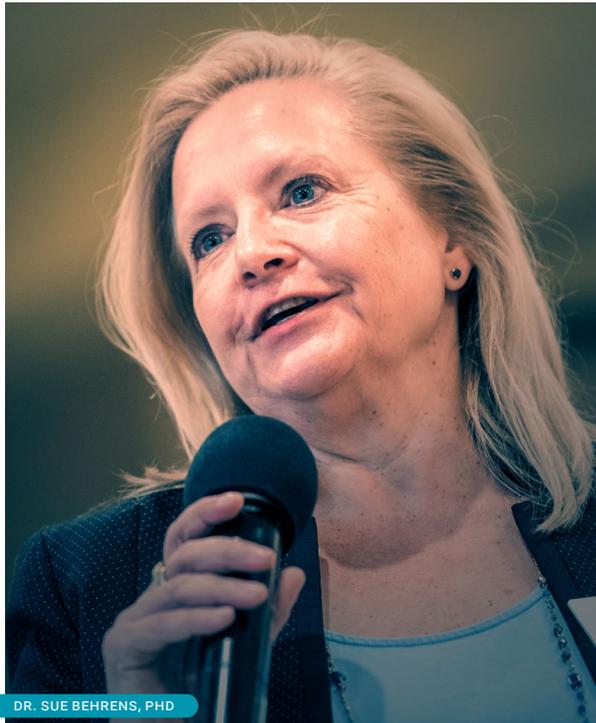


“  
Who we recruit, where we recruit them from, and how and where we train them is critical in encouraging doctors to practice in the communities that need them the most.”  
”

Graduates will positively impact the Los Angeles County safety net—those practices and clinics that offer care regardless of a patient’s ability to pay.

According to a UC San Francisco study in 2017, California is projected to face a shortfall of more than 4,100 primary care physicians within the next 10 years.

## KGI Receives Funding from NIIMBL for Bioprocessing Project



DR. SUE BEHRENS, PHD

During the summer, KGI received funding for a project from the National Institute for Innovation in Manufacturing Biopharmaceuticals (NIIMBL).

The project, Bioprocess Online Training using Digital Twin (BOT-DT), will be led by George B. and Joy Rathmann Professor in Bioprocessing and Director, Amgen Bioprocessing Center Dr. Sue Behrens. Project partners include researchers at California Polytechnic State University, Catalent Pharma Solutions, LLC., Merck, OUAT!, Santa Clara University, and Sartorius.

“We are honored to be selected by NIIMBL for this opportunity to build new online modules for bioprocessing,” said Behrens. “Leveraging existing technology from OUAT! with input from our industry partners will rapidly deliver hands-on learning capabilities to NIIMBL members.”

The BOT-DT project aims to enhance biopharma remote learning capabilities by developing blended training modules that utilize video, animation, virtual reality, and digital twin technology to provide training on one upstream operation (rocker bioreactor) and one downstream operation (tangential flow filtration/TFF) as proof-of-concept.

The modules will engage students and industry professionals in online courses through a simulated hands-on experience and provide the biopharmaceutical industry with a flexible training opportunity as well as a mechanism to tap into the pool of talent successfully completing the blended learning modules.

In total, NIIMBL awarded \$4.6M to 10 projects within three different biopharmaceutical manufacturing categories. KGI’s project was within the Talent and Workforce Development Projects category. This work is performed under financial assistance award 70NANB17H002 from the U. S. Department of Commerce, National Institute of Standards and Technology.

NIIMBL has funded more than 80 technical and workforce development projects with a total investment of approximately \$25M since 2017. The NIIMBL community is comprised of more than 170 members from academia, industry, government, and non-profit organizations, all sharing a common goal to advance biopharmaceutical manufacturing.

“

We are honored to be selected by NIIMBL for this opportunity to build new online modules for bioprocessing. Leveraging existing technology from OUAT! with input from our industry partners will rapidly deliver hands-on learning capabilities to NIIMBL members.

”



# Making an Impact with Transformative Gifts

## Chan Family Makes Generous Donation to the KGI School of Pharmacy and Health Sciences



KGI received a generous donation from Tony and Virginia Chan to support the School of Pharmacy and Health Sciences (SPHS). Tony, the owner and CEO of ABC Pharmacies and a Claremont resident, is a long-time supporter of KGI and spoke at the SPHS White Coat Ceremony in 2019. Virginia, the President of Covina Pharmacy and ABC Pharmacy-Redlands, was the keynote speaker at the 2021 White Coat Ceremony.

“It is our pleasure to support and honor the healthcare professionals of today and tomorrow who so selflessly dedicate themselves to the well-being of others,” the Chan family wrote in a statement.

To celebrate the Chan family’s philanthropy, KGI has renamed its café and patio to the Chan Family Café and Patio.

“We are incredibly grateful for the Chan family’s generosity,” KGI President Sheldon Schuster said. “This donation will help us move the School of Pharmacy and Health Sciences forward. It will also continue to support the success of our students as we create career pathways in healthcare.”

New signage to recognize the name change was installed in March 2021. In early April, Tony, Virginia, their son Jonathan, their daughter Megan, and son-in-law Tyler joined Schuster to visit the campus and view the new signage.

## L.A. Care Commits \$5 Million to Help Fund Medical Pathways



### Elevating *The Safety Net*

An L.A. Care Health Plan Initiative to Strengthen the Provider Safety Net in L.A. County

L.A. Care Health Plan, the nation’s largest publicly operated health plan, announced in October that it is committing \$5 million to KGI to support medical pathways. The investment is part of L.A. Care’s Elevating the Safety Net, an initiative to address a looming physician shortage in Los Angeles County.

“KGI will serve as a pipeline for physicians into the L.A. County safety net,” said John Baackes, L.A. Care CEO. “This commitment is an exciting addition to our Elevating the Safety Net initiative. Ultimately, our members will greatly benefit from this pipeline of physicians and other providers who are passionate about caring for these communities.”

L.A. Care’s Elevating the Safety Net initiative focuses on recruiting high-quality physicians into the Los Angeles County safety net—those practices and clinics that offer care regardless of a patient’s ability to pay. The U.S. Department of Health and Human Services recommends at least 60 primary care doctors for every 100,000 people, with 80 being preferable to ensure high-quality care. Right now, Los Angeles County has only 56 primary care physicians per 100,000 people.

KGI will work to address the growing physician shortage by tailoring its admissions process to recruit local students who are passionate about improving the health of our region’s residents and who reflect the community’s demographics. Recruitment will consist of students from non-traditional pre-medical programs, and the curriculum will include training in compassion, empathy, and resilience. It will prepare doctors who are aware of how culture, language barriers, care access, food, housing, income security, and geography affect healthcare outcomes.

Dr. David Lawrence, KGI dean, said: “Research has shown that who we recruit, where we recruit them from, and how and where we train them is critical in getting doctors to practice care in the communities that need them the most.”

Drawing on KGI’s strengths of faculty expertise and advanced educational technologies, KGI will prepare a different type of physician. With new scientific advances, powerful technology-driven tools, and advanced analytics, healthcare professionals now have an unprecedented ability to provide “Precision Health.” This solution can help

people stay healthy, prevent illness and injury, and detect those conditions before symptoms occur.

“We will prepare outstanding, rigorously trained community medicine specialist physicians with the backgrounds, maturity, intelligence, skills, ethics, and compassion to confront the challenges that lie ahead,” said Lawrence. “We will do this in partnership with health professionals, community representatives, and the families and individuals our graduates will serve.”

“This is truly a momentous day in the history of Keck Graduate Institute,” said Sheldon Schuster, KGI president. “This extraordinary gift will shape KGI as we aim to provide pathways for student physicians to impact our Southern California region. We are deeply grateful for L.A. Care’s generous support in aligning their Elevating the Safety Net initiative with our new medical school.

With the L.A. Care gift paving the way, KGI has an opportunity to transform medical education and prepare physician leaders for satisfying careers in community medicine in the underserved and underrepresented communities where they work.

## Ardmore Institute of Health Grant Supports Lifestyle Medicine in KGI’s Occupational Therapy Doctorate Program



The Ardmore Institute of Health (AIH) has awarded a grant to KGI to create a lifestyle medicine and occupational therapy integrated curriculum in support of the launch of KGI’s developing Occupational Therapy Doctorate (OTD) program.

“The AIH grant will enable us to create a premier educational experience for students to utilize lifestyle medicine-informed occupational therapy to promote health and well-being in a wide range of settings,” said Dr. Christy Billock, professor and founding program director of the occupational therapy program.

Dr. Ron Stout, president & CEO of AIH, added: “AIH is delighted to support KGI’s Occupational Therapy Doctorate program as it develops a benchmark, replicable lifestyle medicine approach to providing care.”

The grant from the Ardmore Institute of Health will provide support in several key areas:

- It will help with innovative curriculum development as Billock integrates principles and practices of lifestyle medicine with occupational therapy models and service delivery into courses across the OTD program, preparing students to be champions for lifestyle changes to improve health and well-being.
- It will provide funding to create an open textbook available at no cost that could be used in occupational therapy educational programs or by practicing therapists to increase visibility and integration of lifestyle medicine into occupational therapy practice.

“The goal of the American College of Lifestyle Medicine is to change healthcare systems and delivery models to move beyond symptomatic treatment to address lifestyle-based root causes of chronic disease,” Billock said. “As experts in daily life activity, occupational therapy professionals are an ideal and natural fit for lifestyle medicine’s interdisciplinary approach.”

KGI’s developing OTD program will prepare graduates as innovative leaders within the occupational therapy field. Expected to enroll in fall 2022, pending WASC and ACOTE approval, the three-year program will showcase active-learning, hands-on lab and fieldwork experiences, and team collaboration to prepare students to become resourceful, ethical, and agile problem solvers.



## KGI Joins Forces with ATUM to Offer MEng Scholarship for Underserved Students



MASTER OF ENGINEERING IN BIOPHARMACEUTICAL PROCESSING (MENG)

KGI has partnered with biotech company ATUM to offer two \$50,000 scholarships (each spread out over two years) to students in KGI's Master of Engineering in Biopharmaceutical Processing (MEng) program. The ATUM Scholarship specifically targets underserved students (those identifying as Black, Latinx, or Native American). These groups are traditionally underrepresented in STEM fields in general and the biotech industry specifically. A significant challenge to advancement is demonstrated financial need.

ATUM provides tools and solutions, including gene design and synthesis, protein engineering, and cell line development, to life science researchers. Dr. Oren Beske, ATUM's Amalgamator of Business and Biology, first developed a relationship with KGI around six years ago, when a KGI alum was recruited to work for his previous employer.

Beske has initiated and is spearheading this scholarship on behalf of ATUM, as he saw an opportunity to use the company's resources to support underrepresented minorities in biotech.

"I've been in the biotech industry for over 20 years, and it's clear that while things have improved, there certainly remains a lack of diversity in the industry," Beske said.

He believes that this lack of diversity is largely due to inadequate mentorship and financial resources. Many underrepresented groups are not even aware of existing career opportunities within the biotech field. Additionally, the expenses of a biotech education make such careers seem out of reach for many.

"Working two jobs and going to graduate school at the same time is a huge hurdle to many," Beske said. "Over the years, I've built many companies, and it's frustrating not to have an applicant pool of well-educated folks so that I could build a racially diverse workforce to represent who we are as a community, especially here in the Bay Area. That's my driving force—to give motivated minority students an educational opportunity they may not have otherwise been able to afford, such as a program like KGI's MEng. It is one way that we can do our part to bring diversity to the biotech world."

Dr. Sue Behrens, KGI's George B. and Joy Rathmann Professor in Bioprocessing and Director of the Amgen Bioprocessing Center, agrees that many underrepresented students are unaware of existing biotech opportunities. Even if these individuals have obtained a bachelor's degree in biology or another science-related field, such opportunities are still largely unknown to the general public. Additionally, when most people think of engineering, biopharmaceutical engineering—taking potential drug molecules from discovery to commercial application—does not typically come to mind.

"Here at KGI, we began to say, 'How can we help these students who are dedicated and persistent in getting to the next stage?'" Behrens said. "Many students interested in the life sciences or healthcare think that their only option is to become a doctor. Then perhaps they go through pre-med and decide this path isn't for them, but they still want to contribute to healthcare."

Educating such individuals on the opportunities available within biotech shows them how they can pursue healthcare in a way that doesn't require obtaining an MD degree while still making a meaningful contribution to the field and human health and wellness.

Having a more racially diverse workforce will benefit the biotech and biopharmaceutical engineering field as a whole. Because engineering by nature involves problem-solving, including various perspectives is essential for coming up with better solutions.

"When you have the same kind of people working on a problem, you don't get nearly the diversity of thought, and the solutions can be limited," Behrens said. "Thus, bringing together people with different life experiences always provides a more robust problem-solving opportunity."

Funds Raised this Year:

**\$9,112,182.98**

Gifts In Kind:

**\$2,040,890.00**

Cash Gifts:

**\$7,071,292.98**

**4.07x  
OVER  
GOAL**

**227**

ONLINE DONATIONS

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TOTALING

**\$139,916**

TOTAL DONORS

**244**

NEW DONORS

**44**

**\$336,340**

## Donor Breakdown

**Faculty/Staff**  
101 Donors  
**\$28,846.96**

**Board of Trustees**  
23 Donors  
**\$2,162,875.00**

**Alumni**  
49 Donors  
**\$34,745.04**

**Corporate**  
23 Donors  
**\$28,846.96**

**\$8,277.96**  
in PAYROLL  
DEDUCTIONS

**\$1,485,041**

Raised for Student Scholarships

**\$11,808**

Raised for Student Success Fund

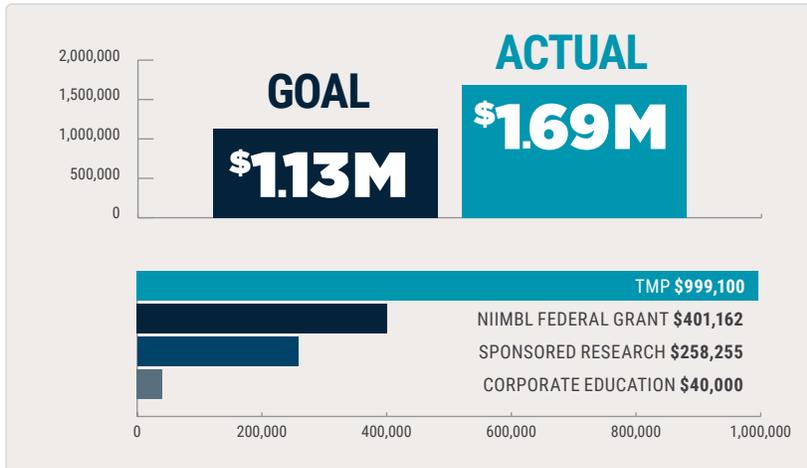
**\$250,000**

Received in Legacy Gifts



"KGI has given me a network, friends, and a family. Before coming here, I didn't know what would fit my interests. But this brought everything together in one place. 30-40 years from now, I see my class giving back, as we stand now on the shoulders of the giants before us." —Justin Mathew, MBS '22

## Corporate Partnerships Impact Report



## TMP Impact

Team Master's Projects provide active learning for students and value to corporate sponsors.

**19** Unique projects from **16** corporate sponsors

**57** Corporate Liaisons providing expertise and mentorship

**122**

Students collaborating in teams, developing professional skills, and learning from industry experts

**35,000**

Hours of student effort invested in developing solutions for corporate partners

**68** Companies engaged with KGI through advisory boards, speaker events, and sponsorship of research and TMP.

## Corporate Education Impact

Training designed for working professionals.

Biomedical Commercialization Workshop

Introduction to Healthcare Data Analytics

Certificate in Applied Genomics

3 New Programs

**71** In-career professionals developing their skills in KGI Corporate Education

## Industry Speaker Series

Highlighting careers in the life science and healthcare industries



Speaker Events **17**



Individual Speakers **21**



Alumni Speakers **8**

Average Attendance | **37**

Total Attendees | **635**



"The return on investment is huge. We're talking double, triple digits return on investment, 100-, 200-percent return on investment. The numbers from a business standpoint are very eye-opening."

—Monde Qhobosheane, President & CEO, Analytik Jena US

## Corporate Relations Board

An advisory board of 27 industry professionals providing support to KGI.

**\$7,200**  
in Philanthropic Giving

**\$322,500**  
in TMP Revenue

**\$92,695**  
in Fellowship Revenue

## Sponsored Research Impact

KGI is a trusted academic partner for industry.

**8** Companies engaged KGI faculty and students to conduct proprietary research

**7** KGI faculty served as principal investigators

**10** KGI students hired as research associates

**We thank the following engaged corporate partners:**

Student experiences at KGI are greatly enhanced by collaboration and partnership with the life science industry. We appreciate participation in our programs through advisory boards, speaking engagements, and sponsorship of research and Team Master's Projects from the following companies.

- 3M
- Acceleron Pharma
- Amgen
- Analytik Jena
- Ascendis Pharma
- AstraZeneca
- Atara Biotherapeutics
- BD
- Bill and Melinda Gates Foundation
- Biogen Idec
- BioMarin Pharmaceuticals
- Bio-Rad Laboratories
- Boehringer Ingelheim
- Cardea
- Catalent Pharma Solutions
- Celltheon Corporation
- City of Hope
- DeciBio Consulting
- Dexcom
- Edwards Lifesciences
- EVERSANA CONSULTING
- Evren Technologies
- Exelixis
- EyeGate Pharmaceuticals
- FUJIFILM Irvine Scientific
- Genentech
- GenVivo
- Gossamer Bio
- Hologic
- Intercept Pharmaceuticals
- IPS Global
- Ivantis
- Jazz Pharmaceuticals
- Johnson & Johnson DePuy Synthes
- Johnson & Johnson Vision
- Kite Pharma
- L7 Informatics
- Medtronic Neurovascular
- Meissner Filtration Products
- Merck & Co.
- NAT Diagnostics
- Natera
- NIIMBL
- Orbillion
- Ortho Clinical Diagnostics
- Pall Life Sciences
- Pfizer
- Poseida Therapeutics
- Prescient Healthcare Group
- Progenity
- Regeneron Pharmaceuticals
- Resilience
- Roche
- Roehm America
- Sage BioSolutions
- SanBio
- Sangamo Therapeutics
- Sarepta Therapeutics
- Sartorius Stedim
- Soil Carbon Co.
- Sutro Biopharma
- Syneos Health
- Takeda Pharmaceuticals
- Thermo Fisher Scientific
- TRACON Pharmaceuticals
- Veracyte
- Voxx Analytics
- Xontogeny



# Transforming the Future of KGI

## KGI Announces Master of Science in Community Medicine Program; Dr. Williams Hired as Program Director



DR. MONIQUE J. WILLIAMS, PHD, MSPA

Weeks after KGI announced a partnership with L.A. Care Health Plan—the nation’s largest publicly operated health plan—the Institute has announced its first degree offering: A Master of Science in Community Medicine (MSCM), which enrolled in fall 2021.

The two-year online MSCM program will prepare students as skilled community medicine practitioners to work in the safety net community clinics, federally qualified health centers, public health departments, healthcare systems, non-governmental organizations, and industries that serve those communities.

Students will have careers devoted to improving health, preventing illness and injury, and detecting treatable medical conditions early enough to avoid premature death and unnecessary poor health.

“Our new MSCM program enables students from different backgrounds and educational experiences to learn in a course of study designed to ensure their success while holding them to the high standards of excellence and rigor,” said KGI Dean Dr. David Lawrence.

KGI’s MSCM is a focused skills- and knowledge-based graduate degree that prepares leaders and practitioners who work in underserved and underrepresented communities to decrease demand for medical care services by improving health and preventing disease and illness.

Because courses will be taught entirely online, students from anywhere in the country will have increased access to the program. In addition to online courses, students will experience real-world, community-based learning occurring in the student’s geographical location.

After graduating with a MSCM degree, students are qualified to enter the workforce directly or seek further training as physicians or other health professionals.

“We want MSCM graduates to be the bridge between individuals, families, and their communities,

and assess and improve the healthcare system’s performance,” Lawrence said.

Dr. Monique J. Williams was hired on March 1, 2021, as Founding Program Director and Professor of Practice for the MSCM program. Williams received her Master of Science in Physician Assistant (PA) studies at Western University of Health Sciences and her PhD in Health Sciences Education and Research from Trident University.

Most recently, she served as Assistant Professor and Academic Coordinator for the PA program at the University of La Verne, where she was involved in developing the new College of Health Sciences and Well Being. She served on numerous academic committees engaged in diversity and inclusion, academic life, and student affairs.

According to Williams, one of the most pressing medical issues that underserved communities face is the lack of quality care and education for preventable conditions such as hypertension and diabetes. She believes this is partially due to a disconnect between patients and providers.

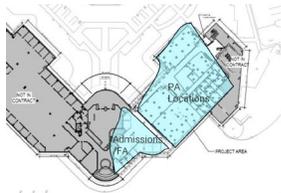
“Patients are just not being heard in terms of what’s important to them for their health and wellness,” Williams said. “KGI’s program will help address these issues by recruiting students who come from these communities, understand their unique needs, and want to know these communities on a deeper level because every community is different.”

At the root of community medicine is the goal to emphasize the human element of medicine, view the patient as a whole person, and help them live healthy, thriving lives. KGI’s MSCM program will help students reach this goal through capstone projects that involve engagement in a specific community, building a rapport with individuals and families to address their needs better.

Some students may be preparing for careers as physicians, while others may eventually become health educators or public health advisors, focusing on policy and improvements. The key is that all students are committed to serving diverse, underrepresented communities for accessible, quality healthcare.

## Campus Improvements and Construction Showcase Future Innovation

As KGI continues to meet society's ever-changing needs by developing new programs and academic models, it must also update campus buildings and classrooms to keep pace. Construction occurred in three different KGI buildings this past year: 535 Watson Drive, 517 Watson Drive, and 555 Arrow Highway.



OVERVIEW OF BUILDING 555 CHANGES

555 Arrow Highway will house four new labs and classrooms for students entering KGI's Master of Science in Physician Assistant Studies (MSPA) and Occupational Therapy Doctorate (OTD)

programs. The classrooms include a Patient Assessment Lab, Standardized Patient Assessment Center, Shared Skills Lab, and Physician Assistant (PA) classroom.

The PA Classroom will be used for each cohort's didactic phase (start of the program). The classrooms are thoughtfully and strategically designed to provide a collegial, supportive, and engaging learning environment. Active lectures, group projects, and group discussions will occur in this space.

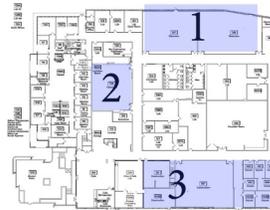
In the Patient Assessment Lab, students will learn physical exam skills. This lab includes 25 physical exam tables for students to gain and practice these critical clinical skills.

MSPA and OTD students will take the lab components of various courses in the Shared Skills Lab. The lab will include a 3D virtual anatomy platform in the front of the room, as well as anatomic models stored throughout the cabinets. No cadavers will be utilized. Clinical procedural skills will also be practiced in this lab by MSPA students, including simulated suturing, intubation, nasogastric tube insertion, incision and drainage, and many others. Additionally, OTD students will practice using physical agent modalities, splinting, and other evaluation and intervention skills in the Lab.

Throughout the MSPA program, the Standardized Patient Assessment Center will be utilized for administering practical exams called objective structured clinical examinations (OSCEs). This space includes eight simulated patient exam rooms, a video control room, and a debriefing room (for before and after testing). OTD students will also use this space for OSCE exams during their five trimesters of didactic education.

Additionally, the Admissions and Financial Aid Offices are moving to 555 Arrow Highway and will provide prospective student interviews and tours.

In the 517 Watson Drive building, existing space is being re-configured to build additional classrooms for students in the OTD and Doctor of Pharmacy programs. The new pharmacy classrooms will have seats of eight clustered together to enable group activities, team projects, and active learning.

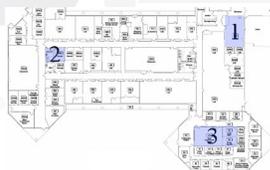


OVERVIEW OF BUILDING 517 CHANGES

A pediatric/neuro lab for OTD students will showcase a range of equipment and tools for students to learn how to do therapy. It will function like a pediatric occupational therapy clinic where students

will practice sensory integration and other occupational therapy evaluations and interventions. The lab will also transform into a neurological occupational therapy clinic.

A second OTD space, the daily living lab, will teach students occupation-based intervention techniques in a natural apartment-like environment. Another classroom for OTD students will have plinth tables as desks to do hands-on learning amid didactic courses. Students will practice assessment and intervention skills with partners and within teams. Additionally, another classroom will be utilized for didactic and lab courses where mobile tablet chairs will help enable dynamic learning opportunities.



OVERVIEW OF BUILDING 535 CHANGES

In 535 Watson Drive, a new genomics teaching lab will be built for students in the Master of Science in Human Genetics and Genomic Data

Analytics program. As part of the Center for Training in Applied Genomics (funded by Amgen), the lab will be an innovative teaching space for preparing samples for next-generation sequencing to a genomics/bioinformatics computation lab.

Also in the 535 building, a new classroom will be built for hands-on, active learning, and collaboration.

For more details and to view architectural renderings, visit [kgi.edu/construction](http://kgi.edu/construction).



## Keck Graduate Institute Announces Year-Long 25th Anniversary Celebration



Reflecting on its tradition of developing leaders in healthcare and the applied life sciences, KGI is proud to announce a year-long celebration of its 25th anniversary, from January through December of 2022.

KGI's story began in 1995 when the late Henry E. ("Hank") Riggs, president of Harvey Mudd College since 1988, gathered a team to contemplate a "new venture." He envisioned a stellar new institution in The Claremont Colleges that would be innovative in higher education, productive for our nation and the region's economy, and beneficial to our society in solving critical problems related to the emerging field of biotechnology.

In July 1997, the W.M. Keck Foundation provided a \$50 million founding gift that transformed KGI from a dream into a reality. Riggs departed Harvey Mudd College in 1997 to become the founding president of KGI. He was a visionary who could see that the next century would be ruled by the life sciences and knew it was important to educate its leaders in novel ways.

KGI's pioneer program—the Master of Business and Science—began its first classes in 2000 and conferred its first degrees in 2002 with an inaugural graduating class of 28.

After eight years of guiding the "new venture," Riggs retired in 2003, and Dr. Sheldon Schuster became KGI's second president. Guiding accelerated growth for KGI, Schuster put together plans for an additional set of innovative programs. In 2004, the W.M. Keck Foundation made a \$20 million grant, challenging KGI to raise an additional \$30 million over seven years. KGI completed the challenge one year ahead of schedule.

Since the mid-2000s, KGI has rapidly expanded its degree offerings, adding a PhD in Applied Life Sciences in 2006 and the Postbaccalaureate Premedical Certificate in 2010.

At the start of 2014, Schuster collaborated with Biocon Limited founder and current KGI Board of Trustee member Kiran Mazumdar-Shaw to establish the Biocon Academy in Bangalore, India, offering certificate programs taught online by KGI faculty.

A monumental milestone occurred in August of 2014, as KGI's Doctor of Pharmacy program enrolled its first cohort. The program showcased KGI's innovative spirit by responding to the needs of industry. This creative mindset was further celebrated in 2016 when the first class of KGI's Master of Engineering in Biopharmaceutical Processing program enrolled.

Through the 2016–2017 academic year, KGI shifted from a commuter campus to a residential setting. The community celebrated a ribbon-cutting at 1 North Indian Hill Blvd. in Claremont in November 2016. In March 2017, KGI opened its first full-service café. Then in May 2017, the KGI and Claremont communities rallied together to break ground on the school's first housing complex. The 225,000-square-foot facility, Oasis KGI Commons, opened in the fall of 2019.

In the fall of 2018, two programs in genetics—the Master of Science in Human Genetics and Genetic Counseling and Master of Science in Human Genetics and Genomic Data Analytics—along with a Master of Science in Medical Device Engineering and Master of Science in Translational Medicine started their first cohorts. These new programs further showcased KGI's response to industry needs and ability to stay on the cutting edge of higher education.

Within the last year, KGI has expanded its healthcare offerings with two new programs set to enroll in 2022: Occupational Therapy Doctorate and Master of Science in Physician Assistant Studies. Additionally, a first-of-its-kind Master of Science in Community Medicine program enrolled in fall 2021.

With dynamic flexibility, KGI continues to meet society's ever-changing needs. Whether this means researching vaccines for new viruses or developing products to enhance human welfare, KGI students and faculty are a vital part of the process that shapes the future of bioscience and healthcare. KGI instills a sense of readiness in its students to solve world problems, and students continue to meet that expectation.

As part of the 25th Anniversary Celebration, special events and series will be scheduled to connect with students, alumni, corporate partners, and other friends of KGI. More details will be shared soon.

To access more information about the anniversary and to share your memories, visit [25.kgi.edu](https://25.kgi.edu).





# Year in Review

## Year-in-Review

### July 2020

#### AACP Selects Dr. Kathy Webster for James E. Wynn Memorial Award

The Chemistry Section of the American Association of Colleges of Pharmacy awarded the James E. Wynn Memorial Award to the late Kathy Webster during the association's virtual meeting in July 2020. As the Founding Dean of the KGI School of Pharmacy and Health Sciences, Webster was a visionary leader and a genuine innovator in higher education.

#### Sonia V. Otte Named KGI's Founding Program Director for Physician Assistant Studies



SONIA V. OTTE, MMS, PA-C

KGI Dean Martin Zdanowicz announced Sonia V. Otte as the Founding Program Director for the new Master of Science in Physician Assistant Studies (MSPA) program. Based on the accreditation

process timelines, KGI is aiming for a 2022 launch of the MSPA program.

### August 2020

#### Bioprocessing Summer Program Educates Students for Future Careers in Industry



WILLIAM HOU

KGI's Bioprocessing Summer Undergraduate Internship Training and Education (BSUITE) program introduces undergraduates to the world of bioprocessing and bioengineering. William Hou, a rising senior

and Bioengineering major at UC Berkeley, said that he applied to the BSUITE program to learn more about the industry of bioengineering and gain more practical experience. "In the KGI program, I learned about upstream and downstream processing along with how the final product is labeled and shipped. I finally became the chef instead of just studying the recipe," Hou said.

#### Kiana Aran, Inventor of the CRISPR-Chip, Wins Pinnacle 2020 Award

Professor Kiana Aran received the Pinnacle 2020 award, which is given to women in STEM leadership positions. Aran is the inventor and developer of the CRISPR-Chip, the first CRISPR-powered transistor which allows for fast detection of heritable disease variants like muscular dystrophy.

### September 2020

#### InvisBreeze Mask Designed at KGI's Medical Device Development Bootcamp Summer Program Addresses Common Mask Objections

Some of the most common objections to wearing face masks during the COVID-19 pandemic include an uncomfortable fit, difficulty breathing, and moisture buildup that causes glasses to fog. A team at KGI's Medical Device Development Bootcamp, a summer program for undergraduate students, designed a user-friendly mask that would answer these objections and more.



#### KGI Professor Animesh Ray Publishes New Findings on Melanoma Drug Resistance

KGI Professor Animesh Ray co-authored a paper with researchers at Johns Hopkins University on melanoma tumor growth, which appeared in the *Journal of Investigative Dermatology*. They demonstrated that a non-coding RNA, microRNA-211 (miR-211), is central to the formation of drug-resistant melanoma cells and illustrated the molecular mechanisms behind the formation of drug resistance.

**CSHP Announces Daniel Kudo as the 2020 Affiliate Chapter Volunteer of the Year Award**

The California Society of Health-System Pharmacists named KGI Professor Daniel Kudo as the recipient of the 2020 Affiliate Chapter Volunteer of the Year Award. This award recognizes one individual annually who has made exceptional and sustained contributions to the Society at the affiliate level.

**October 2020**

**KGI Student Alice Wen Aims to Empower the Disabled with Affordable Assistive Devices**



ALICE WEN, MBS '22

For individuals with physical disabilities, finances can often be a barrier when it comes to obtaining medical devices that grant them the independence they desire. KGI Master of Business and Science student

Alice Wen, MBS '22, became Co-Founder and COO of LegTrek, a company on a mission to create an affordable assistive device for those with limited control of their lower limbs.

**KGI Receives Impactful \$2 Million Gift**

KGI received a \$2 million unrestricted gift from an anonymous donor. "We wholeheartedly thank our donor for this gift to KGI," said KGI President Sheldon Schuster. "The \$2 million will be truly transformational to the advancement of our current and future programs." The donor said: "I have confidence in KGI's development of leaders and innovators, and I am particularly enthusiastic about KGI's work in genetics and genomic healthcare education."

**PharmD Student Mitchell Timbol Receives CSHP 2020 Student Leadership Award**



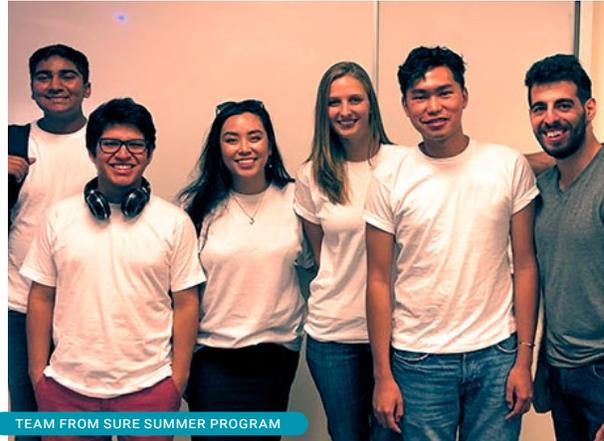
MITCHELL TIMBOL, PHARM D '21

KGI Doctor of Pharmacy student Mitchell Timbol, PharmD '21, was among the 13 students to receive the California Society of Health-System Pharmacists 2020 Student Leadership Award. Timbol received the

award for his contributions to CSHP as President of KGI's Student Executive Board.

**SURE Summer Program Students Publish Papers**

Two different teams of students from KGI's Summer Undergraduate Research Experience had papers published in *ACS Omega*. One paper investigated a new antibacterial agent while the other paper investigated treatments for anthrax disease.



TEAM FROM SURE SUMMER PROGRAM

**Venie Pham and Chidozie Olumba Win KGI Clinical Skills Competition**

Each year, the American Society of Health-System Pharmacists holds a Clinical Skills Competition, where students across the nation showcase their clinical skills via a team-based analysis of a patient case. KGI Doctor of Pharmacy students Venie Pham and Chidozie Olumba were winners of this year's KGI local competition.

**November 2020**

**MS Student Zaed Hindi Shares His Passion for KGI as Admissions Ambassador**



ZAED HINDI, MS '21

For many students, KGI is more than just a school. It is a home away from home where they can forge lifelong connections and embark on a journey of transformation. Such is the case for Zaed Hindi, MS

'21, whose enthusiasm for KGI inspired him to become an Admissions Ambassador to spread awareness of the Institute's name and mission.

**KGI Announces New Online Degree Program: Master of Science in Community Medicine**

Weeks after KGI announced a partnership with L.A. Care Health Plan—the nation’s largest publicly operated health plan—the school has announced its first degree offering: A Master of Science in Community Medicine, enrolling in fall 2021.

**Former KGI Bioprocessing Director Matt Croughan Publishes COVID-19 Home Healthcare Guide**

Back in March 2020, most people—including health professionals—were still unaware of what exactly COVID-19 was or the full repercussions when left untreated. Such was the case for Matt Croughan, former director of KGI’s Amgen Bioprocessing Center, who contracted the virus. His hard road to recovery inspired him to write the book *COVID-19: A Guide to Home Healthcare* to help others in his situation.

**December 2020**

**KGI Professor Hu Zhang Publishes Two Papers on 3D Printing Hydrogels and Wave Bag Bioreactors**

KGI Professor in Bioprocessing Hu Zhang published two new publications as the corresponding author. “3D printing of a thermosensitive hydrogel for skin tissue engineering: A proof of concept study” appeared in issue 19 (2020) of *Bioprinting*, while “Computational fluid dynamics analysis of mixing and gas-liquid mass transfer in wave bag bioreactor” was accepted for *Biotechnology Progress* in July 2020.

**KGI PhD Candidate Christine Urrea Publishes Internship Results on Improved Filtration for Bioprocessing**



CHRISTINE URREA, MENG '19, PHD '23

KGI student Christine Urrea, MEng '19, PhD '23, had her internship results for Bristol-Myers Squibb, a global biopharmaceutical company based in Massachusetts, published in *Biotechnology Process*.

The publication, “Control of leached beta-glucan levels from depth filters by an improved depth filtration flush strategy,” sought and ultimately found a better filtration process for the production of monoclonal antibodies.

**January 2021**

**KGI Adds Harlan Levine and Monde Qhobosheane to Board of Trustees**



DR. HARLAN LEVINE, MD



DR. MONDE QHOBOSHEANE, PHD

KGI appointed two members to its Board of Trustees: Harlan Levine, MD, and Monde Qhobosheane, PhD. Dr. Harlan Levine is president of strategy and business ventures for City of Hope. Dr. Monde Qhobosheane serves as the President and Chief Executive Officer at Analytik Jena US LLC.

**KGI Alumnus J. Robert Rankin Embraces Change As Bioinformatics Startup Exits Beta in Amsterdam**



ROBERT RANKIN, MBS '09

Robert Rankin, MBS '09, embarked on a new adventure. After relocating from the Bay Area to Amsterdam in August 2020, his bioinformatics software startup, ConnexBio, has exited beta. He attributes his

interesting career trajectory to his experience in KGI’s Master of Business and Science program.

**KGI Professor Animesh Ray Participates in COVID-19 Vaccine Trial**

KGI professors often study clinical trial results and sometimes organize these trials themselves. Still, Professor Animesh Ray got firsthand experience as a trial participant when he volunteered for the COVID-19 vaccine trial along with his wife in early September. Although he didn’t find out whether he received the placebo or the actual vaccine until March, his experience was informative.

“

I have confidence in KGI’s development of leaders and innovators, and I am particularly enthusiastic about KGI’s work in genetics and genomic healthcare education.

”

### Pomona Free Clinic to Hold Medical Spanish Workshops for KGI Students

Roxanne Marquez Arellano, PharmD ’22 and coordinator of KGI’s Medical Spanish Committee for Pomona Free Clinic, organized six virtual medical Spanish workshops starting in February. The workshop taught attendees how to greet and provide guidance for patients on diabetes, hypertension, cholesterol, nutrition, and stress in Spanish.

### February 2021

### Severe Injuries Motivate KGI Student Michael Gonzalez to Design Medical Devices



MICHAEL GONZALEZ, MSMDE '22

From an early age, KGI student Michael Gonzalez, MSMDE ’22, has always been interested in building and fixing things. However, it wasn’t until he was hit by a car at age 17, tearing his left ACL and fracturing his vertebrae, that he decided he wanted to become a biomedical engineer. After getting his undergraduate degree in Biomedical Engineering, he started KGI’s Master of Science in Medical Device Engineering program.

### KGI Faculty Collaborate on Synthetic Opioids Research

KGI Professors John Krstenansky and Alex Zambon collaborated on a study that explains how gaps in pharmacological knowledge of old drugs can be exploited to find new synthetic drugs. The research paper “Synthesis and pharmacological characterization of ethylenediamine synthetic opioids in human  $\mu$ -opioid receptor 1 (OPRM1) expressing cells” was published in *Pharmacology Research & Perspectives*.

### KGI Announces new MS in Regulatory Affairs program and New Concentrations for MS and MBS Programs

KGI is partnering with City of Hope to launch a second joint master’s degree: The Master of Science in Regulatory Affairs. The program aims to provide students with translational and applied experience in regulatory affairs for all FDA-regulated product classes throughout the product lifecycle. Additionally, in response to the COVID-19 pandemic and student demand, KGI introduced a series of courses comprising a new Infectious Diseases concentration as part of the Master of Science in Applied Life Sciences and Master of Business and Science programs.

### Dr. Kiana Aran Receives Prestigious NSF Career Award

The National Science Foundation (NSF) granted its most prestigious award in support of junior faculty, the Faculty Early Career Development (CAREER) award, to KGI Professor Dr. Kiana Aran. The NSF CAREER award is given to promising scientists early in their careers and recognizes “outstanding research, excellent education, and the integration of education and research.”

## March 2021

### KGI Student Cecile Maria Vazquez Advocates the Healing Powers of Nutrition and Fitness

For KGI student Cecile Maria Vazquez, PPC '21, MS '22, her passions for health, fitness, and giving back to the community go hand-in-hand. After graduating from undergrad, Vazquez took a break from school and immersed herself in volunteering and clinical experience. She then enrolled in KGI's Postbaccalaureate Premedical Certificate program and will continue to the Master of Science in Applied Life Sciences program.



CECILE MARIA VAZQUEZ, PPC '21, MS '22

### KGI Alumnus Samet S. Yildirim Joins Cultivated Meat Company Orbillion Bio as Co-Founder & COO

KGI alumnus Samet S. Yildirim, MBS '13 and Advisory Board Member for KGI's Amgen Bioprocessing Center, joined cultivated meat start-up Orbillion Bio as Co-founder and Chief Operating Officer. Before joining Orbillion, Yildirim worked for biopharmaceutical company Boehringer Ingelheim for seven years in multiple roles, including Head of Global Technology & Innovation for the Biopharma Business Unit.

### KGI Student Amanda Miller Finding a Place for Female Empowerment in Medicine

KGI student Amanda Miller, PPC '21, is a true Renaissance woman, skilled in art, singing, archery, fishing, and construction, which she learned from her family and upbringing in Alaska. Starting her undergraduate career as an Art and Business major, she transitioned to the pre-medical path and eventually applied to KGI's Postbaccalaureate Premedical Certificate program.

### KGI Student Cassidy Mirjah-Jablonski Helps Others Navigate the Pandemic Using Education and Resources

KGI student Cassidy Mirjah-Jablonski, MS '22, volunteered as a scribe for both an allergist and a cardiologist, and volunteered at a COVID testing site at Dodger Stadium. She also wrote for the Postbaccalaureate Premedical Certificate Journal at KGI and tutored K-12 students, which allowed her to integrate her passion for writing into her daily activities while also exercising her love for science and helping others.

## April 2021

### KGI Adds Former CSU Chancellor Dr. Timothy White to Board of Trustees



DR. TIMOTHY WHITE, PHD

KGI appointed former California State University (CSU) Chancellor Timothy White, PhD, to the KGI Board of Trustees. Dr. White served as chancellor of CSU, one of the largest and most diverse

higher education systems in the United States, from December 2012 to January 2021.

### KGI Signs Articulation Agreement with San Jose State University and San Bernardino Valley College



KGI expanded its list of articulation agreements to 30 institutions, helping prospective students make a seamless transition into programs within the Henry E. Riggs School of Applied Life Sciences and the School of Pharmacy and Health Sciences. The most recent additions to the list are San Jose State University and San Bernardino Valley College.

### Max Zocchi Explores Bioprocessing Opportunities Through KGI's BSUITE and MEng Programs

For Massimiliano Zocchi, MEng '22, KGI has opened the door to a world of possibilities in the bioprocessing industry. First through KGI's Bioprocessing Summer Undergraduate Internship Training and Education program and now through the Master of Engineering in Biopharmaceutical Processing program, he has gained a wealth of hands-on experience.

### Alum Line Stigen Raquet Joins Panel of Judges for KGI's Business Plan Competition



LINE STIGEN RAQUET, MBS '02

The 20th class of KGI's Master of Business and Science program hosted its Business Plan Competition, and a member of the first graduating class returned virtually to judge. Line Stigen Raquet, MBS '02, is

CEO of Creoptix AG, a Swiss startup company that has developed a novel optical biosensor tool for the study of biomolecular binding kinetics.

### KGI Announces Pfizer Executive Dr. Bill Gruber as Commencement Speaker

Dr. Bill Gruber, Pfizer's Senior Vice President of Vaccine Clinical Research and Development, will serve as the keynote speaker at KGI's 20th Annual Commencement Ceremony. In his role at Pfizer, Gruber is responsible for the global clinical research and development of vaccines to meet licensure and post-licensure requirements. He led the Pfizer-BioNTech COVID-19 vaccine clinical research and development effort.

### May 2021

#### KGI's Summer Program Inspires Incoming Student Cynthia Martinez to Pursue a Career in Genomic Data Analytics

Future KGI student Cynthia Martinez has long been interested in genetics. After attending KGI's Clinical Genetics and Bioinformatics Summer Program, she decided to pursue a career in genomic data analytics. Since then, she has been accepted into KGI's Master of Science in Human Genetics and Genomic Data Analytics program.

#### Incoming PharmD Student Angie Aceves Guided to Forge a Unique Path in Pharmacy

KGI incoming student Angie Aceves, PharmD '25, is the youngest of four girls and is the first in her family to pursue a career in science. In the summer of 2020, she attended KGI's Pre-Pharmacy Enrichment Program and was so drawn to KGI's size and opportunities for industry connections that she enrolled in KGI's Doctor of Pharmacy program.

### KGI Celebrates Accomplishments and Graduates of 2020 and 2021



In celebration of KGI's accomplishments during the 2020–21 academic year, the School of Pharmacy and Health Sciences and Henry E. Riggs School of Applied Life Sciences hosted virtual award ceremonies in mid-May. Later that week, KGI hosted two commencement ceremonies to honor graduates from the classes of 2020 and 2021.

### June 2021

#### 2021 White Coat Ceremony Features Dr. Virginia Chan as Keynote Speaker



DR. VIRGINIA CHAN, PHARM D

The KGI School of Pharmacy and Health Sciences is proud to announce that Dr. Virginia Chan, PharmD, will be the keynote speaker at the 2021 White Coat Ceremony.

The ceremony honors the Doctor of Pharmacy classes of 2024 and 2025.

#### KGI PharmD Graduates Earn CPJE Pass Rate Above National Average and 4th in California

California's qualifying test for pharmacy practice is considered one of the most difficult in the country. Yet the Doctor of Pharmacy Class of 2020 from the KGI School of Pharmacy and Health Sciences is excelling on the California Practice Standards and Jurisprudence Examination for Pharmacists.



# About KGI

## About KGI

In 1997, Founding President Henry E. Riggs conceived the idea of KGI, and through a generous \$50 million grant from the W.M. Keck Foundation, KGI was born as a member of The Claremont Colleges. Since 2003, under the leadership of President Sheldon Schuster, KGI continues to grow both in terms of its number of enrolled students and in its reputation for excellence.

KGI offers innovative postgraduate degrees and certificates that integrate life and health sciences, business, engineering, pharmacy, and genetics. With a focus on team projects and hands-on industry experiences, KGI provides pathways for students to become leaders within healthcare and the applied life sciences.

KGI consists of three schools: Henry E. Riggs School of Applied Life Sciences, School of Medicine, and School of Pharmacy and Health Sciences

## Administration

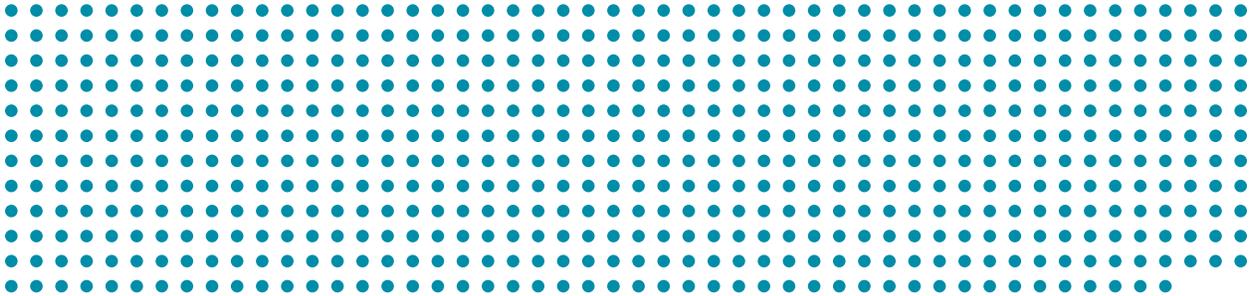
- **Sheldon M. Schuster**, President
- **Larry Grill**, Dean of Research
- **David M. Lawrence**, Dean of the School of Medicine
- **Cynthia Martinez**, Dean of Students
- **Sofia Toro**, Dean of Admissions and Financial Aid
- **Martin Zdanowicz**, Dean of the School of Pharmacy and Health Sciences and Henry E. Riggs School of Applied Life Sciences
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- **Barbara Kosacz**, Chief Operating Officer and General Counsel, Kronos Bio, Inc.
- **Harlan Levine**, President of Strategy and Business Ventures, City of Hope
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- **Cecilia Montalvo**, Cambria Community Healthcare District Board of Directors Member
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- **Carol A. Nancy**, Founder and Chief Executive Officer, Sequella, Inc.
- **Monde Qhobosheane**, President and Chief Executive Officer, Analytik Jena
- **Arthur D. Riggs**, Director Emeritus & Chair, Diabetes Research Department, Beckman Research Institute, City of Hope
- **José Ignacio Santos**, Secretary of the General Health Council, Government of Mexico; Professor, Experimental Medicine Unit, School of Medicine, National Autonomous University of Mexico
- **Sheldon Schuster**, President and Professor, KGI
- **Lydia Villa-Komaroff**, Consultant of Intersections: Science, Business, Diversity
- **Timothy P. White**, Former Chancellor, California State University
- **James F. Widergren**, Former CEO and President, Corgenix and ORGENTEC

## Board of Trustees

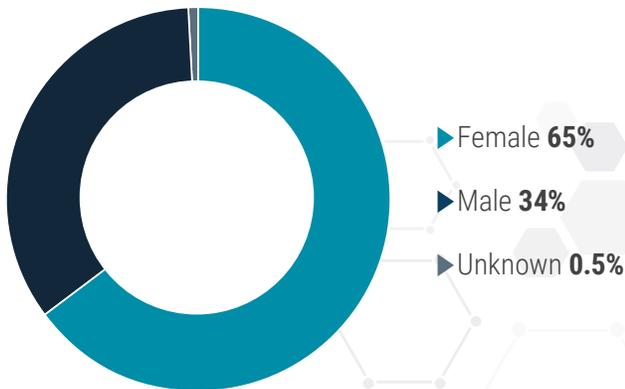
- **Wade Ackerman**, Partner at Covington & Burling LLP
- **Karen Bernstein**, Co-founder and Chairman, BioCentury
- **Daniel M. Bradbury**, Executive Chairman, Equillum, Inc.
- **Robert E. Curry**, Board Chair Emeritus, KGI; Former President, PerceptiMed, Inc.
- **Jamie Dananberg**, Chief Medical Officer, Unity Biotechnology
- **Steven Galson**, Former Senior Vice President, Research and Development, Amgen
- **Richmond Wolf**, Partner, Portfolio Manager, and Investment Analyst, Capital World Investors
- **Richard E. Yochum**, President & Chief Executive Officer, Pomona Valley Hospital Medical Center

## KGI Statistics

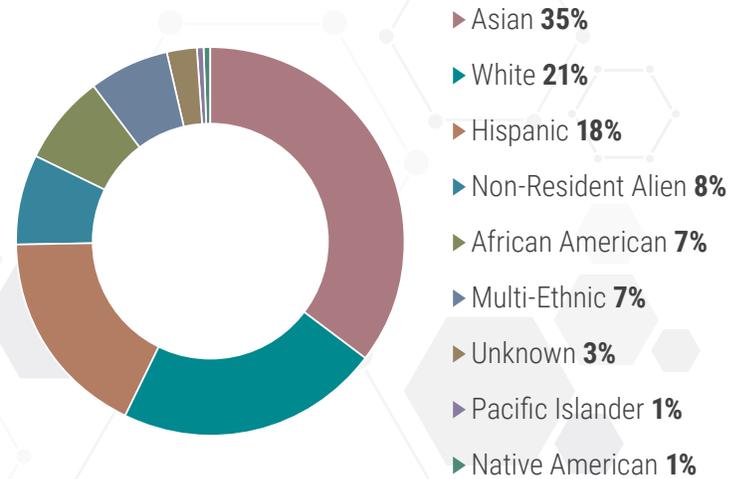
- 597 students enrolled



- Gender breakdown:



- Ethnic breakdown:



- Average age of KGI students:



- Total number of KGI alumni:

**1,952** with **2,182** earned degrees



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ABOUT KECK GRADUATE INSTITUTE (KGI)

KGI, A MEMBER OF THE CLAREMONT COLLEGES, IS A RECOGNIZED LEADER IN BIOTECHNOLOGY AND HEALTHCARE EDUCATION. KGI OFFERS INNOVATIVE POSTGRADUATE DEGREES AND CERTIFICATES THAT INTEGRATE LIFE AND HEALTH SCIENCES, BUSINESS, PHARMACY, ENGINEERING, AND GENETICS, WITH A FOCUS ON INDUSTRY PROJECTS, HANDS-ON INDUSTRY EXPERIENCES, AND TEAM COLLABORATION.

WITH AN ENTREPRENEURIAL APPROACH AND INDUSTRY CONNECTIONS, KGI PROVIDES PATHWAYS FOR STUDENTS TO BECOME LEADERS WITHIN HEALTHCARE AND THE APPLIED LIFE SCIENCES. KGI CONSISTS OF THREE SCHOOLS: HENRY E. RIGGS SCHOOL OF APPLIED LIFE SCIENCES, SCHOOL OF MEDICINE, AND SCHOOL OF PHARMACY AND HEALTH SCIENCES.

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