

# Innovative Careers in Healthcare and the Life Sciences

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# Contents

Bioprocessing Scientist . . . . .	3	Medical Devices . . . . .	14
Business Development . . . . .	4	Medical Science Liaison . . . . .	15
Clinical Variant Curator . . . . .	5	Operations and Supply Chain . . . . .	16
Competitive Intelligence . . . . .	6	Pharmacist (Clinical) . . . . .	17
Entrepreneur . . . . .	7	Pharmacist (Industry) . . . . .	18
Executive . . . . .	8	Pharmacist (Outpatient Specialist) . . . . .	19
Finance . . . . .	9	Physician Assistant . . . . .	20
Genetic Counselor . . . . .	10	Project Management . . . . .	21
Legal . . . . .	11	Regulatory & Quality Affairs . . . . .	22
Market Analyst . . . . .	12	Research & Development . . . . .	23
Medical Affairs . . . . .	13	Systems Biologist . . . . .	24



# Bioprocessing Scientist

Bioprocessing is an expanding field encompassing any process that uses living cells or their components to obtain desired products, such as biofuels and therapeutics. As with other fields considered under the broader scope of biotechnology, bioprocessing draws upon multiple areas of knowledge, but especially molecular biology, chemical engineering, and manufacturing. With advances in biotechnology and an ongoing need for pharmaceuticals as well as cheaper, more effective ways to make them, the opportunities in bioprocessing, at both the undergraduate and graduate levels, are promising.

## Industry Insight



**Samet Yildirim**

Technology Innovation Manager, Boehringer Ingelheim

KGI Class of 2013,  
Master of Business and Science

**Q: What has your career path been like?**

**A:** I was a PhD student passionate for science business and became a co-founder of a small startup for developing smart instruments for bioprocessing. After almost a year I decided to get proper bioprocessing and business training and joined KGI. After earning my first job in bioprocessing while studying at KGI, I joined Boehringer Ingelheim (BI) in 2013 as a Process Scientist for upstream process development. After a few different positions and promotions within BI, I now serve in a global role to develop technologies for next-generation manufacturing of biopharmaceuticals and digitalization.

**Q: On a typical day in your position, what do you do?**

**A:** My role has technical and business responsibilities, and my typical day is a combination of all of them. I meet with individual teams in my portfolio to have technical discussions and review projects. I am also responsible for managing business development activities for technologies, so part of my day is spent meeting with external partners, managing negotiations, and contracting processes. Within my role, I develop processes for innovation. I always spend some time every day to develop and try new processes to motivate people to innovate more.

**Q: What are the toughest problems you have to deal with?**

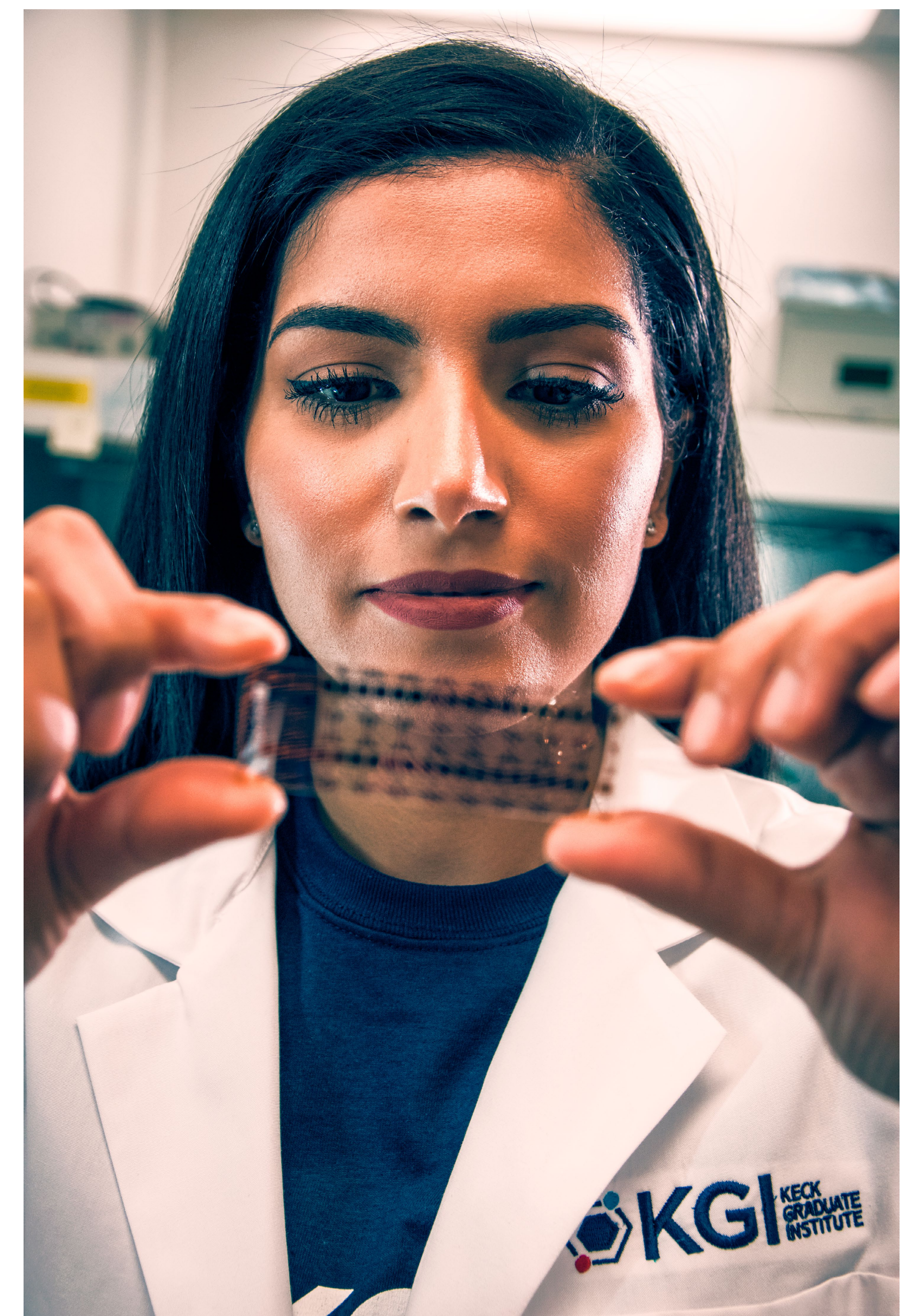
**A:** Managing change is one of the toughest problems. Most people do not want

to change. Therefore, motivating them to develop new technologies or to change existing ones is challenging. This applies to the stakeholders, too. In some cases, even though the new disruptive technology is developed, it is then hard to convince the stakeholders to approve the change. Another tough problem is to predict the future and make sure that you will have the right technologies to develop and manufacture the therapies of the future. This requires you to gain as much insight as possible and constantly analyze those insights to identify what the future will look like.

**Q: What is the most rewarding part of your job?**

**A:** When you see how the technology you developed enables drugs to reach patients faster and with higher quality—those are the most rewarding moments.

To learn more about graduate-level programs for this career pathway, visit [kgi.edu/meng](https://kgi.edu/meng).





# Business Development

Within the area of business development, you will connect “big picture” work to measurable deliverables in terms of business growth, product and market development, and—ultimately—sales. While business development jobs in the life sciences involve selling, almost all sales activities are B2B, organizational team sales activities. Responsibilities may range from building alliance relationships, communicating to different stakeholders (e.g., medical affairs), evaluating performance data, negotiating market access, and selling activities.

## Professor Perspective



**Jay Chok**

Associate Professor of Management,  
Keck Graduate Institute (KGI)

**Q: What are job prospects like in this career pathway, and can you provide examples of potential employers?**

**A:** It may not be easy to transition directly into positions with “business development” in the job titles. However, there are many jobs with business development duties. Do not restrict yourselves only to jobs with nice job titles. Examples of companies with entry-level business development jobs include Illumina, Roche-Ventana, and Baheal Pharmaceuticals.

**Q: What advice would you have for someone who might be interested in this career pathway?**

**A:** I recommend taking classes in strategy, alliances, intellectual property, regulatory affairs, negotiations, international business, market access, and healthcare economics. I also encourage you to identify alumni mentors who are already in business development jobs.

**Q: What personal qualities or abilities are important for success in this career pathway?**

**A:** The ability to speak a foreign language can be really useful in certain circumstances—U.S. companies with no foreign expertise and foreign companies with no U.S. expertise all need business development professionals. The willingness to network and communicate is an important quality for identifying business development opportunities. It’s also important to keep track of events and people, have patience, know when to trust your partners, and know how to time the opportunities. Critical thinking skills are very important for reframing business development discussions into viable opportunities for all partners involved.

**Q: To get another perspective of this career pathway, where can prospective students learn more?**

**A:** <http://bit.ly/science-mag>

To learn more about graduate-level programs for this career pathway, visit [kgi.edu/mbs](http://kgi.edu/mbs).





# Clinical Variant Curator

A clinical variant curator, or variant scientist, is responsible for analyzing and interpreting genetic information generated by genetic testing, including gene panel, whole exome, or whole genome sequencing. These scientists write reports of their findings for doctors, genetic counselors, and genomic scientists, and may participate in genomics research.

## Professor Perspective



**Barbara Fortini**

Master of Science in Human Genetics  
and Genomic Data Analytics

**Q: What are job prospects like in this career pathway, and can you provide examples of potential employers?**

**A:** As personalized or precision medicine continues to grow, variant scientists are needed to analyze the data generated by genomic testing for every patient. Jobs are available at testing companies such as Fulgent Genetics, Ambry Genetics, Counsyl, and Invitae, and in clinical genomics labs at research hospitals.

**Q: What advice would you have for someone who might be interested in this career pathway?**

**A:** In order to interpret the effect of genetic variants, you need expertise in genetics and bioinformatics with a strong foundation in molecular biology. I advise taking a wide variety of biology courses and perhaps some computer science to prepare for graduate studies in human genetics and genomics. I also suggest learning about DNA sequencing technology—it seems like there is an exciting new development every week!



**Q: What personal qualities or abilities are important for success in this career pathway?**

**A:** A variant curator is like a genetic detective. Successful variant scientists are curious by nature and always learning. When researching a set of variants, successfully interpreting the data requires a scientist to be up to speed on the latest research in genetics and genomics and to have a desire to help the patient, and any other people with the same variant in the future, even if they never meet that person face-to-face.

**Q: To get another perspective of this career pathway, where can prospective students learn more?**

**A:** The National Human Genome Research Institute is a great place to learn about advances in human genomics funded by the NIH. The American Society of Human Genetics Career Corner and the Human Genome Variation Society are sources of information on careers in genomics. To get a feel for the type of data that is used in clinical genomics, you should visit ClinVar to see the clinical variants database.

## Industry Insight



**Sarah Klemm**

Clinical Genomics Scientist, Invitae

**Q: What has your career path been like?**

**A:** I have a master's degree in genetic counseling. I began my career working as a genetic counselor in pediatric, prenatal, and general genetics settings. Following clinic, I worked at a commercial genetic testing laboratory where I had a report writing role and learned variant interpretation. I now work at a different genetic testing laboratory, where my role is in variant interpretation.



**Q: On a typical day in your position, what do you do?**

**A:** I perform variant interpretation for clinical genetic testing reports, and I review reports interpreted and written by others. This involves review of literature and publicly available databases and utilizing the variant interpretation framework (SHERLOC). I also curate gene and disorder information for internal laboratory use. In all cases, the reports are the result of teamwork where multiple individuals review and work on each report, and so I also spend a lot of my time in conversation about reports.

**Q: What are the toughest problems you have to deal with?**

**A:** Genetic variants can be difficult to classify, whether due to a lack of published information or to large amounts of conflicting published information. An accurate variant interpretation is critical for patients and families, and we want to be sure that when we are putting out a report for someone, we are giving them the best interpretation possible. Thankfully, in my job I am surrounded by an excellent team where, when these instances come up, I have others that I can turn to for input and collaboration.

**Q: What is the most rewarding part of your job?**

**A:** The most rewarding part of my job is knowing that the variant interpretation can impact and provide answers to many individuals and families.

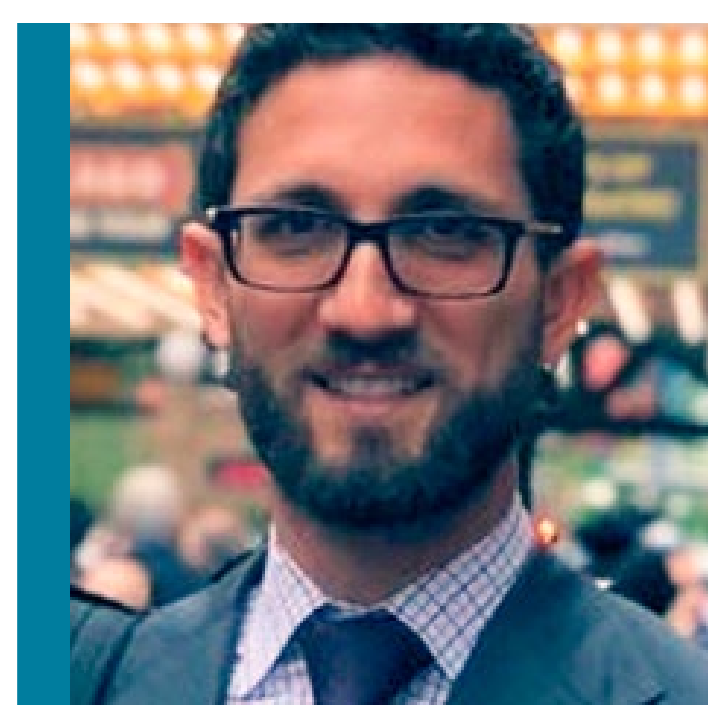
To learn more about graduate-level programs for this career pathway, visit [kgi.edu/msgda](https://kgi.edu/msgda).



# Competitive Intelligence

Competitive intelligence is fundamental to business success, because it allows you to detect any new threats or opportunities in time for you to act accordingly. These days, a lot of companies utilize different digital tools and technologies to facilitate, automate, and speed up the collection of data to get real-time information for business. But, apart from tools, more and more companies are also hiring a competitive intelligence analyst to be in charge of gathering data, processing it, and reporting information within their organization.

## Industry Insight



**Salvador Carlucci**

Director of Competitive Intelligence and Product Strategy, Atacana Group

KGI Class of 2004,  
Master of Business and Science

**Q: What has your career path been like?**

**A:** It has been an amazing rollercoaster. After leaving KGI, I joined a Competitive Intelligence (CI) agency. Then, I took a one-year sabbatical to travel by motorcycle across Latin America. Shortly after, I joined Novartis as a CI Manager and was later promoted to Director and Global Head of CI for the Pharma division. After another sabbatical year where I crossed Africa by motorcycle, I joined Roche as Global CI Head. After Roche, I got the entrepreneurial bug and founded Atacana Group with another KGI alum. Now, we provide CI products to pharma companies with a focus on supporting blockbuster or potential blockbuster products.

**Q: On a typical day in your position, what do you do?**

**A:** A typical day consists of team meetings, analyzing and writing reports, presenting findings to clients, recruiting, and doing business development activities.

**Q: What are the toughest problems you have to deal with?**

**A:** The toughest problem has been laying off employees who were underperforming. Putting the organization ahead of personal feelings and personal relationships can be very difficult.

**Q: What is the most rewarding part of your job?**

**A:** The most rewarding part of my job is knowing that we are helping bring to the market new medicines for patients. Hearing patient stories on how our clients' products have positively changed their lives is priceless.

To learn more about graduate-level programs for this career pathway, visit [kgi.edu/mbs](http://kgi.edu/mbs).





# Entrepreneur

Entrepreneurship is a cornerstone of wider economic success and a key engine for growth. The life sciences industry has benefitted hugely from the growth of startups, contributing to drug development, alternative energy solutions, and more throughout the value chain.

## Industry Insight



**Benjamin Pavlik**

KGI Class of 2009,  
Master of Business and Science

**Q: What has your career path been like?**

**A:** A major interest of mine was how science is brought into society. This led me to study biology, engineering sciences, and entrepreneurship. After earning my graduate degree, I started a biotechnology company to translate lab science into human benefit. This experience has been challenging and exciting.

**Q: On a typical day in your position, what do you do?**

**A:** There many things that I could be doing—it usually depends on project phases or funding cycles. Communicating science, fundraising, collaborating, bench work, and writing are all activities that I may be involved with on a given day.

**Q: What are the toughest problems you have to deal with?**

**A:** The toughest problems are in the communication of science. Depending on the audience, it can be very challenging.

**Q: What is the most rewarding part of your job?**

**A:** The most rewarding part of my job is working on interesting projects and seeing them develop.

To learn more about graduate-level programs for this career pathway, visit [kgi.edu/mbs](https://kgi.edu/mbs).





# Executive

An executive manages, organizes, and coordinates an organization's financial processes and marketing strategies to accomplish sustainable competitive advantages. Executives lead activities and decisions related to the selection and appointment of top management personnel and implement procedures and policies that enable a company's operations to be efficient and effective.

## Professor Perspective



**Sukumarakurup  
Krishnakumar**

Associate Professor, Management, KGI

**Q: What are job prospects like in this career pathway, and can you provide examples of potential employers?**

**A:** Executive positions, especially at the top management level, can be very challenging and rewarding at the same time. Every organization needs to have executives; hence, job prospects are good. This is, to a greater extent, true in large companies such as Pfizer, GlaxoSmithKline, 3M, etc.



**Q: What advice would you have for someone who might be interested in this career pathway?**

**A:** Most executive jobs are those that involve top management positions and they include a large number of administrative and/or leadership duties and responsibilities. Therefore, anyone who is interested in this career should try to accumulate experience in both technical and interpersonal managerial tasks. Engaging oneself in jobs that involve key managerial and administrative responsibilities will be helpful. Also, attending graduate school and completing either a technical or a business degree (or both) can be very helpful too.

**Q: What personal qualities or abilities are important for success in this career pathway?**

**A:** Again, because the job of an executive involves a significant amount of managerial responsibilities that also involve interpersonal interactions, individuals who are good and effective with influencing people are more likely to succeed in such careers. An executive who is higher up in the organizational hierarchy should also have leadership qualities such as visionary thinking, effective delegation skills to get tasks done, as well as consideration for his or her employees. Finally, as a top manager and an executive, one should also exhibit moral courage and ethical decision-making in trying situations.

**Q: To get another perspective of the career pathway, where can prospective students learn more?**

**A:** To get a good perspective, prospective students should first do a thorough research on the backgrounds of chief executives and study their educational and career paths. A good start will be to read biographies/books of great leaders and former executives such as Jack Welch and Steve Jobs. Second, I suggest that prospective students participate in informational interviews and/ or shadow executives who work in their preferred area of specialty. Third and finally, I recommend students to proactively engage themselves in leadership initiatives such as student clubs or team projects.

To learn more about graduate-level programs for this career pathway, visit [kgi.edu/mbs](https://kgi.edu/mbs).





# Finance

Financial professionals may work for individual companies, making corporate financial decisions such as capital budgeting, financing, payout policy, and risk management. They may also work for financial intermediaries and institutions, facilitating security transactions, mergers and acquisitions, and asset management. Other finance careers include private equity, venture capital, consulting, and financial engineering.

## Professor Perspective



**Yun Liu**

Assistant Professor, Finance, KGI

**Q: What are job prospects like in this career pathway and can you provide examples of potential employers?**

**A:** There are great job aspects for finance professionals in the life science and healthcare industries because of the robust growth in biotechnology and the amazing sciences that come to practical use at a fast speed. There is great demand for people who possess both finance acumen and scientific knowledge. Potential employers include post commercialization biotech companies, investment banks, funds, consulting firms, and PE/VC firms.

**Q: What advice would you have for someone who might be interested in this career pathway?**

**A:** Obtain a solid understanding of finance in general but also develop industry specific knowledge based on your targeted niche. Sharpen your analytical skills to be able to process large amount of data. Look for real-world experience and start building a network through internships and extracurricular activities. Keep up with the business press for current economic trends and new industry developments.

**Q: What personal qualities or abilities are important for success in this career pathway?**

**A:** Analytical skills to conduct quantitative analysis with a high degree of accuracy. Ability to communicate what the data means for corporate strategy and come up with recommendations and options. Ability to make sense out of complexity and uncertainty.

**Q: To get another perspective of the career pathway, where can prospective students learn more? (any recommended publications, journals, associations, websites, etc. ?)**

**A:** Vault Career and Industry Guides at [vault.com](https://www.vault.com) (The Guide to Finance Interviews, The Guide to Investment Banking, The Guide to Investment Management, The Guide to Venture Capital, and The Guide to the Top 100 Banking Employers).

## Industry Insight



**Paul Schuber**

Investment Banking Associate, Healthcare, Mizuho Americas

KGI Class of 2015,  
Master of Business and Science

**Q: What has your career path been like?**

**A:** I have had a very unique career path thus far. Out of undergraduate school, I worked as an EMT responding to 911 calls. Then, I started performing phase 1/2 clinical trials at a CRO, became a Chief Technology Officer at an e-commerce company (2 years Inc. 500), and then did pre-clinical trials at UC Irvine. I enrolled at KGI and graduated in 2015, which propelled me to become an investment banker at both Silicon Valley Bank and Mizuho.

**Q: On a typical day in your position, what do you do?**

**A:** On a given day, I review any work that the analysts have completed the night before and turn back edits for them to implement. I follow up with senior bankers on any data requests, deliverable updates, and new client development tasks, then put final touches on client deliverables and send them for senior banker review. I also review any recent industry news and market updates (IPOs, M&As, Follow-ons, and broader market conditions).

**Q: What are the toughest problems you have to deal with?**

**A:** Continually staying on top of each and every client's needs and quickly ramping up on new client's product development, as well as strategy, to add value when meeting with the client. For "me-too product" companies, this is fairly straightforward, as there is not much innovation occurring, but with companies that are introducing new technologies, this can be time-consuming to add on top of a full schedule.

**Q: What is the most rewarding part of your job?**

**A:** Learning at a fast pace, as well as building a knowledgebase and skillset that will be applicable for eventually exiting the service industry and joining a senior-level position within a biotech company. Getting face-to-face access with multiple CEOs and CFOs of biotech companies, which helps build general internal knowledge of the difference between successful executives and subpar executives.

To learn more about graduate-level programs for this career pathway, visit [kgi.edu/mbs](https://kgi.edu/mbs).



# Genetic Counselor

Within this career pathway, you will evaluate and understand an individual's or family's risk for a variety of inherited medical conditions, while providing information and support to other healthcare providers and to individuals and families concerned with the risk of inherited conditions. You will also advise, educate, and serve as an advocate for individuals and families by facilitating decision-making and coping methods for those at risk.

## Professor Perspective



**Ashley Mills**

Program Director and Professor of Practice,  
Master of Science in Human Genetics and Genetic Counseling, KGI

**Q: What are job prospects like in this career pathway, and can you provide examples of potential employers?**

**A:** The rapid development of genetic technologies and the increasing need for genetic counselors allow for a wide range of career opportunities in an expanding variety of settings. Many counselors work in the clinic providing direct patient care, while some provide counseling over the phone or via video. Other counselors work in clinical genetic testing laboratories, where they aid in writing and interpreting test results and have clinical interface through answering questions for physicians, other genetic counselors, and patients. Other examples of settings in which genetic counselors may work include public health, education, industry, and research.

**Q: What advice would you have for someone who might be interested in this career pathway?**

**A:** Diversify your portfolio, education, and experiences! Do your research. Talk to genetic counselors and ask to shadow in the clinic. You must learn how to advocate for yourself before you can advocate for others. Be passionate about your strengths and interests, and honest about the areas you want to improve. Love genetics and genomic medicine! Embrace humility. Have genuine compassion and the ability to communicate effectively with a vast array of people. Think outside the box. Meet people where they are. Make it happen!

**Q: What personal qualities or abilities are important for success in this career pathway?**

**A:** In order to be successful in many areas of life, and especially in genetic counseling, one must be resourceful and a life-long learner. Other traits or abilities that are extremely useful for genetic counseling include innovation, empathy, critical thinking, curiosity, self-reflection, tenacity, adaptability, dependability, leadership, and integrity.

**Q: To get another perspective of this career pathway, where can prospective students learn more?**

**A:** National Society of Genetic Counselors, Journal of Genetic Counseling, American College of Medical Genetics and Genomics, Association of Genetic Counseling Program Directors, Maps and Genes Blog, and DNA Exchange Blog.

## Industry Insight



**Kailey Owens**

Progenity Inc.

**Q: What has your career path been like?**

**A:** After completing my master's degree in genetic counseling, I worked for several years in an academic hospital setting where I participated in direct patient care. I was also involved in teaching and supervising genetic counseling students in both clinical training and research projects. For the past few years, I have been working in an industry position as a laboratory genetic counselor.

**Q: On a typical day in your position, what do you do?**

**A:** As a laboratory genetic counselor, my main roles are to answer questions/concerns from our clients regarding the genetic testing process and to assist in normal laboratory operations. I counsel patients on their test results and explain results to ordering providers. I review test requisitions to ensure appropriate testing is being ordered, and I review result reports to make sure they are accurate and easy to understand.

**Q: What are the toughest problems you have to deal with?**

**A:** The most challenging aspects of my job are working through client/patient misinformation regarding the genetic tests that we offer and the implications of the results, along with managing client expectations for the testing process.

**Q: What is the most rewarding part of your job?**

**A:** The most rewarding aspect of my job is providing patients with information about their test results that empowers them to make decisions regarding their health and family planning. I also have an amazing team of coworkers who are incredibly supportive.

To learn more about graduate-level programs for this career pathway, visit [kgi.edu/msgc](https://kgi.edu/msgc).



# Legal

As a lawyer within the healthcare or life sciences industries, you may help your clients in the areas of transactional, litigation and enforcement, regulatory, finance, and intellectual property matters. Lawyers represent companies and investors around the globe in every sector of the industry, including pharmaceutical, biotechnology, and medical device companies; hospital and healthcare systems; long-term care facilities; and other service providers.

## Professor Perspective



**Charles Cronin**

Adjunct Professor, KGI

**Q: What are job prospects like in this career pathway, and can you provide examples of potential employers?**

A: Among the most valuable (and profit-generating) assets of the biotechnology, pharmaceutical, and medical sectors are new formulas, proprietary manufacturing methods, and other intangible information legally protectable as various types of intellectual property including patent, trademark, copyright, and trade secret. Commercial and non-profit entities involved in these sectors (e.g., pharmaceutical companies, research universities) employ lawyers (both full-time employees, and on an ad hoc basis from external firms) to protect their “stables” of patents, copyrights, etc. Large organizations also employ other professionals and paraprofessionals who assist with managing intellectual property assets and negotiating and monitoring the licenses by which they are monetized.



**Q: What advice would you have for someone who might be interested in this career pathway?**

A: Given the value of intellectual property assets, and their vulnerability to misappropriation in a global economy in the digital era, employers in the biotech and health industries increasingly expect their professional employees to have at least basic familiarity with the various types of intellectual property that protect employers' assets. To be licensed as a patent lawyer, however, one needs to have studied science or engineering as an undergraduate or graduate student, and pass both the bar exam and the patent bar exam. Because relatively few individuals who have studied science or engineering attend law school, there is always a shortage of patent lawyers and, accordingly, patent lawyers are generously compensated and highly employable.

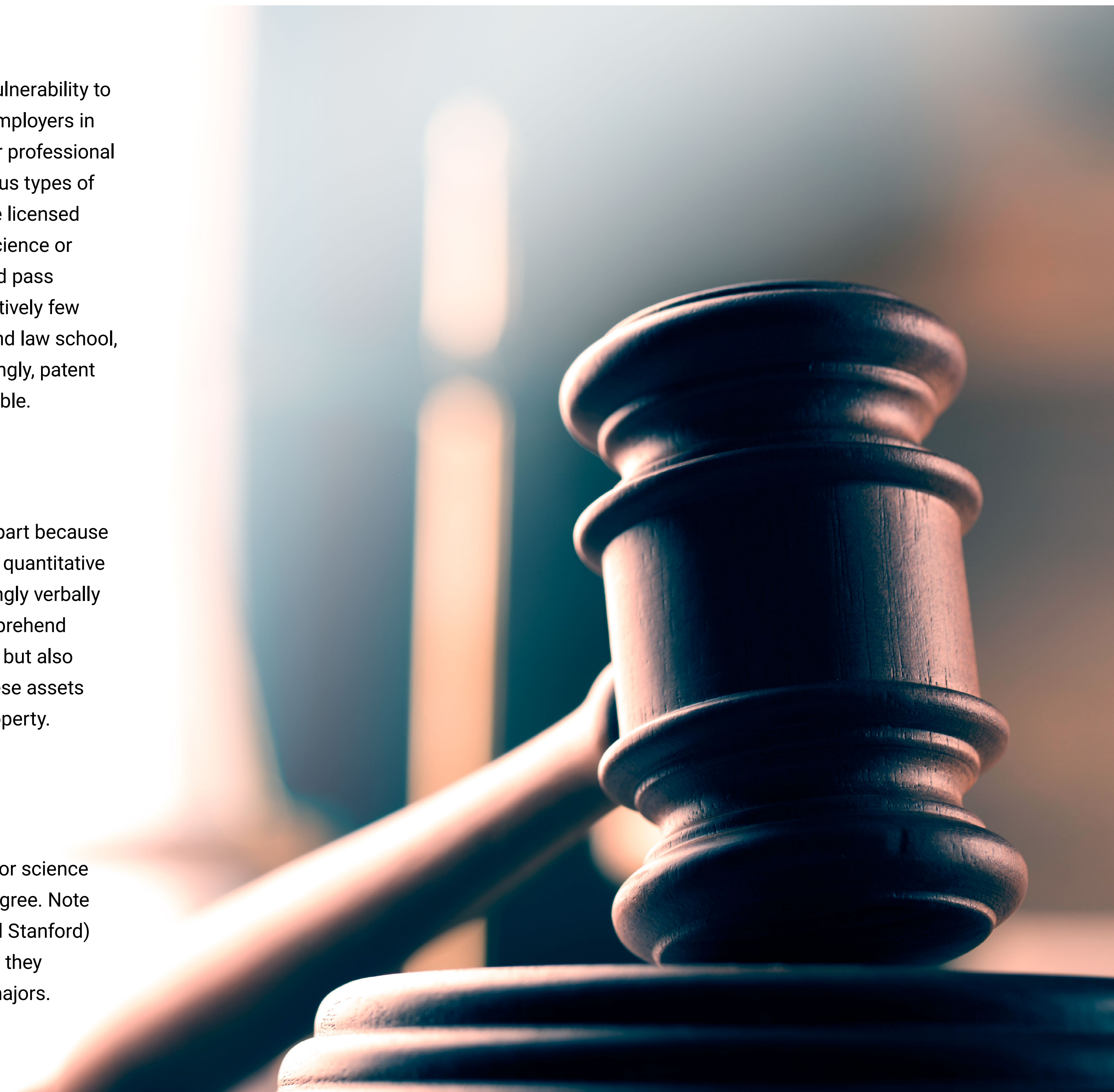
**Q: What personal qualities or abilities are important for success in this career pathway?**

A: Engineers and scientists tend not to attend law school in part because whereas engineering and sciences have an empirical and quantitative orientation, the study (and practice) of law is overwhelmingly verbally oriented. The most valued patent attorneys not only comprehend the science or engineering underlying protectable assets, but also skillfully articulate in speech and writing how and why these assets are legally protectable as various forms of intellectual property.

**Q: To get another perspective of this career pathway, where can prospective students learn more?**

A: There are dozens of websites that address prospects for science and engineering students interested in obtaining a law degree. Note that one reason some law schools (including Harvard and Stanford) now accept GRE scores in lieu of LSAT scores is because they want to increase enrollment from undergraduate STEM majors.

To learn more about graduate-level programs for this career pathway, visit [kgi.edu/mbs](http://kgi.edu/mbs).





# Market Analyst

A marketing analyst takes a bottom-up, data-driven perspective to marketing decision-making. Instead of relying on one's "gut" to make decisions, an analyst requires that analytics enable the marketer to: (a) identify and evaluate alternative marketing options and actions, (b) calibrate opportunity costs of the various options, and then (c) choose one or more of these options that afford the greatest likelihood of achieving the firm's business goals. Analysts spend their days curating datasets and seeking insights from that data.

## Professor Perspective



**Scott Motyka**

Assistant Professor, Marketing, KGI

**Q: What are job prospects like in this career pathway, and can you provide examples of potential employers?**

**A:** Job prospects are extremely good for marketing analysts. A recent McKinsey report estimates a coming shortage of 140,000 to 190,000 people with deep analytic talent and 1.5 million managers capable of leveraging insights driven by Big Data. A job shortage not only means it is easier to find a job; it also means that salaries in this area are likely to rise faster than average in coming decades. Marketing analysts are applied at almost every major company. Recently, Bristol-Meyers-Squibb added an entire analytics division with dozens of employees all working on leveraging data to improve business processes and decision-making.



**Q: What personal qualities or abilities are important for success in this career pathway?**

**A:** A successful analyst should be comfortable dealing with large datasets and have good attention to detail. Beyond that, a truly successful analyst also needs to be creative and have good communication skills. Having data is great, but without being able to think creatively about potential insights, all the data in the world won't do the firm much good. Similarly, although an analyst may discover transformative insights, if they cannot communicate their findings in a simple, accessible manner, management will not be able to leverage the insights to drive business growth.

**Q: To get another perspective of this career pathway, where can prospective students learn more?**

**A:** Data analytics is an ever-evolving field. The best thing a potential analyst can do is develop a lifestyle of reading and curiosity. Good blogs to start with include "Occam's Razor," Google Analytics Academy, and GreenBook. To learn more about data visualization, Reddit's r/dataisbeautiful sub is a great start! Find a few data visualizations that you think are interesting, download the dataset, and try to recreate it on your own. Similarly, Tableau's Public Viz Gallery is a great place for inspiration. There are also many good books that will help get your feet wet. My favorites include Drinking from the Fire Hose by Frank and Magnone, Principles of Marketing Engineering (3rd Edition) by Lilien and Rangaswamy, Analytics in Healthcare and Life Sciences edited by McNeill, and Web Analytics 2.0 by Kaushik.

To learn more about graduate-level programs for this career pathway, visit [kgi.edu/mbs](http://kgi.edu/mbs).

**Q: What advice would you have for someone who might be interested in this career pathway?**

**A:** There are three main areas of expertise to consider developing: database management (skills with SQL, NOSQL, Python, etc.), analytics (graduate-level multivariate statistics classes), and data visualization (designing dashboards with Tableau or developing infographics). It is a great time to get involved in marketing analytics/Big Data, as it is an evolving field; this means that companies are hiring candidates who are strong in one of those three areas and training them on the rest. During your time at KGI, I would suggest focusing on the analytics and data visualization components of the marketing analytics career path.





# Medical Affairs

Drug development never rests. With new sophisticated molecules, medical devices, and even gene therapies, there is a higher demand for clinical and drug information, creating new career opportunities in the growing area of medical affairs. The jobs and functions that often occur within medical affairs include roles in publication planning, in-house medical information, and health outcomes research.

## Industry Insight



**Sharoni Billik**

CEO & Founder, SBHC

KGI Class of 2004,  
Master of Business and Science

**Q: What has your career path been like?**

**A:** My career path has been slightly untraditional. I was trained at KGI for the biosciences, but was based in Los Angeles without wanting to relocate. The industry in Los Angeles 15 years ago was nascent, so I had to be creative! I started my career in contract manufacturing and went on to sales and marketing, consulting, investor relations and, finally, medical communications and peer-to-peer marketing. In 2016 I started my own firm, supporting medical affairs and commercial clients with Key Opinion Leader engagement, publication planning, investigator support, and medical science liaison (MSL) onboarding.



**Q: On a typical day in your position, what do you do?**

**A:** Every day is different, which I love. Because I support clients with many different kinds of projects, it depends on the project(s) at hand. I am regularly in touch with my clients to provide project updates and discuss developments. I also meet with my medical writers and meeting planners regularly to ensure progress is being made and that we are (ideally) ahead of schedule, and to avert any roadblocks. Certain times of year I am onsite at my clients', or at a congress or meeting. In addition to project execution, I also spend time on client relations, networking, and business development.

**Q: What are the toughest problems you have to deal with?**

**A:** The toughest problems have been logistical. I was once conducting an onboarding meeting for a team of MSLs, and while I was onsite, my car was broken into, and the hotel that we were staying at had given some of our reserved rooms away. I have to deal with these types of challenges while ensuring that the project, an MSL training meeting in this case, continued smoothly without any hiccups.

Other types of challenges are just that—challenges—that are overcome. I work with a great team of subject matter experts who always know how to get a job done well—whether it is for a literature review, FDA documentation, or planning an ad board or congress summary.

**Q: What is the most rewarding part of your job?**

**A:** The most rewarding part of my job is being helpful. When a client calls me and says they need help at an upcoming congress, or they need to develop some content, there is nothing better. When it is a return client, I know that the level of service they received in the past was superior, and I know I have done my job well. As an entrepreneur, there is no better confirmation.

To learn more about graduate-level programs for this career pathway, visit [kgi.edu/mbs](https://kgi.edu/mbs).



# Medical Devices

Medical device companies create and sell devices that diagnose, prevent, or treat medical conditions. These devices can be simple, such as a thermometer, or complex, such as an MRI machine. Careers in medical devices involve learning what problems patients and doctors need help with, designing and manufacturing the devices, conducting clinical trials to test that the devices are safe and effective, selling the devices, and supporting patients and users.

## Professor Perspective



**Anna Hickerson**

Assistant Professor; Program Director,  
Master of Business and Science (MBS) and  
Master of Science in Medical Device Engineering (MSMDE), KGI

**Q: What are job prospects like in this career pathway, and can you provide examples of potential employers?**

**A:** There are numerous jobs in medical devices that together help create a sustainable business. The largest medical device companies in the world include Medtronic, Johnson & Johnson, and Phillips Healthcare. There are also thousands of smaller companies, and more than 70,000 people in California work in this industry.

**Q: What advice would you have for someone who might be interested in this career pathway?**

**A:** If you are interested in medical devices, learn about as many diseases and devices as you can. As you come across medical devices in your life, observe how they are used.

**Q: What personal qualities or abilities are important for success in this career pathway?**

**A:** Each role in the medical device industry has specific skills that need to be learned. Common to all for success, a person needs to be analytical about the products, and demonstrate empathy for the patients whom the products serve.

**Q: To get another perspective of this career pathway, where can prospective students learn more?**

**A:** You can learn about what the medical device industry is doing by reading the MD+DI newsletter available online. The Medical Futurist Institute has a blog and great articles discussing the future of healthcare. Academic organizations include the Biomedical Engineering Society (BMES) and the IEEE Engineering Medicine and Biology Society (EMBS). With library access, you can read cutting-edge research in journals such as the Annals of Biomedical Engineering (ABME).

To learn more about graduate-level programs for this career pathway, visit [kgi.edu/msmde](https://kgi.edu/msmde).







# Medical Science Liaison

Within the medical science liaison (MSL) role, you will engage with other Health Care Professionals (HCPs) in a specific geographical area in scientific discussion related to the therapeutic area assigned. You will identify potential research sites and serve as the company-scientific connection to the study team at each site, communicating concerns expressed by the sites as well as ensuring that sites meet target dates for study completion. You will also gather insights from Key Opinion Leaders (KOLs) related to the safety and efficacy of drugs in the assigned therapeutic area.

## Professor Perspective



**Daniel Kudo**

Adjunct Associate Professor, KGI

**Q: What are job prospects like in this career pathway, and can you provide examples of potential employers?**

**A:** Job prospects are very good. Most of the major pharmaceutical companies go through hiring phases as drugs are approved by the FDA. In addition, there are many biotech companies that are now hiring for jobs in medical affairs, which include positions like MSL, Medical Information, Medical Communication, Legal and Regulatory, etc.

**Q: What advice would you have for someone who might be interested in this career pathway?**

**A:** This is an excellent career path with many opportunities for promotion. Fellowships would be my recommendation for those interested in the greatest chance for getting a “running start,” as they provide an opportunity to gain work experience and to understand the working culture of an organization.

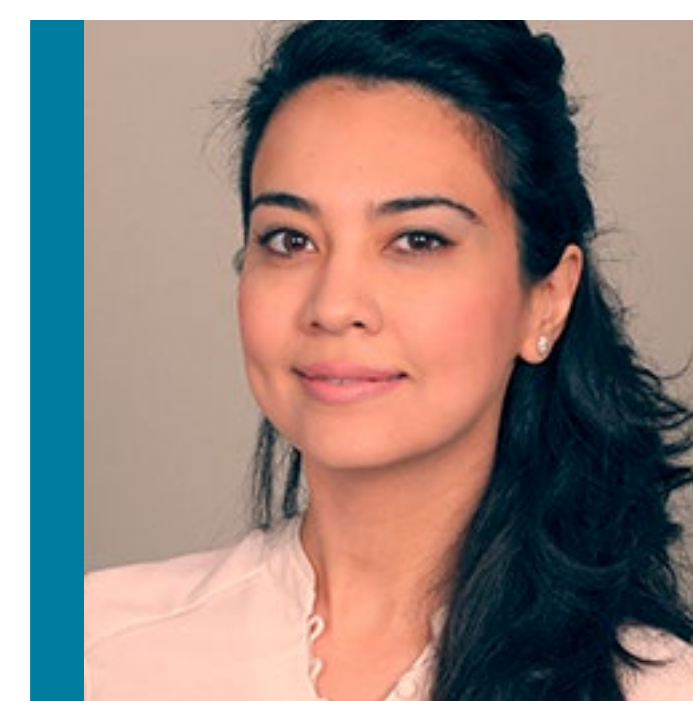
**Q: What personal qualities or abilities are important for success in this career pathway?**

**A:** First and foremost, a great work ethic and excellent communication skills are absolutely essential. In addition, the ability to develop and maintain relationships in an effort to build strong networks will help to ensure success in the long run.

**Q: To get another perspective of this career pathway, where can prospective students learn more?**

**A:** There are emerging MSL and Medical Affairs organizations that have annual meetings. There are also blog sites where one can learn the positives and negatives about the industry.

## Industry Insight



**Atanaz Zargar**

Director, Oncology Global Medical Affairs - Merck  
Medical Science Liaison

**Q: What has your career path been like?**

**A:** When I started as a pharmacy student, my goal was to enter academia. After graduating, I practiced as a community pharmacist for one year and then pursued a one-year generalized residency. Beyond that, I decided to change my route to do a postdoc fellowship and during that time, I was exposed to the pros and cons of academia as compared to industry. I applied to jobs in industry and my first position was an MSL in Big Pharma. From there I transitioned to mid-size and then back to Big Pharma with my current job at Merck.

**Q: On a typical day in your position, what do you do?**

**A:** The way I like to describe it is that I’m essentially a professional student. I’m getting paid to learn and to transfer my knowledge at the same time. It works out very well for people who are looking to learn on a continuous basis. This position involves a great deal of networking because one gets to work with many individuals internally within the company and externally.

**Q: What are the toughest problems you have to deal with?**

**A:** I think that most MSLs agree that it is getting more competitive to get time with doctors, partly because the role of doctors is changing as well. Doctors are getting more involved in different activities, such as administrative roles, so the access to physicians is challenging because we’re looking to transfer the knowledge or provide updates.

**Q: What is the most rewarding part of your job?**

**A:** I am fortunate to be part of the oncology world, because it’s currently a fast-changing and cutting-edge part of science. I am learning everything fresh and trying to transfer that knowledge in the best way possible. It’s thrilling and unique to play a role in providing the most updated information in a highly scientific environment.

To learn more about graduate-level programs for this career pathway, visit [kgi.edu/pharmd](https://kgi.edu/pharmd).



# Operations and Supply Chain

Make decisions to effectively manage global value networks by analyzing data and creating effective metrics. Improve customer satisfaction, minimize all forms of waste, and strengthen market position. Understand the application of business strategies that minimize waste and optimize the value network utilizing lean management and Six Sigma methods. The fundamental concepts of operations management can be applied to both manufacturing and service operations, so assessing transactional and “back office” operations is equally important.

## Professor Perspective



**Ed Arnheiter**

Professor of Practice, KGI

**Q: What are job prospects like in this career pathway, and can you provide examples of potential employers?**

**A:** Job prospects are strong, particularly in the area of process improvement. Companies are eager to hire those who can make processes better, faster, cheaper, and safer. Virtually all of the well-known biotechnology companies have programs incorporating “Lean Sigma” to drive improvement, including Amgen, Abbott, Gilead, Biomarin, Merck, Pfizer, Novartis, AbbVie, and GlaxoSmithKline.

**Q: What advice would you have for someone who might be interested in this career pathway?**

**A:** Learn as much as you can about statistics, probability, and process control methods. Practice and hone your quantitative skills, and learn how to build spreadsheet models. Learn how to effectively present data in a visual format using graphs, charts, tables, etc.

**Q: What personal qualities or abilities are important for success in this career pathway?**

**A:** You should like mathematics and possess a data-driven mindset. It is important to have a passion for improving processes, and never view results as “good enough.” If you walk through a workplace and are curious about the work, and question the manner in which tasks are performed, then this career pathway might be right for you.

**Q: To get another perspective of this career pathway, where can prospective students learn more?**

**A:** Investigate certification options through well-known organizations. For example, review the body of knowledge for earning a “green belt” certification, and consider either ASQ or the Lean Enterprise Institute. Check out the Project Management Professional certification, and if you are interested specifically in supply chain management, APICS is the benchmark.

To learn more about graduate-level programs for this career pathway, visit [kgi.edu/mbs](https://kgi.edu/mbs).







# Pharmacist (Clinical)

Clinical pharmacists, just like any other pharmacists, are tasked with dispensing medications. But instead of choosing the more traditional route that pharmacists take, you focus on specific drug therapies for specific patients. You can specialize in certain areas of medicine like mental health, geriatrics, oncology, and nutrition, to name a few. Hospitals and clinics employ their own clinical pharmacists, but you can also choose to freelance, and make your services available on an as-needed basis to doctors and the public.

## Professor Perspective



**David Ha**

Assistant Professor of Clinical Sciences, KGI  
Infectious Disease pharmacist, Pomona Valley Hospital Medical Center

**Q: What are job prospects like in this career pathway, and can you provide examples of potential employers?**

**A:** All hospitals and other healthcare facilities are mandated by law to have antibiotic stewardship programs responsible for appropriate antibiotic use. Most of these facilities employ infectious diseases pharmacists for these purposes. Other potential career paths include the pharmaceutical industry, public health, academia, and regulatory affairs amongst others.

**Q: What advice would you have for someone who might be interested in this career pathway?**

**A:** What many do not realize is that a PharmD degree alone is generally insufficient to become a clinical specialist. Like physicians and other healthcare disciplines, specialization requires post-graduate training in the form of residency and/or fellowship. Post-graduate training to become an infectious diseases specialist usually takes 2-3 years after graduating from a school of pharmacy, and it is highly competitive.

**Q: What personal qualities or abilities are important for success in this career pathway?**

**A:** Requisite qualities include a passion for infectious disease management and prevention, a high degree of interpersonal skills, an interdisciplinary and collaborative approach to problems, and lots of training.

**Q: To get another perspective of this career pathway, where can prospective students learn more?**

**A:** Several organizations represent and support the role of infectious diseases pharmacists in the U.S. These include the Society of Infectious Diseases Pharmacists, American College of Clinical Pharmacy Infectious Diseases Practice and Research Network, Infectious Diseases Society of America, and Society of Healthcare Epidemiology of America.

## Industry Insight



**Kerry Anne Rambaran**

Assistant Professor of Clinical Sciences, KGI

ICU Clinical Pharmacist,  
Pomona Valley Hospital Medical Center

**Q: What has your career path been like?**

**A:** I initially did a bachelor's in pharmacy prior to completing a PharmD. I then went on to complete a Nephrology and Medical Information fellowship followed by a two-year pharmacotherapy residency. Following my residency, I became a clinical faculty member.

**Q: On a typical day in your position, what do you do?**

**A:** It varies on whether I'm precepting students or not. If I am, then my day starts earlier with student meetings and patient presentations, followed by rounds where I make clinical interventions and respond to codes. In the afternoon there are topic discussions and presentations, coupled with meetings for several committees within the hospital.

**Q: What are the toughest problems you have to deal with?**

**A:** As a student, it was difficult to adjust to having lecture handouts provided, because I was used to having to read the textbook prior to coming to class. As a practitioner, it's sometimes difficult to balance the cost of therapy for patients who are underprivileged. In academia (as I'm also a faculty member), it's difficult to balance wanting to do research (finding the time) with all of the other responsibilities.

**Q: What is the most rewarding part of your job?**

**A:** Because I'm the lead ICU clinical pharmacist, one of the best things is that I can make a big impact on the critically ill patients, which can affect how long (or short) their stay is in the hospital. I get to help determine the optimal regimen for their medications so they get the most benefit and prevent complications with the optimal length of stay for the patients. The other great thing is, because I'm also a faculty member, I get to bring those real-life cases into the classroom to help students apply the theory they have learned.

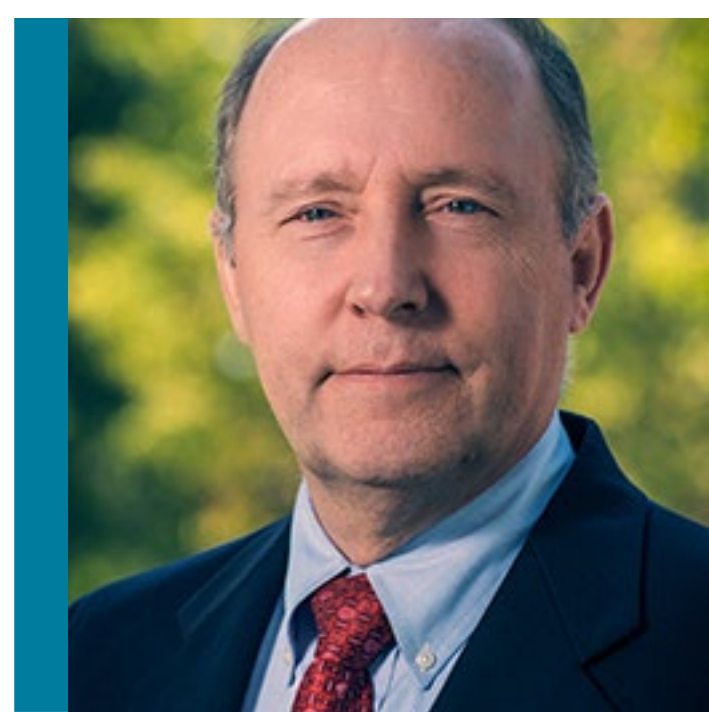
To learn more about graduate-level programs for this career pathway, visit [kgi.edu/pharmd](https://kgi.edu/pharmd).



# Pharmacist (Industry)

The biopharmaceutical industry is an essential partner in solving our healthcare challenges. Much of the basic research is carried out by universities that receive grants from the federal government. These grants spur new understanding of diseases and possible pathways for treatments. It is a dynamic industry, with many companies of all sizes looking for the future innovations to treat symptoms, as well as the cures, when possible, of various human diseases. There are approximately 10,000 pharmacists who work in the industry today.

## Professor Perspective



**Bernard Tyrrell**

Associate Dean for Pharmacy and Industry Relations, KGI

**Q: What are job prospects like in this career pathway, and can you provide examples of potential employers?**

**A:** Job prospects are excellent for those individuals who like math and science. The typical pathway is to have a college education in STEM. The higher the degree, the more you know and the better your chances of entering the industry. Once you graduate, there are internships and fellowships that help to bridge your college education into a rewarding industry career. A pharmacy school education is excellent preparation to enter the industry.

**Q: What advice would you have for someone who might be interested in this career pathway?**

**A:** Network with healthcare professionals (pharmacists) on what they know about the industry. Look into the Industry Pharmacist Organization—they have a job board that will give you an idea of the diversity of positions for pharmacists. The state chapters of the Biotechnology Innovation Organization also have job boards for pharmacists. These state chapters help you gain an understanding of what jobs are available. If a biopharmaceutical company is located near you, contact them for more information about what they do and the skills necessary to fulfill those roles. Networking with family and friends will help. You never know who might know someone who works in the industry until you ask.

**Q: What personal qualities or abilities are important for success in this career pathway?**

**A:** Enjoying math and science is a plus. Working well with others, being bright and ambitious, and desiring to help others are all necessary skills and qualities.

**Q: To get another perspective of this career pathway, where can prospective students learn more?**

**A:** The first area I would explore would be your local colleges and universities that have STEM or pharmacy programs. The second is to ask family, friends, and any healthcare professionals you know. The third suggestion is to go to professional healthcare societies and to Google “pharmacists.” And, finally, if you know of a company like Johnson & Johnson, go directly to the company’s website. You can see what products they make. This will help you gain a better understanding of the professionals who are necessary to research, develop, and commercialize modern innovative medical products.

To learn more about graduate-level programs for this career pathway, visit [kgi.edu/pharmd](http://kgi.edu/pharmd).





# Pharmacist (Outpatient Specialist)

Specialty pharmacy focuses on high-cost, high-touch medication therapy for patients with complex disease states. Medications in specialty pharmacy range from oral to cutting-edge injectable and biologic products. The disease states treated range from cancer, multiple sclerosis, and rheumatoid arthritis to rare genetic conditions. A specialty pharmacist may work in a variety of practice settings.

## Industry Insight



**Tarah Soebianto**

PharmD, AAHIVP

**Q: What is the most rewarding part of your job?**

**A:** With the emergence of new anti-retroviral medications on the market, people with HIV are living longer. Therefore, the most rewarding part of my job is seeing patients live a longer and healthier lifestyle throughout the years. As a pharmacist, it is gratifying to know that your job as a trusted medical professional is having a direct impact on the community and improving the knowledge and awareness of HIV across the world.

To learn more about graduate-level programs for this career pathway, visit [kgi.edu/pharmd](https://kgi.edu/pharmd).

**Q: What has your career path been like?**

**A:** After graduating from pharmacy school, I worked in a specialty pharmacy that provided pharmaceutical services to the HIV and LGBTQ communities in the Los Angeles Area. It was a unique experience because it combined the clinical aspect with a community pharmacy setting by allowing pharmacists to verify electronic medical records and laboratory results to monitor treatment plans and advise physicians for changes in therapy when necessary. My experience and leadership skills have allowed me to become a leader in the community by managing an HIV specialty pharmacy that provides HIV care, preventative treatment, and transgender care to the Long Beach and Los Angeles communities.

**Q: On a typical day in your position, what do you do?**

**A:** As an HIV specialty pharmacist, I work closely with the medical providers to monitor patients' HIV regimens and make appropriate recommendations to changes in therapy when necessary. I review electronic medication records to verify that medication regimens are complete, as well as verifying lab results pertinent to patient treatment plans. I am part of a comprehensive care team that works together to help individuals gain access to treatment for HIV, and to increase knowledge of preventative measures to reduce the transmission of HIV in the community.

**Q: What are the toughest problems you have to deal with?**

**A:** Compliance with medication is a major issue that affects the pharmacy community, thereby negatively impacting HIV treatment outcomes due to the risk of drug resistance from missed doses. The high pill burden to treat HIV and other comorbidities can result in patients stopping or forgetting to take their medications. Adverse effects, pill size, food requirements, and socioeconomic issues are also factors that affect patients' ability to seek medical treatment and to adhere to medication regimens. Lack of access to health insurance or a need for assistance in applying for coverage is another major obstacle pharmacies deal with to provide medications to patients.







# Physician Assistant

Physician assistants (PAs) are medical professionals who diagnose illness, develop and manage treatment plans, prescribe medications, and often serve as a patient's principal healthcare provider. With thousands of hours of medical training, PAs are versatile and collaborative. PAs practice in every state and in every medical setting and specialty, improving healthcare access and quality.

## Industry Insight



**Erica Liu**

Physician Assistant,  
Marian Regional Medical Center

KGI Class of 2013,  
Postbaccalaureate Premedical Certificate

**Q: What has your career path been like?**

**A:** I decided to become a PA while working as an ER scribe and enrolled in the Postbaccalaureate Premedical Certificate program at KGI after completing my undergraduate degree. I graduated from Rosalind Franklin University last June, and I have been working as an Emergency Medicine PA for almost a year.

**Q: On a typical day in your position, what do you do?**

**A:** Every day is different. In the ER, I see a mixture of medical problems and injuries, and I often perform procedures as well. Some days can be relatively slow-paced, while others are extremely busy and stressful. We also have a lot of charting and paperwork that needs to be done.

**Q: What are the toughest problems you have to deal with?**

**A:** There can be a disconnect between what the patients want and what is medically indicated, which leads to a lot of conflict. People misunderstand the role of the ER and often walk away dissatisfied that we haven't provided them with a diagnosis or cure.

**Q: What is the most rewarding part of your job?**

**A:** The most rewarding feeling is when you are able to follow up with a patient long after a severe injury or diagnosis of a severe medical condition, and they have had a good outcome. We don't have many opportunities to truly "fix" a problem, so it feels amazing when we can.

To learn more about graduate-level programs for this career pathway, visit [kgi.edu/ppa](https://kgi.edu/ppa).





# Project Management

Project management is one of the most complex fields of work out there. A project manager (PM) is responsible for leading an entire project through initiation, planning, execution, control, and completion. Project managers always work in a team. They are most often sociable and great team players. As a PM, you will need to adapt to different people, cultures, environments, and situations. Being flexible is key to team communication, because you'll be the builder and controller of the team.

## Industry Insight



**Ryan Peeler**

Director, Network Analytics, Voxx Analytics

KGI Class of 2007,  
Master of Business and Science

**Q: What has your career path been like?**

**A:** As an undergraduate, I had too many interests, and that caused a kind of paralysis. I wasn't sure I wanted 18-year-old me to commit to becoming a medical doctor or a post-doc focused on a highly specialized problem 10-12 years later. KGI was the perfect solution for me at the time. I was able to have practical experience in many areas to find something I thought I would love and make an impact doing. I found people with similar vision to mine, and we built the company I work for now.

**Q: On a typical day in your position, what do you do?**

**A:** Working in a small company is great because you can do so many things in one day. Hiring manager, technical sales, marketing, R&D, work on academic partnerships, project management, corporate strategy, HR—pretty much anything I want to do that adds value to the business fuels me through the day.

**Q: What are the toughest problems you have to deal with?**

**A:** Problems of inconvenience. We have these "North Star" types of problems that we love, and we chase them relentlessly until we overcome them, and that's gratifying. Then there are these "hangnail" types of problems that are simply distracting and annoying. Those are the toughest because the motivation is hard to find, and the reward is minimal.

**Q: What is the most rewarding part of your job?**

**A:** Getting to work with my team, in the culture they drive, on the problems we solve. It's incredibly rewarding to be surrounded by a diverse group of problem solvers, and the results speak for themselves. In addition to a long list of happy clients, three years in a row we were named a top workplace in our region and we were named a Gartner Cool Vendor in Life Sciences for 2018.

To learn more about graduate-level programs for this career pathway, visit [kgi.edu/mbs](https://kgi.edu/mbs).





# Regulatory & Quality Affairs

Every drug is required to be approved by regulatory authorities before it can be administered to patients. Similarly, every batch of a drug is required to pass rigorous quality checkpoints before it can be administered to patients. It is the responsibility of a Regulatory and Quality Affairs Department to ensure every batch of the drug product is safe and effective and is manufactured in compliance with all regulatory requirements.

## Professor Perspective



**Rajesh Parti**

Professor of Practice, KGI

**Q: What are job prospects like in this career pathway, and can you provide examples of potential employers?**

**A:** Every company—from a startup to a global enterprise—has a Regulatory and Quality Affairs Department. The job prospects for a career in this field are tremendous, because potential employers such as biopharmaceutical companies (Amgen, Genentech, and Biomarin), Regulators (FDA), and Consultants (Parexel) are continually looking to hire individuals with expertise in Regulatory and Quality Affairs.

**Q: What advice would you have for someone who might be interested in this career pathway?**

**A:** To gain insight into the skills and responsibilities needed in this career pathway, an internship in a biopharmaceutical company within the Regulatory and Quality Affairs Department would be optimum. Also, there are multiple online resources (as listed below) that can provide information on the roles and responsibilities of a Regulatory and Quality Affairs professional.

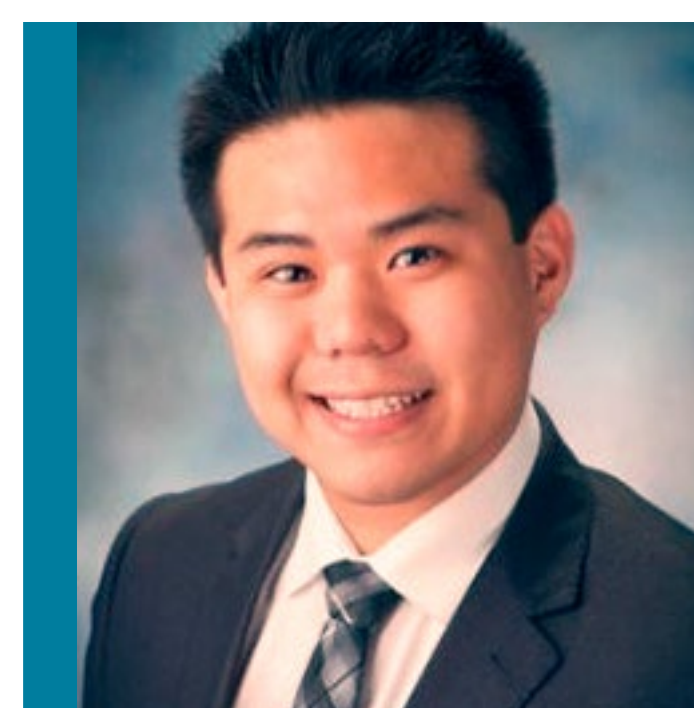
**Q: What personal qualities or abilities are important for success in this career pathway?**

**A:** Excellent interpersonal skills are essential as a professional in this field, because you have to work in a multi-functional team environment. Attention to detail, critical thinking, problem solving, and multi-tasking are additional skills needed to succeed in this career pathway.

**Q: To get another perspective of this career pathway, where can prospective students learn more?**

**A:** The Food and Drug Administration, European Medicines Agency, International Council for Harmonisation, Parenteral Drug Association, and Drug Information Association.

## Industry Insight



**Jason Kerr**

External Affairs Quality Specialist, Amgen

KGI Class of 2016,  
Master of Business and Science

**Q: What has your career path been like?**

**A:** It's been all over the place. I went from polymer chemist to material engineer to where I am currently—a quality assurance specialist. If I've learned one thing, it's that opportunities come in different shapes and sizes. It's important to always learn something new and understand the process rather than depend on rote memorization.

**Q: On a typical day in your position, what do you do?**

**A:** In general, I spend about 30% of my time responding to emails and 20% attending meetings, and the remaining 50% is spent on reading reports, GMP updates, and keeping up-to-date on regulatory requirements. This job requires reading a lot of documentation and reports while being able to defend your position.

**Q: What are the toughest problems you have to deal with?**

**A:** Saying no to people. There are times when I must put my foot down and request more information to be included. Without further support, not only will regulatory authorities not approve of it, but, more importantly, it can also put patients at risk; we simply do not want that.

**Q: What is the most rewarding part of your job?**

**A:** Ensuring that patient safety is the first thing on my mind. I recently read a warning letter issued to a supplier that Amgen receives starting material from. Catching this early on and reporting it to key staff allows us to assess whether any of Amgen's product is affected, thereby ensuring a high-quality and safe supply. Being a part of that is rewarding enough.

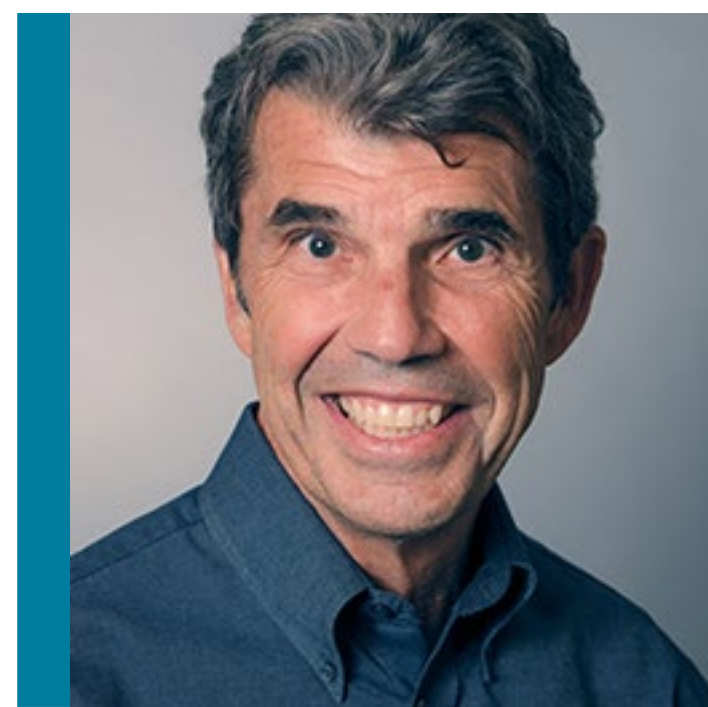
To learn more about graduate-level programs for this career pathway, visit [kgi.edu/mbs](https://kgi.edu/mbs).



# Research & Development

Research and development scientists don't only work for commercial organizations; they also often work for higher education institutions and publicly-funded research bodies. If you pursue a career as a research and development scientist, your responsibilities will vary depending on the specific area of science you work in. However, the basic principles and processes of research and development are similar across all areas. You will spend your day working alongside other scientists, conducting tests and experiments and carrying out other research projects.

## Professor Perspective



**Larry Grill**

Dean of Research and Research Professor, KGI

**Q: To get another perspective of this career pathway, where can prospective students learn more?**

A: As curiosity is really a desired trait if you are to enter the field of healthcare/biotechnology research, the internet is the best starting place. Choose the diseases that interest you the most and see what is new and interesting. Then, search the internet for the academic labs and the pharmaceutical companies that are working on those diseases. Investigate them and talk with the investigators who interest you the most. There is no better way to start a career in healthcare research.

To learn more about graduate-level programs for this career pathway, visit [kgi.edu/ms](https://kgi.edu/ms).

**Q: What are job prospects like in this career pathway, and can you provide examples of potential employers?**

A: With the ability to sequence genomes and the genetic causes of disease, the world of medical care and therapeutic drugs is rapidly changing. Several thousand genetic diseases have been untreatable up to the present. However, that is changing rapidly and our ability to address these diseases now exists with the ability to provide the diseased with a genetic or enzymatic cure. Identifying the cause and cure to these thousands of diseases requires research. While a great deal of research is being done in academic institutions, there is a substantial amount of research taking place in pharmaceutical companies around the globe. There is a need for researchers at all levels, from the basic lab bench research to the global coordination of disease research and the conducting of clinical trials to test drug efficacy. In California alone, the number of drug development companies range in the thousands, and there is demand for researchers.

**Q: What advice would you have for someone who might be interested in this career pathway?**

A: There is no better time to enter this field. The speed at which we can identify the cause of disease is increasing at a rate that has not been seen before. Within the last couple of years, we have found cures for several types of cancer that were virtually untreatable just a few years ago. With the newly developed methods of gene therapy and genetic editing, the rate of discovering cures for disease is increasing annually, along with the potential of finding cures to most common and rare diseases. Just knowing the mechanism of the cause of the disease is thrilling, but then discovering the method to treat the disease provides even greater satisfaction to every researcher in healthcare.

**Q: What personal qualities or abilities are important for success in this career pathway?**

A: Curiosity, along with the ability to pull together disparate facts and concepts, are both desired qualities in the field of research. In addition, the desire to find the causes and cures of unfair and malicious afflictions is important, as it provides the drive to be on the team of researchers who want to stop unnecessary suffering.





# Systems Biologist

Understand life as a system of communication among genes and their environment. With the advent of whole genome sequencing and computational techniques for large data analysis, it is now possible to interrogate the basis of life and diseases through an integrative approach. This is systems biology.

## Professor Perspective



**Animesh Ray**

Professor, KGI

**Q: What are job prospects like in this career pathway, and can you provide examples of potential employers?**

**A:** Biotechnology companies with research and development programs are busily recruiting scientists with experience in systems biology. This is the future of biomedicine. Experience in data analytics—gained through research in systems biology—is also an entry point into the emerging big-data-intensive healthcare industry opportunities.

**Q: What advice would you have for someone who might be interested in this career pathway?**

**A:** You must have a background in statistics, data analytics, and programming, in addition to genetics/molecular biology.

**Q: What personal qualities or abilities are important for success in this career pathway?**

**A:** A passion to learn, to discover. The courage to formulate simple models to understand complex phenomena. The ability to work in teams of multidisciplinary scientists.

**Q: To get another perspective of this career pathway, where can prospective students learn more?**

**A:** Here are three resources from [nature.com: systems biology](#), [a user's guide to systems biology](#), and a [journal article about synthetic biology](#).

To learn more about graduate-level programs for this career pathway, visit [kgi.edu/ms](#).

