

Pharmaceutical Chemist



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Describe your job responsibilities.

"I am part of the Research & Development Analytical group and work in conjunction with the Research & Development Formulation group. I am responsible for running a battery of tests on drugs created by our formulations department. The projects I work on require different stages of development and each stage requires various testing. Those stages include, but are not limited to, the formulation stage, where the recipe for the tablet is created (and refined) and the scale-up stage, where the manufacturing process is scaled-up from small batches to very large ones. I'm preparing to continue with the formulation stage on a project, which will take about 3 weeks to refine all of the testing procedures. I am responsible for making sure the test parameters and specifications are correctly established, known as a validation.

What does a typical day or week look like for your job?

"I'm involved in testing samples, using [quantitative methods](#) such as dissolutions, to determine the rate of release of a drug, and [assays](#), to determine the amount of an active drug that is in a tablet or sample. I also test for the moisture content of samples, as well as any impurities that may be present.

One of the most important aspects of my job is maintaining good documentation in my notebooks. "If it's not written down, it didn't happen." I must maintain records for not only our company, but for any clients and the FDA. As I work on different projects during the week, I must keep track of hours spent on each one to provide accurate billing. Each week is different and changes based on the needs of the company and my project. Depending on what's due, I may assist other chemists with their projects or perform clean checks to ensure equipment cleanliness out in the production area, during product changes."

How did your education and activities prepare you for this job?

"I graduated from [Ohio University](#) with a Bachelor of Science Degree in [Forensic Chemistry](#). This option had fewer math classes, specifically calculus, and focused more on the applications of chemistry to criminal law. One of the primary deviations from a typical chemistry degree (at OU) was the inclusion of series of classes known as LET (Law Enforcement Technologies), which was a 6 quarter (2 year) program that focused on 6 particular topics involved in law enforcement. These classes ranged from evidence collection techniques, to criminal law, to the tools used to process a crime scene and analyze evidence.

The biggest thing that helped me prepare for a career in chemistry was conducting research under a professor in the Chemistry Department. I worked, earning credits in the process, for 2 years as an undergraduate researcher, spending my junior year working with a graduate student analyzing proteins, and my senior year on a personal project working with gunpowder. I was testing the chemistry of gun powder to determine if gunpowder found at a crime scene could be matched to a suspect's home, using an instrument known as an IRMS ([Isotope Ratio Mass Spectrometer](#)), which measures the ratio of various types of atoms, such as Carbon, Nitrogen, and Oxygen. Being part of these projects allowed me to get hands-on experience with instruments. I would recommend to anyone in college to do this ... to find a

project you're interested in, get the lab experience, and gain some specialized knowledge along the way. It will not only help to show you where your interests lie (or don't), but also will help to distinguish you from other applicants when applying for jobs.

Being in the lab for a class differs greatly from being in a lab for personal research. In a class setting your goal is to just get a good grade, but in a research lab, the goal is knowledge and discovering something, no one else has even done. When you own a project, if something happens with the instrument, you have to take care of it, figure it out. It's a puzzle, but in the end, you can call it your own.

Although my degree is not directly related to my current job other than the chemistry part, it still is very important and has many applications. For example, working with controlled substances in school gave me the confidence to handle any pharmaceuticals at work."

Why did you choose the field you are in now?

"During high school, I had a really good teacher for chemistry, who sparked something about the field that I wanted to follow. I decided to study forensic chemistry, similar to what is seen on the CSI television shows, because I enjoyed puzzles and chemistry. Unfortunately, I wasn't the only one that had this same thought process and there were no crime lab positions available upon graduation. As a result though, I was able to enter into the pharmaceutical industry and am able to apply my skills to this newfound field."

Describe the types of technology that you work with to accomplish your job?

"The technology involved in my line of work varies greatly. It can be as simple as a balance, because nearly every test requires accurately measuring out the sample. It can be as complex as an HPLC or GC. HPLC, [high performance/pressure liquid chromatography](#) and GC, gas chromatography are both used to separate complex mixtures into their individual components or peaks. Those individual components can then be analyzed further and quantified. The general concepts behind HPLC and GC are roughly the same just that HPLC uses a liquid as a separation medium and GC uses a gas. I also use a piece of equipment known as an autotitrator for [moisture analysis](#). This instrument uses a reagent that reacts with water in a sample and determines the % moisture in a sample."

What about your education was most helpful to prepare you for your current job?

"It seemed trivial at the time, but it is very important as I look back – execution of [wet chemistry](#)-all aspects of it including skills and techniques. I have found that having the skills to conduct wet chemistry is only half the battle. You also need to develop confidence in your skills and be able to defend what you did and why, which only comes with practice."

What advice would you give to students exploring a career in your industry and your field?

"In [pharmaceutical manufacturing](#) the best thing to do to be prepared and stand apart from others is work as an intern at least once. This will, not only get you real world experience, but also can show a company your work ethic, which may lead to a job offer upon graduation. Because a good deal of experience is usually required to get a job in this field, I recommend trying different things in college. I conducted research my junior year, working with proteins. I knew what they were, but had never really worked with them. After a year of research, however, I realized I didn't like working with proteins and decided I didn't want to do this for a job in my field, so I gave it up and switched projects. College is the best time to "test drive" a particular interest and determine, if it's for you. There are no strings attached in college, like there is with building a career. I also recommend [job shadowing](#) someone if you get the chance. This is a great way to learn about a particular job and decide if you'd want to pursue it further, or not.

One final piece of advice is to keep in touch with any contacts you gain inside or outside of school. You never know when they could come in handy. Even consider making your own business cards with contact info to give out."

What has been the most challenging for you in this role?

"Regulations, by far, and knowing you are working on a product that could go into a human being someday. That was, and is, a lot of pressure. You have to keep those thoughts in the back of your mind, but get beyond them quickly to be able to focus on the tasks at hand.

Also, learning the different procedures and protocols at a company can be challenging. Even with the notebook training I had with forensics chemistry, I wasn't sure what they really wanted, because every company is different.

Lastly, many hazardous chemicals are handled on a daily basis and common sense has to be employed at all times. I always have to be aware of my surroundings, with respect to what I'm working on, as well as, others that may be in the lab."

What do you predict about the future of your industry 1 to 5 years and to 10 years from now?

"I expect a more global market than it already is – Eurand already interacts with customers, not only in the United States, but around the world. I would expect that the lines of communication become more seamless, making processes and decision making faster. Research labs will be able to be farther apart, but still work in tandem. There will always be new techniques and methods being developed and evolving."

Where do you see yourself in 5 to 10 years?

"It's important to set goals and objectives, and I'd like to further my education by getting a master's degree, but I'm not sure in what area. I would also like to see myself move up in Eurand, steadily gaining responsibilities. However, I'm torn, because I might want to get back to using the criminalistics side of my degree, so it's up in the air. It's hard to say where I'll be."

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Source: Interview in June 2009, careerME.org project for the southwest Ohio region.