CASE STUDY

Advancing Health by Supporting Safe Pharmaceutical Compounding

charles river

Erin Patton
Senior Product Specialist
~ Charles River
St. Louis, Missouri

Erin received her Bachelor of Science degree in biology from Xavier University and her Master of Science degree in cell and molecular biology from the University of Illinois, Urbana-Champaign. Erin has over 15 years' experience in molecular biology research, microbiology QC, and regulatory compliance. As a Senior Product Specialist for Charles River's Microbial Solutions division, Erin provides innovative rapid micro solutions for endotoxin testing, microbial identification, and microbial detection (Celsis® rapid bioburden and sterility testing).

PRIMARY INTENDED OUTCOME

Human drug compounding is an important branch of pharmacy practice that creates medications tailored to the health needs of specific patients. Compounded drugs improve and save lives by providing medicines that may be unavailable or not commercially sold in a particular formulation. However, compounded drugs are generally not required to meet federal approval and can be at risk for contamination.

Charles River provides a range of microbiological testing services and equipment to support drug discovery, development, and manufacturing that can be tailored to a facility's specific needs and ensure patient safety.

THE CHALLENGE

In 2012, an outbreak of fungal meningitis caused numerous cases of serious illness and more than 60 deaths, according to the CDC. The public health tragedy resulted from contaminated injectable steroids that were produced by the New England Compounding Center (NECC). Confusion over state and federal oversight was called out as a contributing factor. The NECC was also found to be acting, erroneously, as a drug manufacturer, which would be subject to different regulations than a compounding pharmacy.

Compounding pharmacies are now divided into two sectors. Designated 503A facilities are limited to dispensing small amounts of drugs and must follow USP and state pharmacy guidelines. Larger 503B pharmacies are allowed to use bigger batches and must validate every process with current good manufacturing practices (cGMPs). These 503B requirements include more frequent environmental monitoring, on-site inspections, and submitting products for testing, which can result in longer lead times.

charles river

CASE STUDY

Reliable & Rapid Endotoxin Testing

When gram-negative bacteria are destroyed, they leave behind endotoxins. These cell wall fragments are capable of causing fever and septic shock in human and animals. Bacterial endotoxins are ubiquitous and can contribute to the contamination of IV drugs and vaccines. Product release testing for endotoxins is required for all sterile products.

As the leader in the evolution of endotoxin testing, Charles River has developed revolutionary products and technologies that have increased both the quality and speed of testing.

Traditional endotoxin testing can be performed in a 96-well titer plate, which requires a trained analyst, can be very tedious and complicated, and ultimately opens up huge potential for human error. "This is generally a test for a scientist to perform," Patton said. The Charles River Endosafe® nexgen-PTS™ (portable test system), in contrast, is a simple, handheld instrument specifically designed for non-scientists to perform endotoxin testing.

The instrument utilizes FDA-licensed LAL cartridges, which contain all the necessary reagents to produce quantitative endotoxin results in as little as 15 minutes, making it simple and affordable enough for even very small pharmacies. There is no need to prepare endotoxin standards and no microbiology training required to run a test utilizing the Endosafe® cartridge technology. In fact, the test is so user-friendly that even personnel from different departments can be relied upon to carry it out.

"One large client wanted to test their water early in the morning, so that they could save time in getting their manufacturing lines up and running," Patton recalled. "They taught the first person who arrived each day to run the test; that just happened to be the janitor."

THE DECISION

Erin Patton was a Charles River customer long before she was hired to work there as a senior product specialist. As a microbiologist and lab manager at a large analytical testing lab at the time of the NECC crisis, she performed and reviewed hundreds of thousands of tests, including potency and sterility testing. "I developed a very good understanding of the regulatory issues facing compounders today," she said.

At Charles River, Patton focuses on endotoxin testing, microbial detection, and microbial identification. These highly specialized tests often require expensive equipment and scientifically trained personnel to run them. It may not make sense for a compounder to take those functions on in-house.

"A compounder's expertise is in making drugs, not testing them," Patton said. "We offer rapid and reliable technologies that remove the possibility of human error and increase operational efficiency, which ultimately saves money. Our purpose-built portfolio of progressive products and services are targeted toward large and small compounders as they deliver accurate, relevant, and measurable data to fuel confident decisions on product quality for release."

THE RESULTS

When it comes to environmental monitoring, Charles River supports routine day-to-day microbial monitoring as well as more urgent investigations. Clients who may be concerned about an organism found in their clean room or, more urgently, a product sterility test result that did not pass, need detailed and rapid results.

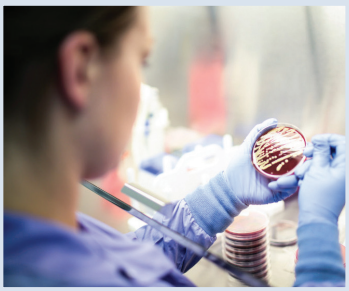
Genetic sequencing is considered the gold standard in microbial identification. An organism's DNA will be the same regardless of phenotype or stress state. "It's not enough to look at a sample and say 'oh, there aren't too many organisms,'" Patton said. "You need to know what species are present to learn how the problem happened and to understand potential patient risk downstream."

Charles River's Accugenix® microbial identification and strain typing services deliver powerful genetic sequencing. This level of specificity, combined with the industry's largest reference library of organisms relevant to drug manufacturing, provides the most advanced method of microbial identification available.

The Charles River ID lab processes hundreds of samples per day and offers same-day and up to 5-day results, depending on the customer's time frame. "We can take a sample plate and use genetic sequencing as well as MALDI-TOF technology to get a detailed result back within the day, if that's what is needed,"

charles river

CASE STUDY



Patton said. Those turnaround expectations are met 99.6% of the time with a 98% identification rate.

Rapid testing turnaround is especially crucial when it comes to sterility testing and the impact on beyond-use dating. Confirming that a sterile product is saleable typically requires travel time to and from a lab and a sterility testing period of 14 days. This waiting period results in a shortened beyond-use dating window that may already be quite compressed.

Charles River's Celsis® rapid microbial detection systems deliver sterility testing results in 5 to 7 days, effectively cutting the waiting time in half. "This extra wiggle room allows more time to get the product to the hospital," Patton said, which ultimately affects not only the bottom line but also patient well-being.

THE CONCLUSION

Some compounding pharmacies still fall under state pharmacy board jurisdiction, but they are experiencing increasing scrutiny from the FDA that is not likely to change. When inspections happen, they are usually unannounced and will require the facility manager to produce records to prove that cGMPs are being followed.

"We know it's very important to able to produce documentation to show that a facility's quality situation is tight," Patton said. "Inspectors want to know what you are doing to assure quality and sterility, and they expect compounders to build quality into every procedure. This is one of the reasons the NECC got into trouble – their facility was not under control."

Testing can tell you when a problem exists with a product; it can also act as a valuable surveillance system. "You may get something in your microbial identification results that is not going to show up in your product, but they can correlate. This kind of data allows you to take action before a big problem occurs. This is the point of what we do."

Charles River clients are able to generate targeted reports through a web portal at any time. "Customers can do a deep dive into their own data," Patton said. When it comes to proving compliance and control, she said, "it's all about using that data to tell the story of your facility."

Compounding Solutions for Compounding Problems.

With compounding pharmacy regulations under scrutiny, compliance has never been more important. Maintain control and consistency in your compounding procedures with solutions from Charles River.

Offering unmatched regulatory expertise and a portfolio of FDA-licensed products and GMP-compliant services, Charles River is the trusted partner who can help you align your operations with current regulatory standards.

Endotoxin Testing | Microbial Identification for Environmental Monitoring Programs | Sterility Testing | Microbial Limits Testing

Learn more at www.criver.com/compounding

charles river