Agilent Case Study: Fragment Analyzer system

Successful Biopharma Production and Quality Control with Automated Electrophoresis

Assessing multiple biomolecules in biopharma

Kaneka Eurogentec, a contract development and manufacturing organization (CDMO) based in Belgium, produces biopharmaceutical critical raw materials including RNA-based, DNA-based, and protein-based biomolecules. Sophie Wehren, project leader, works directly with Kaneka Eurogentec clients and said their biomolecules of interest include mRNA, oligonucleotides, and recombinant plasmids. Because these products are made in current good manufacturing practice (cGMP) facilities, they require rigorous quality testing throughout production.

To ensure the integrity of their biologics, Nicolas Smargiasso, PhD, quality control laboratory manager, has implemented flexible and efficient sample quality assessments within the department workflow. The quality control (QC) laboratory conducts in-process control (IPC) testing of manufactured products, final release testing, and stability testing of samples coming from different production areas. They receive DNA and RNA samples and assess their quality using the Agilent 5200 and 5300 Fragment Analyzer systems along with the Agilent Fragment Analyzer Qualitative DNA (1-500 bp) and Fragment Analyzer RNA kits.

Advantages of nucleic acid sample QC

Because the team works in a cGMP environment, it is important to ensure rigorous and reproducible data. The QC team finds the fragment sizes produced by the Fragment Analyzer electropherogram and smear analysis function to be accurate and provides this information to their customers. They also have special PCR samples that sometimes appear as smears; the Agilent Fragment Analyzer ProSize data analysis software averages the smear size to deliver precise sizing information. The accuracy of the Fragment Analyzer

From left to right:
Nicolas Smargiasso **(QC manager),**
Thibaut Restiaux **(GMP QC operator),**
Sophie Wehren **(QC Development Project Leader)**

Kaneka Eurogentec
Belgium

Agilent
Trusted Answers

system helps them to successfully qualify and validate their test methods. “We can reproducibly perform the procedure without any change, this is something we can really rely on,” said Ms. Wehren.

Flexibility to quickly change between applications helps improve laboratory efficiency. “We can easily switch from one application to another,” said Dr. Smargiasso. This enables the team to analyze RNA fragments and DNA fragments by using different Fragment Analyzer kits. The instrument and reagents together deliver a system that is consistent and easy to use. “We are always doing the same kinds of analyses and the kits are perfect for that,” said Ms. Wehren.

High resolution and multiplexing capability are valuable features for their stability studies. The sensitivity of the Fragment Analyzer system allows the QC laboratory team to see when there are changes in the mRNA, enabling them to confidently know when something has impacted its quality. Instead of having to process one sample at a time, parallel analysis of multiple samples with the Fragment Analyzer system enables the team to reduce the time needed to identify unsuitable samples.

Finding solutions for accreditation and manufacturing

One of the biggest challenges that the QC team encountered was attaining cGMP accreditation. The process required a great deal of work and preparation, especially when qualifying test methods. Because the Fragment Analyzer system delivered reproducible data, they succeeded in validating methods for QC release testing. The QC team also needed to find ways to ensure data integrity to meet these accreditation requirements, which involved solutions from within the system software and solutions developed outside of it.

Meeting tight manufacturing schedules was also challenging. For efficient IPC testing, the QC lab needed to find a way to deliver rapid and accurate analysis of mRNA integrity and size. They found the Fragment Analyzer system capable of delivering quick, precise results for more informed decisions. “The instrument works really well, and it’s appreciated because when we only have a few hours to provide the production team with the results, we have to trust the instrument,” Dr. Smargiasso said. “Sometimes we have a sample at midnight, and we have to get a result to the production team before the morning. It’s very easy with the Fragment Analyzer because we have a quick result and an accurate analysis,” Ms. Wehren added.

Confidence in the future

The company is moving toward business-to-business contracts, which means an increase in customer-based services. This will change the way the production lab plans their operations and experiments. Flexibility will continue to be a high priority as they bring on more tailor-made, customized services. And the QC laboratory team is confident they can maintain that flexibility with the help of the Fragment Analyzer system.

In the future, the Fragment Analyzer system may be used to help optimize plasmid assessment. Right now, production laboratories are analyzing plasmids using agarose gel methods. Dr. Smargiasso noted that since the plasmids are the starting material for mRNA production, it would be interesting to replace the traditional technique with capillary electrophoresis (CE) using the multifunctional Fragment Analyzer system. “We know it is a robust solution for mRNA, and we would be happy to use it in other applications,” Ms. Wehren said.

Even with so many different nucleic acid sample types, these scientific leaders have created ways to successfully evaluate the integrity of their biologics, ensuring their clients receive the products they expect. Whichever future projects Kaneka Eurogentec pursues, Dr. Smargiasso and Ms. Wehren will ensure their biopharma products are of the highest quality.

Learn more about the Agilent Fragment Analyzer System at:
www.agilent.com/genomics/fragment-analyzer

PR7001-1870

Published in the USA, December 01, 2023
5994-6958EN

Agilent
Trusted Answers