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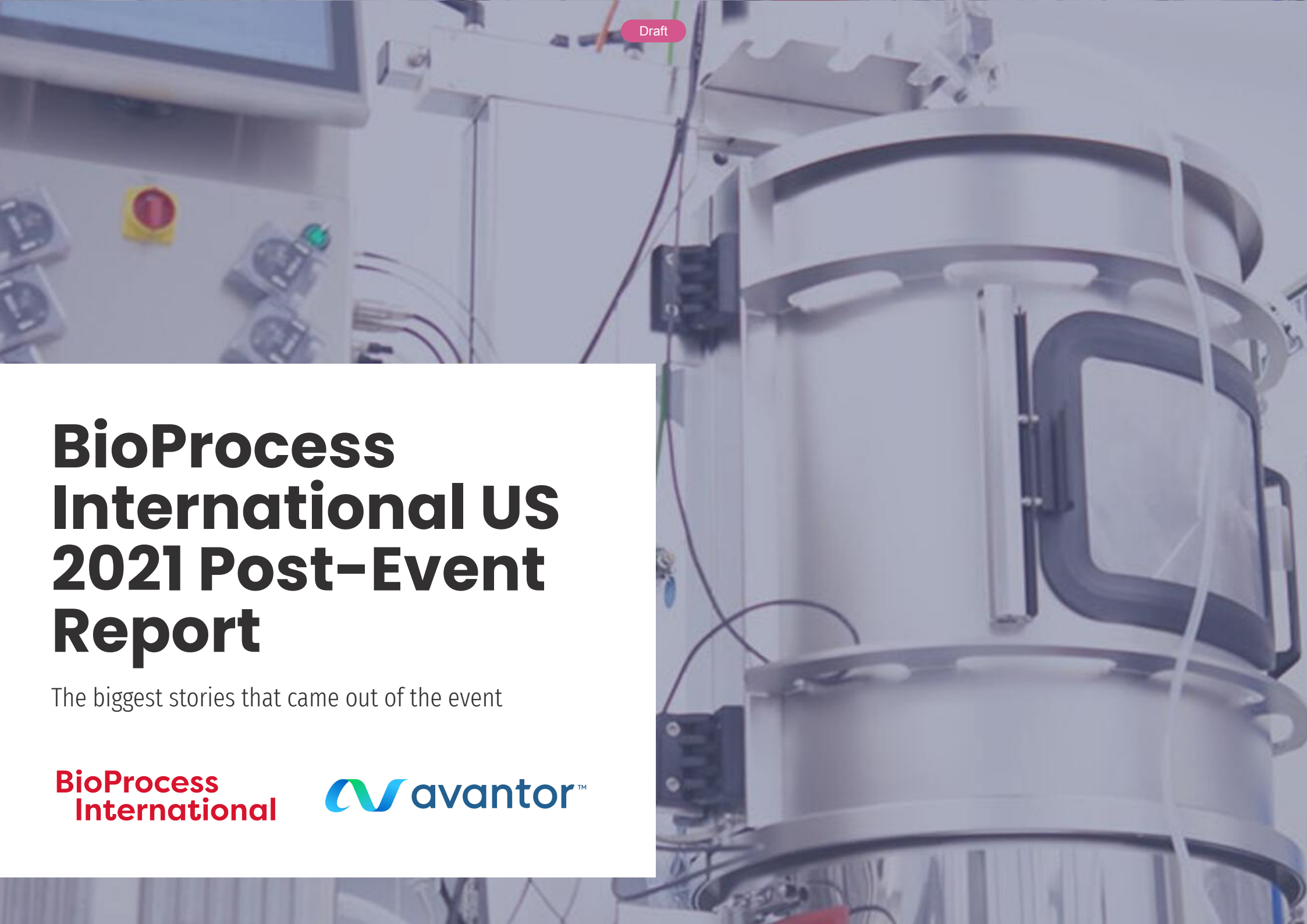

BioProcess International US 2021 Post-Event Report

The biggest stories that came out of the event

BioProcess International

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Introduction & Contents

Introduction

In September 2021, BioProcess International went hybrid for the first time. Part of Biotech Week Boston, over 2000 industry professionals joined in person at the Boston Convention and Exhibition Center and online on the ConnectMe digital event platform.

It may have been a new format, but there was the same in-depth content from industry leading figures spread across nine days ((Sept 21-30), exploring:

- Analytical and Quality
- Cell Culture and Upstream Processing
- Intensified and Continuous Processing
- Manufacturing Strategy and Bioprocessing 4.0
- COVID-19 Impacts, Development and Production

In this post-event report in association with Avantor, we have gathered together some of the highlights and biggest stories from the week, as covered by BioProcess Insider.

Whether you joined us for the event and are looking for a summary of the week, or else want to see what you missed out on, this is a great round-up of the week and will hopefully whet your appetite for 2022 BioProcess International events (mark your calendar BioProcess International 2022 as we return to Boston on September 27-30).

Barry Walsh,
Conference Director,
Informa Connect
Bioprocessing Series

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A collaborative ecosystem to accelerate the commercial manufacturing of novel vaccines and other therapeutics

Dr. Nandu Deorkar, VP, Research & Development & Biopharma Production at Avantor presents

A collaborative ecosystem to accelerate the commercial manufacturing of novel vaccines and other therapeutics

This presentation by Dr. Nandu Deorkar, Vice President, Research & Development & Biopharma Production at Avantor, discusses how suppliers and manufacturers can partner to overcome the challenges of drug development related to the scale-up, technology transfer, regulatory considerations, and commercialization timelines of bringing new therapies to market. Watch the full on-demand session or read the overview on the following page.

Session Overview

Over the last 35 years, the biopharmaceutical industry has made significant contributions to improving human health outcomes by developing and commercializing recombinant protein and monoclonal antibody (mAbs) therapies. 2021 marked the FDA's approval of its 100th mAb therapy while simultaneously, groundbreaking research has resulted in safe and effective nucleic acid and gene therapy platforms.

Innovation in these areas enabled the rapid commercialization of vaccines for COVID-19 and will continue to drive the future of medicine; however, the industry will need to achieve greater efficiencies and scale for its manufacturing and supply chain processes for innovation to continue to translate to successful, sustainable commercialization.

About the Speaker

Dr. Nandu Deorkar is Vice President, Research & Development & Biopharma Production at Avantor. During his more than 25-year career in materials technology research & development, Dr Deorkar has worked on various aspects of chemical/ polymer R&D, drug development, formulation, drug delivery technologies, process development, and technology transfer.

Dr Deorkar earned his PhD in chemistry from the Indian Institute of Technology, Bombay, and his MBA from Fairleigh Dickinson University, New Jersey (USA).

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How COVID-19 drove innovation in consumables sourcing and inventory management

How COVID-19 drove innovation in consumables sourcing and inventory management

COVID-19 has changed how drugs and vaccines are made according to a number of speakers who say limited raw material supplies and manufacturing capacity have forced industry to innovate in sourcing and inventory management.

The pandemic has disrupted the global supply of consumables and technologies according to Josh Speidel from Latham BioPharm Group, who told delegates that delivery timelines have increased significantly.

“The pandemic has put immense pressure on the global manufacturing capacity”, adding that efforts to develop vaccines resulted in “capacity shortages for vials and single use components piping, filters and bags.”

“And as a result, the US government made significant investment in novel vial types that were less reliant on boron silicate glass. And they're also actively leveraging the defense procurement act to place themselves at the front of the line to receive the scarce materials.”

“Our clients are seeing across the board delays in the availability of raw materials, equipment pyramid form fitting tube assemblies, container closure materials, and filters. In our experience, the standard lead times to these products is being exceeded by three times. In certain raw materials that are typically six weeks to procure have lead times from three to five months.”

CDMO timelines

And the shortage of raw materials and consumables further impacted the manufacturing sector Speidel said, citing US contractors as an example. “I've seen multiple cases where filters, especially larger filter sizes, have 18 to 24 month lead times for the US base. CDMO capacity for monoclonal antibody production was significantly constrained with some vendors quoting three years for their first available GMP manufacturing line.”

This lack of manufacturing capacity and

raw materials has forced the drug firms and CDMOs Latham BioPharm works with to innovate to Speidel, who said: “They're looking at qualifying vendors in India and China, places that they wouldn't normally seek to qualify for raw materials.

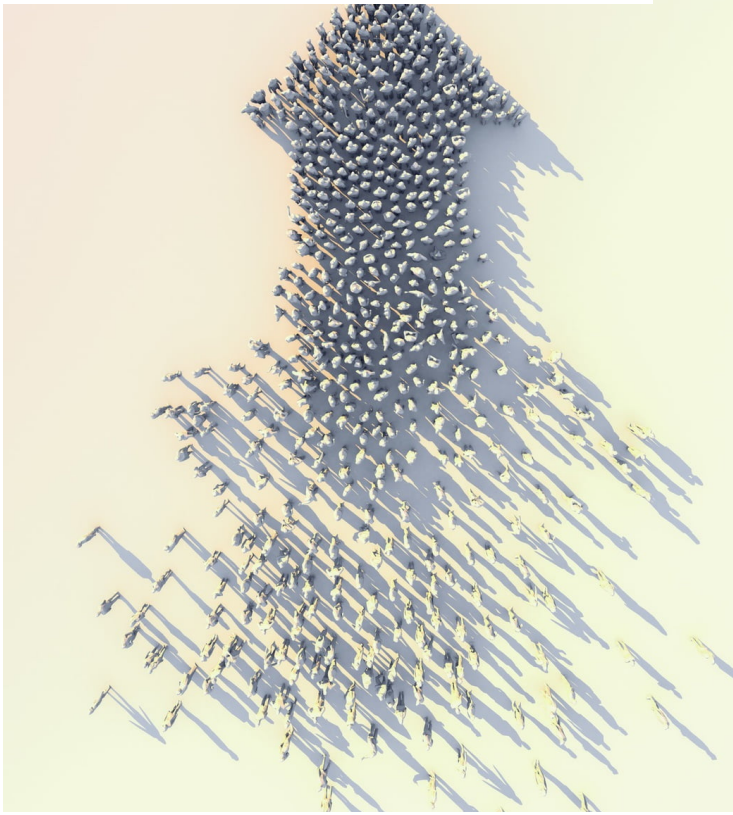
“They're changing their manufacturing processes to accommodate the absence of a particular excipient. They're changing their filtration methods to allow them to use filters that are available versus filters that are ideal. And many of these changes require redevelopment to their products or we manufacture the product so they can conduct comparability studies, and there are regulatory hurdles associated with the changes that if it weren't necessary, they would never try.”

Forecasting challenges

For Amelie Boulais, Head of Market Entry Strategy at Sartorius, uncertainty was the biggest challenge that resulted from the pandemic.

> "[Drug firms and CDMOs] are changing their manufacturing processes to accommodate the absence of a particular excipient...and there are regulatory hurdles associated with the changes"
>
> Josh Speidel, Latham BioPharm Group

"The pandemic had a huge impact on our sales and the entire supply chain for the industry has been stretched by the pandemic. And it's also starting from our own suppliers. So from our perspective, we already had a robust supply chain, meaning that we try to mitigate any risk of shortages or unanticipated disruptions, we monitor our stock levels during daily operations.



“But all our strategies rely on the forecast from our customers. And with COVID, suddenly some customers stopped working. For example, the gene therapy field, just stopped production because the trials were on hold.”

The sudden increase in demand for vaccine production technologies was also a challenge Boulais said.

“We had all those customers and companies who are trying to develop and starting to develop vaccines with different type of methods - relying on mRNA, relying on recombinant proteins or inactivated vaccines on viral vectors. So we have to anticipate what will be the products that will be ordered tomorrow for the production. And that's not an easy thing to do.”

Sartorius’ response was to expand capacity Boulais said, explaining that the firm hired additional staff, extending shifts, operated at higher production capacities and accelerated planned manufacturing facility expansions.

“We have been prioritizing all products requests that were going into vaccines and to COVID-19 applications. We have been trained to really maintain flexibility. And we have been able to provide all the customers that were working on the on the vaccine applications and to find the best solutions. But it has been a tough period and all our forecasts have been completely changed because of COVID.”

Stockpiling

Acting quickly was key to ensuring a sufficient supply of raw materials and technologies according to Patrick Lucey, CEO of cell therapy CDMO Lykan Bioscience.

“We actually have avoided a lot of these delays in the cell therapy space. Obviously, the equipment we use and the amount of materials we use is reasonably small scale. And so we're not looking for major demand of excipients or media components or buffer components or disposables.

“So we've been able to navigate this in a couple of ways. First, you know, our supply chain team was pretty forward looking. So there are common materials across all biologics manufacturers, cleaning materials, and things like this.

Lucey added, “So we moved quickly, early on, and stockpiled a lot of these cleaning materials and things to be prepared for changeover and all that work. So we have a great stock of those materials.”

By Gareth Macdonald - freelance business and science journalist writing for BioProcess Insider.

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Regeneron says tech was key to rapid COVID-19 mAb cocktail dev

Regeneron says tech was key to rapid COVID-19 mAb cocktail development

Efforts to combat COVID-19 were aided by a platform-based approach says Regeneron, which cites its mAb and cell line technologies as key to the process.

REGEN-COV, Regeneron's antibody cocktail reduces the risk of COVID-19-related hospitalization and death by 71 percent and lowers viral loads faster than a placebo according to data recently published in the NEJM.

REGEN-COV is a combination of casirivimab and imdevimab. It developed in less than a year, which is much faster than comparable therapies. Typically, antibody-based drugs take between six and eight years to bring to market.

Platform

The key to the shorter timeline was a platform approach according to Hanne Bak, Regeneron Senior Vice President of Pre-clinical Manufacturing & Process Development.

She told delegates that work on REGEN-COV began in 2020 with a clear aim in mind.

"We wanted to have two potent neutralizers with breadth against known variants of the [SARS-CO-2] spike protein. We wanted a cocktail. So we didn't have any issues with escape mutants. And we wanted them to be non-competing and we wanted them to have the option to be used both prophylaxis as well as treatment," she said.

Development speed

Development of REGEN-COV began on February 5, 2020, days after the SARS-CoV-2 sequence was published. Regeneron used its Velocimmune mouse platform to generate 3,000 antibodies against the virus. 92 of these antibodies were then isolated and cloned into CHO cell lines so they could be stably produced for further screening. Lead selection took place on April 15 with the first clinical trials beginning in June.

"So in 56 days we had selected the lead antibodies, we had protein out the door that we had a green light from the FDA to put into patients" Bak said.

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Lose the LIMS? B-MS says QC labs of the future need to be digital

Lose the LIMS? B-MS says QC labs of the future need to be digital

Drug quality control labs of the future will need to be more closely integrated with manufacturing operations and make greater use of data management tech and automation says an industry expert.

Quality control is a vital part of ensuring drugs are safe, effective and can be produced consistently.

However, despite understanding this importance, manufacturers have often focused on improving manufacturing processes rather than QC labs according to Steve Muller from Bristol Myers Squibb, who says firm's looking to digitize operations need to make sure their labs are digital-ready.

"The reality is that quality control labs have fallen behind the digital enablement of the manufacturing environment," according to Muller, who said the mismatch has hindered industry's ability to reduce testing lead times.

"Test execution may not be automated, partly because lab equipment may face limitations to be controlled digitally. Data may not be captured or shared automatically or consistently making it potentially difficult to use analytics to optimize outcomes.

He told delegates the lack of lab digitization also impacts staff. "Technicians may use non-integrated systems they may not be guided or assisted by technology. What does that cause? Human errors. Human errors lead to defects which then lead to repetition of these tasks."

"And finally, when we look at the digital future, we look at a level of digital integration that doesn't exist today. When we talk about the lab of the future in today's context, we talk about offline testing – you're removing material from the manufacturing equipment and putting it into the laboratory, so it may not be integrated with manufacturing."

Biophorum QC manifesto

To try and address this, in 2020 Biophorum developed a manifesto of digital

capabilities for the quality control lab of the future to provide industry with a blueprint which, Muller says, aims to help labs understand the business capabilities they need as biopharma enters the digital age.

“When we talk about these business capabilities, we talk about supply management. Supply management is needed to perform the [QC] testing. Automated testing is where we would like to be in the future. And then test output management. While testing is very important, it’s really the information derived that is so vital.”

Realizing these capabilities involves having the right “enabling dimensions” Muller said, citing areas like system interoperability, IT infrastructure and staff training and culture as examples.

“My recommendation is that you take a look at your QC strategy in the context of the [Biophorum] manifesto," he said, explaining that B-MS had benefitted from the approach.

“We’ve had some significant achievements. We have a mature laboratory and QC application stack. We’ve digitalized a significant number of business processes and capabilities and I would estimate that we cover over 95% of all business requirements.

“But we’re not living in the lab of the future either,” Muller continued, citing issues with “unintuitive” user interfaces and problems integrating systems and the need to maintain master data in multiple systems as hurdles the firm still needs to overcome.

Solutions

To try and address these issues, B-MS is piloting an automated QC lab scheduling system Muller said. “It’s a multi-year project to optimize labs and provide additional business insights and real-time performance analysis.

“One of the advantages of this system is that we are getting real-time information from all the systems that are being used to accurately measure turnaround time – it’s not something that is being reported by the user or something that is being researched.

The firm also plans to look at a next generation LIMS to reduce user training and the time spent navigating multiple systems."

> "“The next generation LIMS might not be a LIMS. We really need to look at how we are using the data and how we can maximize access to the data and understanding of that data.”"
>
> Steve Muller, Bristol Myers Squibb

By Gareth Macdonald - freelance business and science journalist writing for BioProcess Insider.

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Collaboration and managing stress: What biopharma learned from COVID

Collaboration and managing stress: What biopharma learned from COVID

COVID-19 showed biopharma at its best and worst says an expert who argues that the scrutiny which came with the pandemic highlighted some key industry challenges.

The pandemic put biopharma in the spotlight according to Jeff Baker, former Deputy Director of the Office of Biotechnology Products in CDER, who told delegates the crisis highlighted industry's strengths and weaknesses.

"There will be a lot of books written about the COVID-19 crisis and response and a lot of them will be very critical. And I hope they are, because that's how we learn, and we get better ready next time.

"But I hope there are a few written about the almost organic uprising of the biotech community to address this global challenge. And I have never seen more transparency, more cooperation, more collegial participation, and common cause than I saw among the scientists and engineers and project managers of the biotech community in rising to this global challenge."

Baker added industry's ability to develop several COVID-19 vaccines in a year was a major validation of the sector. "We science-ed the crap out of it. And I hope that you'll be able to tell your kids about that with pride," he said.

Stresses

Public demand for COVID-19 vaccines and therapies was quickly followed by questions about how medicines are made according to Baker, with the sudden focus on industry's approach to chemistry, manufacturing and controls being one example.

"Not only was CMC in the critical path, CMC was on the front page of *The Washington Post*. CMC was on Fox News, and we never want to be there....This put a lot of tensions into what was going on. The science didn't change. The engineering didn't change. The scrutiny changed. And that put a lot of stress into our system."

The pandemic also highlighted the need for better supply chain management according to Baker, who said industry needs staff able to come with disruption.

"We need to grow managers that manage because hunting, praying, scavenging and waiting did not put us did not position us for success in managing profoundly disrupted supply chains."

> "I have never seen more transparency, more cooperation, more collegial participation, and common cause than I saw among the scientists and engineers and project managers of the biotech community in rising to this global challenge."

Jeff Baker, former Deputy Director of the Office of Biotechnology Products in CDER

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