

# CAN YOUR LABORATORY MEET THE DEMANDS OF TODAY'S BIOPROCESSING LANDSCAPE?

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As the industry shifts its focus from blockbuster drugs to niche drugs for targeted patient populations, the market for biologics is evolving. Batch sizes are decreasing and the global footprint is expanding, leading to a greater need for efficiency in development and manufacturing, in order to make drugs more quickly and at a lower cost. Relying on slow R&D processes in this fast-changing environment will prevent you from not only increasing your speed to market but also standing out among your competitors. By adapting to today's demands using smart bioprocessing, you can help drive efficiency in your laboratory and contribute to the economical and reliable production of next-generation molecules.

## SMART BIOPROCESSING: OPTIMIZING THE LABORATORY WORKFLOW

Improving efficiency in your laboratory calls for the implementation of smart bioprocessing. With this concept, intelligent integration of the peripherals associated with your instruments, such as the software and the consumables, allows ease of use and optimization across the entire workflow. This is similar to how the devices we use as consumers are integrated into one another efficiently and seamlessly, such as a printer that can be plugged in and used almost immediately, regardless of the type of computer to which it is connecting. This integration is made possible through standardization, which allows the various types of equipment to communicate with each other. The same effort is being made in bioprocessing, with many companies creating internal communication protocols to standardize their instruments and then utilizing available standards on the market to establish a consistent language. As a result, instruments across a laboratory workflow that are used for various activities, such as thawing to initial incubation to primary and then secondary growth, can communicate and operate in harmony. Observations can then be made about how much each instrument is in use and where optimizations are possible to improve utilization.

In addition, bioprocessing generates reams of data, and the ability to utilize it to your advantage through digitization is tremendously valuable. This could be through artificial intelligence or a form of adaptive control mechanism where the instrument or the product helps to fine-tune its own process based on how it has been used in the past. Through adaptive learning, we can predict future use as well as recommend set points for optimization or even accumulate internal data on how much internal wear and tear has occurred within an instrument. This creates opportunities to proactively recommend service before an issue occurs. Other classic run data – like pH, dissolved oxygen, and agitation rate – can be observed together to establish a more meaningful picture of how each instrument is being used. The data collected must be maintained in a secure database to safeguard it against accidental deletion and allow for real-time monitoring. It also provides a level of assurance to regulators that the platform is safe and stable and that the data has not been tampered with and can thereby provide an adequate representation of what actually occurred within a bioreactor, leading to better process economy and higher yield.

## EQUIPMENT FOR THE FUTURE OF BIOPROCESSING

Meeting the needs of today's industry and beyond, including improved efficiency, requires "future proof" solutions that can evolve as the needs of the market change. For example, what if a new novel sensor type enters the market, but the manufacturer of that sensor has unique electronics associated with it? Rather than having to redesign an entire electronics platform, it would be ideal to just be able to adapt those connections, so the sensor can be connected to the controller and digitally integrated. Eppendorf's SciVario® twin bioreactor control system, part of a bioprocess controller platform for all future Eppendorf small and bench-scale devices, was designed with adaptability in mind.



The SciVario® twin is built off Eppendorf's VisioNize® architecture, a controller platform which creates a consistent user experience across all products by sharing information models. The SciVario twin also includes configurable bay-drawers, so rather than having to buy new products as your needs change, additional bays can be purchased to ensure adaptability to your process. The goal is that, once a product is purchased, any new features that become available can be add-ons, making it unlikely someone would need to buy an entirely new instrument for at least five to 10 years. Another area rapidly growing in bioprocessing is the implementation of single-use technology (SUT), which offers several benefits, such as rapid turnarounds, reduced cleaning requirements, increased flexibility, smaller overall footprint, and more. Eppendorf's BioBLU® product line is a single-use platform focused on elements of scalability with technologies currently on the market. The BioBLU looks like a glass bioreactor and mimics the results of one but offers the benefits of SUT.

As the industry continues to adopt SUT for cell culture but needs a solution that can scale up to meet growing needs, Eppendorf plans to release a new industrial controller well suited to fit the needs. The next generation of the BioFlo® product line of bench scale bioreactors will be extended to up to 2000 liters pilot and production scale, facilitating scale-up, not only in size but also in terms of intelligent software

guidance. Transferring the knowledge from bench to production scale is time consuming and challenging. Many engineering factors need to be considered to perform a successful scale-up process. The newly developed software includes features, such as scale-up assistance and an auto-calibration function developed to improve usability, save time, and mitigate the risk of errors. Once you choose the preferred scale-up strategy and bioreactor size (ranging between 25 milliliters and 2000 liters), the software calculates the parameters, so the process can be started immediately. The new software is based on the known BioFlo 320 software, in order to ensure a consistent user experience across all BioFlo control systems as well as the ability for the BioFlo 320 to benefit from new software solutions.

When evaluating your own bioprocessing needs, be sure to consult with industry peers about what equipment they use and what their experience has been with it. It is beneficial to develop relationships with other subject matter experts, such as field sales engineers, to dig deeper and to make sure you are getting the right product for the future. Stay in contact with these experts to ensure you are at the forefront of today's newest technologies and know what is available and when. Regardless of what solutions you adopt, the goal is to increase productivity and efficiency, giving you the added value you need to survive in today's changing but exciting new biopharmaceutical landscape.