Integrating continuous technologies for the rapid, cost-effective delivery of biotherapeutics to patients

Continuous 2

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The Challenge

The biopharmaceutical industry is going through radical change. New technologies like advanced-process analytics, artificial intelligence, genetic modification and robotics are driving innovative therapies to help treat many debilitating diseases, with life-changing benefits for patients.

Yet patients are missing out on those benefits, not because treatments don't exist but because of the high costs and risks associated with producing them at scale. Current medicines manufacturing involves inefficient traditional large-batch methods that are resource and time-intensive. This holds back the SMEs and startups creating these game-changing drugs, so they remain underdeveloped.

Continuous and integrated biologics manufacturing processes can address this challenge. They give manufacturers the flexibility to respond to demand in real-time, delivering life-changing biologics more rapidly and cost-effectively to patients.

We partnered with Sciex, Biopharm, BiologIC Technologies and Cytiva to create a world-leading continuous manufacturing system. It offers a new model for more sustainable, efficient and decentralised production, empowering SMEs to develop the next generation of biologic treatments.

How CPI helped

- Designed, developed and demonstrated a small-footprint intensified biomanufacturing platform.
- Integrated advanced technologies, including automation, cloud software, 3D-printed microfluidic devices and adaptive Advanced Process Control (APC).
- Provided industry expertise and state-of-the-art facilities to develop and house the platform.
- Helped develop software to support resource management and process optimisation.
- Coordinated four external partners' contributions to the project.

Achievements

- Produced a fully functional demonstrator system, capable of running end-to-end advanced biological processes across multiple applications.
- Reduced analysis time from 8 hours to 30 minutes.
- Demonstrated the benefits of continuous, integrated biomanufacturing, including cost-effectiveness, resource- efficiency and flexibility.
- Helped create a digital platform for real-time data sharing, secured by the cloud.
- Supported partner SMEs in designing and developing four novel products.

Impact

We used our state-of-the-art facilities and expertise to develop one of the world's most advanced continuous manufacturing demonstrators for biotherapeutics, which can operate with limited human intervention. And the implications are hugely significant.

Continuous 2 demonstrates the tangible benefits of continuous manufacturing. Through the more efficient use of raw materials, water and power, as well as a smaller equipment footprint, it enables medicines to be produced more sustainably. Its modular design, meanwhile, means it can be adapted to wide range of technologies.

Above all, the project supports innovation in this high-potential area of medicine. The system will be used as a test bed for UK innovators to de-risk and demonstrate new technologies, software and process intensification. It will enable rapid, cost-effective manufacturing, speeding up the process development of new biologics and making them available to patients more quickly.

Ultimately, this will give SMEs with low budgets and limited resources the flexibility they need to develop groundbreaking personalised treatments for debilitating conditions like autoimmune disease. In the long run, it could change the lives of millions of patients.

Find out more: https://www.uk-cpi.com/smarter-faster-and-more-sustainable-biologics-manufacturing