Case study

Application of Cyto-Mine® in Cell Line Development at Abzena



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Enhancing the AbZelectPRO™ Platform with Single-Cell Precision

Abzena, a leading integrated partner for biologics discovery, development, and manufacturing, has strengthened its cell line development capabilities by incorporating Cyto-Mine® into its AbZelectPRO™ platform. This integration has improved project timelines, enhanced monoclonality assurance, and enabled deeper, earlier insights into clonal productivity and stability.

By adopting next-generation picodroplet technology, Abzena's scientists can make informed, data-rich decisions at earlier funnel stages; supporting faster development of robust, scalable, and commercially viable cell lines.

Accelerating Development While Meeting Increasing Demands

In today's fast-moving biologics landscape, biopharmaceutical developers require high-performing, production-ready cell lines in increasingly compressed timeframes. CDMOs like Abzena must deliver these outputs rapidly and at scale—without compromising on clonal assurance, product quality, or long-term stability.

Traditionally, the early stages of cell line development rely on manual processes and limited data, making it difficult to predict performance or ensure long-term viability. Challenges such as resource-intensive colony picking, delayed stability assessments, and difficulty in confirming monoclonality can all introduce risk and delay.

To stay ahead of demand and maintain its commitment to scientific and operational excellence, Abzena sought a more advanced, integrated approach.



Cyto-Mine® in practice: Gaining Insight and Reducing Risk

Cyto-Mine® is a compact, automated platform that encapsulates single cells in picoliter-sized droplets, enabling miniaturized, high-throughput assays to be run early in the development workflow.

At Abzena, Cyto-Mine® is used to screen and isolate high-producing, viable clones while capturing key data on productivity and monoclonality - all before stable pool generation.
This allows teams to validate early decisions and confidently select the best-performing clones for downstream development.

We're able to identify the top-performing clones right from the start. We're not waiting until we've done the stability studies to understand how a clone behaves - we already know.

Dr Brett Verstak,
Director of Cell Line Development,
Abzena



Cyto-Mine® in practice: Gaining Insight and Reducing Risk

Using Cyto-Mine®, Abzena scientists work with fully traceable data on cell productivity, growth, and viability before moving into labor and time intensive stages. This enables them to:

- Screen up to 200,000 single cells in a matter of hours
- Rapidly isolate high-performing clones from a diverse population
- Visually confirm monoclonality at the time of dispensing
- Gain early insight into clonal stability and performance trends

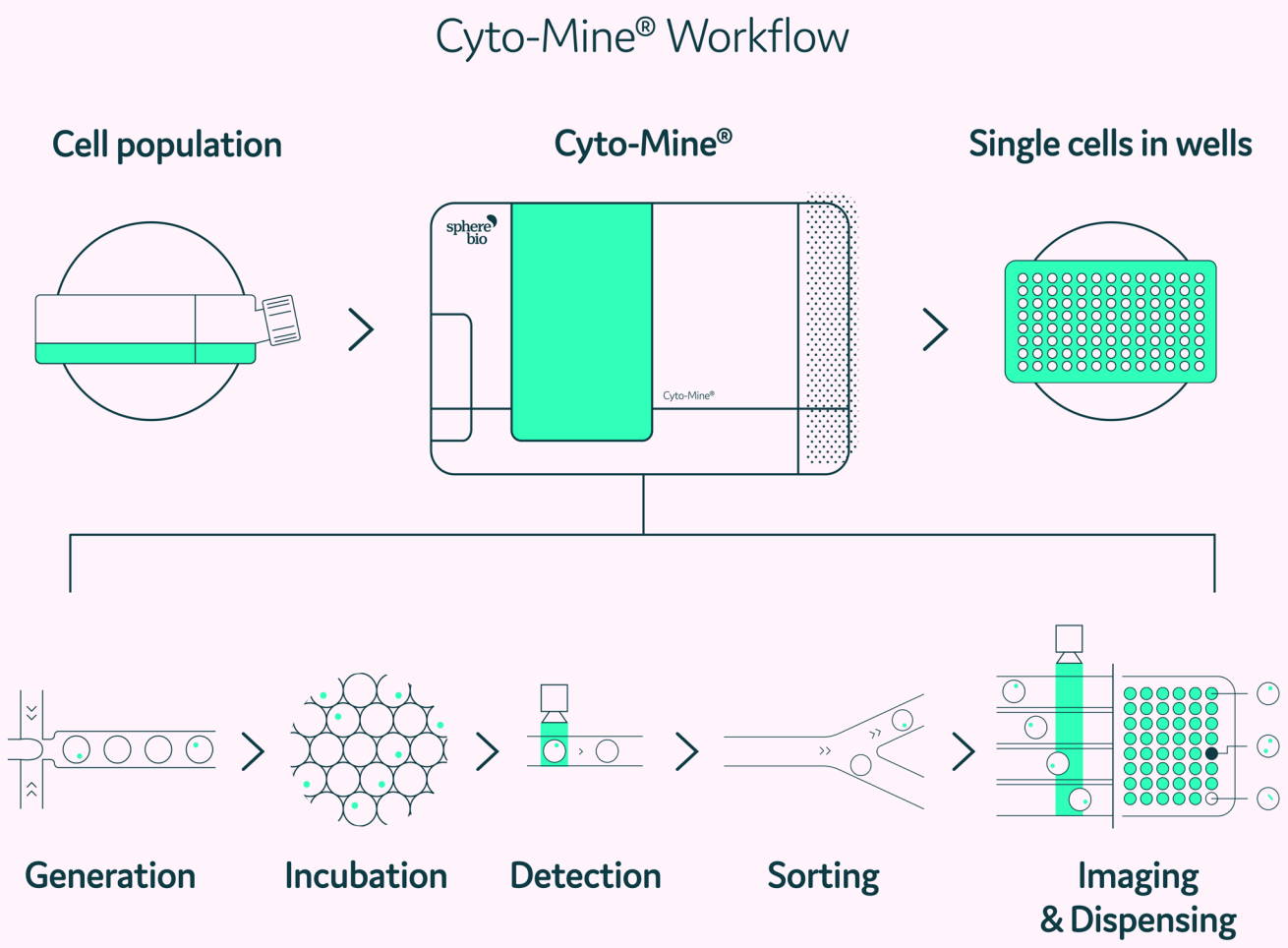


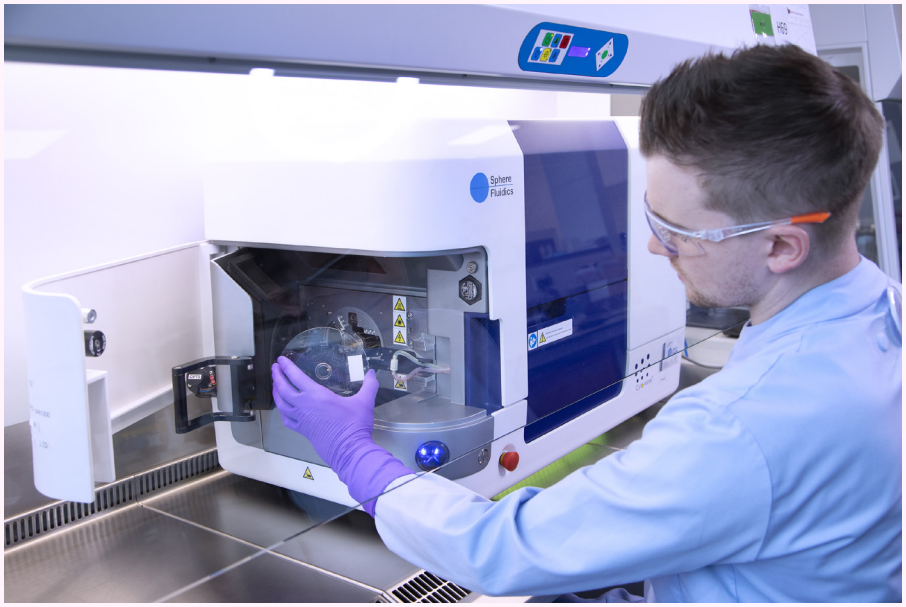
Figure 1. Integration of productivity assay screening, sorting, isolation and verification using a fully automated picodroplet microfluidic process.

Driving Efficiency and Scale

By embedding Cyto-Mine® into its AbZelectPRO™ platform, Abzena has been able to significantly reduce the time required to progress from transfection to clonal candidate selection. Teams spend less time on manual screening tasks and more time focusing on scientific optimization and process scale-up.

This streamlined, data-driven approach supports Abzena's mission to deliver high-quality cell lines that meet the needs of clients advancing into clinical development and commercial production.





Scientists at Abzena using the Cyto-Mine® for single cell isolation.

High-throughput cell line development and biotherapeutic production

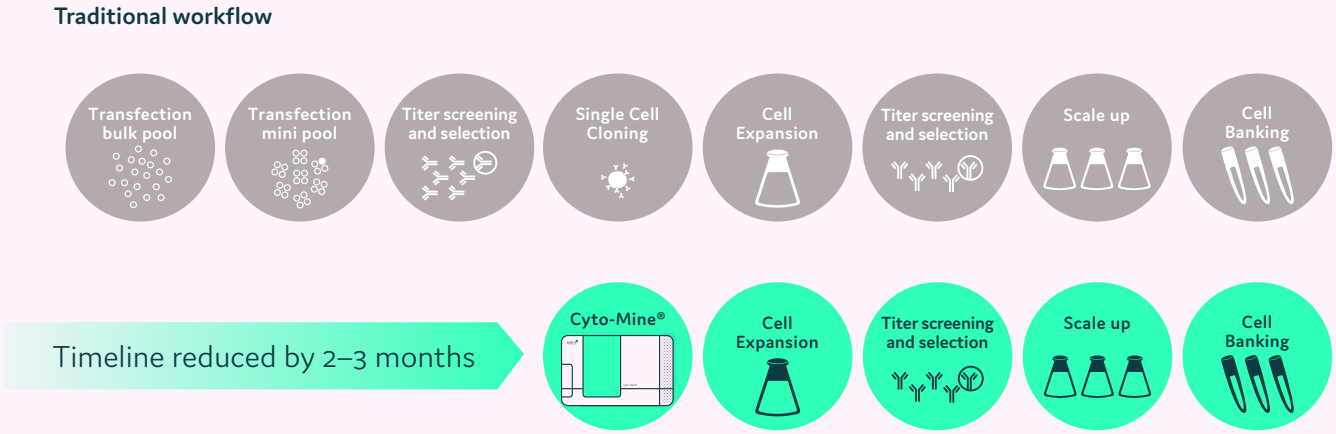


Figure 2. Accelerated cell line development workflow using Cyto-Mine®

Cyto-Mine plays a key role in the AbZelectPRO platform by accelerating development timelines. It enables early-phase enrichment of the pool population, thereby streamlining and reducing the duration of the subsequent clone screening process.

Dr Brett Verstak, Director of Cell Line Development, Abzena



The benefits of picodroplet technology

- **Earlier insight** into clone productivity and viability
- **Streamlined workflow**s with fewer manual steps
- **High-throughput screening** of up to 200,000 cells
- **Assured monoclonality** through in-droplet imaging
- **Reduced timelines** from transfection to candidate selection
- **Greater confidence** in decision-making and regulatory readiness

Abzena continues to explore further applications for Cyto-Mine® in its biologics pipeline, with the goal of driving even greater efficiency, scalability, and innovation across its development services.

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