

USE OF THE CYTO-MINE FOR RAPID GENERATION OF HIGH-PRODUCING CLONAL CELL LINES

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There is significant pressure in the biopharmaceutical industry to reduce timelines from DNA to IND, and a large portion of the timeline on the critical path is the cell line development process. Whether utilizing random integration or targeted integration for introducing genes into the genome, the regulatory requirement to address monoclonality requires a time and resource-intensive step in the process. In addition, a screen for productivity such as minipool titering or FACS analysis is typically included prior to the monoclonality stage in order to minimize the work involved.

The Janssen R&D Cell Line Development (CLD) group has partnered with Sphere Fluidics to evaluate the utility of the Cyto-Mine, which is a high-throughput, microfluidic instrument developed specifically to address unmet needs in the monoclonality and productivity screening stages of the cell line development process. The Cyto-Mine takes a mixed population of cells that the user loads into the device and encapsulates individual cells in picodroplets. The machine analyzes each individual droplet for productivity using a FRET-based screen, and then images and dispenses the high productivity droplets in individual wells of microtitre plates. This entire process is performed on a single-use cartridge and is completely animal-component free.

We have tested the Cyto-Mine and associated screening method with mAb and non-mAb projects and found that it can generate cell lines with high productivity, high viability, and a high assurance of monoclonality after a single round of screening. Thus, we have determined that by incorporating the Cyto-Mine into our cell line development process we can significantly shorten the overall cell line development timeline and reduce screening and resource requirements without compromising productivity or product quality in our production cell lines.