

CASE STUDY

Eurofins DiscoverX Cell Services Facility



DiscoverX Cell Services Facility Adopts ThawSTAR[®] Automated Cell Thawing System into their BioAssay and Cell Profiling Workflow.



Katherine Quinlan, Cell Services Manager, DiscoverX (Fremont, CA), has been working in the biotech field, particularly cell culture and assay development, for six years.

➤ Introduction

Eurofins DiscoverX[®] is the products division of Eurofins Discovery and part of the Eurofins BioPharma global network. They are headquartered in Fremont, CA and specialize in cell-based assays. Their work supports drug discovery research across many different areas, from screening and selection of new drug candidates, to toxicity studies, to phenotypic profiling using human primary cell-based assays.

A large part of the work at DiscoverX is handled by their Cell Services facility. Cell Services Manager Katherine Quinlan is responsible for coordinating cell culture activities as well as establishing testing schedules and production priorities for her team. Since she spends a significant amount of her time in the lab helping out with the growth and maintenance of cell lines, Ms. Quinlan knows first-hand how fragile cells can be post thaw, and how important high quality, robust cells are to the company's success.

She spoke to a BioLife Solutions representative in the spring of 2019 about why their Cell Services and Profiling laboratories have decided to make the switch from an in-house cell thawing protocol to utilizing the ThawSTAR[®] system for their cell thawing needs.

➤ Making the Switch to Automated Cell Thawing

Prior to introducing the ThawSTAR® system into their lab, Ms. Quinlan and her colleagues were using a traditional warm water bath, a thawing method that has, in the past, given them mixed results. Sometimes a vial would thaw unevenly, leaving the quality of the cells within the vial up to question. Researchers tend to underestimate the importance of the thawing process, but in fact, thawing that is too slow, or uneven, can lead to ice recrystallization damage, one of the major causes of post-thaw cell death.¹ Apart from inconsistency in the thawing rate, vials were occasionally found to be contaminated, most likely from the water bath itself. There was also some variability in the cell recovery results, which the researchers believed was due to the guesswork involved in estimating a correct thawing rate for each vial – some vials may have been left in the water bath too long, while others were found to still be partially frozen when prepped for cell culture. The Cell Services lab were on the lookout for a more efficient and reliable method for thawing their cells.

After a promising short trial, DiscoverX decided to purchase their first ThawSTAR® system, shortly after it was released on the market. They were pleased to find that the system could be incorporated into their workflow immediately, and operated exactly as described. In functional tests comparing cells thawed in a water bath to those thawed using the ThawSTAR® system, ThawSTAR® cells performed better with fewer problems with cell recovery, and no cases of contamination originating from the vial thawing process.



“When using the ThawSTAR® system in our process there was much less guesswork involved than using the water bath. We were able to run a functional test comparing cells thawed via a water bath and cells thawed via the ThawSTAR®, and found that the ThawSTAR® cells performed slightly better... We have fewer problems with cell recovery and no contamination originating from the vial thawing process,” stated Ms. Quinlan.

➤ Incorporating Automated Cell Thawing into the Workflow

Ms. Quinlan’s team thaw anywhere from 10-100 cryovials per day, five days a week. The most common cell types they use are CHO (Chinese hamster ovary) cells, HEK (human embryonic kidney) cells, and U2OS (human osteosarcoma) cells, but many other cell lines and types are also kept in-house for their broad array of screening assays. Some cells are expanded into large lots for consumer purchase, while others are used for screening or profiling of pre-clinical drug candidates such as cancer immunotherapy drugs. Because many academic labs and biotech companies will be basing critical decisions on the cell-based data Ms. Quinlan’s team are generating, it’s crucial that the work is carried out efficiently, and that the results are standardized and reliable.

“The ThawSTAR® system has allowed us to streamline and standardize the thawing process. It is quick, efficient, and, most importantly, consistent. One year on and I have yet to encounter ANY problems. It’s taken some of the guesswork out of science, which inherently has a lot of guesswork to begin with,” reported Ms. Quinlan.

Ms. Quinlan explained in more detail how using the ThawSTAR® system helps their daily workflow. In the Cell Services facility, the ThawSTAR® cell thawer is situated on a lab bench in the center of the culture hood area, giving everyone easy access. Cell vials are retrieved from liquid nitrogen, and stored on dry ice prior to thawing. The team routinely use 1.2 mL and 2.0 mL cryovials. Several vials are often thawed in quick succession, with a tissue culture flask being filled with growth media and labeled while the vial is in the cell thawer. As soon as a vial pops up, it is wiped down with ethanol and placed in the hood. Another vial immediately takes its place in the cell thawer, and the process continues. Ms. Quinlan estimates each cryovial takes 90 seconds to 2 minutes to thaw, so the workflow moves along quickly.

“I often have 10 vials lined up on dry ice ready to switch in when the previous one has completed its thaw cycle. The unit not only has lights that allow me to track the progress of the thaw but it also beeps in the last 10 seconds of the thaw cycle, and makes a different noise when thawing is complete. It’s not an annoyingly loud noise but I am able to hear it over the noise of my hood which is perfect,” stated Ms. Quinlan.

Ms. Quinlan summarized her experience with the ThawSTAR® automated thawing system by describing the benefits the system has brought to her lab.

“Both of my teams solely use the ThawSTAR® system as their go to thawing device for thawing cells. It is second to none when it comes to efficiency, consistency and sterility. If we have high quality, robust cells, they tend to recover better, propagate better and, overall, perform better in assay. I look forward to using our ThawSTAR® system for many years to come,” concluded Ms. Quinlan.

Proximity to Silicon Valley may naturally inspire DiscoverX to gravitate toward promising new technology. As cellular therapies edge closer toward regulatory approval and mainstream implementation, however, the biotechnology industry as a whole is realizing an increasingly pressing need to adopt technologies that minimize variability. Together, standardization and reliability will help us fulfill the promise of cell-based medicine.

References:

¹ Capiccioni CJ, et al. Small molecule ice recrystallization inhibitors enable freezing of human red blood cells with reduced glycerol concentrations. *Scientific Reports*. April 2015. 8 (5):9692. doi: 10.1038/srep09692

