

biobanking for biotech

a case study

TTP Labtech's comPOUND® provides efficient biobanking for high quality antibody storage

introduction

In a large number of academic research centres and small pharmaceutical and biotech companies, biological sample storage remains a manual process requiring meticulous sample labelling, robust data logging, accurate placement and retrieval. As the sample library grows, the acquisition of additional freezers can place a strain on laboratory space or storage areas. Manual placement and retrieval of samples from large libraries not only increases the potential for error but can inhibit sample processing speeds necessary to satisfy research flow or customer delivery schedules.

Manual placement, search and retrieval of samples often requires scientists to spend lengthy periods of time handling samples in freezers or standing in cold rooms. The ability to automate sample dispensing and processing whilst ensuring robust sample labelling and tracking is invaluable. It significantly reduces the effort and turn-around time of compound storage and retrieval.

This case study demonstrates that TTP Labtech's comPOUND biobanking storage modules are successfully employed by Abcam, a worldwide supplier of high quality antibodies, proteins, peptides, lysates and assay kits. In this company, the turnaround time of sample placement and retrieval is an essential component of high quality service to its customers. This case study highlights a number of features of comPOUND which have proved to be of significant value during the development of this rapidly expanding company and helped to ensure high quality customer service and support.

case study: Abcam

Abcam was established in 1998 as a global web-based company providing high quality reagents for both academic research and the drug development industry. Based on the Science Park, Cambridge, UK, the company grew rapidly, expanding its antibody repertoire and customer lead throughput. As space became limited, Abcam soon needed an automated, reliable, low cost and footprint biobanking facility to store valuable antibody stocks. This was to replace costly, unreliable and large footprint traditional -20°C and -80° C laboratory freezers.

With an extensive stock range and large sample numbers, Abcam need fast, robust, secure, efficient sample storage and management.

“comPOUND is the key reason why Abcam is able to ensure fast delivery to its customers”

abcam[®]
discover more

TTP Labtech's automated comPOUND storage modules not only provide low footprint, cost-efficient automated biobanking capabilities but have the ability to cherry pick samples individually whilst not disturbing the internal storage environment. This ensures the integrity of unselected samples.



TTP Labtech's comPOUND storage modules at Abcam, UK.

automated biobanking versus traditional freezer storage

The ability to automate sample dispensing and processing whilst ensuring robust sample labelling and tracking, significantly reduces the effort and turn-around time of compound storage and retrieval.

manual storage

- manual sample labelling, storage and tracking increases the risk of error
- manual database input and management is open to error
- users are subjected to unpleasant lengthy periods of time sorting and locating samples in a cold zone and transporting the sample
- there is a risk to sample integrity due to partial thawing whilst freezer doors are open
- stores have limited storage capacity in a larger footprint.

versus automated biobanking

- 2D barcodes are checked on sample storage and on retrieval
- automatically updated database
- high speed cherry picking of only the samples required
- undisturbed storage environment ensures sample integrity
- space-efficient design
- remote sample delivery.

ttplabtech

natural innovators

unrivalled cherry picking, sample processing and speed

With a focus on guaranteed next day delivery of reagents, it is vital for Abcam to rapidly and reliably retrieve requested products in order to maintain its good reputation. Using comPOUND, a single cherry picked sample can be delivered within 8 seconds. For larger orders, a rack of up to 96 samples can be dispensed in under 10 minutes.

Number of tubes	Time taken for manual selection	Time taken for selection via comPANION
1	22 secs	8 secs
5	1 min 50 secs	40 secs
10	3 mins 40 secs	1 min 20 secs
50	18 mins 20 secs	2 mins 40 secs
100	36 mins 40 secs	6 mins 40 secs

Table 1. Study comparing manual selection of samples from a -20°C freezer to automated retrieval from two comPOUND stores via comPANION.



TTP Labtech's comPANION linked to and controlling throughput of 2 neighbouring comPOUND modules

As library requirements increase, additional comPOUND stores can be easily integrated. Linking additional storage units further enhance sample processing time as the modules can be accessed simultaneously (Table 2). For example, with two modules connected, comPANION is able to retrieve over 7,000 cherry-picked microtubes in 8 hours.

Number of stores	Library size	Throughput tubes per hour
1	100,000	2,500
5	500,000	30,000
10	1,000,000	60,000
15	1,500,000	90,000
20	2,000,000	120,000

Table 2. Sample processing time and throughput remains efficient as the number of comPOUND stores are increased.

TTP Labtech Ltd
Melbourn Science Park
Melbourn
Hertfordshire SG8 6EE
United Kingdom

tel: +44 1763 262626
fax: +44 1763 261964

sales@ttplabtech.com

TTP Labtech Inc
One Kendall Square
Suite B2303
Cambridge MA 02139
United States

tel: +1(617) 494 9794
fax: +1(617) 494 9795

maximising storage space

comPOUND has 1.5 x footprint of one standard -80°C freezer. When floor space for storage is limited, a single comPOUND can store the equivalent of 10 standard -80°C freezers: up to 100,000 x 1.0 or 1.5 mL tubes per module.

secure, reliable, expandable storage

TTP Labtech's proprietary pneumatic transport technology eliminates the need for moving parts within the cold zone, reducing the risks of module error or failure.

As Abcam has expanded, additional units have been easily integrated to house an increasing reagent portfolio without affecting process flexibility.

During relocation, the compact modules were easily transferred to new laboratories across the Science Park, with minimum disruption to process efficiency.

Abcam, UK, has employed comPANION for sample storage and retrieval from two comPOUND stores to a central input and dispatch point. This allows valuable stock to be divided and distributed through multiple storage units for rapid access, or safety and backup.

“comPOUND’s small footprint enables us to keep our offices and logistics functions on prime real-estate, close to centres of excellence for life science research, enabling us to maintain our same day local delivery promise”

discussion

Abcam has continued to expand rapidly over the past 15 years. Now with stock holding sites in the US, UK, Japan & China, it supplies reagents to over 88 countries throughout the world. Abcam currently handles in excess of 100,000 reagents and stores over 220,000 tubes, enabling it to maintain a large range of high quality biologics. This company recognises the advantages of a secure, robust biobanking facility such as TTP Labtech's comPOUND modules. With fast cherry picking capabilities as a key feature, comPOUND has enabled Abcam to ensure fast sample delivery times to meet the deadlines expected by its customers.

Features such as comPOUND's high capacity, compact, expandable modular format, fast cherry picking capabilities, and its automated sample logging, placement and dispensing all help to ensure robustness, security and traceability. These features ensure easy incorporation of the storage modules into the laboratory workflow, increasing process efficiency. Integration with comPANION allows rapid transportation of samples from remote storage units to the processing laboratory. This replaces manual effort and tedium, ensuring fast delivery is maintained.