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

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introduction

In a large number of academic research centres and small pharmaceutical or 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 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 samples often requires scientists to spend lengthy periods of time handling samples in freezers or standing in cold storage rooms. Therefore the ability to automate sample dispensing and processing whilst ensuring robust sample labelling and tracking is invaluable, significantly reducing the effort and turn-around time of compound storage and retrieval.

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

This poster presents a case study where TTP Labtech's comPOUND biobanking storage modules have been 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 for high quality service to its customers.

We highlight 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 ensuring high quality customer service and support.

1. Abcam: a global antibody provider

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 in 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 small footprint biobanking facility to store valuable antibody stocks. This was to replace costly unreliable and high footprint traditional -20ºC and -80ºC laboratory freezers.

Abcam has continued to expand rapidly over the past 15 years. Now with stock holding sites in the US, UK , Japan and China, it supplies reagents to over 88 countries throughout the world. Abcam currently has 4 comPOUND modules across its US and UK distribution hubs, handling in excess of 100,000 reagents (including antibodies, proteins, peptides, lysates, assay kits and other biochemicals) and storing in excess of 220,000 tubes.

abcam®
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Figure 1. TTP Labtech's comPOUND storage units at Abcam in the UK

2. automated biobanking versus traditional freezer storage

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

The company recognises the advantages of a secure, robust biobanking facility such as TTP Labtech's comPOUND modules.

automated biobanking

- 2D bar coding with manual scanning
- High speed cherry picking of selected samples
- Automatically updated database
- Undisturbed storage environment ensuring sample integrity
- Space efficient design
- Remote sample delivery.

versus manual storage

- Manual sample labelling, storage and tracking increases risk of error
- Manual database management input open to error
- User subjected to unpleasant lengthy periods of time sorting and locating samples in cold zone and transportation of sample
- Risk to sample integrity due to partial thawing whilst freezer doors open
- Larger footprint, limited storage capacity.

"comPOUND is the key reason why Abcam is able to ensure fast delivery to their customers"

3. 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.

Vial type	Capacity
1.4 ml screwcap microtube	100,000
1.0 ml screwcap microtube	100,000
0.5 ml screwcap microtube	200,000

Figure 2. Number of tubes that can be stored in a single comPOUND unit

4. unrivalled cherry picking, sample processing and speed

With a focus on reliability and guaranteed next day delivery of reagents, it is vital for Abcam to rapidly retrieve selected products in order to maintain its good reputation. Using comPOUND, a single cherry picked sample can be delivered within 6 seconds. For larger orders, a rack of 96 samples can be dispensed in under 10 minutes.

As library requirements increase, additional comPOUND stores can be easily integrated and sample processing time is enhanced.

No of stores	Library size[1]	Hours/day	Throughput Tubes/hour
1	100,000	24	**2,500**
5	500,000	24	**30,000**
10	1,000,000	24	**60,000**
15	1,500,000	24	**90,000**
20	2,000,000	24	**120,000**

[1]Assuming 1.4 mL tubes. Doubles for 0.5 mL tubes

5. 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 grown, additional units have been easily integrated to house an increasing reagent portfolio without affecting process flexibility. The compact modules have been easily transported into new laboratories across the Science Park with minimum disruption to process efficiency.

Figure 3. TTP Labtech's comPANION linked to and controlling throughput of 2 neighbouring comPOUND modules

Abcam, UK, have found it easier to link sample storage and retrieval to a central point. Linking up to 4 comPOUND units to one comPANION means stock can be split and distributed within multiple storage units which can be accessed simultaneously. Splitting stock provides reassurance that samples are backed up in the rare event of a fault occurring.

conclusion

Abcam has implemented TTP Labtech's automated comPOUND stores, enabling it to maintain a large range of high quality biologics. With rapid cherry picking capabilities as a key feature, comPOUND has enabled the company to ensure fast sample delivery times to meet the supply and demand deadlines expected by its customers.

Features such as comPOUND's high capacity, low footprint, modular format; its fast cherry picking capabilities; and automated sample logging, placement and dispensing, all ensure easy integration into the laboratory workflow, thus increasing process efficiency and workflow speeds. Integrating comPOUND with comPANION or lab2lab allows rapid transportation of samples to the processing laboratory, easing the manual efforts and tedium of scientists whilst ensuring sample integrity and storage.