

Biostorage Trends 2010



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Executive Summary

- This market report summarizes the results of HTStec's global web-based benchmarking survey on biological sample storage carried out in July 2010.
- The study was initiated by HTStec to meet the specific needs, interests and focus of the survey sponsors. The objectives of the study were to comprehensively document current practices and preferences in biological sample storage and to understand future user requirements. Specifically the survey focused on the needs for deep-cooled (-20°C and below) automated biosample storage and the requirements of software systems used for biosample tracking and the wider LIMS application.
- Equal emphasis was given to soliciting opinion from academic & government laboratories; private & publicly-funded research organizations; and pharmaceutical & biotech companies. The majority of labs contacted were in North America and Europe.
- The survey looked at the following aspects of biostorage as practiced today (2010) and in some cases as predicted for the future (up to 2015): the primary storage temperature used, number of individual store(s) and whether any stores were automated; the main types of biological materials stored frozen; biological materials stored at room temperature; types of vessels (containers) used for frozen storage; store size; the temperature of samples when first added into frozen storage; the quantities of samples processed in and out of storage; routine storage and aliquoting strategy; whether sample preparation or processing was performed prior to thermal preservation or before they are delivered to end users; the maximum processing time; use of different types of software systems to track sample inventory and audit trail; features of software systems currently used for biostorage; features needed in a future software system for biostorage; familiarity with commercial software products for biostorage; requirements of a biostorage software system; whether particular software technologies are mandated; size of the team responsible for a biostorage facility; annual running costs and breakdowns of manual stores; the biggest limitations of manual storage; when the use of automation and commercial software becomes a necessity; functionalities needed in an automated biostorage facility; features of greatest importance when choosing an automated biostorage facility; throughput (cherry picking) requirements for automated biostorage; plans to purchase a new automated biostorage system or commercial software systems for biostorage; what is a reasonable cost of automated biostorage; keys factors which would stand in the way of implementing automated biostorage; purchasing plans respondents might consider to secure automated biostorage adoption; automated biostore manufacturer most associated with desirable attributes; and interest in outsourcing biosample management and storage.
- The survey questionnaire consisted of 31 mainly multi-choice questions. In addition, there were 7 questions related solely to survey demographics.
- The survey collected 66 responses (43 comprehensively & 23 partially filled out) from 59 different organizations.
- Survey responses were geographically split: 43% North America, 35% Europe, 11% Asia (excluding Japan), 8% Rest of World and 3% Japan.
- Survey respondents were drawn from persons or groups currently involved in biostorage, biobanking and/or biorespositories, and also those considering implementing biostorage automation.
- Respondents represented 22 Academic; 11 Other; 9 Hospital/Clinic; 6 Privately-Funded Research; 6 Commercial; 4 Pharmaceutical; 3 Government, 3 Biotech; and 2 Publicly-Funded Research Labs.
- The area of work of the majority (20%) of respondents was Population-Based Biobanking; this was followed by Other Areas (18%); Disease-Based Biobanking (15%), Biomarker Research (12%); Commercial Activities (11%); Clinical Research/Clinical Trials (9%); Pathology (8%); Genomic Research (3%); Routine Clinical Diagnostics (2%); and Environmental (2%).
- Most survey respondents had a senior job role or position which was in descending order: 12 Directors; 11 Project Managers; 8 Other Job Roles; 7 Professors/Assistant Professors; 7 Research Scientists; 6 Store/Laboratory Managers; 6 Department Heads; 3 Section/Group Leaders; 3 Presidents/Vice Presidents; 1 Post-Doc; and 1 Senior Scientist/Researcher.
- Survey results were expressed as an average of all survey respondents. In addition, some of the data was reanalyzed after sub-division into the following 5 survey groups: 1) Pharma, Biotech & Commercial; 2) Academic Laboratories; 3) Other Organizations; 4) Europe; and 5) North America.

- The primary storage temperature used by the majority of respondents was -80°C ; with a median of 6 to 10 individual stores or freezers at this temperature; with 76% of all stores manually operated.
- The biological material respondents were most interested in storing was blood (plasma/serum), DNA and tissues (unfixed/perfused), with -80°C as the preferred storage temperature. Most respondents were also storing formalin fixed paraffin impregnated (FFPE) tissue blocks at room temperature.
- 1.8mL cryovials were the containers respondents were most interested in storing at -80°C .
- The average size of stores today was a median of 10K to 100K containers at -80°C .
- Most samples stored at -80°C were already equilibrated at -80°C prior to thermal preservation.
- In terms of routine storage operations undertaken today most respondents processed very low numbers of samples i.e. <10 containers into storage per day and <10 containers out of storage per week. Most claimed to operate a storage/aliquoting strategy that involved multiple containers or mini aliquots intended for single use, with once only removal from store, and a single freeze-thaw.
- Most respondents perform sample preparation or processing manually prior to storage. The median max. processing time between sample collection, preparation and thermal preservation was 1.5h.
- Most respondents do not perform any sample preparation or processing after the samples are picked and delivered to end users.
- The software system most used to track sample inventory information today was a database system, created in-house.
- The feature of a biostorage software system most used today was tracking of the sample location.
- The features respondents must have in a future software system for biostorage facilities were tracking the sample location; tracking of audit trail; and management of sample dispatch & shipment.
- The commercial software product for managing biostorage that respondents had greatest familiarity with was Freezerworks.
- The database technologies, programming languages and web servers mandated by respondents for biostorage were reviewed.
- The size of the team responsible for an entire biostorage facility was a median of 5 FTE for manual stores versus 3 FTE for an automated system.
- The median annual running cost per manual freezer was \$500–\$1,000 per year, with 1 breakdown per year reported. Most respondents have an automatic alternative power supply for backup.
- Speed of access was ranked the biggest (major) limitation of storage in manual freezers.
- A median of 50K–100K samples was the threshold where biostorage automation becomes a necessity.
- A median of 25K–50K samples was the threshold where commercial software becomes a necessity.
- The functionalities rated most needed in an automated biostorage facility were a 2D barcode reader and 21CFR part 11 compliance.
- Reliability was ranked the feature of greatest importance when choosing an automated biostore.
- The median maximum throughputs required in an automated biostore were 250–500 containers/8h day into storage at -80°C , and 100–250 containers/8h day retrieved from storage at -80°C .
- Details of the budget plans of respondents considering purchasing a new automated biostore and separate purchases of software systems for manual or automated biostores are documented.
- Respondent's opinions on a reasonable price for an automated biostore were obtained.
- Funding the initial capital was ranked as the factor of greatest importance which would stand in respondent's way when justifying the implementation of an automated biostore.
- Most respondents were not interested in alternative purchasing plans for an automated biostore.
- Thermo Fisher was rated the automated store manufacturer most associated with a list of desirable attributes/characteristics.
- Only a small minority of respondents are considering outsourcing biosample management & storage.
- A bottom up model was developed to estimate the global market for automated -80°C biostores. Total sales were estimated to be around \$500 million spread over the next 5 years.
- A bottom up model was developed to estimate the global market for software database systems for biostores. Total sales were estimated to be around \$90 million spread over the next 5 years.
- The full report provides all the data, details of the breakdown of the responses for each question and some estimates for the future (2015). It also highlights several interesting differences between the survey groups.

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General Information on HTStec and HTStec's Trends Market Reports

- HTStec Limited an independent market research consultancy founded in September 2003 whose focus is on assisting clients delivering novel enabling platform technologies (liquid handling, laboratory automation, detection instrumentation and assay reagent technologies) to drug discovery. Over the past 7 years HTStec has published more than 50 market reports on drug discovery technologies and authored over 30 review articles in Drug Discovery World.
- HTStec's Trends reports owe their origins to the need by developers and vendors of new enabling technologies in drug discovery to get up-to-date relevant market metrics on which to base informed business decisions.
- Typically focused on a specific market niche or segment, in many cases overlooked or frequently misunderstood by broader market studies.
- Investigations are mainly initiated in response to a sponsor's specific requests.
- HTStec's extensive experience of the market, both as a Pharma End-User and working for a major Life Science Tool Provider ensures the industry relevance of the market research collected.
- Based entirely on web-based feedback from potential customers drawn mainly from Pharma and Biotechs, although increasingly University and Research Institute labs are also being researched.
- Produced extremely rapidly and typically published within 3 weeks of starting the collection phase.
- Reports are short, concise and focused on giving readers the basic data, analyzed in several different ways.
- Limited to reporting the main findings alone, without exhaustive discussion on the relevance of the results.
- Market estimates are mainly based on bottom-up calculations and usually avoid attempts to forecast widely beyond the next 2-3 years. Full details on the derivation of market estimates are given so readers can apply their own factors and easily make alternative estimates if they prefer.
- Owing to the sensitivity of some of the data collected, all reference to the origin of participating companies is removed, data is pooled to get an industry average and the anonymity of all respondents fully preserved and guaranteed.
- Critically HTStec's Trends reports have generated much interest and acclaim amongst survey respondents, to whom they are made available free of charge (subject to acceptance of HTStec's copyright terms) so they can benchmark their internal processes.
- Unlike alternatives HTStec's Market Surveys and Report are aimed at giving readers, information they want and can rely on, not information they don't need, cannot easily discern or is of dubious authenticity.
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