

SAMPLE HUB SERIES: PART 3

CENTRALIZED SAMPLE MANAGEMENT



**Minimize risk.
Reduce costs.
Improve sample quality.**



brookslifesciences.com

INTRODUCTION

A sample meets a specific research or clinical purpose and provides potential future value to the owner. It is vital for life sciences research, because it helps bring new treatments to patients across many therapeutic areas. However, a sample can only be used if the integrity has been protected through the cold chain, and the associated data can be linked directly to each individual sample. The ability to link important sample and subject metadata while managing appropriate restricted access is critical to enable future biomedical research from these samples.

Samples are also essential to generating robust, reproducible data. Biological variability is one of the biggest frustrations in medical research. Sample handling variability can be a root cause when sample preparation such as serum, plasma, cells, and tissue extraction is processed manually in batches – sometimes by different people in the lab. A strategy of sample consolidation that manages the lifecycle of each sample in the collection can address these issues and create noticeable efficiencies.

THE INDUSTRY-WIDE BIOBANKING PROBLEM

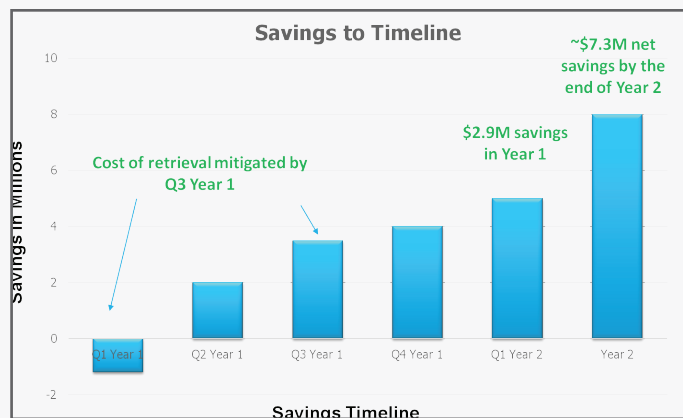
It's a resounding statement: "We have spiraling storage costs with multiple suppliers, slow retrieval times, and poor sample utilization. We work with several vendors with varying performance levels and have to search multiple systems to find samples that contain inconsistent data."

Minimize risk, reduce costs, and improve sample quality with a complete, integrated sample management solution by collecting, transporting, processing, and analyzing samples within one global and interconnected platform.

CASE STUDY: TOP 10 PHARMA CONSOLIDATING SHORT & LONG-TERM SAMPLES

Operational Improvements Gained

- Better utilization of samples for research
- 24-hour sample retrieval/shipment
- Increased data, sample quality and uniformity
- Pro-active, ongoing disposal optimizes inventory
- Control sample renewability
- Single informatics view into all samples
- Retain only the most valuable samples
- Vendor consolidation
- Batch processing, faster retesting or additional testing
- Customer focus on core competencies



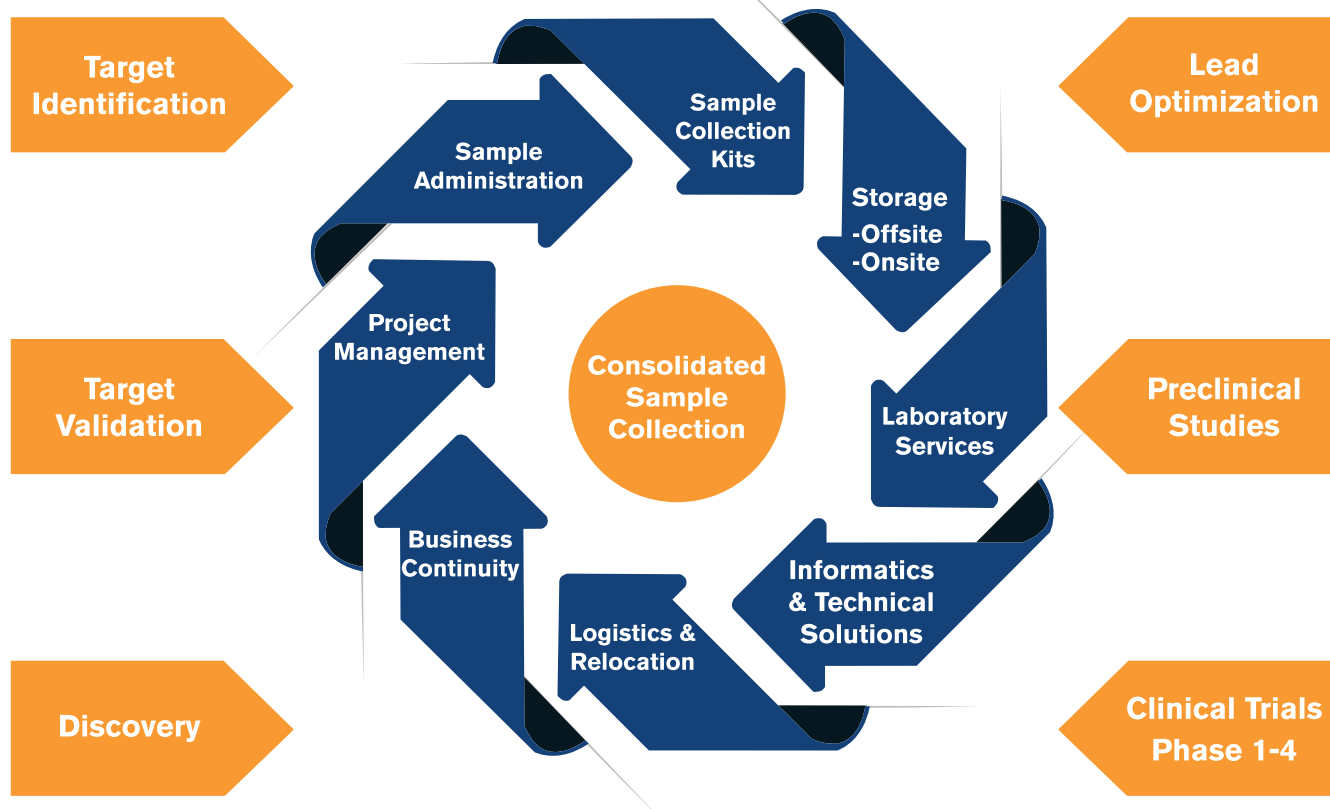
SAMPLE CONSOLIDATION

Collections of biological materials vary tremendously in size, scope, and quality of handling and storage conditions. Brooks Life Sciences manages the complete lifecycle of more than 200 types of biological samples and stores them in temperatures ranging from 27°C (room temperature) to -196°C (liquid nitrogen).

Our biorepositories around the world utilize state-of-the-art sample storage processes and technologies (including over 150 SOPs for sample management), the most powerful sample management technology system in the industry, along with global data virtualization solutions. Biorepositories in North America, Europe, and Asia-Pacific provide consistent processes to efficiently consolidate and optimize your sample assets.

Our people, processes and technology can also be contracted to support on site sample management at your facility to ensure the highest quality storage of samples at your research locations.

We think of it like this: A sample may be labelled with a barcode – but it will never be regarded as just a number.



CO-LOCATED LABORATORY SERVICES

Processing samples at a central location means you send only what is needed for an assay to the testing lab. This allows for better sample management of the aliquots not needed for that test. It also allows other aliquots to remain pristine, makes them rapidly accessible for additional tests, and protects chain-of-custody.

CAP, BAP, and GEN-accredited laboratories strategically located within our biorepository facilities enable time-critical results to be analyzed within rapid turnaround time frames. This efficient analysis service lets clients advance studies to the next phase much faster and clearly differentiates our biorepositories as centers of excellence.

Our diverse range of clinical and discovery bioprocessing services ensure the highest value of your sample assets is maximized throughout their lifecycle, anywhere in the research and development value-chain. Through strict adherence to globally consistent protocols established with industry best practices and regulatory mandates, Brooks Life Sciences helps research teams transform samples into renewable resources for future research.

Our highly trained sample management experts are certified to conduct sample preparation and analysis. We offer a full range of services to break down tissue, cell, and cell-free samples into precise matrix components like plasma, serum, PMBC, DNA, and RNA. Fully automated nucleic acid extraction services include isolating total RNA from liquid biopsies and cell-free DNA from fractionated blood samples. Platforms reduce processing time and improve consistency by eliminating manual steps. We also maintain sample integrity through automated liquid-handling with integrated barcode-scanning systems.

Our sample management experts aliquot samples for customers before shipping to reduce risk and expenses at once with fewer vendor relationships and sample movements in the supply chain. This allows our labs to easily verify the viability of any sample and provide an annotated sample/aliquot audit trail of purity, yield, and concentration. These services empower our customers to focus on their research goals, while our team of experts protect sample integrity and consistency.

CONSOLIDATING SAMPLE DATA

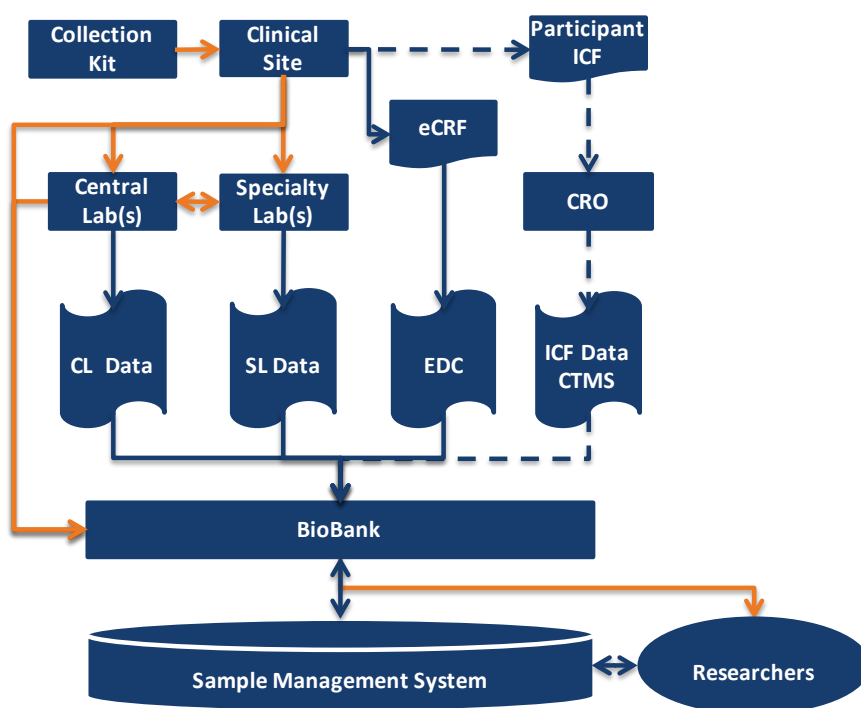
Cost, speed, and compliance efficiencies can be gained through physical sample consolidation, but the sample data required for future use can also be managed in a central location for full-sample collection visibility. Our focus on end-to-end sample management ensures sample integrity and supports physical and virtual data flows with services that can be used as decision-making tools for research professionals. It also confirms chain-of-condition, chain-of-identify and chain-of-custody for all samples. A combination of biobanking, laboratory services and informatics helps us give you the clinical data, sample data, and ethical permissions needed to use a sample.

- ✔ Streamlined Sample Processing: Track sample processing steps and data, such as creating a pre-defined number of aliquots from a single blood tube, DNA extraction, quantification, and normalization.
- ✔ Better Sample Sharing: Publish samples available for research applications. When an application is approved, the software records the complete chain-of-custody history for each sample dispatched.
- ✔ Data Integration: Integrate real-time sample data from processing work flows, instrument data capture, operational biobanking, donor consent, laboratory instruments, phenotypic patent-level, and clinical data.
- ✔ Project Management Flexibility: Each project or study has an owner and associated team with different roles and data access. Project teams can be grouped around a sample collection, a specific research area, or certain identified sample types or work flows.

VIRTUAL SAMPLE MANAGEMENT

A virtual repository compiles sample information received from each of your sites and labs then merges it into a single database. This is a powerful tool when combined with our physical sample consolidation services to protect sample integrity and provide full chain-of-custody, condition, and identity for managed samples.

The 21CFR Part 11 compliant platform records sample information at each stage of the lifecycle, resulting in a full picture of how a sample was collected, processed, and transferred. The system also includes a storage management audit trail to show which site or lab holds the sample, its location in our network of biorepositories, and how many times it has been in and out of the freezer.



- ✔ Locate actual sample and data accruals to protocol requirements.
- ✔ Track samples across multiple labs/institutions.
- ✔ Visualize sample assets.
- ✔ Executive dashboard and detailed project management reports.
- ✔ Account for and communicate across multiple vendors.
- ✔ See event schedule, patient enrollment, and progression at various levels (trial, site, event, sample type, participant).
- ✔ Track actuals to expected – enrollment rate, samples by visit, and within visit window.

Sample Flow →
Data Flow →



CONCLUSION

A central platform for cold-chain sample management, informatics, and laboratory services allows research professionals to focus on the objectives of their study – while a global partner reduces costs, improves operational efficiencies, and enables new treatments to reach the patient faster through effective sample lifecycle management.

Learn more about
[Sample Hub™ Integrated Lifecycle Management](#)
from Brooks Life Sciences.



Brooks Life Sciences, a division of Brooks Automation, (Nasdaq: BRKS) provides the life science industry with the most comprehensive portfolio of sample management solutions, enabling researchers worldwide to accelerate innovation and improve patient health. The company offers automated storage, cryopreservation, informatics, sample storage, lab services, transportation, consumables and instruments. Technologies and services span the entire cold chain supporting research, GMP, pre/clinical, cell therapy, and biologics. The top 20 biopharmaceutical providers and other leading companies rely on Brooks Life Sciences to advance research.

Automated
Storage Systems

Cryopreservation &
Cold Chain Solutions

Informatics &
Technical Solutions

Sample Storage,
Lab Services & Transport

Sample Consumables
& Instruments