

# The Cure for Your Biobanking Informatics Challenges

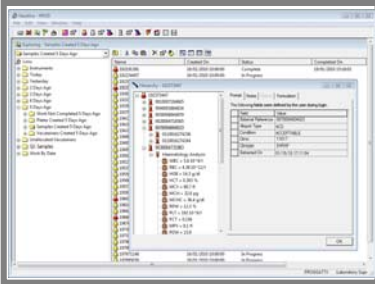
Todd Jones, Shawn Toffolo, S. Doug Holbrook, Mark Murawski, Kimberly Weldon, Tim Mitchell, Scott Savett, Don Crossett

## Introduction

Modern biobanks are facing enormous challenges as the need for collecting biological samples and providing access to researchers is increasing every day. And because biobanks store the precious biological materials that make medical and disease research possible, it is becoming more critical that the methods of storing and accessing this information not only become more efficient and cost effective, but also and foster collaboration and decision making.

Informatics Development and Implementation Services Group at Thermo Fisher Scientific have been working diligently over many years to provide biobanking and biorepository solutions that meet a wide variety of customer needs. Working with some of the world's most renowned biobanks, such as UKBiobank and HUNT Biobank, we have developed a wide array of expertise in our Biobanking module which allows our customers to get up to speed quickly, with the flexibility to meet individual requirements and business needs.

FIGURE 1. The Nautilus client interface can be configured to meet individual users needs. This example is taken from the UK Biobank. The "explorer" style interface is in the background. The hierarchy window on top depicts the entire data hierarchy for a participant visit.



## Biobanking Kit Features:

- ✓Configurable sample types and data hierarchies
- ✓Patented Workflow Process
- ✓Barcoding
- ✓Complex Sample Management and Storage
- ✓Chain of Custody
- ✓Request and Shipment Management
- ✓Consent Management
- ✓Instrument Integration and Automation
- ✓Extensive Plate Management
- ✓Unifying Analytical Data
- ✓Data Compliance and Security

## Benefits:

- ✓Ease of implementation with out-of-the-box functionality
- ✓Increased system ownership with ease of use and administration
- ✓Flexibility to meet changing needs.
- ✓Supportable and upgradable
- ✓Previous experience with high volumes and automation

FIGURE 2. This screenshot shows the ability to query samples, sort/select samples, and create sample requests via the web.

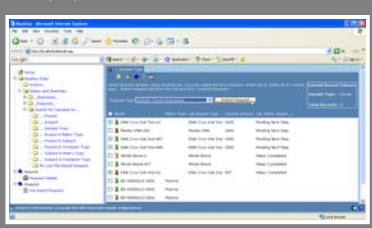
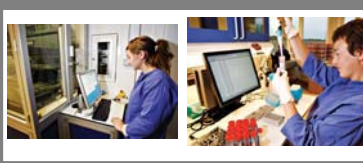


FIGURE 3. Hunt Biobank uses Thermo Scientific Nautilus LIMS



## Case Study – HUNT Biobank

The Nord-Trøndelag Health Study (HUNT) Biobank in Norway is one of the largest population-based health studies ever performed. Initiated to support epidemiological, clinical, and preventive medical research, HUNT Biobank provides insight into disease status and progression, particularly in relation to quality-of-life measures such as environment, education, and occupation.

Receiving an enormous volume of 5,000 samples per week, HUNT Biobank needed a data-management solution capable of delivering speed, efficiency, and simplicity in a single system. It was important that the system could interface with the laboratory's existing robotics, import files from the hospital laboratory, return results, and generate a feedback document for every participant.

The system was also required to provide clinical follow-up, data handling, and quality control following data collection, and then distribute coded data files to various research groups (Figure 3).

\*Microsoft Corp. selected Thermo Fisher Scientific and HUNT Research Centre and Biobank as winners of the 2009 *Microsoft Pharmaceutical and Life Sciences Innovation Awards*, honoring companies that have made the most innovative use of Microsoft-based solutions for breakthroughs in business processes and practices throughout the pharmaceutical and life sciences industry.

FIGURE 4. UK Biobank utilizes 1 mL Thermo Scientific Abgene tubes (left) linked to unique participant identifier numbers. These tubes are stored in a large automated freezer system (right).



## Case Study – UK Biobank

Another major medical research initiative, the UK Biobank in Manchester, England, stores answers to 200 lifestyle and medical questions and a total of up to 15 million individual blood and urine sample aliquots from 500,000 people. Additional follow-up questions will be asked over the next 20–30 years, providing researchers with the information they need to study the progression of illnesses such as cancer, heart disease, diabetes, and Alzheimer's disease.

UK Biobank needed a data-management system to track samples and their associated data. For each aliquot, the system had to store its parent, grandparent, rack bar code ID, rack position, store rack location, and aliquot contents (Figure 4).

In total, UK Biobank needed to obtain several hundred million data points within the underlying database. To appropriately archive the vast amount of data generated by UK Biobank, the solution needed to be part of an automated system that received samples, fractionated them into appropriate vessels for testing, analysis, and storage, and then tracked and stored all data relative to the sample. The system also needed to provide daily updates and management reports

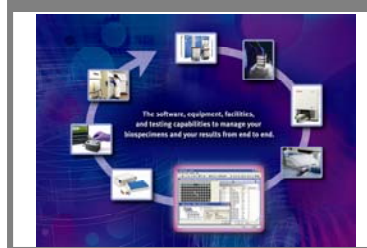
\* For a deeper look at this case study, please attend our joint oral presentation on Tues at 4:30 PM [Track: Partnerships: Use cases in Advancing the Vendor/Customer Relationship Presentation: The Cure for Your Biobanking Informatics Challenges](#)

Thermo Fisher Scientific Philadelphia, PA

## Turn-Key Biobanking

In addition to Nautilus LIMS, Thermo Fisher Scientific's turnkey biobanking offering includes even greater capabilities, tools, and experience for building, equipping and managing biobanks. The comprehensive portfolio also comprises centrifuges, concentrators, freezers, robotics, 2D barcode technology, microplate readers and mass spectrometers required by biobanking organizations for turn-key operations. Fisher BioServices currently manages more than 170,000,000 samples worldwide and was recently selected as the National Children's Study (NCS) biological and environmental sample repository partner.

FIGURE 5. Examples of Thermo Fisher Scientific's breadth of experience in biobanking and biorepositories... ability for turn-key biobanking



## Conclusion

Biobanking software comes in all shapes and sizes. The emergence of biobanking modules that facilitate the integration with Laboratory Information Management Systems (LIMS) can provide biobanks with the tools they need to manage sample login, tracking, and shipping as well as securely storing critical donor information. Furthermore, this information can be integrated with laboratory instruments, assay/test requests, and results capture and reporting.

Please visit [www.thermo.com/biobanking](http://www.thermo.com/biobanking) for more information