Case study: Implementing SLims in a leading Danish hospital in support of their routine NGS-based molecular diagnostic

SLims Added Values

- **SLims streamlines the order management**
  Initially, the laboratory staff from a partnering hospital registers the clinical samples in SLims, ordering the required test and proceeds to sample extraction. Once the samples are collected, typically blood, tubes are sent to the Aalborg University Hospital lab.

- **SLims ELN module helps scientists with an overview of all sequencing run information**
  Whatever molecular test is ordered, SLims can easily trace and record each and every event:
  - Define and version specific workflows to follow for each instrument and method used
  - Link samples to orders and data
  - Derive libraries
  - Provide a document repository for SOPs

- **SLims helps to streamline the sample workflows for the multiple tests performed by the laboratory personnel**
  While the ELN module helps to organize the sample and procedural information, the Order management module of SLims supports the scientist with the life-cycle of the order. Once samples arrive at the Aalborg University Hospital Lab they are registered using SLims' Content management module where they receive internal and external identifiers via barcodes. The Genohm Slims platform configures these barcodes through its labelling and printing templates to standardize the sample receiving and storing process.

  Next they process these samples in specific NGS workflows on either the Ion Torrent-PGM or Proton NGS. Samples are pooled into specific sequencing runs and interrogated for the presence of specific variants, which are verified using Sanger sequencing. The final results of the variant analysis, together with the diagnosis, are subsequently registered in a report and sent back to the ordering party.

- **SLims delivers the information needed to save lives**
  The complete life cycle of the orders are orchestrated in the SLims, allowing all parties involved to keep an overview of the status of the samples being processed. The SLims platform integrates all of the data allowing for a clean transition of both samples and data handoff between collection and analysis teams. In this way, SLims helps link patient samples to results and reports in a seamless way to ensure a diagnosis is facilitated in time.

Background

Located in northern Jutland, the University Hospital of Aalborg is the largest hospital in North Denmark, serving a population of more than 640,000 people. Thanks to significant governmental investments, the hospital infrastructure has developed into a nationally, and internationally renowned site delivering quality diagnostics services.

As part of the improvements the Department of Molecular Diagnostics has developed NGS-based techniques and protocols for patient sample analysis. NGS techniques are now used to diagnose targeted diseases such as breast, ovarian, and colorectal cancers, the familial TAAD syndrome, hereditary deafness. Pathogens and viruses such as Hepatitis B and C are targeted as well as non-invasive prenatal testing (NIPT) is currently being performed.

Today the infrastructure of the majority of the hospital departments are at the cutting edge of health, science and technology standards.
Client Need

The Department of Molecular Diagnostics collaborates with hospitals in Denmark, Sweden and Norway receiving orders to analyze patients' samples for genetic variants within specific genes and regions of interest.

In order to handle the large volume of information associated with such an undertaking the Department of Molecular Diagnostics required a flexible system capable of managing large numbers of patient and sample analysis data associated with the following:

- Accepting and organizing test orders from both internal and external sources
- Interfacing with electronic records to facilitate the collection and organization of data according to family relations
- Collecting and managing information associated with routine genomics workflows.
- Providing a resource for secure sample storage and tracking in the lab

Therefore, the University Hospital at Aalborg sought out a professional solution that offered the flexibility and technological breadth to support their needs.

SLims Solution

Genohm has developed SLims, a laboratory informatics software that integrates LIMS + ELN features. This solution has been selected to manage the NGS activities of the Department of Molecular Diagnostics of the University Hospital of Aalborg.

SLims’ LIMS + ELN features support Aalborg University Hospital in the following ways:

- The content management module helps to track samples coming from different hospitals linking patients to samples, protocols and results
- The order management module helps registering, scheduling, and validation of received orders
- It provides real-time updates of sample orders and status containing every data point linked to it and its derivatives
- The ELN module helps track patient projects by linking together all of the pertinent information required by the lab (e.g. SOPs, results, etc.)
- The workflow module allows a global view of the NGS workflows providing a real-time view of the samples processing at each step

About Genohm

Genohm is a Swiss company with offices in Lausanne (Switzerland), Ghent (Belgium) and in Durham, NC (USA). The company has developed SLims, a laboratory software automation suite. SLims provides laboratories with one integrated LIMS + ELN environment that tracks data and samples from the original sample shipment down to the result from lab machines and in-silico analysis pipelines. It fully accommodates the needs of any research lab, NGS lab, service facility, Biobank or QC lab.

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“SLims is the perfect Lab Companion for your NGS Lab”