AIT Bioscience

Automated Processes for Sample Accessioning and Data Scrubbing

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Purpose

One of the most frustrating, time-consuming aspects of sample analysis is checking the samples received and verifying the sample's correct identifiers (e.g. subject number, time point). Sufficient documentation of verification and subsequent correction in Watson LIMS (Thermo Scientific) is a critical component of sample analysis, but often is lacking. AIT Bioscience has developed automated, fully-electronic processes for checking in samples, verification of sample identifiers from the clinic, and correction of the identifiers in Watson LIMS. Each step is documented and audit trails are maintained throughout the process.

Methods

Shipments of samples are individually logged into AIT's electronic laboratory notebook (ELN), based on a customization of the IDBS E-Workbook.. Each box is opened, the contents are inspected, and the study/analyte/matrix are confirmed. The shipment is then registered under that study in an ELN Sample Accessioning workflow. Samples corresponding with those on the inventory sheet are selected from the study design in Watson. A file of identifiers for those samples is generated in Watson and imported into ELN. The analyst then accessions the samples by scanning the barcode on the sample label, which pulls up the corresponding study design information in ELN. The analyst compares the sample label with the ELN information and the inventory manifest, and then completes a questionnaire regarding discrepancies, noting whether verification from the clinic is needed, whether editing of the study design is needed, and/or if a remark about the sample is to be added.

Based on the questionnaire answers, sample information is moved to one of two ELN tables: 1) "Verified Sample Identifiers" and 2) "Discrepancies for Clinic Verification". The Principal Investigator (PI) exports the Discrepancies table and sends it to the clinic for confirmation (e.g. by checking the CRF), The clinic completes the "Clinic Response" column in the spreadsheet and returns the file. The PI attaches a copy of the spreadsheet to ELN, imports the spreadsheet into the "Reportable Identifiers" table in ELN, and designates the reportable information. The sample information is automatically added to the "Verified Sample Identifiers" table, with Remarks loaded into the Sample User Text 1 field in the table. If Watson editing is marked as required in the "Reportable Identifiers" table, the Accepted Correction field is loaded into the Comments field of the "Verified Sample Identifiers" spreadsheet. This spreadsheet is then manually imported back into Watson. The PI manually edits the Watson study design to be consistent with the Comments, and releases the samples for analysis. QC verification of Watson edits is documented in ELN.

Conclusions

Using automated capabilities of ELN and linking them with Watson LIMS, a process has been developed to significantly decrease the laborious effort required for sample ID verification, to increase the speed of sample accessioning and cleanup, and to greatly improve documentation of corrections every step along the way. The net result is cleaner data, better documentation, and faster turnaround of sample analysis and final reports. All records regarding the receipt and accessioning of samples and corrections are maintained in ELN with an audit trail, e-signatures, fully searchable fields and hyperlinked references.

Results

Shipment Box

Samples

Inventory

Sample Questionnaire

Identifiers from Watson

Watson Study Design Information

Verified Sample Identifiers

Import into Watson & Edit Study Design

Discrepancies for Clinic Verification

Clinic Corrections

Reportable Identifiers