caLIMS2: a next generation cancer Laboratory Information Management System designed for caBIG® Interoperability

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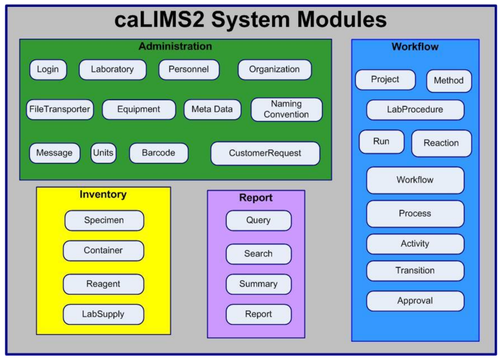
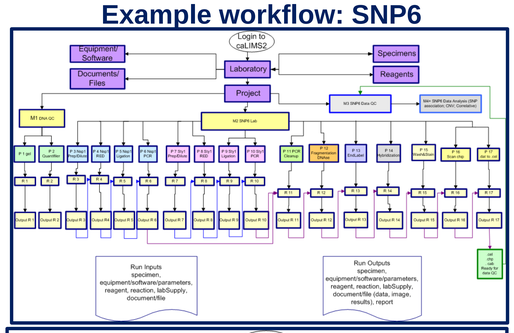
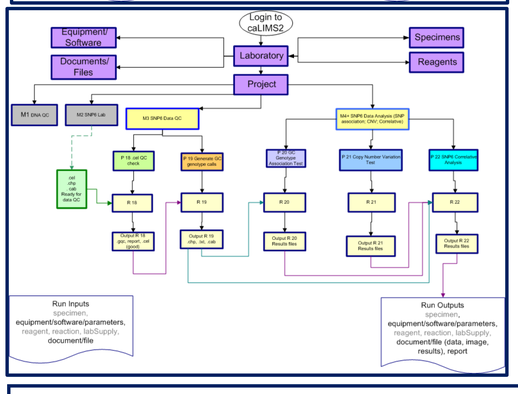
Background

caLIMS2 is a web-based Laboratory Information Management System designed according to CBIIT/caBIG® principles to support Life Sciences research laboratories and core facilities. caLIMS2 completes the caBIG® bench to bed model by bridging the gap between biospecimen repositories, data repositories and analysis tools. The application is designed to allow easy customization by users and to facilitate integration with laboratory equipment, analytical tools and data sources. caLIMS2 will help further translational cancer research through the organization of laboratory workflow, tracking of specimens, acquisition of laboratory data and metadata, and the appropriate sharing and dissemination of the data to support subsequent analyses.



Example workflow: SNP6





Features of caLIMS2

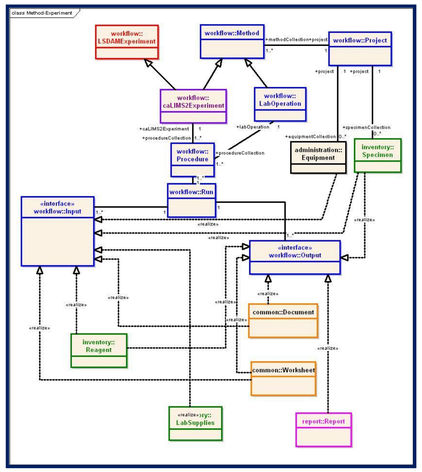
- Open source, consortium-based development
- caBIG® integration
- Security management via CSM/UPT and/or GAARDS
- Generic Experiment model - supports multiple lab domains (genomics, proteomics, nanomaterial, *etc.*)
- Platform and database independence
- Customizable UI layer
- Laboratory Workflow management – import/export standard workflows using Experiment Method Service
- FileTransporter module – import/export files
- Support for research laboratories and core facilities
- Not cancer specific – supports other disease research

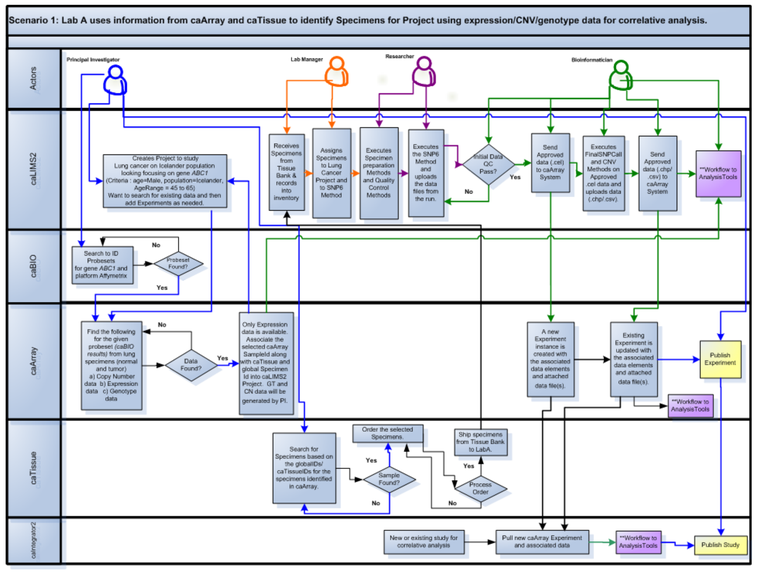
Equipment Service

- Registration of equipment type – manufacturer, model, associated software (operating, firmware, collection, data management/analysis)
- Definition of user defined input parameters
- Functional platforms supported and their expected Input(s), Output(s), and Parameters
- Contact person(s)
- Query Equipment (standard and advanced)

Experiment Method Service

- Create Experiment Method by
- Defining Method and Procedure(s)
- Defining expected Input(s), Parameter(s), and Output(s)
- Assigning Contact person AND/OR
- Reference to associated Equipment service
- Query Experiment (standard and advanced)



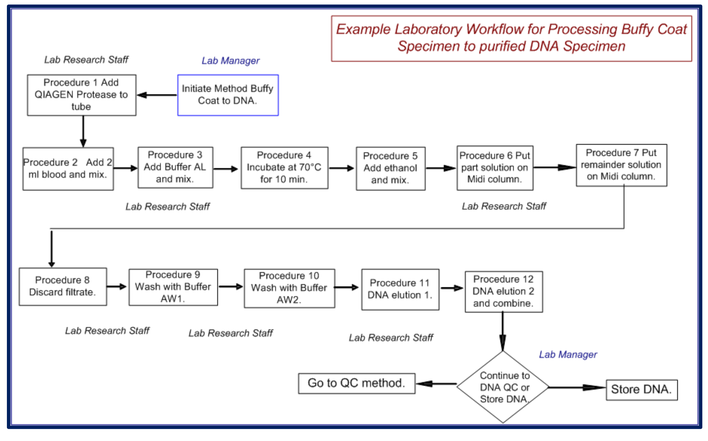


Use Case for Integrating caLIMS2 with caBIG® Services and Applications

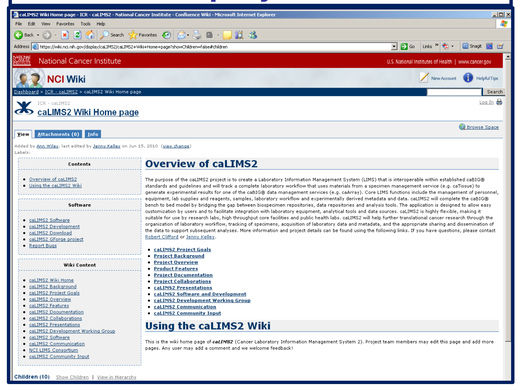
- A Principal Investigator wants to participate in a collaborative study involving the relationship of gene *ABC1* and lung cancer susceptibility in men age 45 – 65. The PI is particularly interested in a population from Iceland.
- PI plans to use multiple data types (copy number, genotype, gene expression) in a new form of correlative analysis and wants to take advantage of existing data and specimen resources.
- PI obtains appropriate tissue specimens by searching caTissue and contacting Biorepository.
- PI obtains pre-existing gene expression data from caArray and generates new genotype and copy number data in her laboratory.
- PI programmatically submits final data to the caArray repository.
- PI publishes paper and makes caArray data available to public.

Current Status

- Use Case design phase completed
- Object Model design for 1.0 completed, approved, and registered in caDSR
- Construction phase I in progress (includes Administration module use cases)
- Incremental releases due: Q2/2010 (admin); Q4/2010 (inventory and report); Q1/2011 (workflow)
- Beta 1.0 release: Q1 2011
- (Beta 0.5M1.1 release: Java APIs/web app – available)



caLIMS2 project wiki site



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