

What's New in GeneLab

Release 3.0

October 1, 2018

Analysis Platform

GeneLab presents a new feature to the GLDS, the Analysis Platform. The [Analysis Platform](#), powered by [Galaxy](#), allows users to analyze –omics data hosted in the GeneLab repository or user uploaded data. Within this platform, users can import, export, share and analyze RNA-Seq datasets.

Within this platform, GeneLab has generated processed data using a standard RNA-Seq pipeline that was derived by the scientific community. The GeneLab processed data is complete through Differential Gene Expression and includes data products from all intermediate steps for GLDS RNA-Seq datasets that are hosted in the repository. These data products can be found in the Analysis Platform under Shared Data > Data Libraries > GeneLab Processed Data.

New Account Registration

GeneLab has incorporated a single sign-on system for all user accounts. Users only need to create one account, which can be used to log on to both the Collaborative Workspace and the Analysis Platform. Users can log in using a Google ID or NASA credentials.

Environmental Data

In addition to extensive metadata for each Experiment, GeneLab has added a new section to capture environmental data, specifically radiation dosimetry readings from spaceflight experiments. A complete table and description of these data can be found under the menu option 'Environmental Data' from both the GeneLab [home page](#) and [data repository](#). Specific radiation dosimetry measurements are also captured in the sample table for GLDS spaceflight datasets found in the repository.

Export metadata from the Repository

Users can now export desired fields from the sample and assay(s) tables with selected datasets. Using the Select Export Column button, users select columns of interest and click Export to csv. A csv file will be downloaded to the user's local computer.

Release 2.0

September 29, 2017

GeneLab introduces new features and enhancements to further extend the capabilities of the GeneLab Data Systems (GLDS) platform. In addition to new features, GeneLab has added user manuals covering how to use and navigate: the GeneLab Data System, the GeneLab configured ISAcreeator tool, and the data submission process. The new data submission process will allow PI's or submitters to receive a GLDS # and link pre-publication.

New features in this release include enhanced search, data federation, new metadata tabbed user interfaces, data visualization dashboard, and a collaborative workspace.

New search capabilities

- Google-like, full text search (e.g., boolean, wildcards, string literals, etc.)
- Customizable search ranking & relevancy software algorithms
- Frequently used words and terms auto-correct spelling lookup feature
- Filter search on GeneLab database using key fields, such as Project Type, Factors, Organisms, and Assay Types

Data federation

GeneLab has integrated, commonly termed as data federation, with multiple heterogeneous external databases. Users can search across multiple databases, including GeneLab.

GeneLab is currently federated with:

- [The National Institutes of Health \(NIH\) Gene Expression Omnibus \(GEO\)](#)
- [The European Bioinformatics Institute \(EBI\) Proteomics Identification \(PRIDE\)](#)
- [The Argonne National Laboratory \(ANL\) Metagenomics Rapid Annotations using Subsystems Technology \(MG-RAST\)](#)

Data Visualization

The Data Visualization Dashboard provides a visual display of GeneLab data sets associated by Organism(s) and Assay type(s). Links are highlighted by clicking on the nodes: Organisms, GLDS Numbers and/or Assay Types.

New Tabbed Metadata User Interfaces (UI)

GeneLab uses the [ISAcreeator tool](#) to define an experimental study and store the metadata. Using the ISATAB configuration, study metadata is now viewable by a customized multiple tabbed user interface. Click on each tab to navigate through the different sections: *Description*, *Protocols*, *Sample and Assay Tables*, *Publications* and *Study Files*. To view metadata and download data files, visit the [GeneLab Data Repository](#).

Collaborative Workspace

Leveraging off the [GenomeSpace](#) platform, GeneLab has customized a workspace for file sharing and access to data analysis tools. To access the workspace, first-time users will need to create an account.

Key capabilities:

- Share data and results with collaborators
- Import other publicly available data sources using convenient “Import from URL” feature
- Drag & drop files and documents from your desktop computer to workspace folders
- User and Group defined security access controls with Private, Shared, and Public folders
- View and navigate between GeneLab data listing and workspace environment
- Default 30 GB quota of storage space per user. Additional storage space can be requested to GeneLab team.

Tools Integration with Collaborative Workspace

As the first set of many tools to come, GeneLab has integrated convenient data synchronization capabilities between the latest open-sourced Java-based ISAcreeator version 1.7.10 desktop tool and GeneLab collaborative workspace for initial streamlining data curation and processing operations.

Other data analysis integration effort is ongoing as additional analysis tools will be available in future releases.

Integrated Search and Federation APIs

GeneLab provides a RESTful Application Programming Interface (API) to its full-text searches, which provides the same functionality available through the GeneLab website. The API provides a choice of standardized web output formats, such as JavaScript Object Notation (JSON) or Hyper Text Markup Language (HTML), for the search results.