# A Guide to Open-Source Laboratory Information Systems (LIMS)

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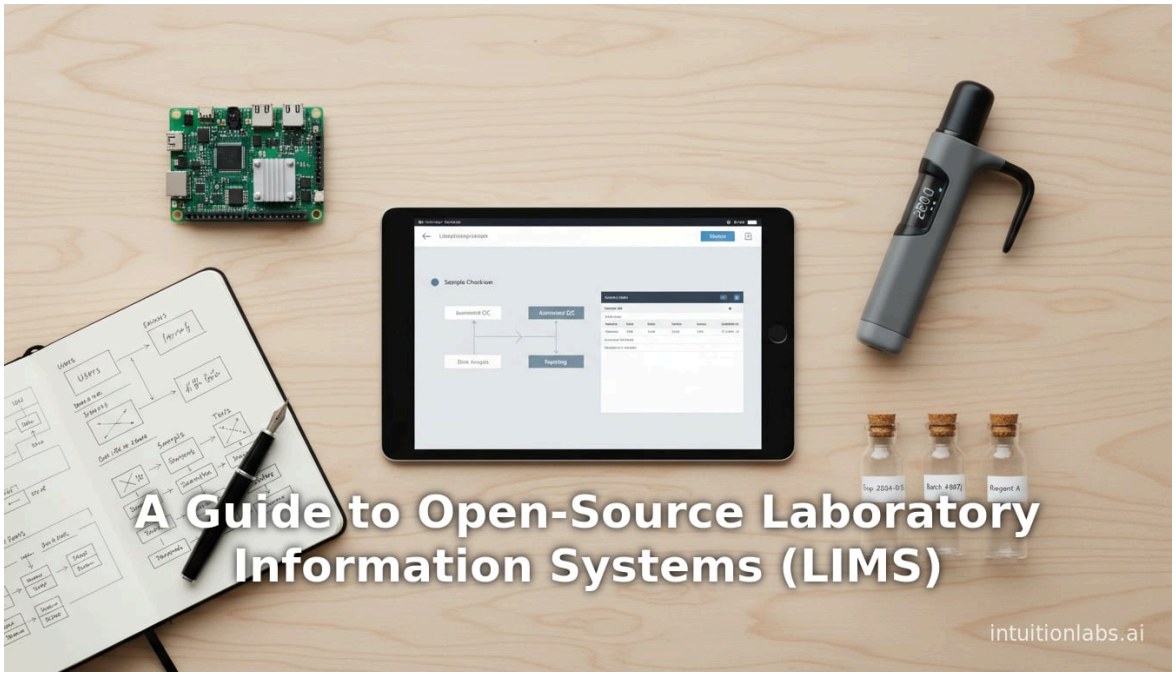

# Open-Source LIMS: A Comprehensive Index

Laboratory Information Management Systems (LIMS) are applications that track samples, experiments, inventory and workflows in research and clinical labs. Open-source LIMS are distributed under free licenses, so their source code can be freely inspected, modified and shared ( medevel.com). This makes them highly customizable and cost-effective alternatives to proprietary systems. In the list below we catalog many notable open-source LIMS (often noting their license or platform) with brief descriptions and references.

- **Bika LIMS** (GPL, Python/Plone) – One of the earliest and most widely adopted open LIMS, originally released in 2002 ( medevel.com). Bika LIMS is a web-based system (built on Plone) with specialized variants for different domains (e.g. water testing, cannabis, food safety). It supports sample tracking, instrument integration, reporting, and large-scale deployment ( medevel.com).
- **Senaite LIMS** (GPL, Python/Plone) – A modern fork/evolution of Bika LIMS for enterprise use. Senaite is built on the Plone framework and provides a modular, extendable LIMS with RESTful APIs ( medevel.com). It is actively developed and supports clinical and research labs that need robust workflow and billing features.
- **OpenLIMS** (GPLv3, PHP/MySQL) – A generic web-based LIMS originally released circa 2010 ( medevel.com). It provides project management, sample tracking and extensions support, but has not been updated since the mid-2010s ( medevel.com). OpenLIMS saw wide adoption early on, but today its codebase is effectively archived.
- **eLabFTW** (AGPL, PHP/MySQL) – An open-source electronic lab notebook and general-purpose LIMS ( medevel.com). eLabFTW emphasizes ease of installation, a responsive UI, and built-in features for experiment tracking, inventory, scheduling and authentication. It is community-supported and frequently updated ( medevel.com).
- **MetaLIMS** (GPLv3, PHP/MySQL) – A simple LIMS for small genomic labs, originally created for metagenomic data. MetaLIMS provides basic sample inventory, project management and reporting. It is open-source, but maintenance has lapsed in recent years ( medevel.com) ( medevel.com).
- **Clover LIMS** (GPL, PHP/MySQL) – A web-based LIMS designed for biological laboratories, with an emphasis on plant biology. Clover includes modules for experiment management, sample inventory, user roles and reporting ( medevel.com). It remains GPL-licensed, though its code base requires older PHP.
- **Baobab LIMS** (GPLv2, Python/Plone) – A biobank-oriented LIMS for managing human biospecimens. Baobab provides specimen tracking and metadata capture from receipt

through re-use, with a flexible module system for developers ( medevel.com). It is actively maintained and widely used by research biobanks.

- **ERPNext (Healthcare/Lab module)** (GPLv3, Python) – An open-source ERP suite with a healthcare app that includes lab management. ERPNext's laboratory module integrates sample tracking and test workflows with inventory, CRM and hospital information ( medevel.com). (While not a standalone LIMS, it is freely available and used by some labs.)
- **GNU LIMS (Occhiolino)** (GPL, Python) – An extension of the GNU Health hospital platform, GNU LIMS (also called *Occhiolino*) is a cross-platform LIMS for clinical labs ( medevel.com). It covers full lab workflows including patient/specimen records, billing, stock management and reporting. It integrates with GNU Health's HIS/EHR system for end-to-end healthcare lab support.
- **C4G BLIS (Basic LIMS)** (GPL, PHP/MySQL) – An open LIMS developed by the Concept Foundation (often used in public health contexts). BLIS provides patient and specimen tracking, test result entry and basic reporting ( medevel.com). Although releases stalled around 2016, its code remains available under GPL for labs needing a simple LIMS.
- **OpenELIS** (open-source public health LIMS) – A web-based, open-source laboratory system initially for HIV/TB testing labs. OpenELIS is backed by a global foundation and is deployed in many countries ( medevel.com). It tracks samples through testing and reporting, and is actively maintained by its community.
- **OpenSpecimen (Krishagni)** (open-source, PostgreSQL/Java) – A biobanking LIMS used worldwide (100+ biobanks) that is "open source" in that the code is publicly available ( www.openspecimen.org). It is highly configurable for various study protocols, supports multiple collections and provides REST APIs for integration ( www.openspecimen.org). (Note: Krishagni also offers paid versions and support.)
- **LabKey Server** (Apache 2.0, Java) – An open-source data management platform with LIMS-like capabilities. LabKey provides specimen management, assay data integration and reporting for research labs ( bmcbioinformatics.biomedcentral.com). It is written in Java and .Net, and its builds/releases are freely downloadable (source under Apache 2.0) ( bmcbioinformatics.biomedcentral.com). Many large consortia (e.g. HIV research networks) use LabKey to coordinate data.
- **OpenClinica** (LGPLv2.1+, Java) – A widely used clinical trials/data management system that is open-source (the Community Edition under LGPL) ( www.openclinica.com). Though it is primarily geared to managing patient study data (EDC/CDMS), it includes specimen and site tracking features. OpenClinica can be adapted by laboratories that need a clinical LIMS.
- **HalX LIMS** (GPLv2, Java) – A crystallography/structural-biology LIMS from 2005. HalX is a GPL-licensed labbook/LIMS for high-throughput structure determination experiments ( sourceforge.net). It tracks the entire pipeline from sample cloning to data collection. (While no longer under active development, the source code is freely available from SourceForge ( sourceforge.net).)

- **openBIS** (open source, Java/Groovy) – A flexible framework for managing complex biological data, developed at ETH Zurich. openBIS provides experiment/sample tracking, metadata management and data warehousing, particularly for sequencing and imaging data. Its code resides in ETH's SIS repository under an open license ( unlimited.ethz.ch). (Users can download it or a virtual appliance from the openBIS site.)
- **Pangu LIMS** – A genomic-data LIMS on GitHub (PHP/MySQL). Pangu is a web-based system for managing, analyzing and visualizing sequencing/genomic experiments ( medevel.com). It offers tools for data organization and quality control specific to bioinformatics workflows. (See GitHub and docs.) ( medevel.com)
- **ViperLIMS** – A Python-based LIMS for evolving laboratory teams. ViperLIMS is designed to be user-friendly and highly extensible via Python and a visual "Boa" front-end ( medevel.com). It supports custom client scripts and modular GUI components to adapt to changing lab processes ( medevel.com). (Source on GitHub.)
- **Drops LIMS** – An open LIMS for clinical laboratories. Drops provides tools to manage patient orders, test results and billing in a clinical context ( medevel.com). It includes features like organized test catalogs, doctor/prescriber databases, report generation and financial reporting ( medevel.com). (Its code is on GitHub under an open license ( medevel.com).)
- **MISO** – The **MI**crosystem **S**equencing **O**peration Manager, an open-source LIMS for sequencing centers ( medevel.com). MISO (GPLv3) is tailored to next-generation sequencing (NGS) labs, with a modular design that integrates with various sequencing instruments. It handles sample submission, run tracking and data management in large genomics facilities ( medevel.com).
- **gP2S** – A web-based LIMS for cryo-electron microscopy (cryo-EM) labs ( medevel.com). gP2S lets multi-user, multi-project cryo-EM facilities record microscopes, samples and protocols. It offers a REST API for integration and is designed to eventually automate data entry from instruments ( medevel.com). The project is on GitHub and open for contributions.
- **LImBuS** – An open biobank management system (GPL) from Aberystwyth University. LImBuS (Living Biobank System) tracks biospecimens in large collections, with features like sample lifecycle audit, hierarchy of storage, barcodes, and REST APIs ( medevel.com). Its name stands for *Living ImBuS*, and the (GPL) source code is on GitHub ( medevel.com).
- **Lab Manager** – A lightweight LIMS for clinical molecular laboratories. This web-based system (Node.js/Express, GPL) helps lab managers organize and retrieve sequencing results and related data ( medevel.com). It provides a results workflow and user management, and the source code is on GitHub ( medevel.com).
- **Open-LIMS (SourceForge)** – A biologist's project management suite released via SourceForge ( medevel.com). Although named "Open-LIMS", it functions more broadly: managing projects, samples and data for biological research ( medevel.com). Labs can use it to plan studies, track sample processing and store results. (The older SourceForge project is GPL, but development appears inactive.)

- **iSkyLIMS** – A GPL-licensed LIMS for genomic facilities, focusing on massive sequencing workflows ( medevel.com). iSkyLIMS streamlines the workflow from library prep through data generation, reducing errors and bridging wet-lab and dry-lab operations ( medevel.com). (Available on GitHub.)
- **NEMO** – A laboratory logistics and resource management system (MIT license) developed by NIST ( medevel.com). NEMO is a web app that makes it easy to reserve and schedule lab equipment, control user access, and track maintenance. Its open-source code (on GitHub) helps labs coordinate instruments and training with transparency ( medevel.com).
- **Sequencescape** – An open LIMS originally from the Wellcome Sanger Institute (GPL). Sequencescape is a scalable LIMS for high-throughput sequencing workflows ( medevel.com). It tracks work orders, manages studies/samples and integrates with accounting. The code and documentation are publicly available for genomics and bioinformatics labs ( medevel.com).
- **Aquarium Lab Operating System** – A Ruby-on-Rails "lab OS" for protocol design and execution (GPLv3). Aquarium allows researchers to define experimental protocols programmatically, manage inventory and automate tracking ( medevel.com). It provides a graphical workflow designer and touchscreen interface so techs can follow steps exactly. (Developed at UW BioFAB; GitHub source ( medevel.com).)
- **UniVersaLIS** – A .NET-based LIS for clinical labs (open-source under the new Apache 2.0 license). Universal LIS supports ASTM/CLSI interfaces (e.g. Siemens instruments) in hospital labs ( medevel.com). It was originally built for integration with Siemens IMMULITE analyzers and now handles sample accessioning, results management and instrument interfaces ( medevel.com).
- **Biobank** – The *CBSR Biobank* application (GPL/EPL) from Canada's BioSamples Repository ( medevel.com). This Java LIMS is designed for biospecimen repositories, letting nurses and techs register and track specimens, patients and shipments ( medevel.com). It supports multi-user access, audit trails and customizable workflows. (The source is on GitHub ( medevel.com).)
- **Biobank Web App (v4)** – A rewrite of the above Biobank system in modern web architecture (Domain-Driven Design, GPL). Biobank v4 modularizes the older desktop app into microservices and web UIs, improving usability for large biobank projects ( medevel.com). Its source is also open on GitHub.
- **labrat** – A Python framework for lab management (active development on GitHub) ( medevel.com). Labrat enhances reproducibility and planning in labs by providing tools for solution calculations, inventory management, project setup and data backup. It is currently under development, but the code and documentation are openly available ( medevel.com).

Each of the above systems is distributed with an open-source license (as indicated) and has public documentation or code. This list is not exhaustive, but it covers the most widely known open-source LIMS projects, from classic systems like Bika/Senaite to newer community-driven

tools. Microbial, genomics, clinical and general research labs can choose among these free platforms to meet their needs, with the ability to inspect and customize the code ( medevel.com) ( medevel.com).

**Sources:** Descriptions above are compiled from project websites, documentation, and reviews ( medevel.com) ( medevel.com) ( www.openclinica.com) ( bmcbioinformatics.biomedcentral.com) ( medevel.com) ( medevel.com) ( medevel.com) ( medevel.com) (see citations for details). Each cited source confirms the open-source status and features of the LIMS listed.

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