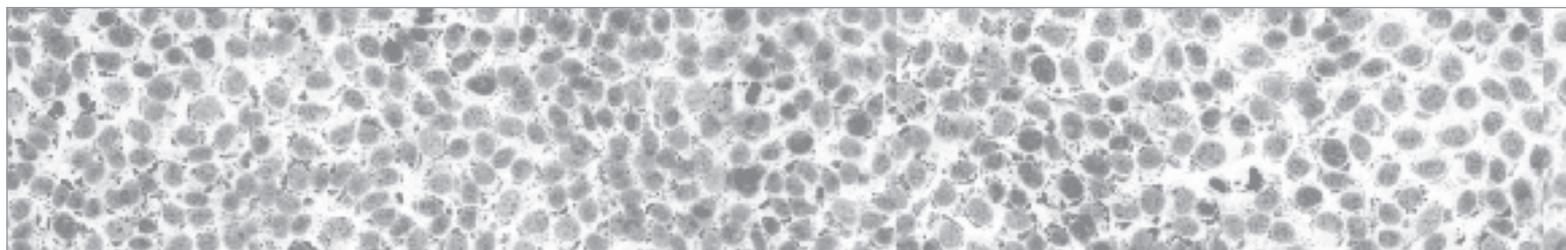




Genedata Imagence™

Image Management for Biological Research

Images have always been of paramount importance in biological research. With the automation of biological imaging, e.g. in High Content Screening (HCS), the number of images being captured has multiplied by several orders of magnitude. They all need to be analyzed, stored, and re-accessed in the research process. Diversity of imagers and image formats, massive amounts of image data, and varying analysis paths and software packages often make consistent management of and easy access to specific images prohibitive. Genedata Imagence is a solution that addresses these challenges. It smoothly integrates with existing components and streamlines the entire image life cycle, from raw images to analysis results, annotation, classification, browsing, searching, retrieval, and archiving of images and associated data sets. Combining openBIS with Genedata's process-specific customizations and extensive experience and know-how, Genedata Imagence lets you focus on analysis and outcome instead of administration and maintenance of all your images.



Store

Images are a great source of information, but require time and storage space to manage. The variety of instruments and image analysis software packages further increases the complexity of managing this high-volume data. Genedata Imagence stores all images, meta and master data, and image analysis results on a single platform, independent of instrument or analysis software.

The platform includes openBIS, built by the ETH Zurich, and easily scales with increasing amount and complexity of data, while keeping costs low. In addition, the system provides fast downstream access by providing appropriate image thumbnails and optimizing storage.

Access

With both automated and manual annotations and a logical structure for organizing data sets, searching always leads to finding. An intuitive web interface lets you reach every stored image from anywhere in the organization, and APIs connect to downstream solutions. Images, sample data, intermediate results, and plates are tagged with process-specific keywords. Permanent links point to the original data at all times, providing easy access.

Through this underlying structure, results can be linked back to the original images, extensive searching and filtering options are available, and different analyses performed on the same image set are logically grouped. This means that you will always find all data associated with an image set and the images for your data.

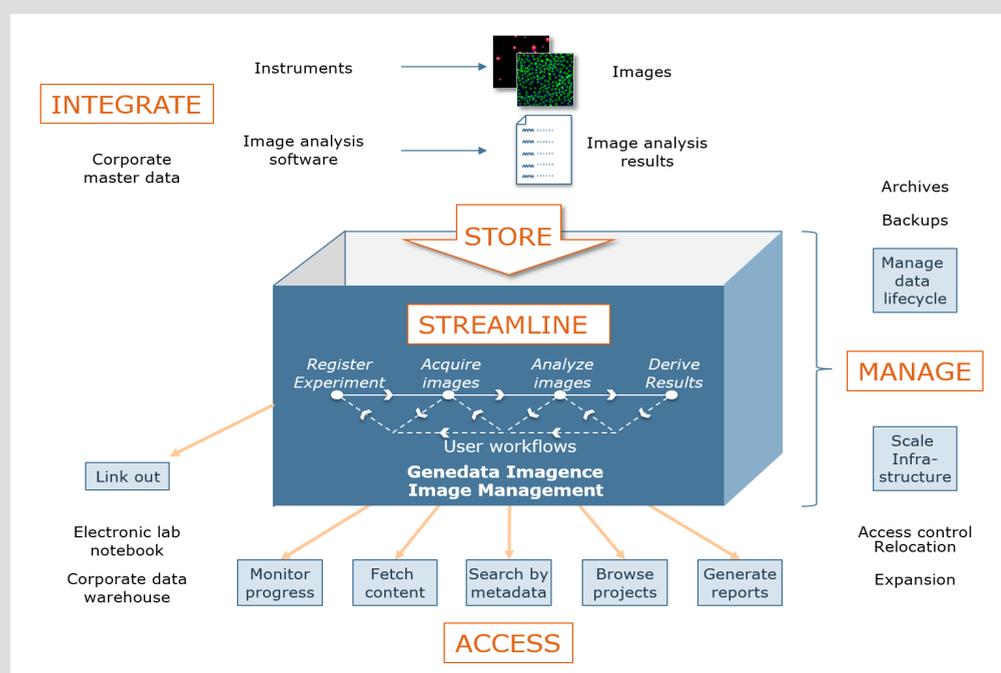
Integrate

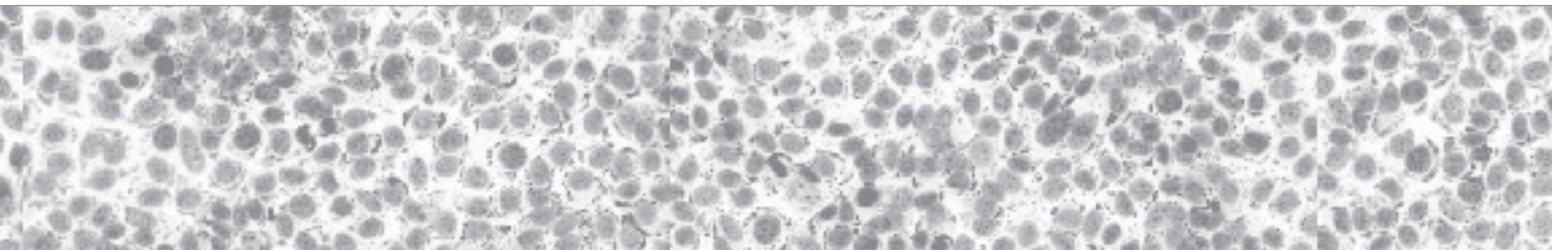
Genedata Imagence integrates with all major high content imagers and their image analysis software solutions. Data import is manual or fully automated, striking a balance between control of the workflow and efficiency and consistency. The platform can also automatically retrieve additional information such as master data, compound mapping, and assay information from your systems, providing one authoritative source for all image-based workflows.

Genedata Imagence also seamlessly integrates with any Genedata Screener® installation you have, e.g. for HCS or cross-assay profiling.

Key Functionality

(FIG. 1) With openBIS, Genedata Imagence provides a complete image management solution compatible with all open image formats in the industry. The solution stores images and image analysis results independently of originating instrument or image analysis software. The data can be annotated manually or automatically on import, resulting in streamlined and documented user workflows. A Web-based User Interface and stable APIs provide access to the system. In addition, several core features for system administration simplify maintenance and keep overhead low.





Manage

Authentication and authorization through Genedata Imagence provide controlled access by users and user groups within your organization, making sure that data is accessible only to those who need it.

Life-cycle management of image data is made easy and convenient. Data sets can be archived automatically with defined business rules or manually via a few clicks in the web interface. Full-resolution images can be moved to an archive location (e.g., a slower hard drive or tape) and thumbnails are kept for quick view by scientists. Recovery of full-resolution images from the archive is equally fast and convenient

Streamline

A proper management solution does not only consist of software. With Genedata Imagence, our experts help you set up, configure, and optimize your entire image management workflow, from import of raw data to querying by downstream tools and finally, archiving.

With more than a decade of experience, our project portfolio contains optimization of existing HCS workflows, consulting to create a multi-instrument platform, and implementation of new, complex workflows from specification to end user testing.

Solution of Choice

The world's top pharma and contract research organizations (CROs) rely on Genedata Screener for streamlined workflows. With Genedata Imagence, Genedata complements existing offerings with a solution for streamlined management of all image-related workflows within your organization.

Industry experts on handling really large datasets, Genedata offers enterprise software solutions that drive cost efficiencies and increase productivity.

With an open and scalable platform combined with excellent support and know-how, you will always be able to improve your throughput in an ever broader range of assays.

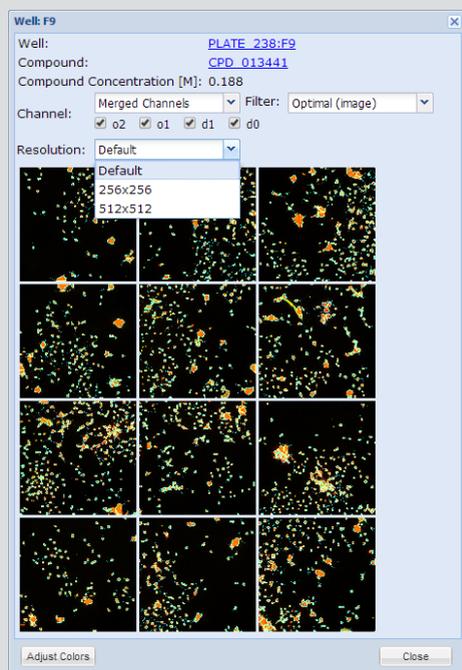
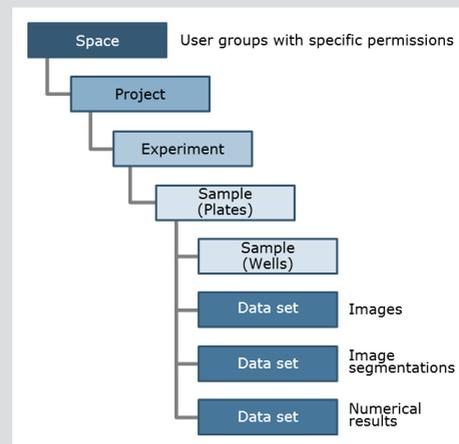


Image and meta data access via the Web UI

(FIG. 2, LEFT) The Well Window of openBIS shows all images taken for a particular well in an HCS campaign. Here, 12 fields were acquired in two different channels (nucleus and cell membrane, d0 and d1). The image analysis software generated two contour overlays (one for each channel, o1 and o2). Thumbnails were automatically generated in two different resolutions upon import. Additional meta data was linked to this sample, such as the test compound and its concentration. The interface contains additional visualization options such as Filters for contrast stretching and Adjust Colors for tailoring the view of all images. The images can also be accessed programmatically via stable APIs.

Hierarchical data structure

(FIG. 3, RIGHT) In openBIS, data is organized in a hierarchical structure where each level can be annotated independent of the others. At the level of Spaces, access and permission control is assigned to each user or user group, and several Projects and Experiments can co-exist in each Space. Each Experiment groups several Samples (e.g. microtiter plates), which, depending on the assay type, can include Samples of their own (e.g. wells). Data Sets (e.g. images, image segmentations, and numerical results) are linked to their originating Sample. This structure provides an assay type-independent grouping of results and facilitates browsing and searching.



Genedata Imagenge™

Genedata Imagenge modernizes imaging research by integrating and automizing imaging workflows in every step. It provides efficient image search capabilities and global access, handles most image and related formats such as video or 3D-models, is scalable up to "big data" volumes, and enables seamless collaboration with internal and external partners. Validating the link between the image and its results and meta data, Imagenge helps to meet regulatory guidelines and prevent loss of data.

Genedata Screener®

Genedata Screener captures, visualizes, and manages data from high, medium and low throughput screens performed with a range of technologies on a wide array of instruments, including High Content Screening (HCS), HT-Flow, ion channel screening, and biophysical screening (including SPR and thermal shift). The software's screening-oriented business logic enables rapid processing and comprehensive analysis of complete campaigns, regardless of the number of plates or read-outs.

Services and Support

Genedata offers a range of services and support, from scientific or IT consulting and image analysis services to installation and customization of Imagenge solutions and global roll-out support and training, all tailored to the specific needs of your organization. Our services team consists of highly skilled professionals with extensive domain knowledge in image-based research and software technology, bringing specialized know-how and experience to your organization.

Experienced Partner

With nearly two decades of experience in enterprise solutions for biological research, and several years of experience in research-specific image management, Genedata is an ideal collaboration partner for companies wanting to modernize their support for image-based research. In addition to powerful software solutions, Genedata offers extensive opportunities for custom or co-development of specific new functionalities, procedures, or methodologies to support your current and future needs.

Next Steps

For a conversation about your image management or image-based research needs or to schedule a live demonstration, please contact us at imagenge@genedata.com.



Genedata Imagenge™ is part of the Genedata portfolio of advanced software solutions that serve the evolving needs of drug discovery, industrial biotechnology, and other life sciences.

Basel | Boston | Munich | San Francisco | Tokyo
www.genedata.com | imagenge@genedata.com

© 2015 Genedata AG. All rights reserved. Genedata Imagenge and Genedata Screener are trademarks of Genedata AG. All other product and service names mentioned are the trademarks of their respective companies. 09S15

