



# Database

## LUCIA Cytogenetics

### Complex data storage

The database server stores the following data:

- Patient, examination, and image data.
- Case reports, summary reports and report templates.
- Information about slides and cell/metaphase coordinates within one slide.
- User settings such as history, classifiers and other.

### No size limits

The number of records stored in the database is virtually unlimited so there is no need to „archive“ the old data. All the data is always fully accessible and can be easily searched for using our filter tool.

### SQL - Reliable and stable platform

The database system is based on a widely accepted third party SQL database server.

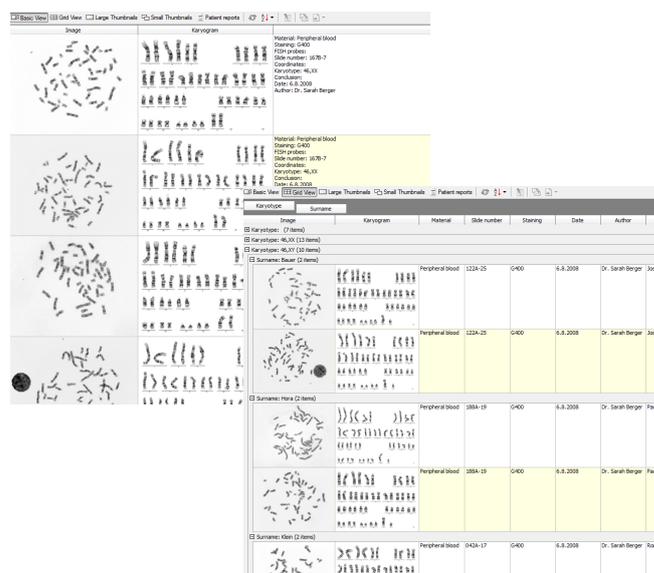
### Flexible database structure

Inspired by usual laboratory usage, there are three types of database records: patient, examination, and image records.

### A record consists of multiple fields.

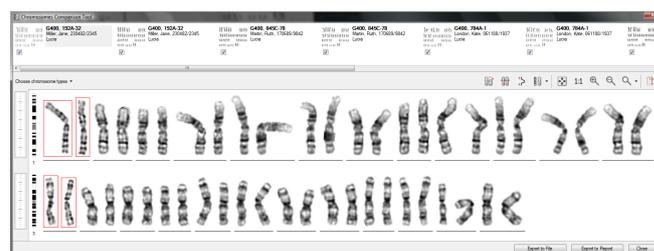
The field properties can be adjusted in order to improve the workflow and ensure the data correctness:

- The „display“ fields are used as representatives - in the database browser etc.
- The „unique“ fields prevent the records from undesirable duplication.
- The „required“ fields must be filled before the record is saved.
- A data type is assigned to each field preventing mistakes – for example „date“ fields accept valid dates only.
- You can let the system fill a field automatically e.g. insert the karyotype, the current date etc.
- Enumeration fields allow users to pick one of the pre-defined values (e.g. insurance codes).



### Tools

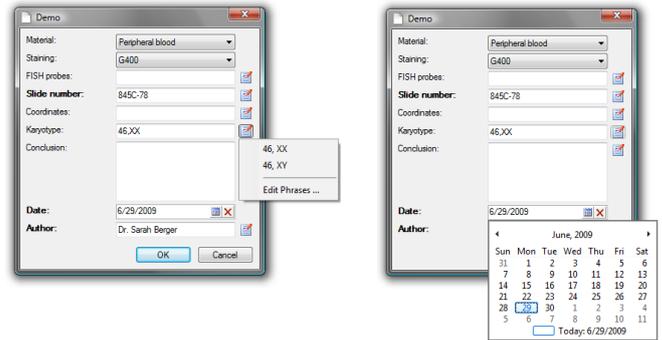
- The database browser offers:
  - » various view layouts
  - » tabular view optimized for cytogeneticist's nature
  - » variable-sized image thumbnails
  - » a grid view allowing data grouping and simple statistics
- Fast data sorting is performed on the database server with full regional-customization support.
- Complex, yet simple to use data filter.
- The LUCIA report tool is fully integrated with the database. The in-database storage of reports and report templates, the direct database-to-report data insertion and other useful features are included.
- The advanced statistics tool enables complex studies to be done easily and efficiently.
- The chromosome comparison tool.



The chromosome comparison tool

## Efficient workflow, access control

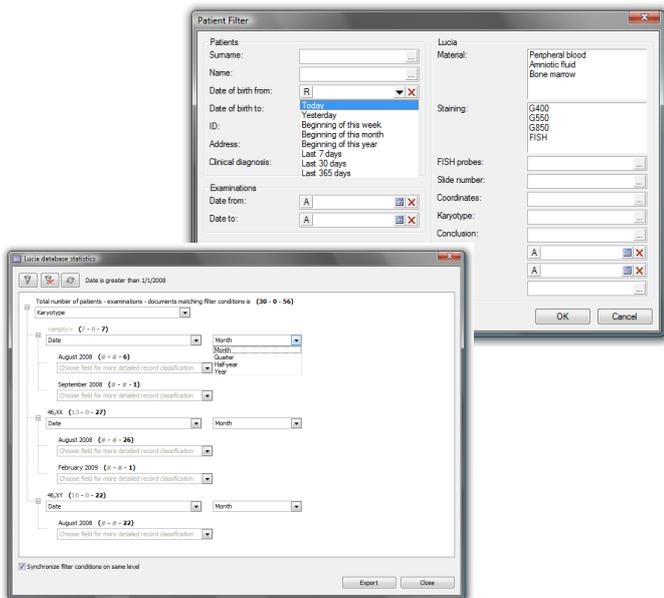
- The access to the data can be controlled on different levels - database, record, field.
- The user who creates a database record becomes its owner. The owner has privileged rights to the record until a supervisor – a user with stronger user rights - takes it over and locks it for other users. However, the role of the supervisor can be omitted so that each user master his own records.
- Concurrent access to the data is resolved by the database server. Each record is locked for others while it is being used. All record changes are registered to a log file.



## Architecture

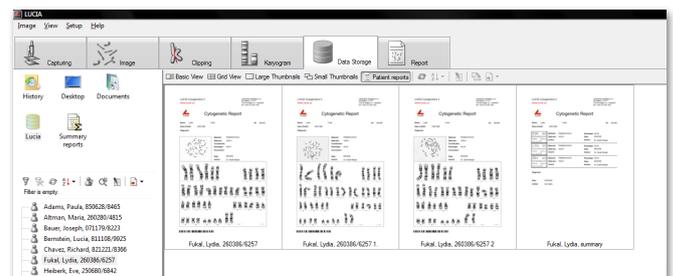
Lucia Cytogenetics Database uses a client-server architecture. For small and simple installations, both the client and the server software runs on the same PC. However, the server can run on a standalone computer dedicated only to this purpose.

- The server software manages all data produced by clients.
- The server software guarantees data integrity and security.
- All maintenance tasks (back-ups etc.) are easier with the server.
- If the standalone server computer is supplied, its components along with the installed operating system are selected very carefully in order to provide stable and fast performance.
- Client computers access the server software via network.
- A local area network (LAN) for in-house data sharing.
- A fully secured internet connection for remote access via internet.



## Easy data maintenance and security

- The LUCIA database provides a fully automated back-up system. Logging, remote reporting and remote monitoring is included.
- The database network communication is encrypted using SSL to increase the data security.



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