
Biolmg Storage Server

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מכון ויצמן למדע
WEIZMANN INSTITUTE OF SCIENCE

Biolmg Overview

Central repository for raw imaging data that provide service for all core facilities at the Weizmann Institute

Data is copied automatically without conversion from all imaging resources

Users can **document, search, access** and **share** data from anywhere on campus

The BioImaging Community at WIS

Distributed and Diverse facilities

- Diverse imaging techniques
- Distributed imaging facilities
- Many Instrument's administrators
- Diverse image visualization and analysis tools

Common Problems

- Hard to find data
- Data storage on the instruments got full quickly
- Use of Disk-on-keys \Rightarrow Computer Viruses
- Data duplication on many computers

Biolmg Objectives

To Improve **storage and retrieval of data** from existing imaging infrastructure at the core service, departmental facilities and individual research lab level.

To set up an **annotation interface**, to add metadata, enabling **organized and effective searching and retrieving**, and improved management of infrastructure and data.

Biolmg is not a backup system.

Main Features

- Central repository for raw Imaging data.
- Data is copied automatically from all connected instruments and users – No user initiation is needed
- Data is saved as is - No file conversion is applied
- Data is organized on *BioImg* by Instruments, users, and experiments
- Users can document, search, access and share data from anywhere on campus.
- Use your favorite visualization and analysis tools - No built-in Analysis tools.
- Analyzed data is not saved on *BioImg*
- Authentication is done by the institute's LDAP system
- Data is automatically shared with the PI
- Data can be shared with people out of campus using http-based service

Biolmg Statistics

- ~60 instruments
 - Core facilities, Departmental Microscopes, Lab microscopes
 - MRI, CT, Electron Microscopy, light microscopy, Digital Histology, FACS
- 1000+ users
- Data: 233TB (out of 544TB) + Mirror
- Over 5 years

What *Bioimg* offers to users ?

Simplicity: single interface and access for all equipment

Access: anywhere over network, inside and outside WIS

Privacy: protected access to own data

Sharing: shared access to experiments and projects

Export: send experiments over email

Documentation: save notes with the data

Search: locate data by user, notes and date

Personalization: own preferences tailor Bioimg behavior

Awareness: email notification on availability of new data

Actualization: data copied up to 8 times a day

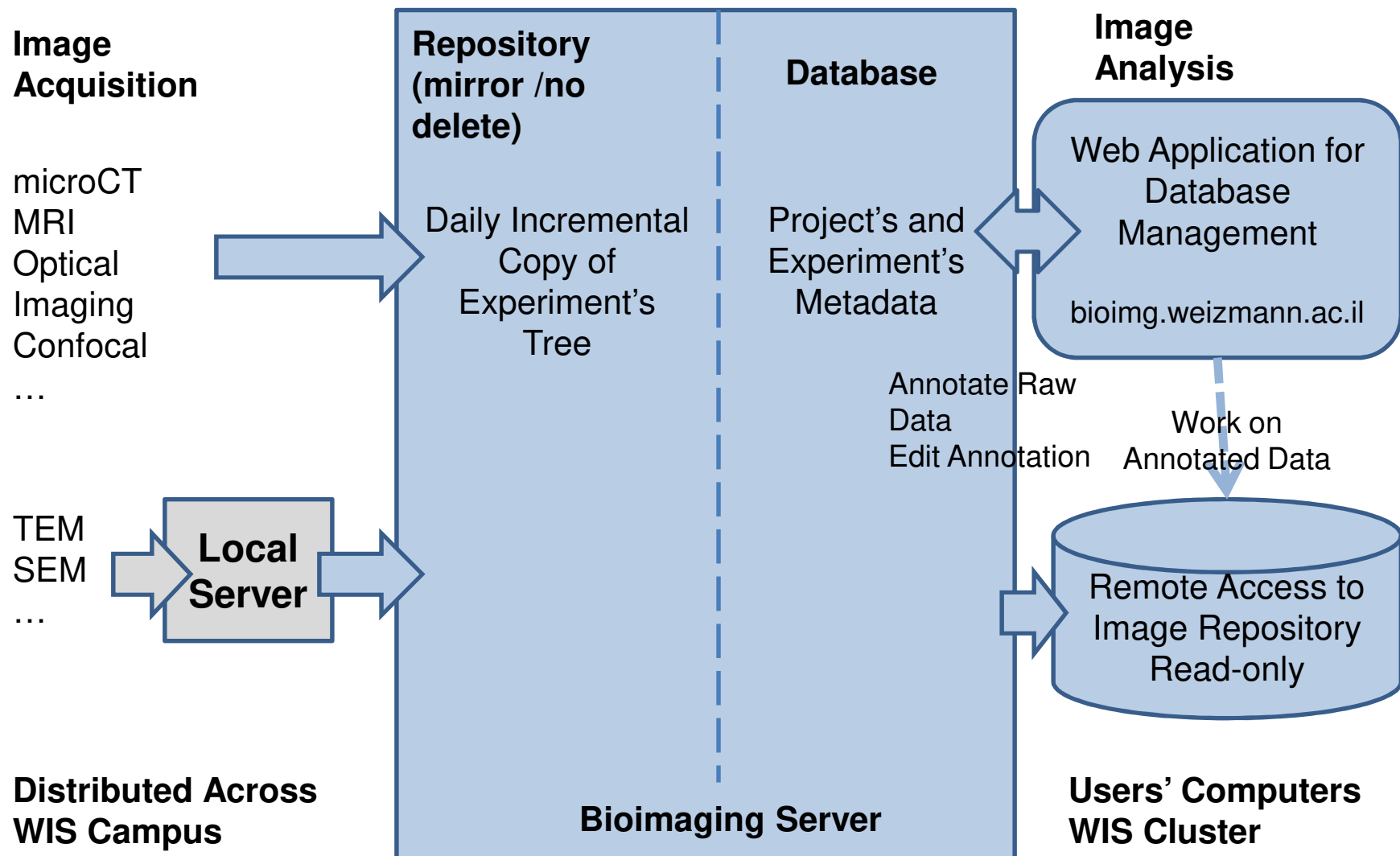
Organization: PIs have access to all their group data

But ...

Analyzed data not included

Data is not archived, Bioimg is not a backup system

Biolmg Structure



Data Organization and Access

- Data is stored by Instruments, Users and experiment
- Each experiment is a folder that can contain any type of files or sub-folders
- Main entity is experiment, experiments are logically organized by Projects
- Logical links to data are created from user folder
- Data Access by mounting the private user folder
- User's view:
 - Choose to organize by Project or Instrument
 - Choose which experiments to show, others are hidden
 - Search experiments by: Date, Project, Textual documentation
- Access, Search and Annotations at the experiment level
- User's folders are read only

Quick Start for Users

At the microscope

- How to store data at the microscope ?

Data Annotation through the website

- Assign the experiment to a project (must)
- Add Notes (optional, highly recommended)

Data Access

- Mount your virtual disk on your personal computer
- Share with other users in WIS
- Send by mail to other users

Storing Data on the Microscope

- Keep the data in the BioImg folder under your folder
D:\DATA_ON_BIOIMG\userid
- Data should be saved in sub-folders.
- Experiment = folder under the userid folder
- Don't save single data files in the userid directories
- Keep the folder structure as flat as possible.
- Rule of thumb: **create a new folder whenever you start a new page in you lab notebook.**
- Use meaningful names: Cond_Date
D:\DATA_ON_BIOIMG\ofrag\20140105_Demo_Exp

Storing Data on the Microscope

- Allowed characters in folders/files names are:
A-Z a-z 0-9 _-.
- Don't use special characters in folder names, ie:
' , " ! @ # \$ % ^ & ? () [] { } < > * + = \
- Don't change folder/file name
- Store only raw files and not processed data.
- You can put short text file with description (readme.txt)

What about old data ?

- Organize the Old data in the new format: folder per experiment
- Use “Move” and not “Copy” to preserve the original dates and to save space

Quick Start for Users

At the microscope

- How to store data at the microscope ?

Data Annotation through the website

- Assign the experiment to a project (must)
- Add Notes (optional, highly recommended)

Data Access

- Mount your virtual disk on your personal computer
- Share with other users in WIS
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Experiments and Projects

- ***Experiment*** is a **directory** of image files, taken at a certain time, with a certain instrument, **located at the highest level in the userid folder**.
- Each ***Experiment*** is assigned to a ***Project***.
- A project can have many experiments, from one or more instruments.
- Add notes at the Experiment and the Project level (*Annotation*).
- Search data by Experiment and Project name/notes/date
- Access data at the experiment level.
- An Experiment can have sub directories but annotation is NOT possible at the sub directories level.

Quick Start for Users

At the microscope

- How to store data at the microscope?
- Ask microscope Administrator.

Data Annotation through the website

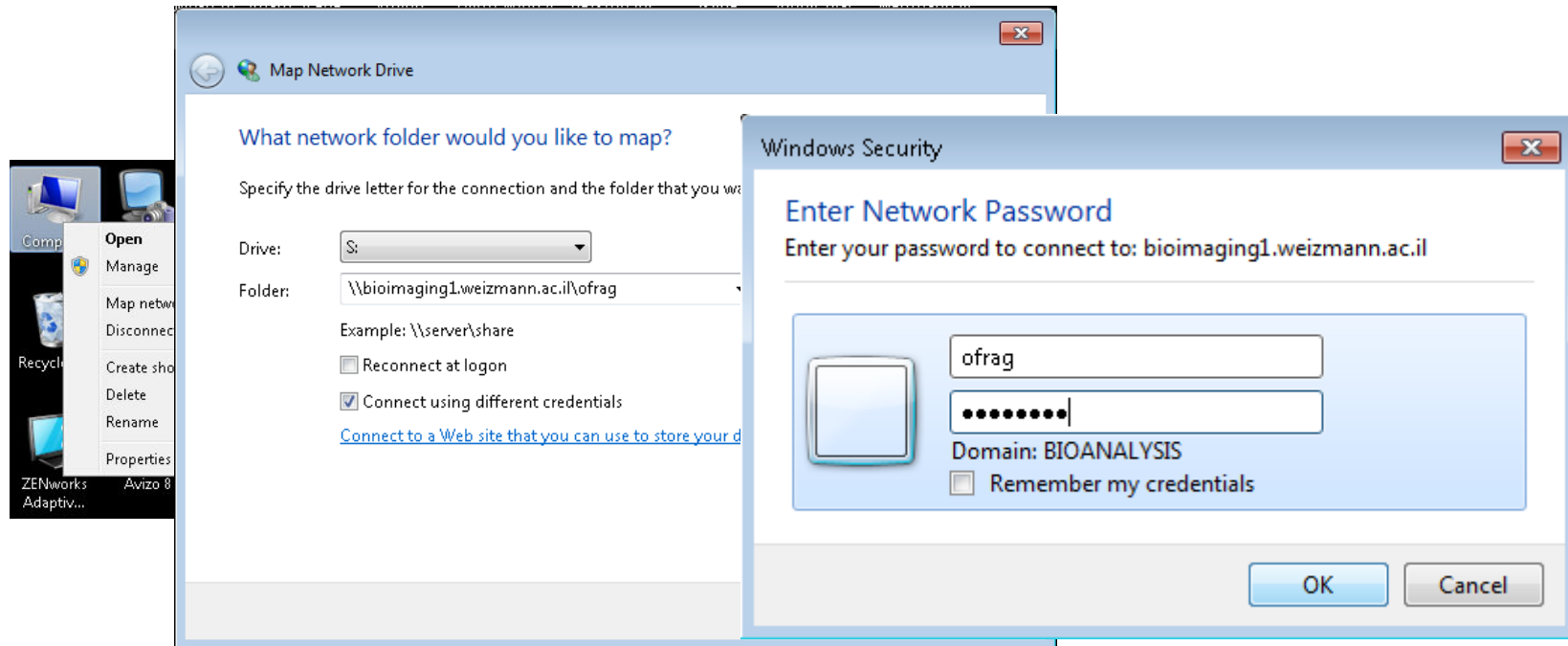
- Assign the experiment to a project (must)
- Add Notes (optional, highly recommended)

Data Access

- Mount your virtual disk on your personal computer
- Share with other users in WIS
- Send by mail to other users

Connect your Virtual Disk

PCs: use *Map Network Drive*



Default password is 'YourUserid1'
Change it using the *Preference* page on the website

Mac: use *Connect to Server*

Control your Virtual Disk

- Show / Hide data using 'Work on annotated data'
- Control organization using 'Preferences'

The screenshot shows the BioIng user interface. On the left is a sidebar with the BioIng logo and a user profile for Ofra Golani, showing 7 projects and 10 experiments. Below this are links for 'Annotate Raw Data', 'Edit Annotations', 'Work on Annotated Data', 'Send Data by email', 'Housekeeping', and 'Preferences'. Further down are 'How To Use' links and an 'Internal' section. The main content area has a welcome message and a section for 'Options' with checkboxes for automatic data location, session constraints, and email alerts. Below this is the 'VirtualDisk data distribution' section with a dropdown menu currently set to 'separated by Project'. At the bottom is the 'VirtualDisk password' section with input fields for new and confirm passwords, and an 'Apply changes' button.

BioIng

Ofra Golani
Projects: 7
Experiments: 10

- Annotate Raw Data
- Edit Annotations
- Work on Annotated Data
- Send Data by email
- Housekeeping
- Preferences

How To Use

- Freq. Asked Questions
- BioIng UserGuide
- BioIng Presentation
- System Overview
- Statistics
- Resources

Internal

- Test Resource Access
- Raw Tables
- Users
- Verify User
- Notes
- Users Stats
- Remote Users
- Logs
- Thumbnails

server time:
Tue Oct 1 13:40:05 2013

Hello Ofra Golani, please set your preferences here.
Use a checkbox to ☒ enable or ☐ disable an option and then click on *Apply changes*.

Options:
(These changes take effect immediately on clicking 'Apply changes')

- ☐ Automatically locate New Data to Annotate
- ☐ Remember Search Constraints Within Session
- ☒ Send email alert on New Data to ofra.golani@weizmann.ac.il

VirtualDisk data distribution:
(This change takes effect immediately on clicking 'Apply changes'.
It will also hide all shown experiment, if any.)

On virtual disk, show experiments separated by Project

VirtualDisk password:
(The password change will take place between 10:00:00 and 22:00:00 and a notification email will be sent to ofra.golani@weizmann.ac.il)

New password

Confirm password

Troubleshooting

- I can't connect to my virtual disk
 - No WiFi
 - Default password is 'YourUserid1'
- My data was not copied
 - Verify that you did not use special characters
- I got an email notification, but I can't annotate my data
 - If you put new data in existing subfolder you only get email but don't need to annotate

Summary

- At the microscope:
 - Create new folder in D:\UserData\youruerid for each experiment
- bioimg.weizmann.ac.il
 - “Annotate Raw Data” to assign the experiment to a project (must)
 - “Edit Annotation” to add notes (recommended)
- Data Access
 - Mount your virtual disk on your personal computer
 - Share with other users (in/out of WIS)
- Make a second copy for archive if needed

Getting Help

- Bioimg.weizmann.ac.il
 - How To Use
 - Frequently Asked Questions
 - User Guide
 - This Presentation
- Instruction sheet at the microscope
- Ofra.Golani@weizmann.ac.il / x5177
- Kiril.Kogan@weizmann.ac.il / x3113
- Jaime.prilusky@weizmann.ac.il / x4959

Bioimg for Facility Administrators

Serenity: No Need to worry if users downloaded their data and about acquiring more hard drives

Security: No more disk-on-keys

Access: Administrators can access all the data acquired on the instrument

Sharing: Easy way to share data they acquire for users

Organization: Data is organized by userids in a common way across all instruments

Reliability: RAID, mirror

Bioimg for System Administrators

Adding New Instruments

Instrument side: creating folders, sharing, setting firewall exceptions

***Biolmg* side:** simple setting using the browser based application

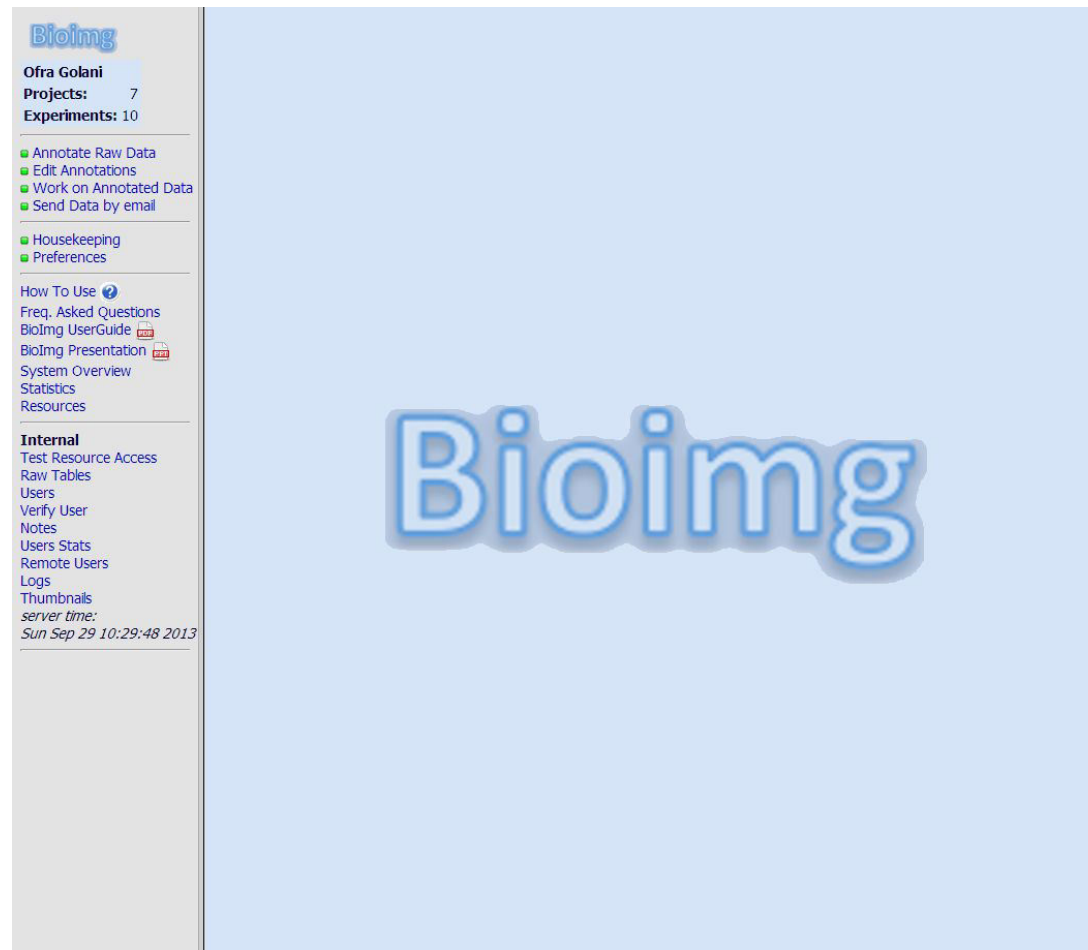
Adding New Users

Mostly automatic, an option for manual addition of users using the website

The website allows also

- Testing resource access
- Statistics
- Activity Log

User Interface



Annotate Raw Data

The screenshot shows the Bioimg web interface. On the left is a sidebar with the Bioimg logo and user information for Ofra Golani (7 projects, 10 experiments). The sidebar contains several menu items: 'Annotate Raw Data' (highlighted), 'Edit Annotations', 'Work on Annotated Data', 'Send Data by email', 'Housekeeping', 'Preferences', 'How To Use', 'Freq. Asked Questions', 'BioImg UserGuide', 'BioImg Presentation', 'System Overview', 'Statistics', 'Resources', and an 'Internal' section with links like 'Test Resource Access', 'Raw Tables', 'Users', 'Verify User', 'Notes', 'Users Stats', 'Remote Users', 'Logs', and 'Thumbnails'. The main content area has a header box explaining the page's purpose. Below this, it shows the user 'Ofra Golani' and their department 'Department of Chemical Research Support'. There are dropdown menus for 'Department' and 'Equipment' (set to 'CRS Ultra'). A message box states 'Found 1 experiment. Please select the Experiment(s) you wish to assign to the same Project and click שלח to proceed.' Below the message is a list of experiments with a checkbox next to 'EXP_IVIS_Spectrum1'.

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- Housekeeping
- Preferences
- How To Use
- Freq. Asked Questions
- BioImg UserGuide
- BioImg Presentation
- System Overview
- Statistics
- Resources
- Internal
 - Test Resource Access
 - Raw Tables
 - Users
 - Verify User
 - Notes
 - Users Stats
 - Remote Users
 - Logs
 - Thumbnails

This page allows you to select Raw Data Experiments to be assigned under a Project. Since you have enabled the option to *Automatically locate New Data to Annotate*, Bioimg found the following data for you. You may change this behaviour in the **Preferences** panel.

User: Ofra Golani
Department: Department of Chemical Research Support
Equipment: CRS Ultra

Found 1 experiment. Please select the Experiment(s) you wish to assign to the **same Project** and click שלח to proceed.

☐ EXP_IVIS_Spectrum1

New Experiments are Listed

Annotate Raw Data

The screenshot shows the Bioimg web application interface. On the left is a sidebar with the Bioimg logo and navigation links. The main content area is titled 'Annotate EXP_IVIS_Spectrum1' and contains fields for 'P Investigator', 'User', and 'Imaging Machine'. Below these is a 'Project' section with a dropdown menu and text input fields for 'Project name' and 'Notes'.

Bioimg

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- Annotate Raw Data
- Edit Annotations
- Work on Annotated Data
- Send Data by email
- Housekeeping
- Preferences
- How To Use ?
- Freq. Asked Questions
- Bioimg UserGuide PDF
- Bioimg Presentation PDF
- System Overview
- Statistics
- Resources
- Internal**
- Test Resource Access
- Raw Tables
- Users
- Verify User
- Notes
- Users Stats
- Remote Users
- Logs
- Thumbnails

Annotate EXP_IVIS_Spectrum1

P Investigator: please select PI

User: Ofra Golani

Imaging Machine: Zeiss Ultra 55

Project

A Project contains one or more Experiments.

please select a Project

Project name: please select a Project

Notes: Hadas Demo, IVIS Test, Katya, Spirit Demo, Suha PKT, Test Project, Tziki

Add Experiment to the database by assigning to project

Edit Annotations

This page allows you to modify the current Annotation of a given Experiment or Project. You can modify the visible name, notes and sharing status with other users.

User: Ofra Golani

Project:

Experiment:

Acquisition: between and

Action:

Project: Hadas Demo
<input type="button" value="edit"/> xxx_12 July12 Hadas (12 July12 Hadas)
Project: IVIS Test
<input type="button" value="edit"/> EXP_IVIS_Kinetic1 (EXP_IVIS_Kinetic1)
Project: Katya
<input type="button" value="edit"/> 15 December Katya (15 December Katya) shared 1 user
Project: Spirit Demo
<input type="button" value="edit"/> EXP_CRIS_Spirit1 (EXP_CRIS_Spirit1)
<input type="button" value="edit"/> EXP_CRIS_Spirit2 (EXP_CRIS_Spirit2)
Project: Suha PKT
<input type="button" value="edit"/> Suha_20Jan2013 (Suha_20Jan2013)
Project: Test Project
<input type="button" value="edit"/> 25 April12 Katia (25 April12 Katia)
Project: Tziki
<input type="button" value="edit"/> Rainbow (Rainbow) shared 1 user

Select experiment to modify it's metadata

Edit Annotations

The screenshot displays the BioImaging software interface. On the left is a sidebar with the BioImaging logo and user information for Ofra Golani, showing 7 projects and 10 experiments. The sidebar contains several menu items: 'Annotate Raw Data', 'Edit Annotations', 'Work on Annotated Data', 'Send Data by email', 'Housekeeping', 'Preferences', 'How To Use', 'Freq. Asked Questions', 'BioImaging UserGuide', 'BioImaging Presentation', 'System Overview', 'Statistics', 'Resources', and an 'Internal' section with links like 'Test Resource Access', 'Raw Tables', 'Users', 'Verify User', 'Notes', 'Users Stats', 'Remote Users', 'Logs', and 'Thumbnails'. The main area is titled 'Annotate EXP_IVIS_Kinetic1' and shows metadata for the selected project: 'P Investigator' (a dropdown menu), 'User: Ofra Golani', 'Acquisition date: 2012-07-09 08:08:39', and 'Imaging Machine: Zeiss Ultra 55'. Below this is a 'List Related Experiments' button. A tabbed interface shows 'Project', 'Experiment', and 'Sharing' tabs, with 'Project' selected. The 'Project' tab contains the text 'A Project contains one or more Experiments.' followed by a dropdown menu showing 'IVIS Test'. Below this are input fields for 'Project name' (containing 'IVIS Test') and 'Notes' (containing 'This is a sample Project'). At the bottom of the tab are two buttons: 'Update Project IVIS Test' and 'Create New Project' (with a tooltip that says '(with the name inside the field 'Project name')').

BioImaging

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- Annotate Raw Data
- Edit Annotations
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- Send Data by email
- Housekeeping
- Preferences

How To Use
Freq. Asked Questions
BioImaging UserGuide
BioImaging Presentation
System Overview
Statistics
Resources

Internal
Test Resource Access
Raw Tables
Users
Verify User
Notes
Users Stats
Remote Users
Logs
Thumbnails
server time:
Tue Oct 1 13:40:05 2013

Annotate EXP_IVIS_Kinetic1

P Investigator: please select PI

User: Ofra Golani
Acquisition date: 2012-07-09 08:08:39
Imaging Machine: Zeiss Ultra 55

List Related Experiments

Project Experiment Sharing

A Project contains one or more Experiments.

IVIS Test

Project name IVIS Test

Notes This is a sample Project

Update Project IVIS Test

Create New Project (with the name inside the field 'Project name')

User may annotate Project additional information

Edit Annotations

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- Edit Annotations
- Work on Annotated Data
- Send Data by email

- Housekeeping
- Preferences

How To Use

- Freq. Asked Questions
- BioImaging UserGuide
- BioImaging Presentation
- System Overview
- Statistics
- Resources

Internal

- Test Resource Access
- Raw Tables
- Users
- Verify User
- Notes
- Users Stats
- Remote Users
- Logs
- Thumbnails

server time:
Tue Oct 1 13:40:05 2013

Annotate *EXP_IVIS_Kinetic1*

P Investigator:

User: Ofra Golani

Acquisition date: 2012-07-09 08:08:39

Imaging Machine: Zeiss Ultra 55

Project **Experiment** **Sharing**

Experiment

Experiment name

Notes

Thumbnail

(You may replace this thumbnail image by uploading a new one. Valid image types are .jpg, .png, .gif or .tif)

Upload image for Thumbnail

User may annotate Experiment additional information

Sharing

The screenshot shows the BioImaging web application interface. On the left is a sidebar with the BioImaging logo and user information for Ofra Golani (7 projects, 10 experiments). It lists various actions like 'Annotate Raw Data', 'Edit Annotations', 'Work on Annotated Data', and 'Send Data by email'. There are also links for 'Housekeeping', 'Preferences', 'How To Use', 'Freq. Asked Questions', 'BioImaging UserGuide', 'BioImaging Presentation', 'System Overview', 'Statistics', and 'Resources'. An 'Internal' section contains links for 'Test Resource Access', 'Raw Tables', 'Users', 'Verify User', 'Notes', 'Users Stats', 'Remote Users', 'Logs', and 'Thumbnails'. The server time is shown as 'Tue Oct 1 13:40:05 2013'.

The main content area is titled 'Annotate EXP_IVIS_Kinetic1'. It includes a 'P Investigator' dropdown menu (currently showing 'please select PI'), the 'User' (Ofra Golani), 'Acquisition date' (2012-07-09 08:08:39), and 'Imaging Machine' (Zeiss Ultra 55). A 'List Related Experiments' button is located below these fields.

Below the main information, there are three tabs: 'Project', 'Experiment', and 'Sharing'. The 'Sharing' tab is active, displaying the following content:

Sharing You may allow other users to browse your Project and Experiment data

This **Experiment** is shared with 1 user:

- ☐ Jaime Prilusky

Add a share to this Experiment

Enter a userid:

Add a share to this project

Enter a userid:

Share Project or Experiments with selected Users

Work on Annotated Data

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- Annotate Raw Data
- Edit Annotations
- Work on Annotated Data
- Send Data by email

Housekeeping
Preferences

How To Use
Freq. Asked Questions
BioImaging UserGuide
BioImaging Presentation
System Overview
Statistics
Resources

Internal
Test Resource Access
Raw Tables
Users
Verify User
Notes
Users Stats
Remote Users
Logs
Thumbnails
server time:
Tue Oct 1 13:40:05 2013

This page allows you to **Show** or **Hide** Experiments on user *ofrag's* virtual disk, creating a subset of all your Annotated data to work with. After clicking **Go**, the Experiments currently available on the virtual disk are listed in **green**.

User: Ofra Golani
Project:
Experiment:
Acquisition: between and
Action:

Project: **3DGels**
shown ☐ 3DGels (3DGels) shared by Alexandra Lichtenst

Project: **BOLD - Sept 2012**
hidden ☐ RA_240912_m1.g71 (RA_240912_m1.g71) shared by Reut
hidden ☐ RA_300912_m1.gd1 (RA_300912_m1.gd1) shared by Reut
hidden ☐ RA_300912_m2.gd1 (RA_300912_m2.gd1) shared by Reut
hidden ☐ RA_300912_m3.gd1 (RA_300912_m3.gd1) shared by Reut

Project: **DeltaVision_2012**
hidden ☐ 120905 (120905) shared by Sara Feigelson (lfe
hidden ☐ 120910 (120910) shared by Sara Feigelson (lfe
hidden ☐ 120911 (120911) shared by Sara Feigelson (lfe
hidden ☐ 121105SF (121105SF) shared by Sara Feigelson (lfe
shown ☐ SF_1208008_test (SF_1208008_test) shared by Sara Fei
shown ☐ SF_120808new (SF_120808new) shared by Sara Feige
shown ☐ SF_120905_MIG (SF_120905_MIG) shared by Sara Feigi
shown ☐ SF_120910_LNstainingsfirst (SF_120910_LNstainingsfirst) shared by S
shown ☐ SF_120911_VCAMbeads (SF_120911_VCAMbeads) shared by S
shown ☐ SF_120919_LNstainings (SF_120919_LNstainings) shared by Se
shown ☐ SF_120920_Shmulklungs (SF_120920_Shmulklungs) shared by :
shown ☐ SF_120924_VCAM_LN (SF_120924_VCAM_LN) shared by Sar
shown ☐ SF_121002_60x (SF_121002_60x) shared by Sara Feigi
shown ☐ SF_121002_LNstaining_60x (SF_121002_LNstaining_60x) shared b
shown ☐ SF_121003_Lung_Mouse1 (SF_121003_Lung_Mouse1) shared by
shown ☐ SF_121105_LNstainings_Pselec_VCAM (SF_121105_LNstainings_Pselec_VCAM
shown ☐ SF_121107_microscopy (SF_121107_microscopy) shared by S

Project: **demo**
hidden ☐ 010813-SHG-7dpf (010813-SHG-7dpf) shared by Guy Ma
hidden ☐ 200712-SHG-5dpf (200712-SHG-5dpf) shared by Guy Ma

Show / Hide data on your virtual disk

Preferences

BioImaging

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Projects: 7
Experiments: 10

Annotate Raw Data

Edit Annotations

Work on Annotated Data

Send Data by email

Housekeeping

Preferences

How To Use

Freq. Asked Questions

BioImaging UserGuide

BioImaging Presentation

System Overview

Statistics

Resources

Internal

Test Resource Access

Raw Tables

Users

Verify User

Notes

Users Stats

Remote Users

Logs

Thumbnails

server time:
Tue Oct 1 13:40:05 2013

Hello Ofra Golani, please set your preferences here.
Use a checkbox to ☒ enable or ☐ disable an option and then click on Apply changes.

Options:
(These changes take effect immediately on clicking 'Apply changes')
☐ Automatically locate New Data to Annotate
☐ Remember Search Constraints Within Session
☒ Send email alert on New Data to ofra.golani@weizmann.ac.il

VirtualDisk data distribution:
(This change takes effect immediately on clicking 'Apply changes'.
It will also hide all shown experiment, if any.)
On virtual disk, show experiments

separated by Project
inside my Home folder
separated by Equipment
separated by Project

VirtualDisk password:
(The password change will take place between the next hour
and a notification email will be sent to ofra.golani@weizmann.ac.il)
New password
Confirm password

Apply changes

Set Preferences

Getting Help

- On the Website
 - How To Use
 - Frequently Asked Questions
 - User Guide
 - PDF Presentation
- Introduction Presentations for groups of users
- Instruction sheet at the microscope
- Help desk

Behind the Screen

- Scheduled Perl scripts for:
 - Copying data
 - Creating user folders
 - Sending email notification about new data
 - Updating statistics
- User Initiated Scripts:
 - Annotating data
 - Reorganizing user links (Project/Instrument view)
 - Updating User preferences
- Running on any Linux server
- MySQL Database
- Connect to the institute LDAP for user authentication
- Inside the institute firewall
- RAID 6