

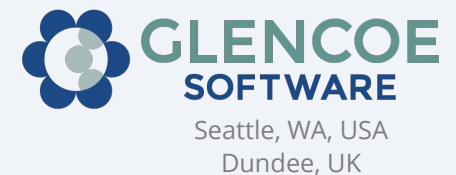
ROI Folders: next steps

Sébastien Besson

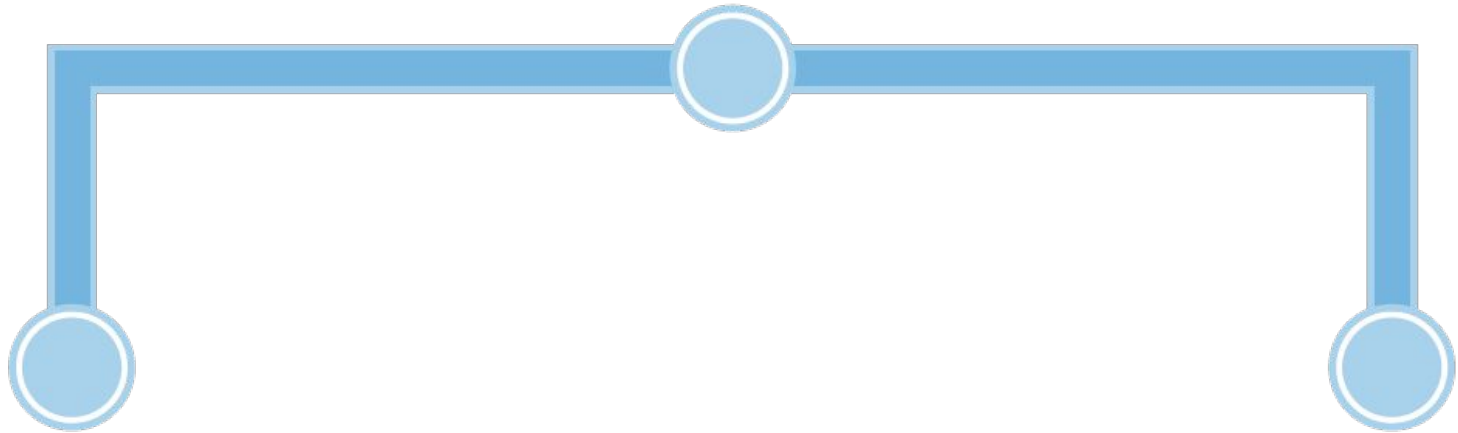
22 March 2016



Open Microscopy Environment
Centre for Gene Regulation & Expression
College of Life Sciences, University of Dundee
Dundee, Scotland, UK



OME : What We Do



OME-XML

OME-TIFF

 **BIO-FORMATS**

Open, exchangeable file formats



Open Image
Management Software

Current model status

The screenshot displays a Windows 8.1 desktop environment with a microscopy software application open. The application window, titled "[ID: 4940] 5.6M P-TRE_23_R3D_D3D_VOL_D3D.dv", shows a 3D volume rendering of a cell with a circular ROI of 6.09 μm. A "Create Folder" dialog box is open, allowing the user to create a new folder named "Test 4" with the description "Testing ROI Folder creation".

The ROI Manager table in the software interface is as follows:

ROI	id	Z	T	Type	Comment	Visible
Folder: Test 3 [4]	352				Testing Folder creation i...	<input checked="" type="checkbox"/>
Folder: Test 2 [2]	351				Test 2 create Folder	<input checked="" type="checkbox"/>
[1]	498	1	1			<input checked="" type="checkbox"/>
[1]	499	1	1			<input checked="" type="checkbox"/>
Folder: CMPO [0]	339					<input checked="" type="checkbox"/>
Folder: phenotype [0]	307					<input checked="" type="checkbox"/>
Folder: by shape [0]	303					<input checked="" type="checkbox"/>
Folder: by side [0]						<input type="checkbox"/>
Folder: CMPO [0]						<input type="checkbox"/>
Folder: phenotype						<input type="checkbox"/>
Folder: by side [0]						<input type="checkbox"/>
Folder: by shape [0]						<input type="checkbox"/>
[1]						<input type="checkbox"/>
[1]						<input type="checkbox"/>

The "Create Folder" dialog box contains the following information:

- Create Folder**: Create a new Folder.
- Name**: Test 4
- Description**: Testing ROI Folder creation

The Windows taskbar at the bottom shows the system tray with the date and time: 15:16, 17/02/2016. The system information in the bottom right corner indicates Windows 8.1 Enterprise, Build 9600.

Current model status

- Model cleanup/unification
 - Alignment of OMERO DB/OME Data model
 - Dropping of unimplemented complex attributes
- Introduction of new top-level schema object: Folder
 - Can be top-level or in another folder
 - Can contain a ROI or an Image at present
- Clients
 - Measurement Tool client modified to allow ROI organization into folders (creation, edition, drag&drop...)
- API
 - Ongoing work on API/gateway to traverse new hierarchy and query objects organized into folders

Limitations/next steps

- **API/Client**
 - Early API days
 - Client work is limited to Java
- **Model changes have large breaking impact for our community**
 - Consider performance at scale
 - If concepts are meant to be extended, evaluate the feasibility via use cases
 - Make sure changes are propagated across the stack or clearly identified as experimental
- **Make use of internal production projects (IDR, Glencoe Software) as drivers for the testing of these concepts**

Glencoe Software

- High-content screening analytical workflow
 - Typical data imported into OMERO:
 - 10+ plates * 384 wells * 10+ fields (38,000+ images)
 - Automated analytical scripts e.g. image segmentation generate ~100 ROIs per image
 - 10^6+ ROIs created per analysis run
- Limitations
 - absence of grouping functionality for analysis runs leads to performance issues when e.g. deleting all ROIs for an analysis run
 - usability issues when dealing with multiple analysis runs
 - current status quo makes the re-import of the whole plate faster than deletion of the ROIs
- Testing at scale of folders in the context of ROIs

IDR

The screenshot displays the OMERO webclient interface. The browser address bar shows the URL: `idr-demo.openmicroscopy.org/webclient/userdata/?experimenter=-1`. The interface includes a navigation menu with 'Data', 'History', and 'Help'. A sidebar on the left shows a tree view of 'Demo data' with various folders and sub-folders, including '11001' and 'Run 829'. The main area displays a grid of microscopy images, with the selected image being '11001 [Well A02 Field #1]'. The grid shows a 10x8 array of images, with the selected image highlighted in blue. The right sidebar provides detailed metadata for the selected image, including acquisition date, dimensions, and channels.

General | Acquisition | Preview

Full viewer

11001 [Well A02 Field #1]

Image ID: 353713
Well ID: 220572
Owner: Demo User

Acquisition Date: 2011-08-31 17:12:44
Import Date: 2015-09-24 15:52:48
Dimensions (XY): 1392 x 1040
Pixels Type: uint16
Pixels Size (XYZ) (µm): 0.32 x 0.32
Z-sections/Timepoints: 1 x 1
Channels: DAPI, TRITC
ROI Count: 0
Status: None

ANNOTATIONS Show all

Added by: Demo User
openmicroscopy.org/omero/bulk_annotations
hORFeome V5.1 Identifier: 168
hORFeome V5.1 Identifier URL: <http://horfdb.dfci.harvard.edu/tv>
Gene Identifier: 84736
Gene Identifier URL: <http://www.ncbi.nlm.nih.gov/gen>
Gene Symbol: RPL27A

TABLES

Plate: 829
Well Number: 2
Well: 220572
hORFeome V5.1 Identifier: 168
Gene Identifier: 84736
Gene Symbol: RPL27A
Gene Description: Homo sapiens ribosomal protein

IDR

- Heterogeneous data including extended metadata imported in public repository
 - Usage of population script coupled with map annotations to store most of the extended metadata at the image level
- Limitations in terms of usability/queryability
 - Revert the paradigm and group objects (plates, wells, regions) by metadata (genes...)
- Investigate of the application of the Folder concept to other objects than ROIs e.g. Plates
- Investigate client work for a representation of folders