Presentation is available at

https://downloads.openmicroscopy.org/presentations/2018/Users-Meeting/Workshops/Metadata-Handling/slides/index.html

This is the third part of the three parts Metadata workshop held at the Annual Users meeting:

- Part 1 https://downloads.openmicroscopy.org/presentations/2018/Users-Meeting/Workshops/Metadata-Import/import.pdf
- Part 2 https://downloads.openmicroscopy.org/presentations/2018/Users-Meeting/Workshops/Metadata-Analysis/analysis.pdf

# Handle Metadata

**Description**

In the third part, we show how to use OMERO.mapr: an OMERO.web app that enables browsing of data through attributes linked to images in the form of Map Annotations.

For more information about OMERO.mapr https://github.com/ome/omero-mapr

## Adding Map Annotation client-side

Each object can be annotated using a map annotation. The editable client-side map annotation is identified by a specific namespace i.e. `openmicroscopy.org/omero/client/mapAnnotation`

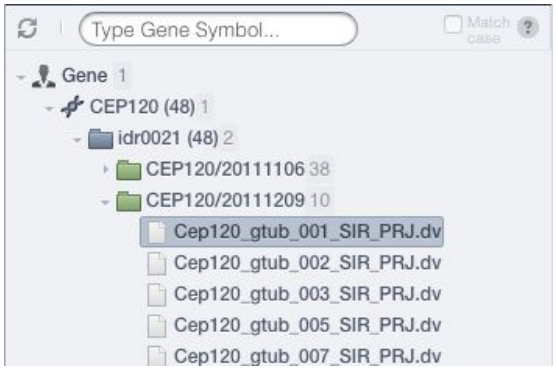
1. Go to http://outreach.openmicroscopy.org.
2. Log in.
3. Select Images within the Project **idr0021**.
4. Go to the right-hand panel.
5. Expand the *Key-Value Pairs* accordion.
6. Enter *siRNAI* for the Key and *INCENP* for the Value.
7. Hit *Tab* or *Enter* or click the + icon to go to next row.
8. Enter: *treatment* for the Key and *2 hours* for the Value.
9. This could be used to record experimental protocol for example.
10. Select the two rows and copy them using the copy button:  .
11. Select a new Image and click the paste button  to add Key-Value pairs to the Image.

12. Repeat for a few more Images. For some, change the value associated to *siRNAi* to *Aurora-B.*

## Search metadata using OMERO.mapr

### Setup and Configuration

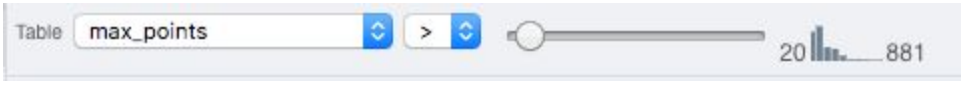
- Install from PyPI:
  - `$ pip install omero-mapr`
  - `$ bin/omero config append omero.web.apps '"omero_mapr"'`
- Configure to search for any value
  - `$bin/omero config append omero.web.mapr.config '{"menu": "anyvalue", "config": {"default": ["Any Value"], "all": [], "ns": ["openmicroscopy.org/omero/client/mapAnnotation"], "label": "Any"}}'`
  - `$bin/omero config append omero.web.ui.top_links '["Any Value", "viewname": "maprindex_anyvalue"}, {"title": "Find Any Value"}]'`

1. Click on the Gene link at the top of webclient to go to the mapr/gene search page.
2. Search for Gene: **CE**… to see auto-completion of all genes starting with CE.
3. Select CEP120. This will allow you to browse *Gene* > *Project* > *Datasets* > *Images* to see Images annotated with this Gene.
4. 

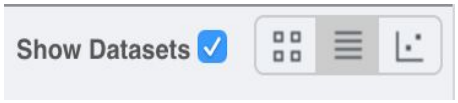
5. You can try the same search on IDR itself to see other studies annotated with this gene: https://idr.openmicroscopy.org/mapr/gene/?value=CEP120.
6. Back in the webclient, click on the Key-Value link to search for user-added map annotations.
7. Search for the values added previously e.g. **INCENP** or ***Aurora-B.***
8. This searches for these values with *Any Key*.
9. It is also possible to use the webclient search box. Enter *siRNAi: INCENP* to find data by Key-Value pair.

## Analyze metadata using OMERO.parade

1. Select the Project **idr0021**.
2. Choose the *parade* option in the centre panel dropdown menu.
3. Expand all Datasets by clicking on the *Open All* button.

    a. All the datasets will be expanded in the left-hand tree.
    b. The Thumbnails will be loaded in the centre panel. This allows to browse a full project.
    c. Note that if you collapse a Dataset in the tree, the Thumbnails will be removed from the centre panel.
4. In the *Add filter...* selection box, select the *Key_Value* item.
    a. When the Map Annotations are loaded, pick the Key *Gene Symbol* and enter the Value *CEP* to show all *CEP* genes and then *CEP120* to show only images with that gene.
5. Repeat the previous step but this time:
    a. Pick the Key *siRNAi.*
    b. Enter the Value *INCENP* or *Aurora-B* or just *B.*
    c. To remove this last filter, hover over the filter and click the X button that shows on hover.
6. In the *Add filter...* selection box, select the *ROI_Count* item.
    a. Enter a Value > *20.* When you hover over the area used to enter the value, the range is indicated in the tooltip.
    b. Then enter < 3 or 4.
7. Remove all filters by clicking the X button showing on hover.
8. In the *Add filter...* selection box, select the *Table* item so we can find using the analytical results generated previously:
    a. Choose the *max_points* item and drag the slider to filter the Images. Note that *PCNT* has the largest number of Images with large ROIs.
    b. 

    c. Adjust the controls to select < *50.*
    d. Note that in that case *CPAP* and *CENT2* have the most of the Images as expected.
9. Switch to Table layout (middle button)  .
10. In the selection box *Add table data*…, select
    a. *Table_max_points*
    b. *Table_mean_points*
    *c. ROI_count*

    Note that it is currently not possible to remove a column.
11. Click on the name of a column to sort it.
12. Uncheck *Show Datasets* to sort all Images together e.g. by ROI count.
13. 

14. Check the checkbox in each column to show the *Heatmap*. Note the corresponding pattern in the Heatmap.
15. Switch now to the Plot Layout (third button)

16. It takes the table data loaded and plot the values.
17. Filters can be added to plot the relevant results.
18. Try plotting by different Axis values.
19. Closing a Dataset in the left-hand tree removes the values from the plot.
20. Drag to select several outliers.
21. Note that you can use the selected images in right panel to annotate or *Open with...*.
22. Add a new Tag to selected images then find the Images with the tag.
23. Preview Images and add Rating *5* to 1 or 2 Image(s) (1 per Dataset).
24. To see that we can also find images in a Plate, open the Plate named **INMAC384-DAPU-CM-eGFP_59223_1**
25. In the *Add filter...* selection box, select the *Table* item
26. Then choose *Ch0Max* and drag the slider to filter Wells. Note that the plate layout does not change as Wells are found.
27. Return to the **idr0021** Project.
28. Filter by Rating - select all the Images then *Open with Figure…*

## Metadata using OMERO.figure

1. Arrange the 10 Images into two rows, select all and snap to grid.
2. Select all Images and Zoom in around ~300%
3. Go to the *Labels* tab, select all Images and add a Scalebar of 1 µm and adjust the size of the Label to 12.
4. Add label from Dataset name: *color=white location=top-left*
5. Add label from Channel names: *size 14, location=bottom-left*
6. Select one image. In the *Labels* tab, click the *Edit* button for ROIs.
7. Load ROIs from OMERO and mouse-over the list to pick the largest ones.
8. Click to add it to the image and click *OK*.
9. In the header, click on the *Save* button to save the Figure as “Figure 1”.
10. To open other saved files, go File > Open… and choose a file from the list.
11. View the opened file then File > Open to choose the “Figure 1” file we saved above.
12. then click on *Export PDF* to export it as PDF.