

## HOW TO USE THE SLIDE TEMPLATES

- To use your institution's slide design and logo, adjust the slides of this presentation using the „slide master“  
Note that these slides are optimized for 16:9 screen presentation layout
- Check the slides for yellow-marked text and insert the information according to your own institute's infrastructure.
- Feel free to use this material for videos, teaching, guidelines, etc., at your institute
- Please cite us (e.g., on page 1) when re-using this material or derivatives of it:

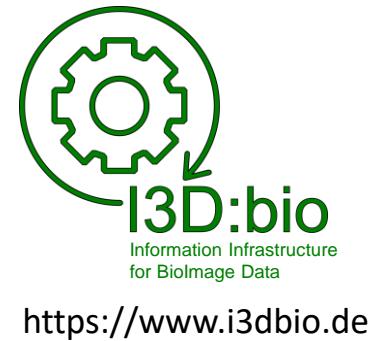
Adapted from: Schmidt C., Bortolomeazzi M., Boissonnet T., Fortmann-Grote C. et al. (2023). I3D:bio's OMERO training material: Re-usable, adjustable, multi-purpose slides for local user training. Zenodo. DOI: 10.5281/zenodo.8323588. If not stated otherwise, the content of this material (except for logos and the slide design) is published under [Creative Commons Attribution 4.0 license](#).

- If not stated otherwise, the content of this material (except for logos) is published under a [Creative Commons Attribution 4.0 license](#).
- This work is funded by the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) – 462231789 (Information Infrastructure for BioImage Data, I3D:bio)

# Disclaimer

- The following slides are intended for reuse after **substituting yellow-marked text** with the relevant information at your institute.
- Some content may not apply to the specific setup of the OMERO installation at your institute.

The content reflects solely the authors' opinions and does not speak on behalf of the original software, its developers, or other cited community resources.



<https://www.i3dbio.de>

Funded by the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation), project I3D:bio, grant number 462231789

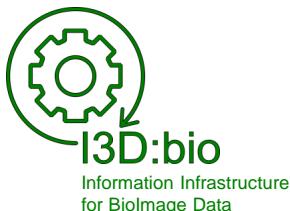
Adapted from: Schmidt C., Bortolomeazzi M., Boissonnet T., Fortmann-Grote C. *et al.* (2023). I3D:bio's OMERO training material: Re-usable, adjustable, multi-purpose slides for local user training. Zenodo. DOI: 10.5281/zenodo.8323588  
If not stated otherwise, the content of this material (except for logos and the slide design) is published under [Creative Commons Attribution 4.0 license](#).



# Research Data Management for Bioimage Data at the **ADD INSTITUTE HERE**

## Metadata Curation: Tags

**ADD AUTHOR / RESPONSIBLE PERSON FROM YOUR INSTITUE**



Adapted from: Schmidt C., Bortolomeazzi M., Boissonnet T., Fortmann-Grote C. *et al.* (2023). I3D:bio's OMERO training material: Re-usable, adjustable, multi-purpose slides for local user training. Zenodo. DOI: 10.5281/zenodo.8323588  
If not stated otherwise, the content of this material (except for logos and the slide design) is published under a [Creative Commons Attribution 4.0 license](#).

**ADD LOGO  
BIG**



# Tags in OMERO are part of the metadata (here: in OMERO.web)

The screenshot shows the OMERO.web interface. On the left, there is a file tree under the group 'Mary Mayperson'. A folder named '2017\_Nuc-Intensity\_Tcells 6' is expanded, showing numerous sub-image files. In the center, a grid of thumbnails displays these images, which appear to be fluorescence microscopy images of cells. On the right, detailed metadata for one specific image is shown. The image details include:

- Image ID: 58103
- Owner: Mary Mayperson
- Import Date: 2022-04-08 13:50:20
- Dimensions (XY): 1912 x 1912
- Pixel Type: uint16
- Pixel Size (XYZ) ( $\mu\text{m}$ ): 0.07 x 0.07 x -
- Z-sections/Timepoints: 1 x 1
- Channels: Ch2-T1, Ch1-T2
- ROI Count: 0

Below these details are sections for 'Tags' and 'Key-Value Pairs'. An orange callout box points to these sections with the text 'Tags and Key-Value Pairs'.

Key	Value
CellType	CD4+ T cell
Organism	Mus musculus
Organ	Spleen
IsolationMethod	MACS negative sort
ActivationMethod	anti-CD3/anti-CD28



# Tags and Key-Value Pairs in OMERO (recommendations)

## Tags & Key-Value Pairs

can be added to:

- Images
- Groups of Images
- Datasets
- Projects

**NOTE: Tags are...**

- **linked to groups**
- **owned by a user**  
(i.e., if a Tag is deleted, it is deleted on all data(sets) using this Tag!)

### I3D:bio recommendation:

- Use **Tags** for data organization across datasets and projects
- Use **Tag categories** to organize the Tags
- Use **Key-Value Pairs** for metadata enrichment

### For advanced users:

Annotate Tags & Key-Value Pairs using *ontology terms* (see subchapter 7-3)

# Tags and Tag categories (recommendation)

**Tags are owned by the user who created the Tag**

**As a research group, discuss and decide together**

- if only one (or few) persons curate the Tags for all group members
- if each user should create own Tags (bears the risk of redundancy!)
- If and which Tag categories might benefit your use case

*I3D:bio recommendation:*

When using the same group in OMERO, one person can curate the Tags for multiple users.

Tags may be created together with the users depending on the research needs.

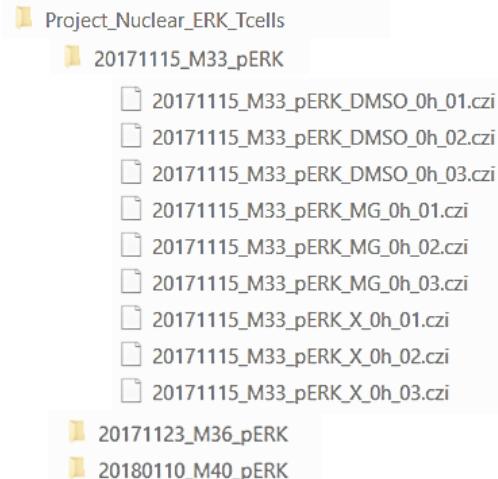
# Why Tags?

## Example of a problem: Searching datasets and images in a file explorer

### Original file structure

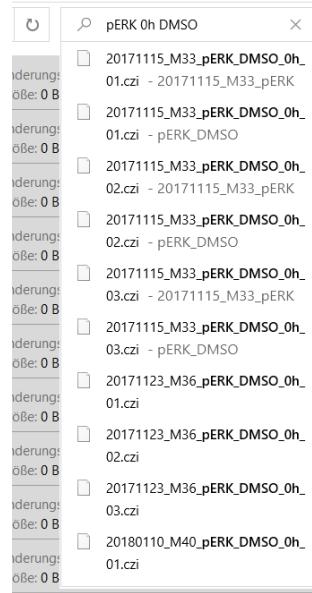
#### purpose:

Compare different treatments per time point for each staining target



### New intention:

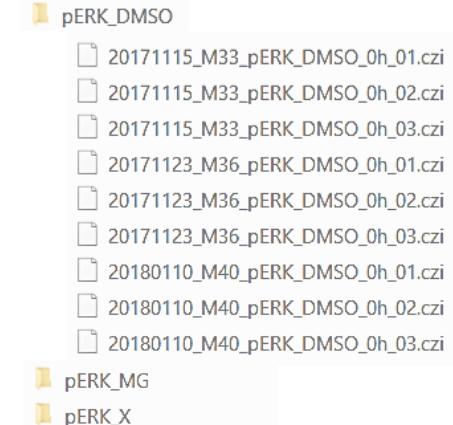
Compare all „DMSO“ control images for „pERK“ staining at „0 h“ of incubation



### What is the solution?

- access individual files
- or
- rearrange the file structure?

### Project\_Nuclear\_ERK\_Tcell\_new



# Why Tags?

## *Example of a solution: Using the search function based on Tags*

Instead of file-path-centered thinking...

D:\MaryMayperson\MyData\Project\_Nuclear\_ERK\_Tcells\20171115\_M33\_pERK\20171115\_M33\_pERK\_DMSO\_01.czi

VS

D:\MaryMayperson\MyData\Project\_Nuclear\_ERK\_Tcells\_new\pERK\_DMSO\20171115\_M33\_pERK\_DMSO\_01.czi

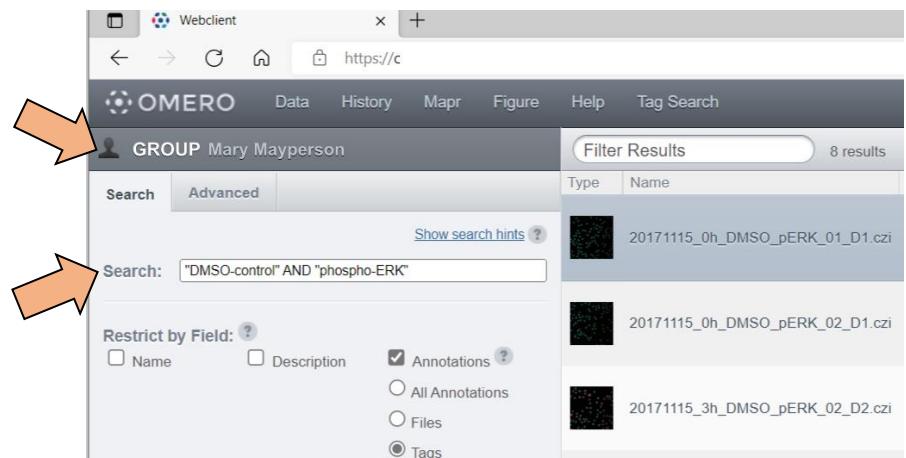
...think of tag combinations, instead:

User: Mary Mayperson

Tags: „DMSO“ AND „phospho-ERK“ AND „0h“

or

Tags: „DMSO“ AND „phospho-ERK“ AND „M33“



(see also: subchapter 6.1)

# Use Tags for flexible data exploration 1/2

Data is shown in a flat (two-folder) hierarchy

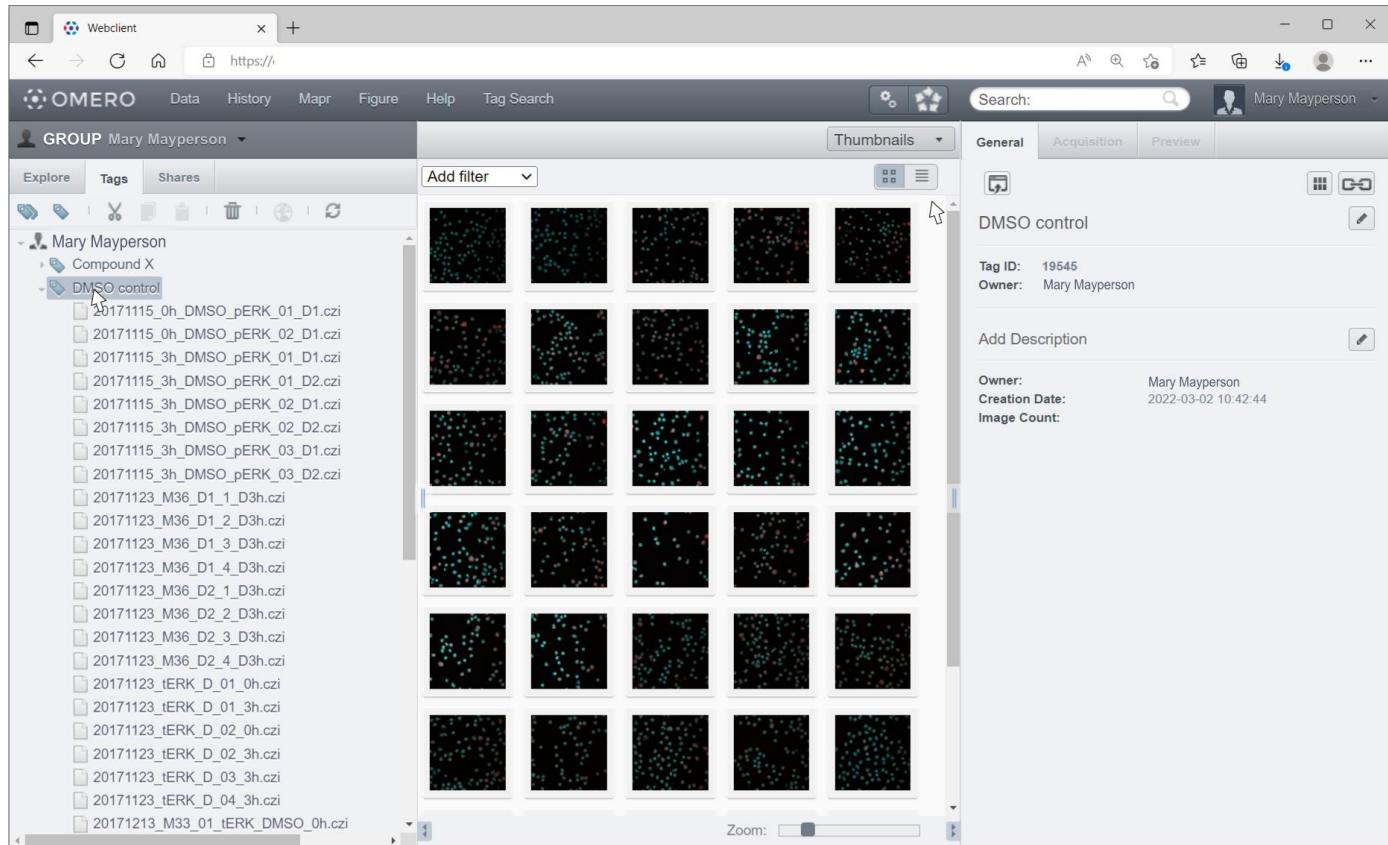
*Example:*  
The data is  
organized by the  
stained  
intracellular  
targets, and the  
independent  
replications are  
organized in  
separate datasets

The screenshot shows the OMERO WebClient interface. The left sidebar displays a tree view of datasets under the group 'Mary Mayerson'. The '2017\_Nuc-Intens\_Tcells' dataset is expanded, showing sub-folders for different staining targets: '20171115\_M33\_pERK 25', '20171123\_M36\_pERK 27', '20171123\_M36\_totalERK 14', '20171213\_M33\_totalERK 30', '20180110\_M40\_pERK 19', and '20180130\_M42\_totalERK 20'. It also contains a folder for '2017\_TestStaining\_Thilo 1' and an 'Orphaned Images' folder. The right panel provides detailed information about the selected dataset: Project ID: 52, Owner: Mary Mayerson, Creation Date: 2022-03-03 13:33:34, and various metadata sections like Tags, Key-Value Pairs, Attachments, Comments, Ratings, and Others.

# Use Tags for flexible data exploration 2/2

Use **Tags** to explore related data across projects and datasets

*Example:*  
Review all imaging results for DMSO-treated samples (negative control) across repetitions and stained targets



## Options to annotate with Tags in OMERO:

- Manually in OMERO.web or in OMERO.insight
- During the data upload with OMERO.importer in the OMERO insight client
- Using the AutoTag function (only available if the OMERO webtagging extension is installed by the OMERO admin)
- (other automated solutions exist, which are not explained here)

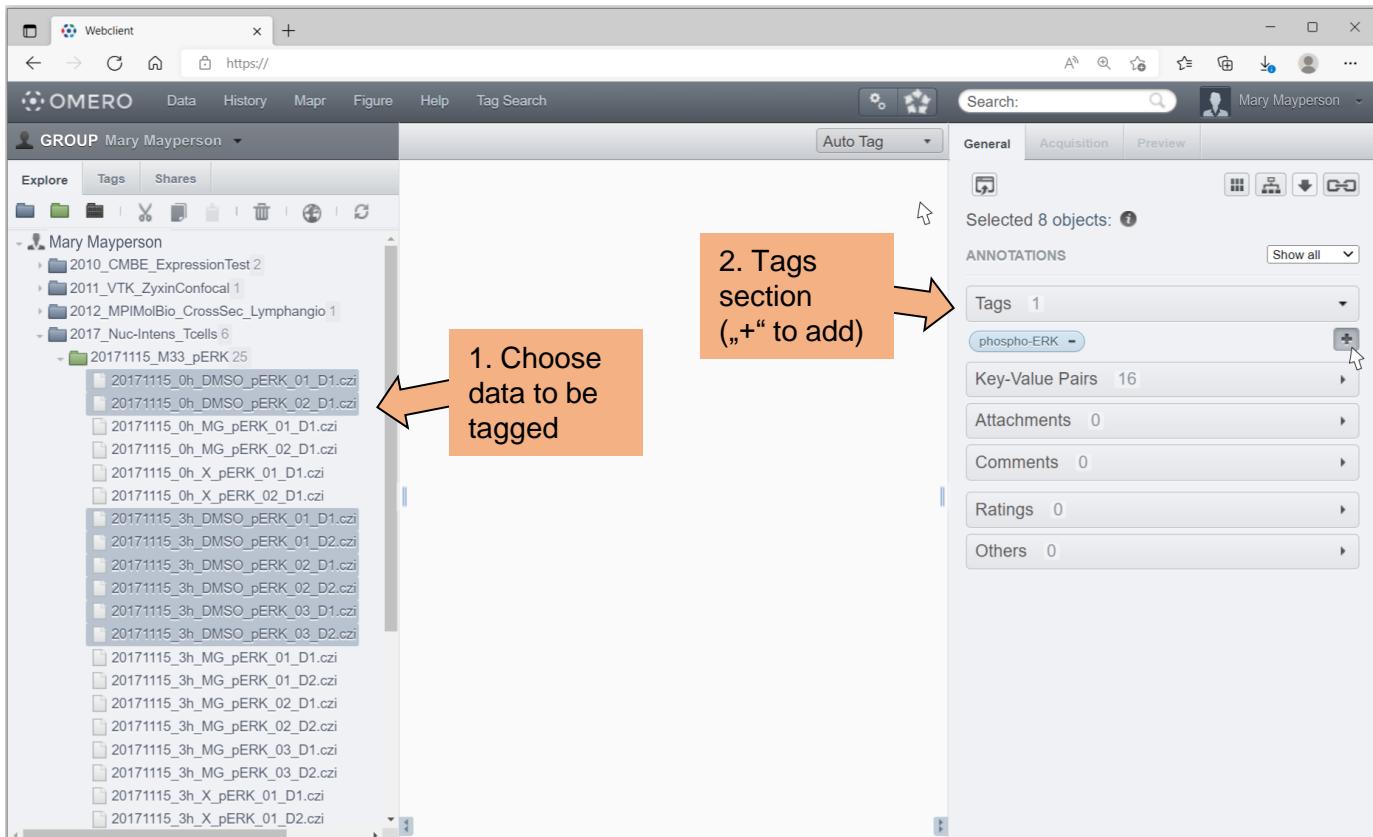
# Manual Tag annotation (here: in OMERO.web) 1/3

1. Mark one or more images, projects or datasets you wish to tag

2. Go to General tab,

Go to the toggle: Tags

Click „+“ to add



# Manual Tag annotation (here: in OMERO.web) 2/3

3. A) Choose from Available Tags
- B) Add a new Tag (and a tag description)

Tags Selection

Select from available tags:

Available Tags: 1 selected

Filter	Compound X	DMSO control	MG-132	Segmentation	total ERK
Filter by anywhere in tag name	Compound X	DMSO control	MG-132	Segmentation	total ERK
Filter by owner	All				

Selected Tags: phospho-ERK

3. A) Choose Tag

3. B) Add new

Add a new tag and select it immediately:

Tag	Description	Add
		Add

Save Cancel Reset

4. Add Tag to Selected Tags and Save

Tags Selection

Select from available tags:

Available Tags:

Filter	Compound X	MG-132	Segmentation	total ERK
Filter by anywhere in tag name	Compound X	MG-132	Segmentation	total ERK
Filter by owner	All			

Selected Tags: DMSO control, phospho-ERK

4. Add and Save

Add a new tag and select it immediately:

Tag	Description	Add
		Add

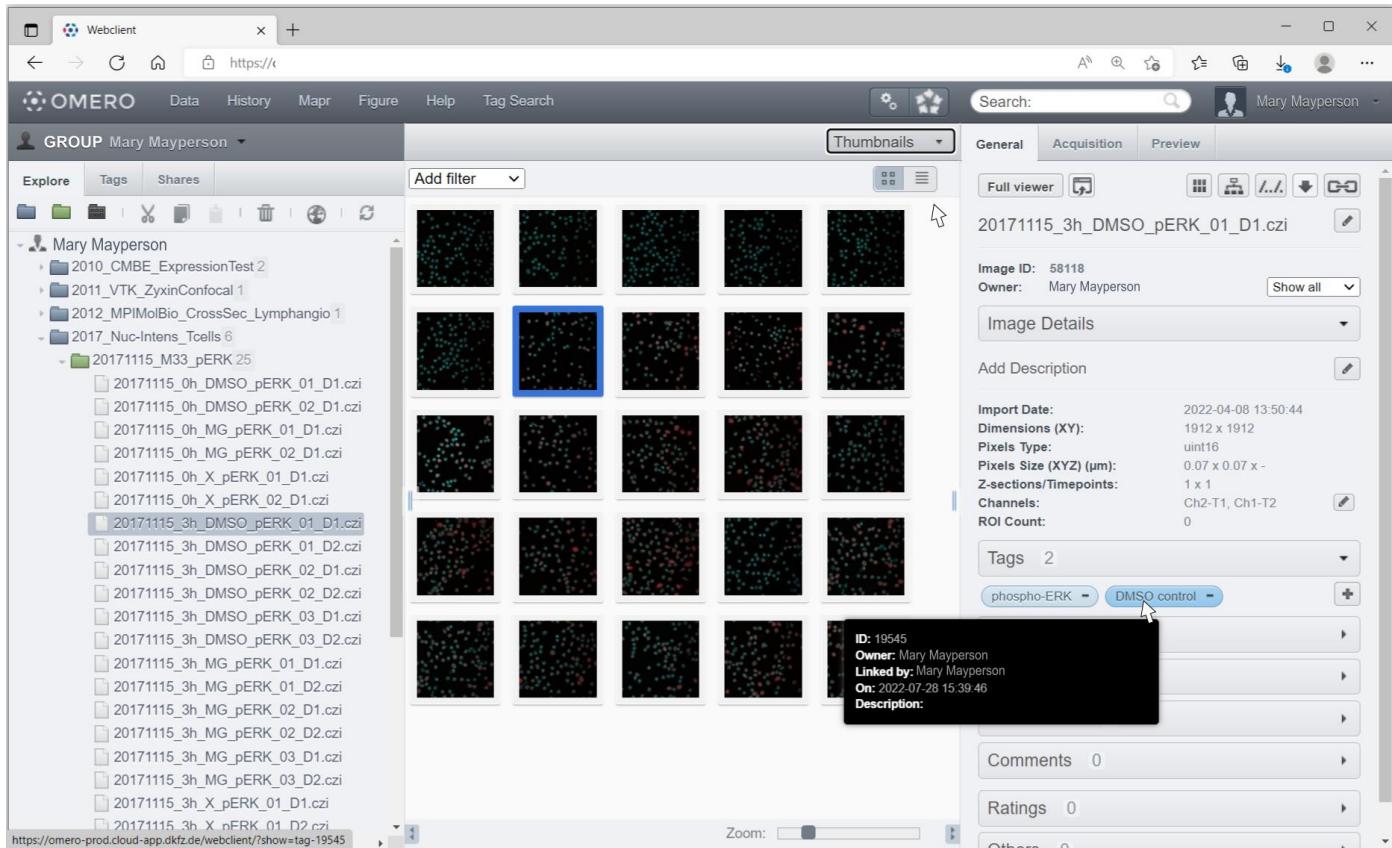
Save Cancel Reset

# Manual Tag annotation (here: in OMERO.web) 3/3

The Tag is now added as an annotation to the data.

Tags have

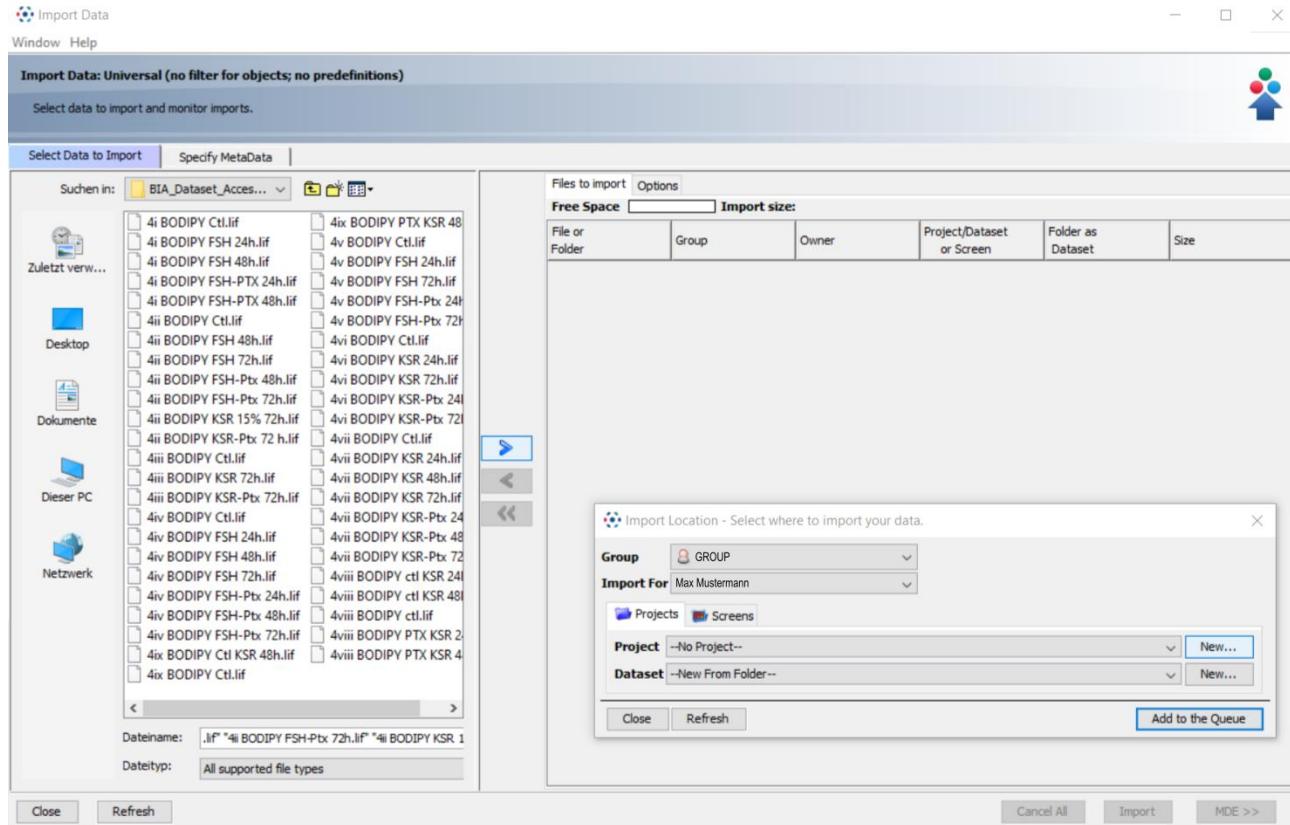
- an ID
- an owner
- Information about who linked the Tag
- a tagging date
- (a Tag description)



# Tag annotation during upload (OMERO.insight) 1/5

Start the upload process with OMERO.insight

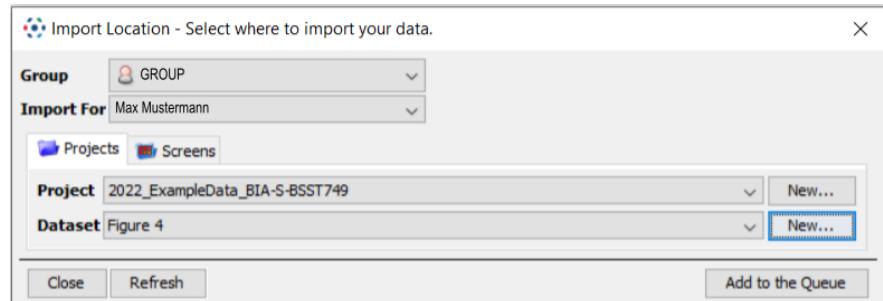
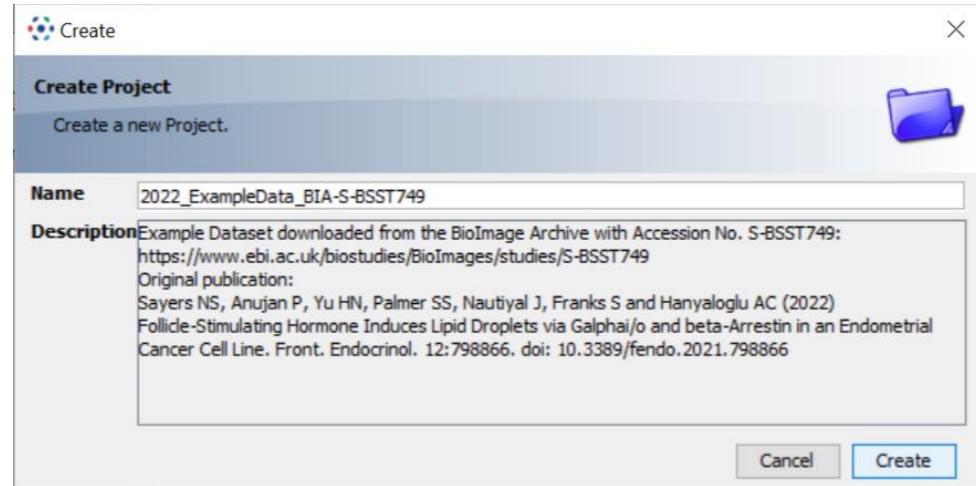
Choose files and select target Project and Dataset ...



## Tag annotation during upload (OMERO.insight) 2/5

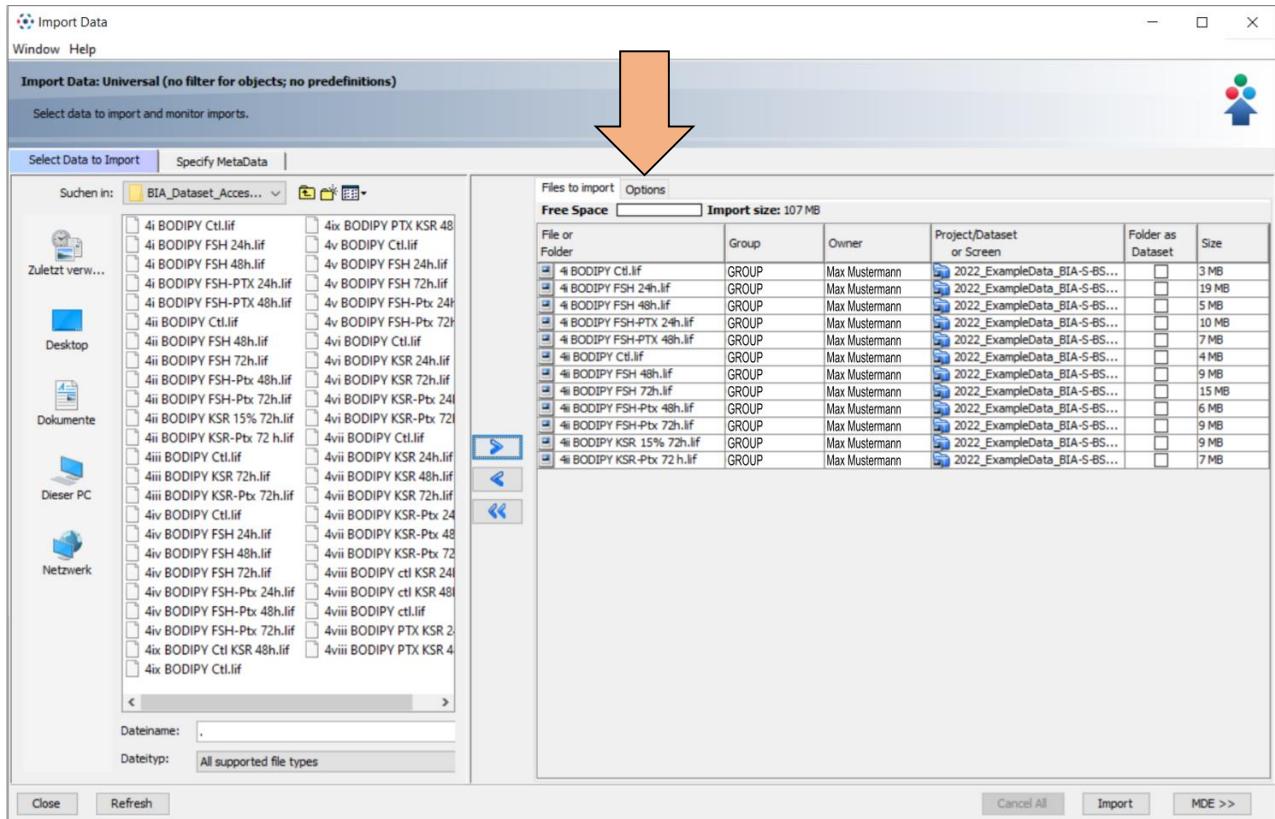
... OR create a new Project and/or Dataset.

When finished, add the data to the import queue



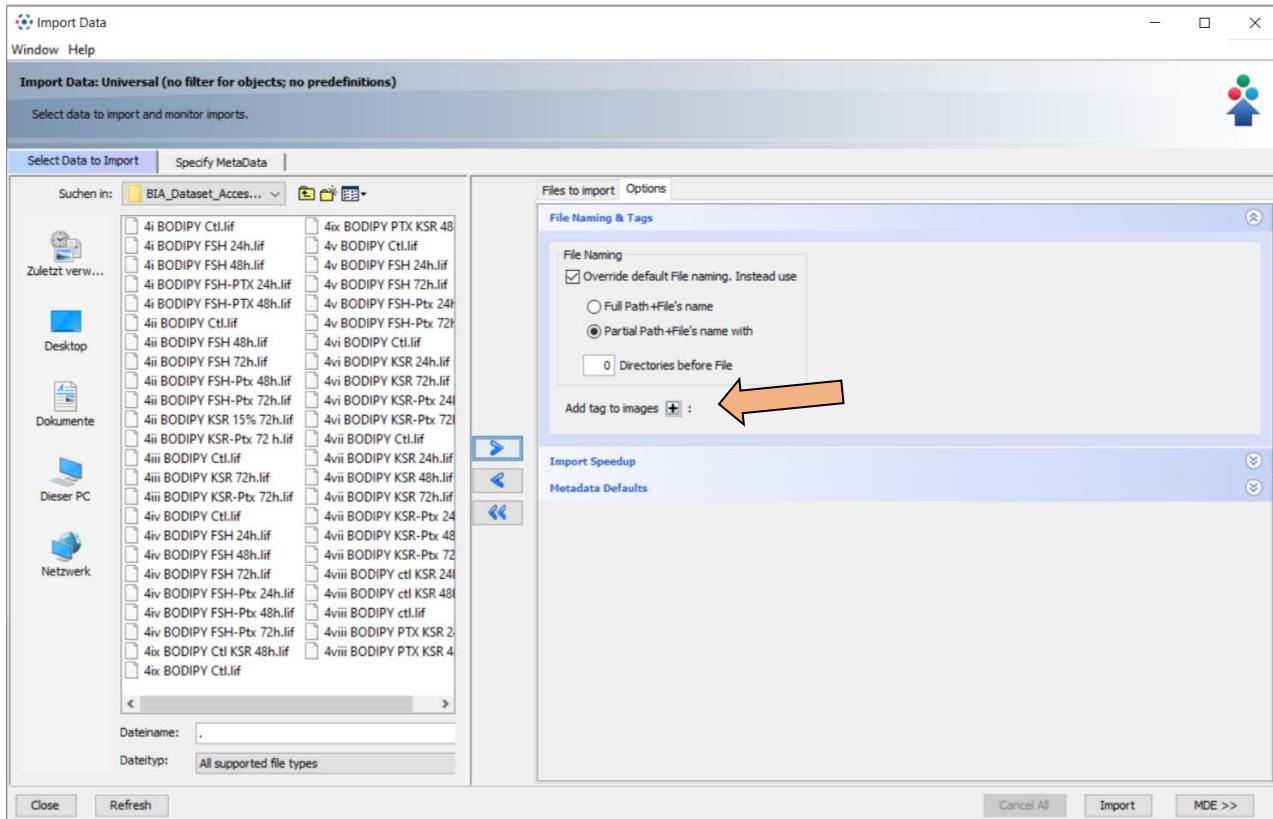
# Tag annotation during upload (OMERO.insight) 3/5

Choose options tab



# Tag annotation during upload (OMERO.insight) 4/5

Use  
Add tag to images  
by clicking on the  
+ symbol



## Tag annotation during upload (OMERO.insight) 5/5

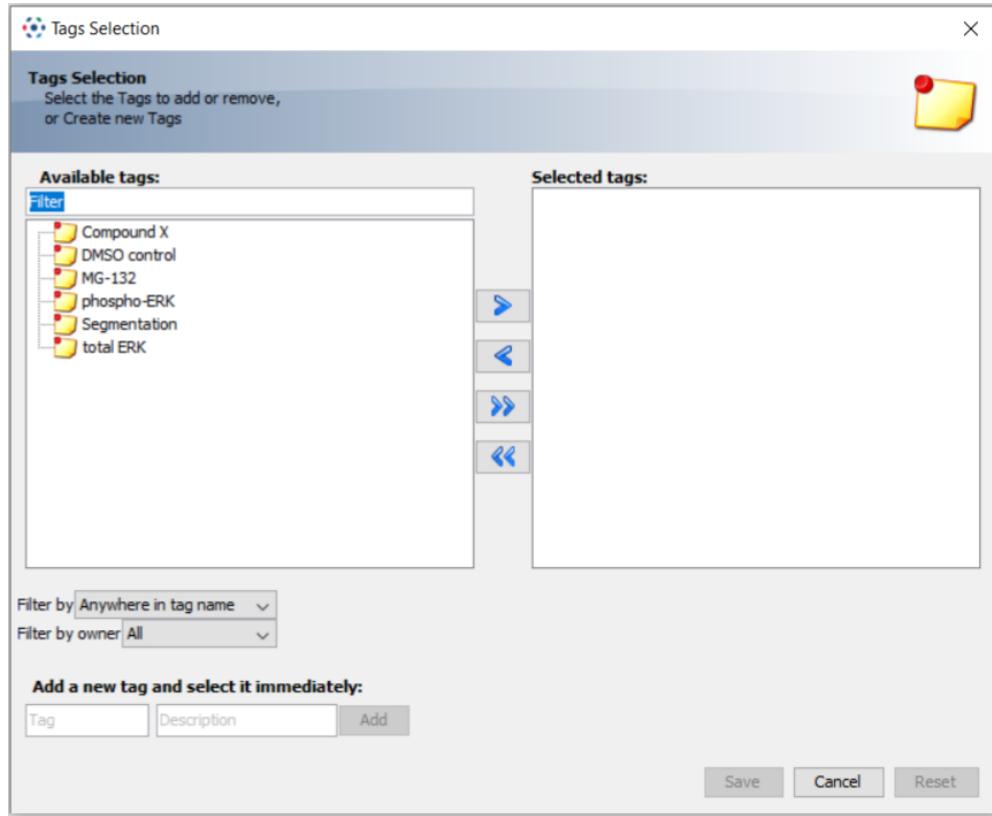
Use Available Tags  
for annotation with existing  
Tags

OR

Create a new Tag  
(similar to OMERO.web)

### NOTE:

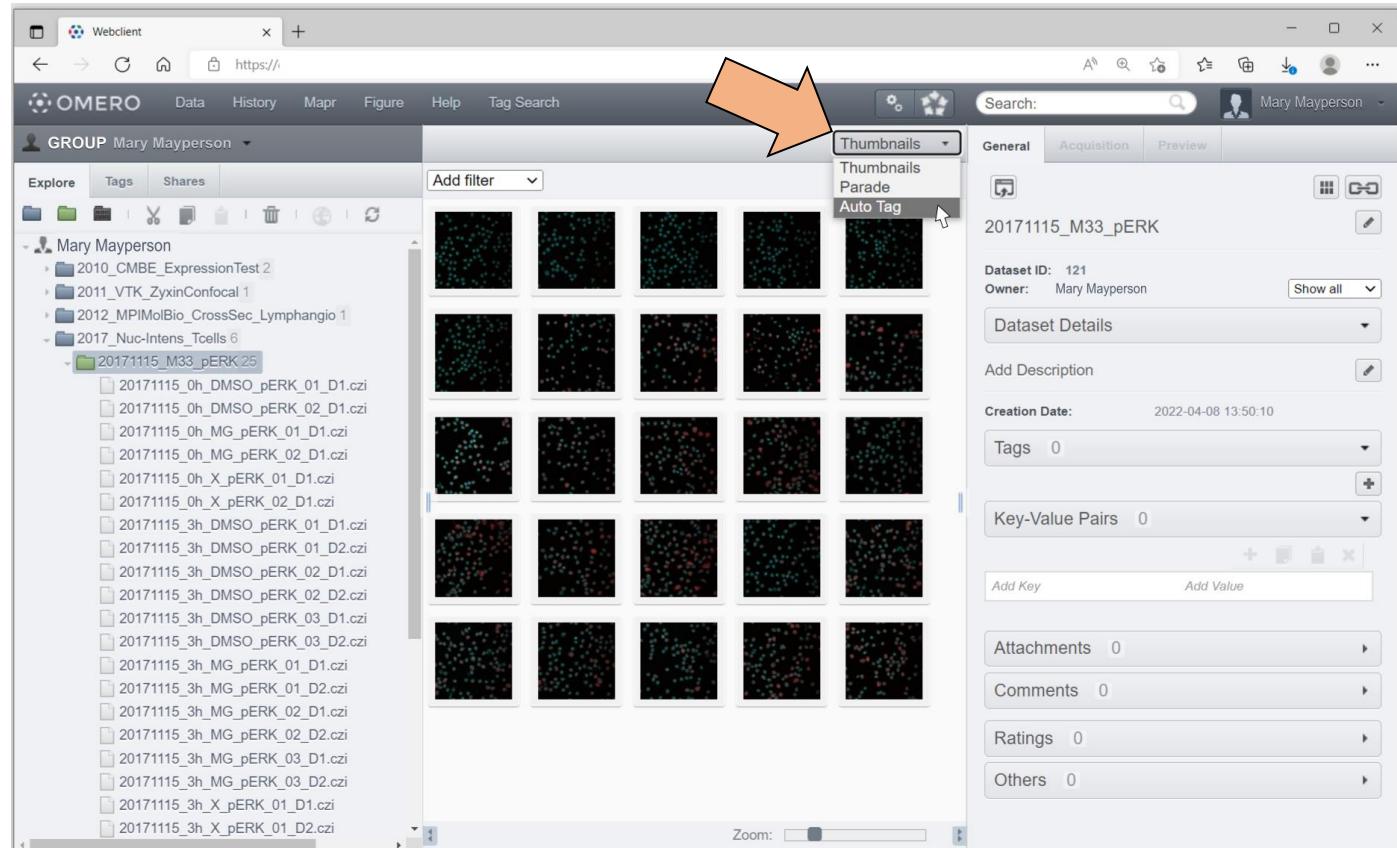
Tags annotated during *Import*  
are applied to all data in the  
queue!



# Using Auto Tag (OMERO.webtagging extension) 1/6

Auto Tag can assist in automatically extracting possible Tags from your data.

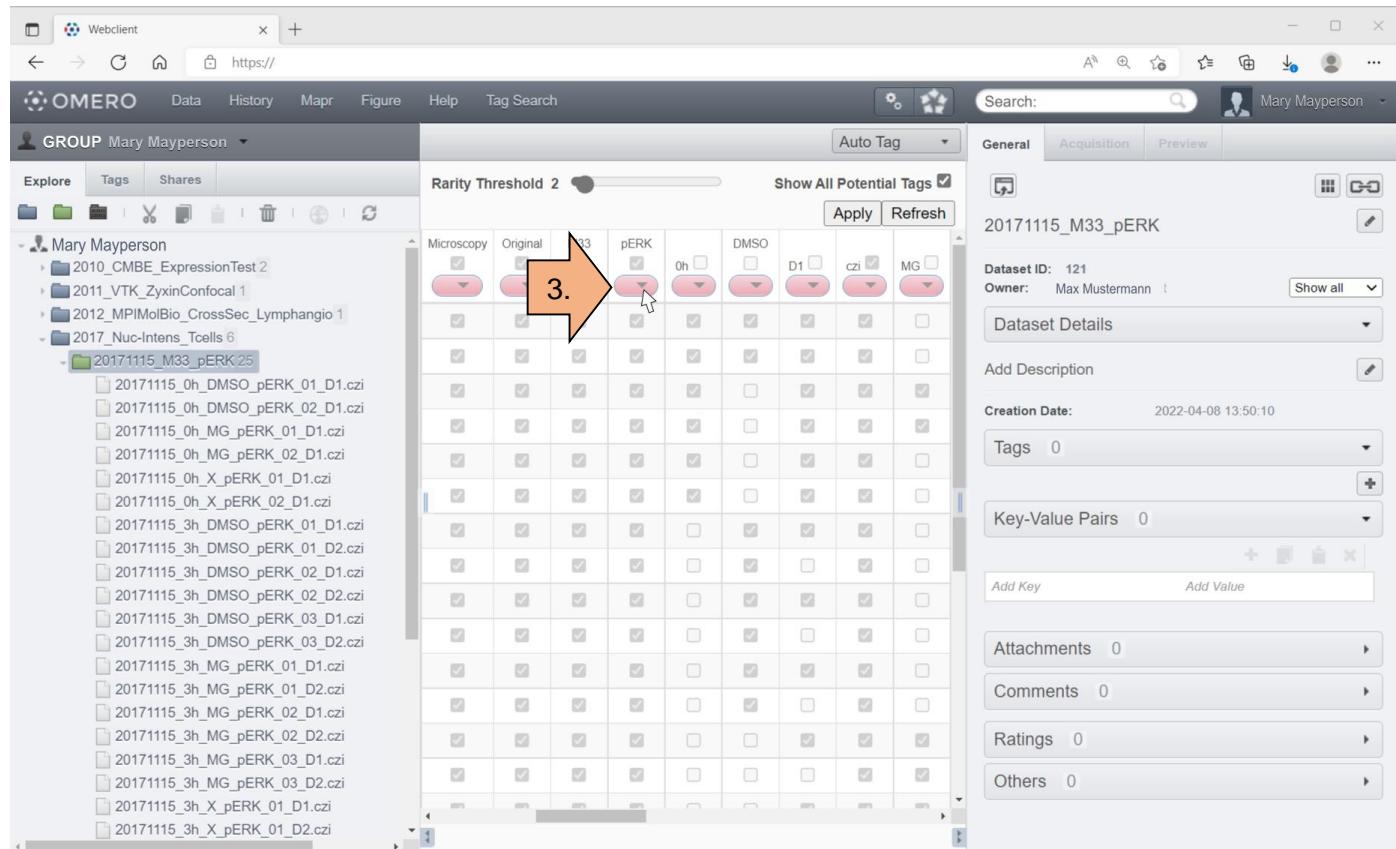
1. Change the view mode to Auto Tag



# Using Auto Tag (OMERO.webtagging extension) 2/6

2. Browse the proposed Tags and choose which you wish to add.

3. Click on  
**New/Existing Tag**  
to add the Tag.



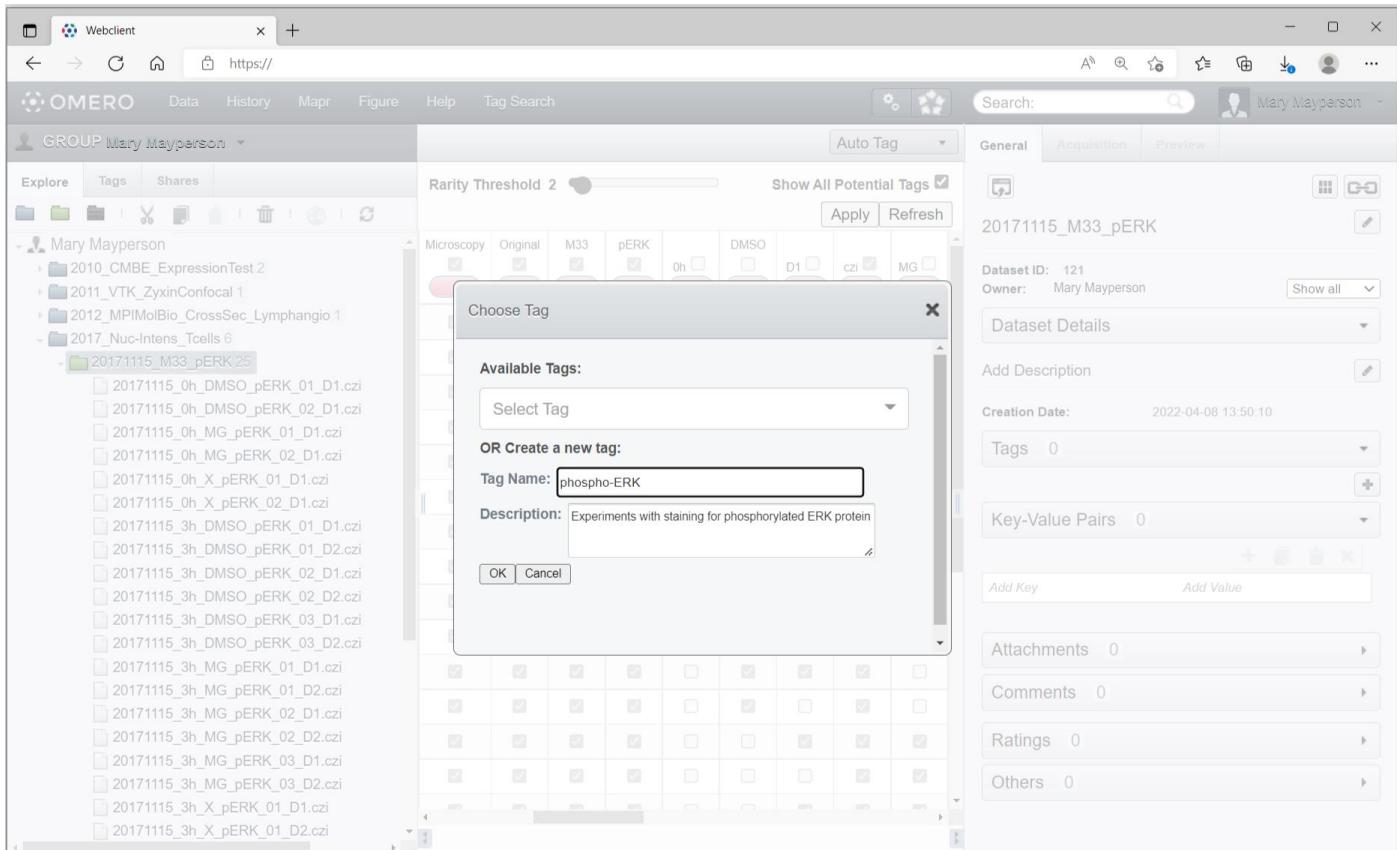
The screenshot shows the OMERO WebClient interface with the 'Auto Tag' extension. On the left, there's a sidebar with 'Explore', 'Tags', and 'Shares' tabs, and a tree view of datasets. The main area shows a grid of tags: Microscopy, Original, 0h, pERK, DMSO, D1, czi, MG. Below the grid is a table of files with checkboxes for each tag. The right side has sections for 'Dataset Details', 'Add Description', 'Creation Date' (2022-04-08 13:50:10), 'Tags' (0), 'Key-Value Pairs' (0), 'Attachments' (0), 'Comments' (0), 'Ratings' (0), and 'Others' (0). A large orange arrow labeled '3.' points to the 'Tags' section in the sidebar.

# Using Auto Tag (OMERO.webtagging extension) 3/6

4. Select from the Available Tags

OR

Create a new Tag.



# Using Auto Tag (OMERO.webtagging extension) 4/6

5. Choose data to be assigned with the Tag.  
(AutoTag prefills boxes as a suggestion)

*Optional:* You can narrow the view by unchecking

Show All Potential Tags

and extend your view by hiding the side panels with this button:



The screenshot shows the OMERO WebClient interface with the 'Auto Tag' extension active. The top navigation bar includes 'Webclient', 'OMERO', 'Data', 'History', 'Mapr', 'Figure', 'Help', 'Tag Search', and 'Auto Tag'. The 'Auto Tag' dropdown is open, showing a 'Rarety Threshold' slider set to 2, a 'Show All Potential Tags' checkbox (which is checked), and an 'Apply' button. Below this is a grid of checkboxes for assigning tags to data files. The grid columns include 'pERK' (checked), '0h' (unchecked), 'DMSO' (unchecked), 'D1' (unchecked), 'czi' (checked), 'MG' (unchecked), and 'X' (unchecked). The rows represent individual data files. To the right of the grid, there is a 'Dataset Details' section showing 'Dataset ID: 121', 'Owner: Mary Mayperson', and a 'Show all' dropdown. Below this are sections for 'Dataset Details', 'Add Description', 'Creation Date: 2022-04-08 13:50:10', 'Tags 0', 'Key-Value Pairs 0', 'Attachments 0', 'Comments 0', 'Ratings 0', and 'Others 0'.

# Using Auto Tag (OMERO.webtagging extension) 5/6

OMERO.web now shows you the Original Import Path of the data, which you can choose for tagging.

## 6. Click Apply

The screenshot shows the OMERO.web client interface. At the top, there's a navigation bar with tabs for 'Data', 'History', 'Mapr', 'Figure', 'Help', and 'Tag Search'. On the right side of the header, there's a user profile for 'Mary Mayerson' and a dropdown menu labeled 'Auto Tag'. Below the header, there's a search bar and some filter options. The main content area is titled 'Original Import Path' and contains a table with several rows. The first row has a checkbox and the path 'D:/Data\_2016-2018/My\_Research\_Institute/PhD\_MyLab/Project\_M/2017\_M28-M50/201711\_M33\_Raw\_Data/20171115\_M33\_Microscopy/20171115\_pERK/pERK 0h/20171115\_0h\_DMSO\_pERK\_01\_D1.cz1 (58103)'. There are 15 such rows, each with a checkbox and a similar path, indicating multiple files to be tagged. At the bottom of the table, there are scroll bars and a footer with some icons.



# Using Auto Tag (OMERO.webtagging extension) 6/6

The data now contains the new Tag

Shown here: One of the images that was marked and its metadata window.

The screenshot shows the OMERO Webclient interface. On the left, the file tree shows a group named "Mary Mayperson" containing various projects and a folder "2017\_Nuc-Intens\_Tcells 6" which contains a sub-folder "20171115\_M33\_pERK\_25" and several image files. In the center, a grid interface displays a table of images from the "M33" experiment. The columns represent different acquisition conditions: pERK (checked), 0h (unchecked), DMSO (unchecked), D1 (unchecked), czi (checked), MG (unchecked), and X (unchecked). A "Rarety Threshold" slider is set to 2, and a "Show All Potential Tags" checkbox is checked. An "Auto Tag" button is visible. On the right, a detailed view of the image "20171115\_0h\_DMSO\_pERK\_01\_D1.czi" is shown. The "Image Details" panel includes fields for Import Date (2022-04-08 13:50:20), Dimensions (1912 x 1912), Pixels Type (uint16), Pixels Size (0.07 x 0.07 μm), Z-sections/Timepoints (1 x 1), Channels (Ch2-T1, Ch1-T2), and ROI Count (0). The "Tags" panel lists "phospho-ERK" (selected). A tooltip for "phospho-ERK" provides key-value pairs: ID: 19802, Owner: Mary Mayperson, Added by: Mary Mayperson, Linked by: Mary Mayperson, On: 2022-07-28 15:30:53, Key: phospho-ERK, Description: Experiments with staining for phosphorylated ERK protein. The "Key-Value" table also lists Organism: Mus musculus, Organ: Spleen, IsolationMethod: MACS negative sort, and ActivationMethod: anti-CD3/anti-CD28.