

Plan

Figures

raster vs vector

guidelines

Compression

Storage

OMERO

Image Files

OME

Handling of Microscope Image Data

David Miguel Susano Pinto

Micron Advanced Microscopy Course, 2019

Microscope Image Analysis in 3 parts

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- ① What is in a microscope image
 - What is in a image?
 - Image display
 - Image acquisition
- ② Careful with your data
 - File formats
 - OMERO
 - Figure preparation
- ③ Images as N dimensional numeric arrays
 - N dimensional images
 - Spatial filters
 - Morphology
 - Connected components
 - Tools

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raster individual pixel values. Use ImageJ.
vector polygons with attributes. Use inkscape.



ImageJ



Inkscape



GIMP

Figure preparation guidelines

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- Carry out all processing and analysis of images before making figures by using pixel based (raster) programs.
- Handling of images for figures should use pixel based (raster) programs.
- Vector graphics for lettering, arrows, diagrams, arranging panels.
- Both can rotate, resize, and crop.
- Do not use office applications like powerpoint, keynote, writer, word, or impress.
- Do not use screenshot.
- Be consistent with processing steps, especially contrasting.

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Save TIFF, not JPEG.

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Save TIFF, not JPEG.
A useful generalisation.

Image data is large

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$1024 \times 1024, 30 \text{ Z slices} = 40\text{MB}$

Image data is large

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$1024 \times 1024, 30 \text{ Z slices} = 40\text{MB}$
Do it in two channels, that's 80MB

Image data is large

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$1024 \times 1024, 30 \text{ Z slices} = 40\text{MB}$
Do it in two channels, that's 80MB
Every minute for 1 hour = 4GB

Image data is large

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$1024 \times 1024, 30 \text{ Z slices} = 40\text{MB}$
Do it in two channels, that's 80MB
Every minute for 1 hour = 4GB
Most cameras are 16bit, so that's 8GB

where

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- 1 you do it
- 2 someone else does it

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- 1 you do it
- 2 someone else does it

- 1 one disk per person
- 2 shared filesystem
- 3 OMERO

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- one file one image

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Image Files

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- one file one image
- one file many images

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- one file one image
- one file many images
- many files one image

Files and metadata

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- why some many formats?
- metadata saved may be format dependent
- use libraries and applications that respect you

Inside a file

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- inside a DV file

Inside a file

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- inside a DV file
- inside a TIFF file

Inside a file

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Image Files

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- inside a DV file
- inside a TIFF file
- TIFF inside Document Viewer

Inside a file

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Image Files

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- inside a DV file
- inside a TIFF file
- TIFF inside Document Viewer
- open formats

Bioformats and OME-TIFF

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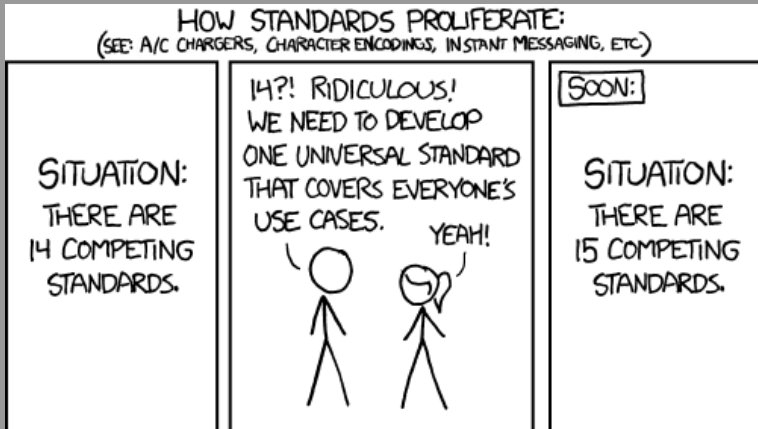
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Open Microscopy Environment

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- bioformats
- OME-XML
- OME-TIFF
- OMERO
- IDR