OMERO
Users Training day
Cambridge, December 2017

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The OME Consortium
Programme of the day

- Short introduction to OMERO
- Managing images (Workflow 1 – z stacks)
- Coffee
- Viewing, analyzing and publishing images using OMERO plugins (OMERO.iviewer, FPBioimage, OMERO.figure Workflow 1 – z stacks continued)
- Lunch
- Filtering and data search, analysis using Fiji features (OMERO.insight plugin for Fiji, Workflow 2 – timelapse images)
- Coffee
- Publishing with OMERO (OMERO.figure – in depth, Workflow 2 – timelapse continued)
Outline

- Scientific Data paradigm
- What is OMERO
- Analyzing with OMERO
- Sharing data with OMERO
- Publishing with OMERO
- Questions
The Standard Paradigm

You ➔ Applications ➔ Data
What about

- Organizing your data?
- Sharing data with coworkers and colleagues?
- Analyzing data?
- Publishing data?
The “Scientific Data” Paradigm

Gray et al, 2005, Scientific Data Management in the Coming Decade, Microsoft Research
OMERO.insight: Desktop Based Application
Import Image Data into OMERO
OMERO.web: Web Based Application
ANALYSIS WITH OMERO
The Extensible OMERO Platform
Examples of Analysis Integration

- **OMERO.iviewer** – plugin for viewing and
- **ImageJ/Fiji, Icy** – Pluggable, desktop Image processing tools (Java)
- **FPBioimage** – 3D viewer from Cambridge
- **R** – statistical analysis software
- **CellProfiler** – HCS segmentation and features (Python)
- **mTools** – Otsu, basic segmentation (Matlab)
- **ORB1T** – Image analysis, specialized on pathology images
- **WND-CHRM** – weighted nearest neighbor machine learning (Python)
- **ThunderSTORM and PALMSiever** – Localisation SRM (ImageJ, Matlab)
- **OMERO2CV** – LSFM Multi-View Reconstruction (C++, OpenCV, ITK)
- **Columbus Acapella®** – commercial Big Data processing…
Viewing and analyzing Images – OMERO.iviewer

→ Google for OMERO.iviewer
→ Go to YouTube and search for OMERO.iviewer
→ See also Workshop OMERO.web
First Person Bioimage – 3D viewer from Cambridge, now in OMERO.web

© Marcus Fantham
See the paper in Nature Photonics
ImageJ and OMERO
ORBIT IMAGE ANALYSIS

http://www.orbit.bio/

Compatible with OMEPO 5.4.0
OMERO.scripts: Kymographs example

Image from Bowen et al. JCB 2011
SHARING DATA WITH OMERO
OMERO group and user system
Security Model

- **Group-Private**: Can only read your own data
- **Group-Read**: Can read but not annotate others’ data
- **Group-Annotate**: Can read and annotate others’ data
- **Group-Write**: Can read and edit others’ data
PUBLISHING WITH OMERO
OMERO:
Data Publication – images on website
The Ndc80 complex targets Bod1 to human mitotic kinetochores
Katharina Schleicher, Michael Porter, Sara ten Have, Ramasubramanian Sundaramoorthy, Iain M. Porter, Jason R. Swedlow
Published 15 November 2017. DOI: 10.1098/rsob.170099
Welcome to the Image Data Resource (IDR). This online, public data repository seeks to store, integrate and serve image datasets from published scientific studies.

Take a look at the data
Winner of the SLS innovator of the Year
Some useful links

- OMERO Downloads:
  - https://downloads.openmicroscopy.org/omero/

- OMERO Help Pages:
  - http://help.openmicroscopy.org/

- OMERO Forums:
  - https://www.openmicroscopy.org/community/

- OMERO demo server:
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