

Talk Outline

- Thank you!
- This Meeting...
- The Problem
- Our Progress
- Funding...
- Future Priorities...

Thank you!!!

- *Institut Pasteur*

- Christiane Pacaud
- Nathalie Aulner
- Anne Danckaert
- Sebastien Simard
- Spencer Shorte

- *University of Dundee*

- June Matthew
- Wilma Woudenberg

- *The OME Consortium*

Thank you!!!

wellcometrust



OME Consortium

- Dundee – Jason Swedlow, Colin Blackburn, Jean-Marie Burel, Mark Carroll, Gus Ferguson, Helen Flynn, Kenny Gillen, Roger Leigh, Simon Li, Dominik Lindner, Josh Moore, Will Moore, Balaji Ramalingam, Gabriella Rustici, Aleksandra Tarkowska, Petr Walczysko, Eleanor Williams *and you?!?*
- University of Wisconsin, Madison (LOCI) - Kevin Eliceiri, Curtis Rueden, Mark Hiner
- UT Southwestern – Gaudenz Danuser, Sebastian Besson
- Oxford – Ilan Davis, Douglas Russell
- Cambridge – Rafael Carazo-Salas, Bálint Antal
- CRS4 - Gianluigi Zanetti, Gianmauro Cucurru, Simone Leo, Luca Lianas
- Edinburgh – Richard Baldock, Bil Hill, Jianguo Rao
- Carnegie-Mellon – Robert Murphy, BK Cho, Ivan Cao-Berg
- Imperial – Paul French, Chris Dunsby, Ian Munro, Yuriy Alexandrov
- NIA, NIH – Ilya Goldberg, Chris Coletta
- Pasteur – Spencer Shorte, Sebastien Simard, Julien Jorde
- EMBL-EBI – Gerard Kleywegt, Ardan Patwardhan, Ingvar Lagerstedt, Alvis Brazma
- Glencoe Software – Chris Allan, Joshua Ballanco, Andreas Knab, Melissa Linkert, Chris MacLeod, Josh Moore, Mike Rossner, Emil Rozbicki, Liza Unson, Rebecca Walker, Wilma Woudenberg

THIS MEETING.....

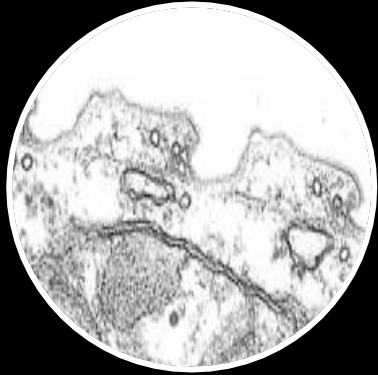
Meeting Purpose

10th Annual User's Mtg

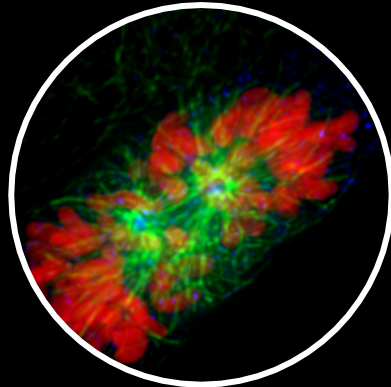
- Attendees
 - OME Consortium
 - Invited Speakers
 - Broad cross-section of users
- *Day 1: Presentations*
 - Lightning Talks
 - Project Overview
 - Users & Guests
- *Day 2: Workshops & Demos*
- Progress Report
- Future development priorities & planning

THE PROBLEM

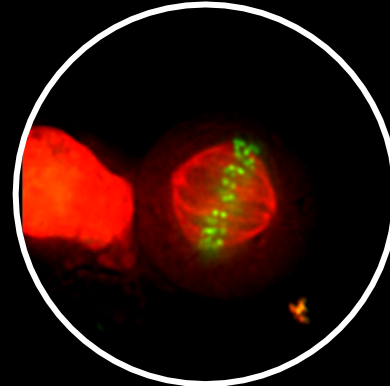
The Image Problem... is Ubiquitous



Organelles



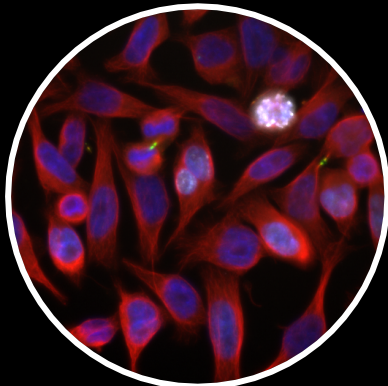
Cells



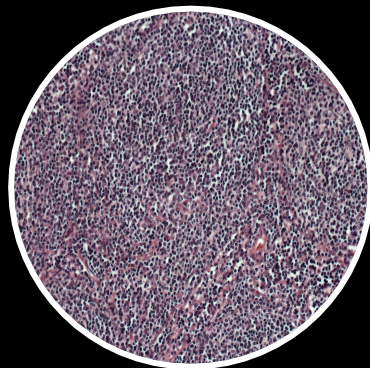
Dynamics



Physiology



Lead Discovery
Target Validation



Pathology



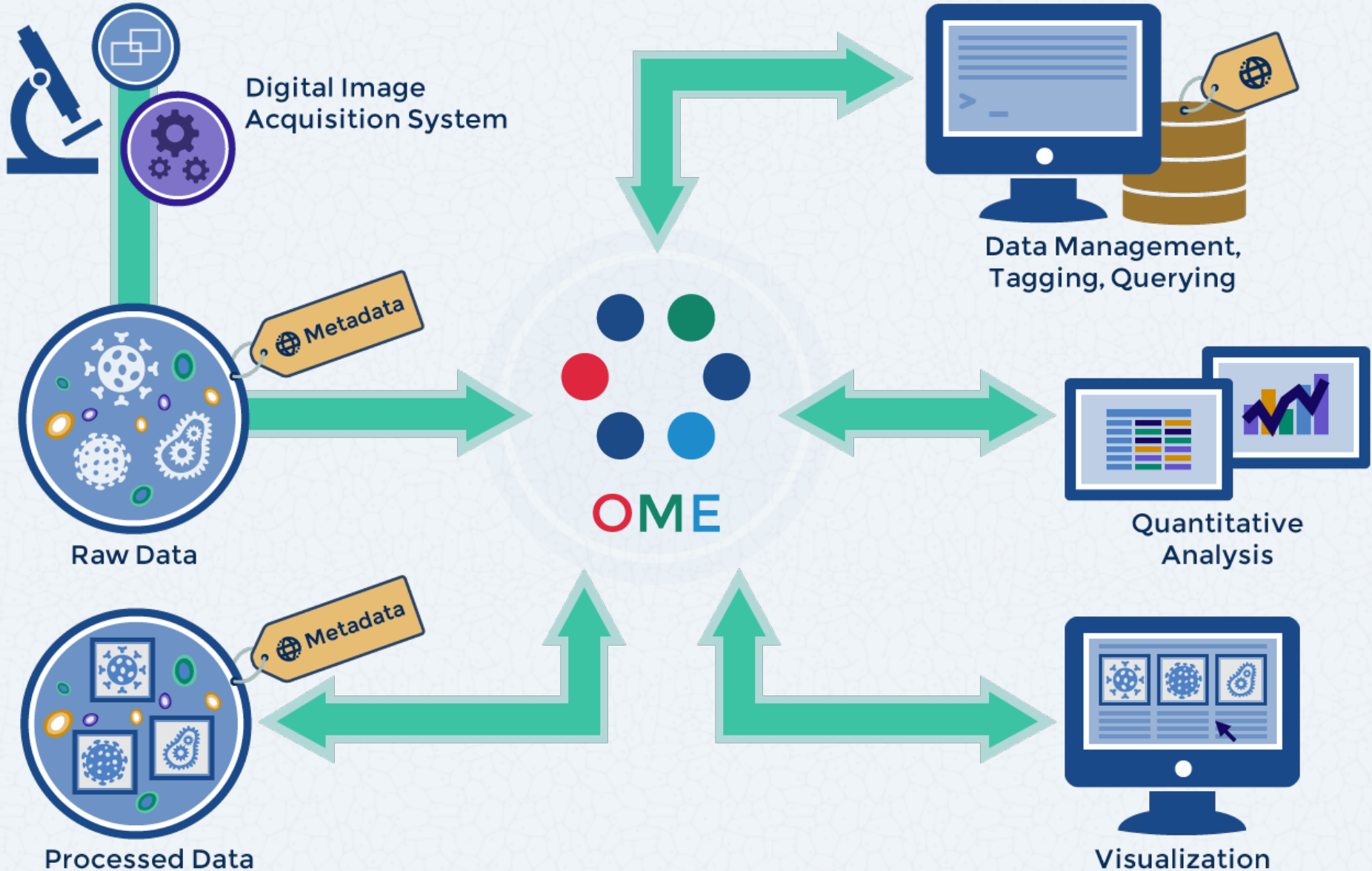
In Vivo

A pretty picture?

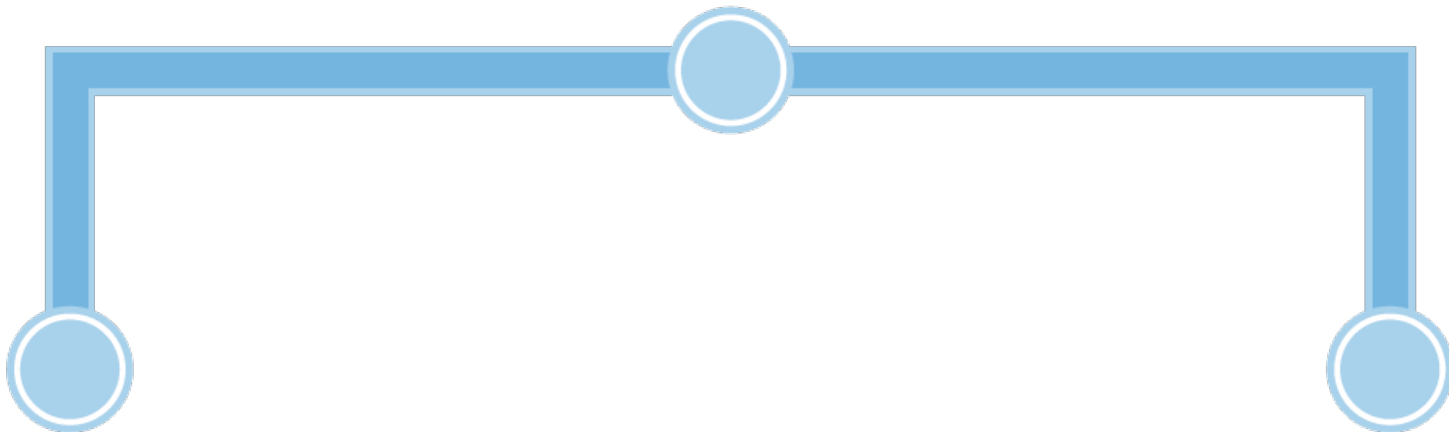
A measurement?

A resource?

...Towards Image Informatics



OME : What We Do



OME-XML

OME-TIFF

 **BIO-FORMATS**

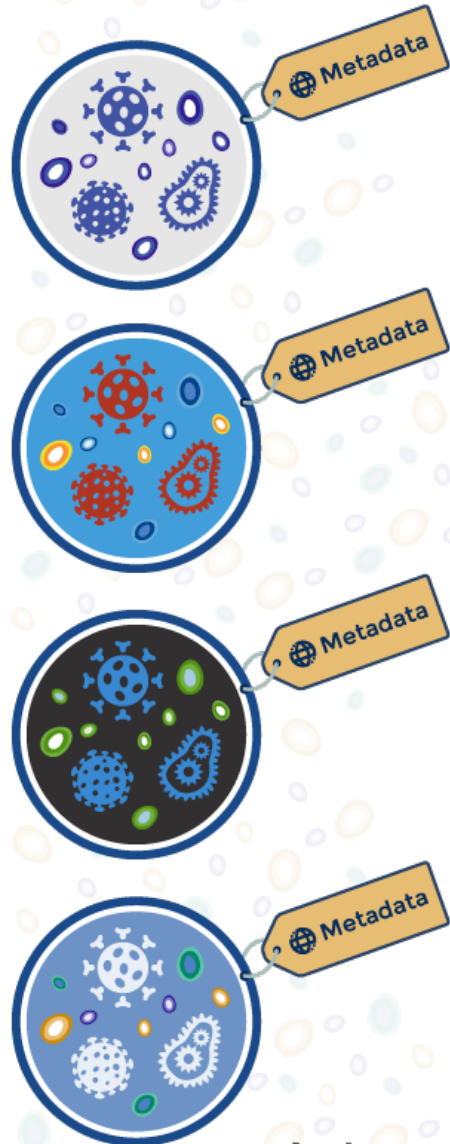
Open, exchangeable file formats



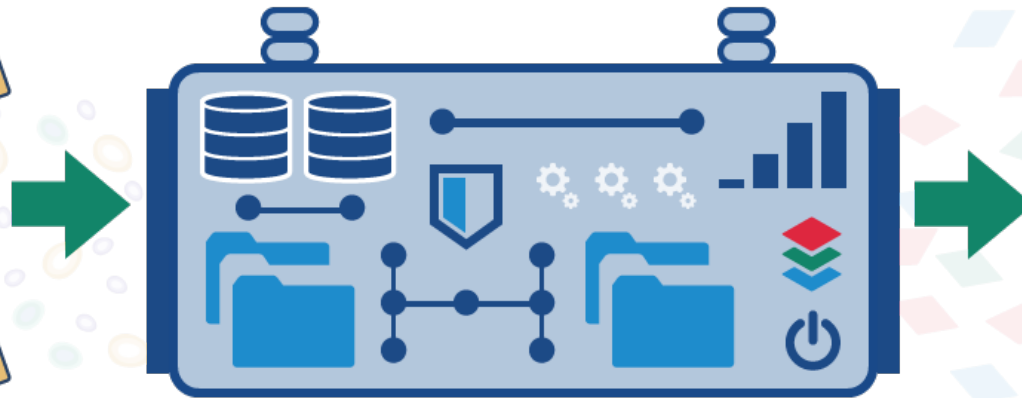
Open Image
Management Software

BIO-FORMATS: Proprietary File Conversion

Raw Data



BIO-FORMATS



594,900+ FILES



28,600+ DATASETS



1.7 TERABYTES

Processed Data



→ Apps using Bio-Formats were started >1.5M times so far in 2015 ←



BIO-FORMATS, OME-TIFF & μ -Manager: openFLIM-HCA



GitHub

This repository Search

Explore Features Enterprise Blog

Sign up

Sign in

imperial-photonics / openFLIM-HCA

Watch 4

Star 0

Fork 0

Home

Fredxxx edited this page 13 days ago · 15 revisions

openFLIM-HCA μ Manager Plugin

Welcome to the wiki for the openFLIM-HCA plugin for [\$\mu\$ Manager](#). This is an open-source project that aims to allow experimenters to conduct their own HCA-FLIM studies.

This wiki is intended to be the main source of documentation both for **users** with access to an FLIM HCA platform, and for **developers** keen to implement their own FLIM HCA solutions.

- [Getting started](#)
- [Software reference](#)
- [Hardware reference](#)
- [Experiment guide](#)
- [About FLIM-HCA](#)
- [Links](#)

Pages 19

Find a Page...

Home

1 [Software reference](#)

1.1 [Getting started](#)

1.2 [The FLIM panel](#)

1.3 [The XYZ panel](#)

1.4 [The light path panel](#)

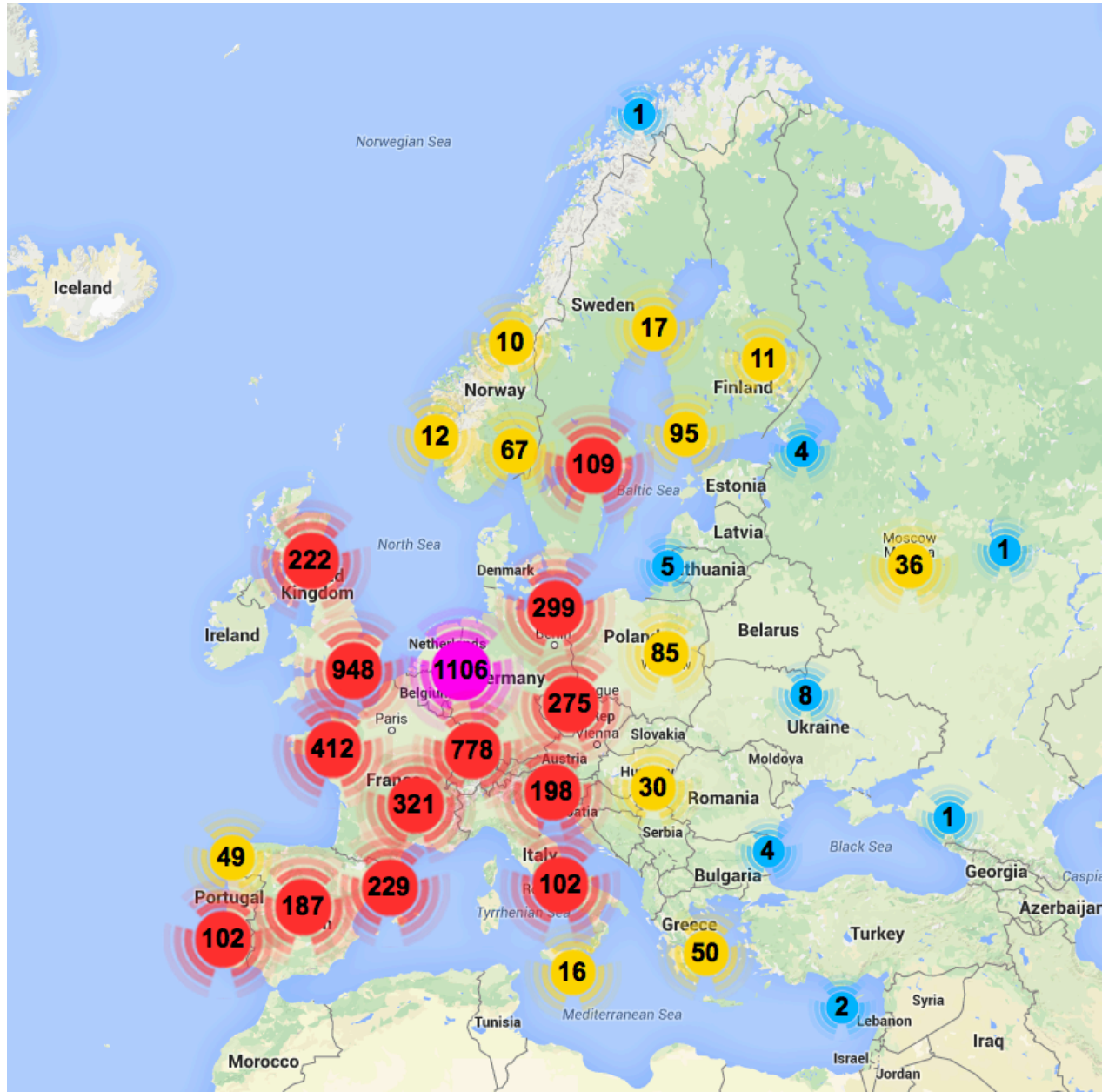
1.5 [The ProSetting Panel](#)

1.6 [The sequenced acquisition panel](#)

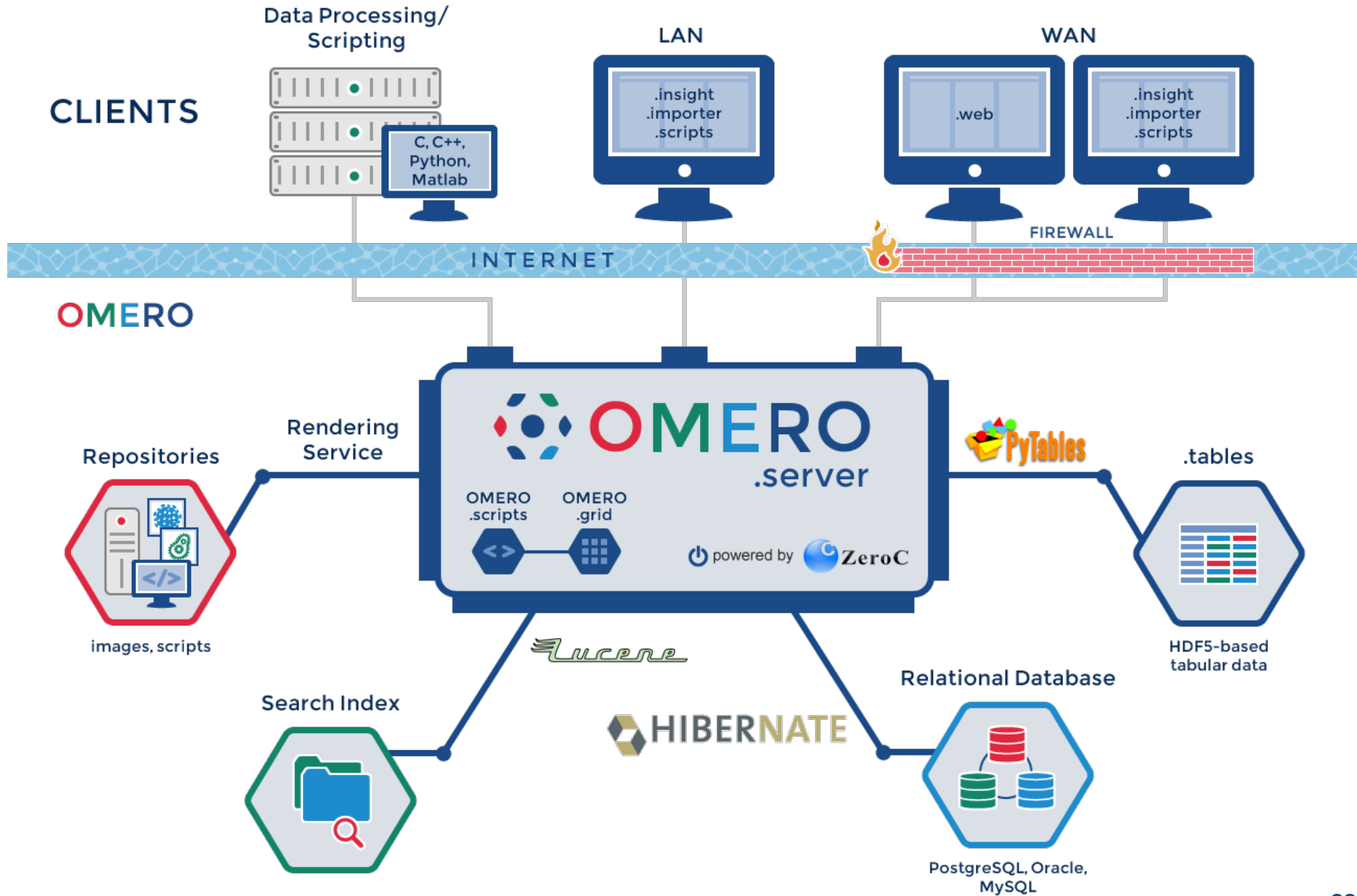
1.6.1 [XYZ positions setup for HCA sequence](#)

1.6.2 [Filter setup for HCA sequence](#)

BIO-FORMATS: Unique IPs: 2015 YTD



The OMERO Platform





OMERO & BIO-FORMATS: OMERO.insight Java Client

The screenshot displays the OMERO.insight Java Client interface. On the left, a 'Projects' tree shows a hierarchy of folders including 'Jason Swedlow', 'iain Porter', 'Michael Porter', 'Alexia Ferrand', and 'Analysis MCAK - GFP-MCAK cell line [8]'. The 'Analysis MCAK' folder is expanded, showing a sub-folder '101026-siCTL-LPM_M_total [11]' with multiple image files. The main workspace shows a grid of 11 images. The right panel displays 'Image details' for 'Image ID: 3840635', including acquisition information and a list of channels: DAPI, FITC, RD-TR-PE, and CY-5. A 'Measurement Tool' window is open in the bottom right, showing a table of ROI data.

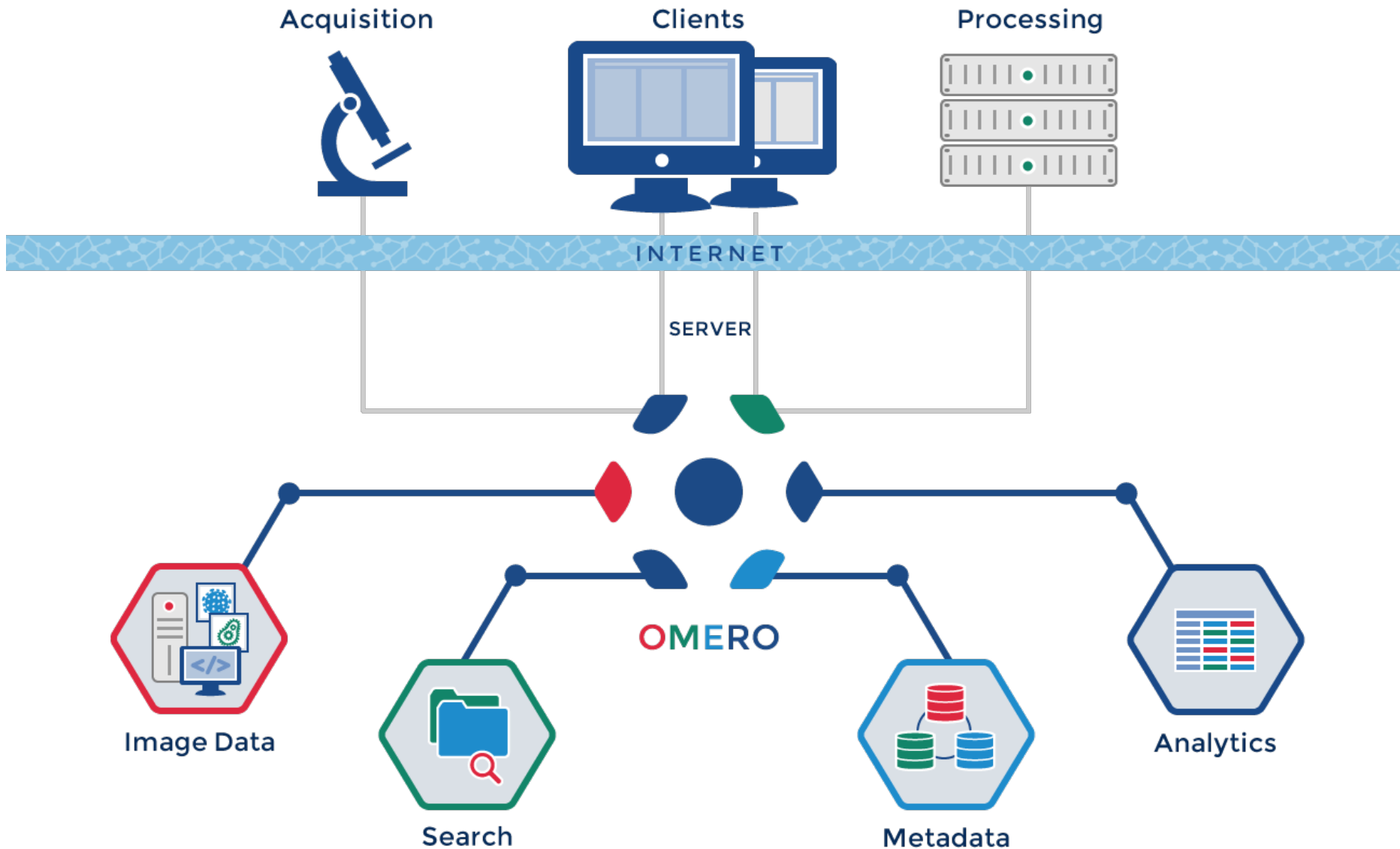
ROI	id	T	Z	Type	Text	Visible
	5662	[1,1]	[1,60]	<input type="checkbox"/>		<input checked="" type="checkbox"/>
	5663	[1,1]	[1,60]	<input type="checkbox"/>		<input checked="" type="checkbox"/>
	5664	[1,1]	[1,60]	<input type="checkbox"/>		<input checked="" type="checkbox"/>



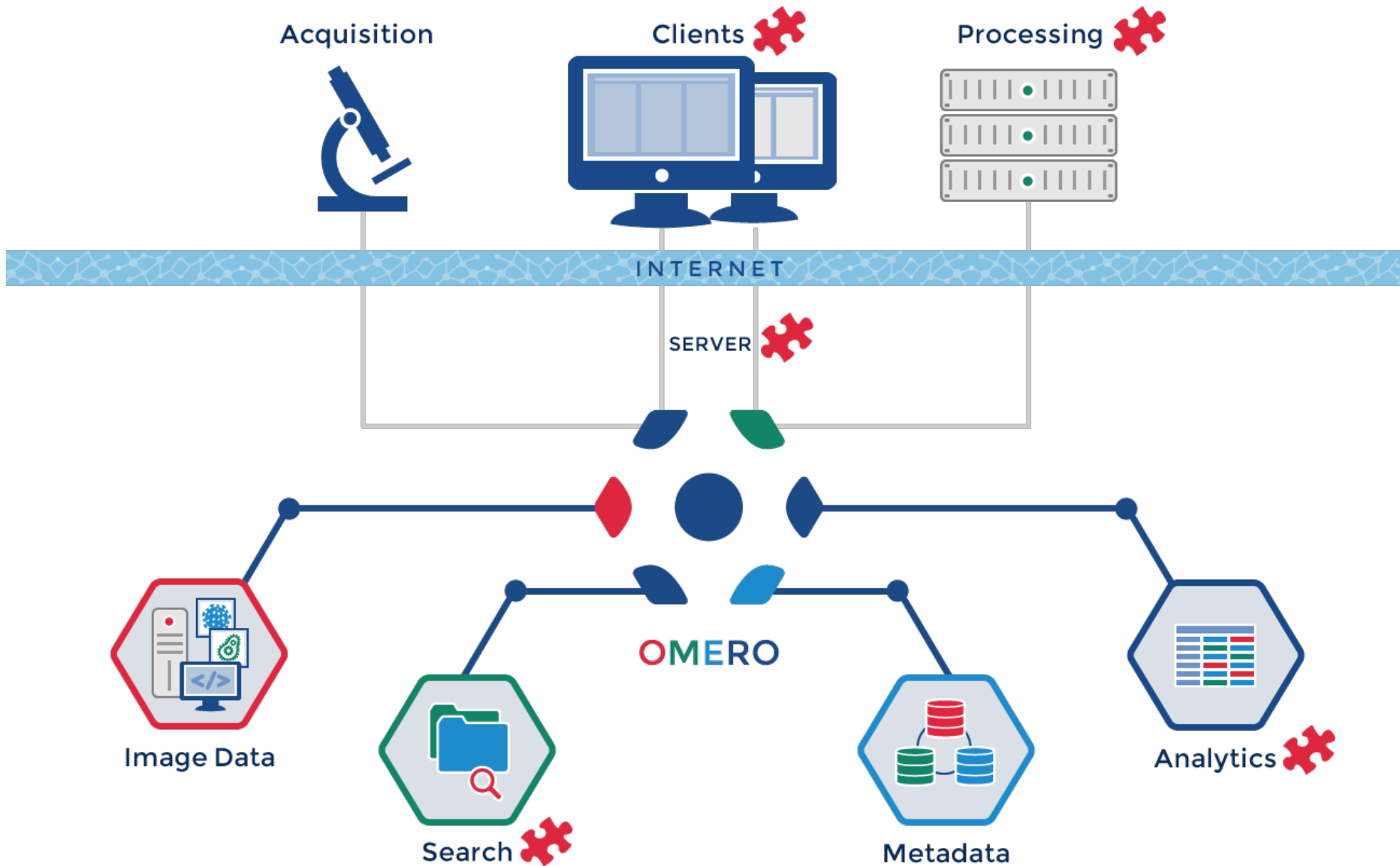
OMERO & BIO-FORMATS: OMERO.web Client

The screenshot displays the OMERO.web Client interface. On the left, a tree view shows a project named 'Alexia Ferrand' with a sub-project 'Analysis MCAK - GFP-MCAK cell line 8'. Under this, there are several image folders, including '101026-siCTL_LPM_M_total 11' and '101216-siHP1a_LPM_M_total 11'. The main viewing area shows a series of image thumbnails at the top. Below them is a browser window displaying the URL: https://nightshade.openmicroscopy.org/webclient/img_detail/3840635/#. The central viewing window contains a large image of cells with red and blue channels. To the left of this image is a vertical 'Z-sections' slider, and below it is a horizontal 'Timepoints' slider. A 'Viewing Options' panel is overlaid on the left side of the image, showing settings for 'Normal' view, 'Max Intensity', 'Split Channel', 'Quality' (Normal), and 'Zoom (%)' (50). The 'Rendering Details' section shows 'Channels - Edit' with 'DAPI' (blue) and 'FITC' (green) selected, and 'RD-TR-PE' (red) and 'CY-5' (blue) also visible. The 'Current Image' section shows 'Z: 32/60 | T: 1/1' and 'ROI Count: 3'. The right-hand side of the interface features a metadata panel with tabs for 'General', 'Acquisition', and 'Preview'. The 'General' tab is active, showing the image title 'Z:/aferrand/HP1/101026-siRNA/101026-siCTL-GFPMCAK_SKIP_ACA_02_07_R3D_D3D.dv', 'IMAGE ID: 3840635', and a 'Launch full viewer' button. Below this, a table lists metadata: Owner: Alexia Ferrand; Acquisition Date: 2010-10-26 13:55:25; Imported Date: 2010-10-26 14:06:41; Dimensions (XY): 512 x 512; Pixels Type: uint16; Pixels Size (XYZ) (µm): 0.1001 x 0.1001 x 0.2000; Z-sections/Timepoints: 60 x 1; Channels: DAPI, FITC, RD-TR-PE, CY-5. A 'Show unset fields' link is present. Further down, there are sections for 'RATING' (No ratings), 'TAGS', 'ATTACHMENTS', and 'OTHERS:'. A comment section shows a comment by Alexia Ferrand at 2010-11-09 14:16:33: 'for fig siCTL VS siMCAK'.

The OMERO Platform



The *Extensible* OMERO Platform



 Plugins Welcome



OMERO & BIO-FORMATS: Extensible Platforms

GitHub [Explore](#) [Features](#) [Enterprise](#) [Blog](#) [Sign up](#) [Sign in](#)

[Contributions](#) [Repositories](#) [Public activity](#) [Follow](#)



Daniel Matthews
drmatthews

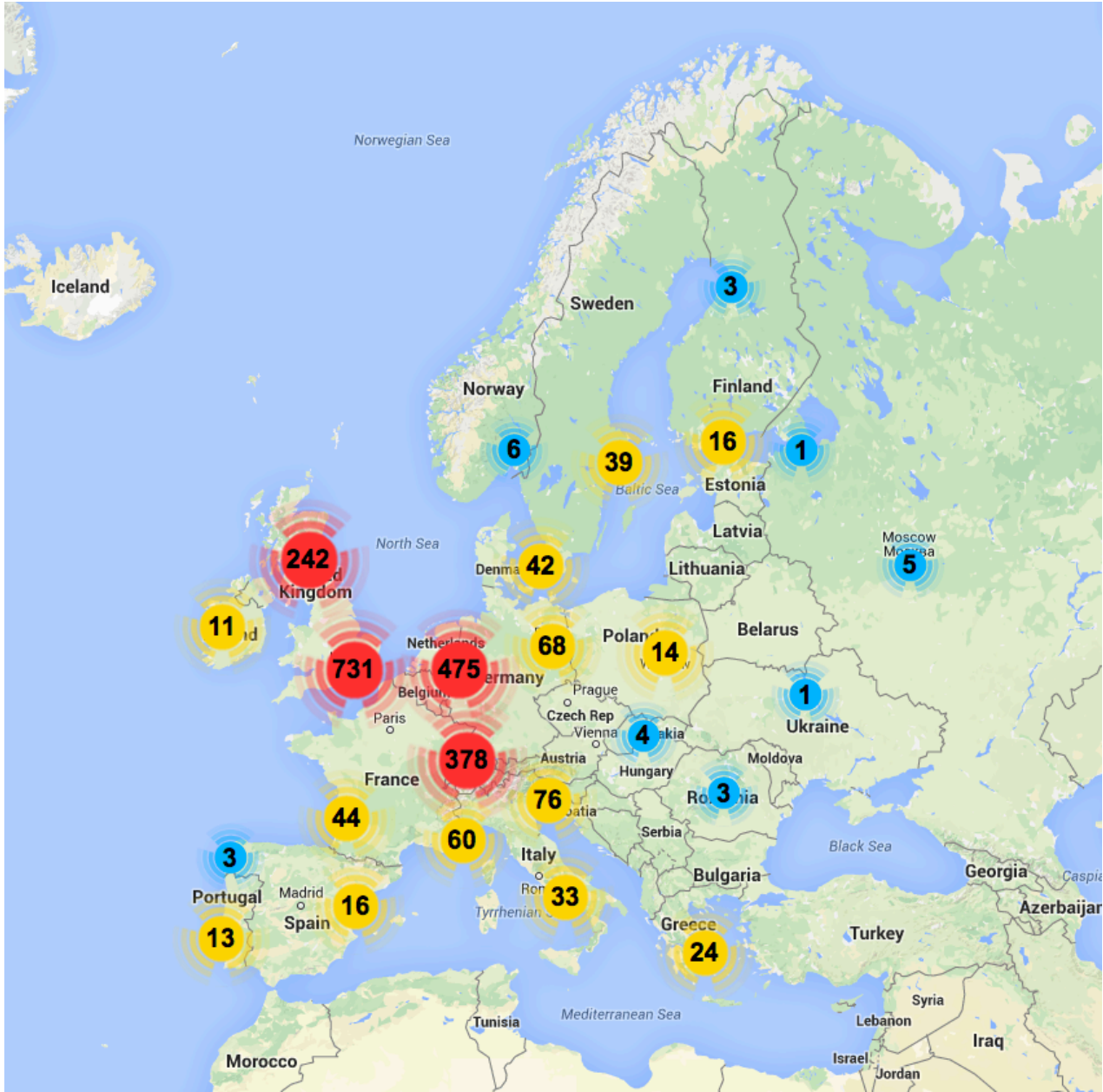
Joined on 18 Jun 2012

Popular repositories		
bioformats	Bio-Formats is a Java library for reading and ...	0 ★
SIMcheck	SIMcheck: ImageJ tools for assessing Structur...	0 ★
CellProfiler	CellProfiler is open-source cellular image anal...	0 ★
simple-STORM	Data processing software for dSTORM super-r...	0 ★
CUDA_SIMrecon	Image reconstruction for structured-illuminatio...	0 ★

Repositories contributed to		
QBI-Microscopy/SlideCrop	Python app, with wxPython GUI, for automate...	0 ★
QBI-Microscopy/omero-scripts-...	Utility functions and classes for omero-user-sc...	0 ★
QBI-Microscopy/Fiji-scripts	Jython scripts for Fiji-ImageJ	0 ★
QBI-Microscopy/Matlab-localisa...	a collection of scripts for parsing and analysin...	0 ★
QBI-Microscopy/omero-auto-upl...		0 ★



OMERO: EU Unique IPs: 2015YTD



OUR PROGRESS

OME : 2011-2016

- More data types (FLIM, LSFM, 3DEM, DigPath)
- Support complex, multi-dimensional, heterogeneous data (OME 5)
- Alternative image data storage methods (e.g., HDF5...)
- Validation of interfaces for analysis (esp. Matlab, Python, etc.)
- Integration of multi-parameter image-based search
- Data sharing & publication
- Shared Analysis Resources

OMERO & BIO-FORMATS: Data Import & Access

Lab & Facility
LM & EM



1-100 GB/day



HCS



0.1 - 5 TB/day



Filesystem



Rendering Service



Repositories

images, scripts



Remote Clients
(aware of Repo/.fs differences)

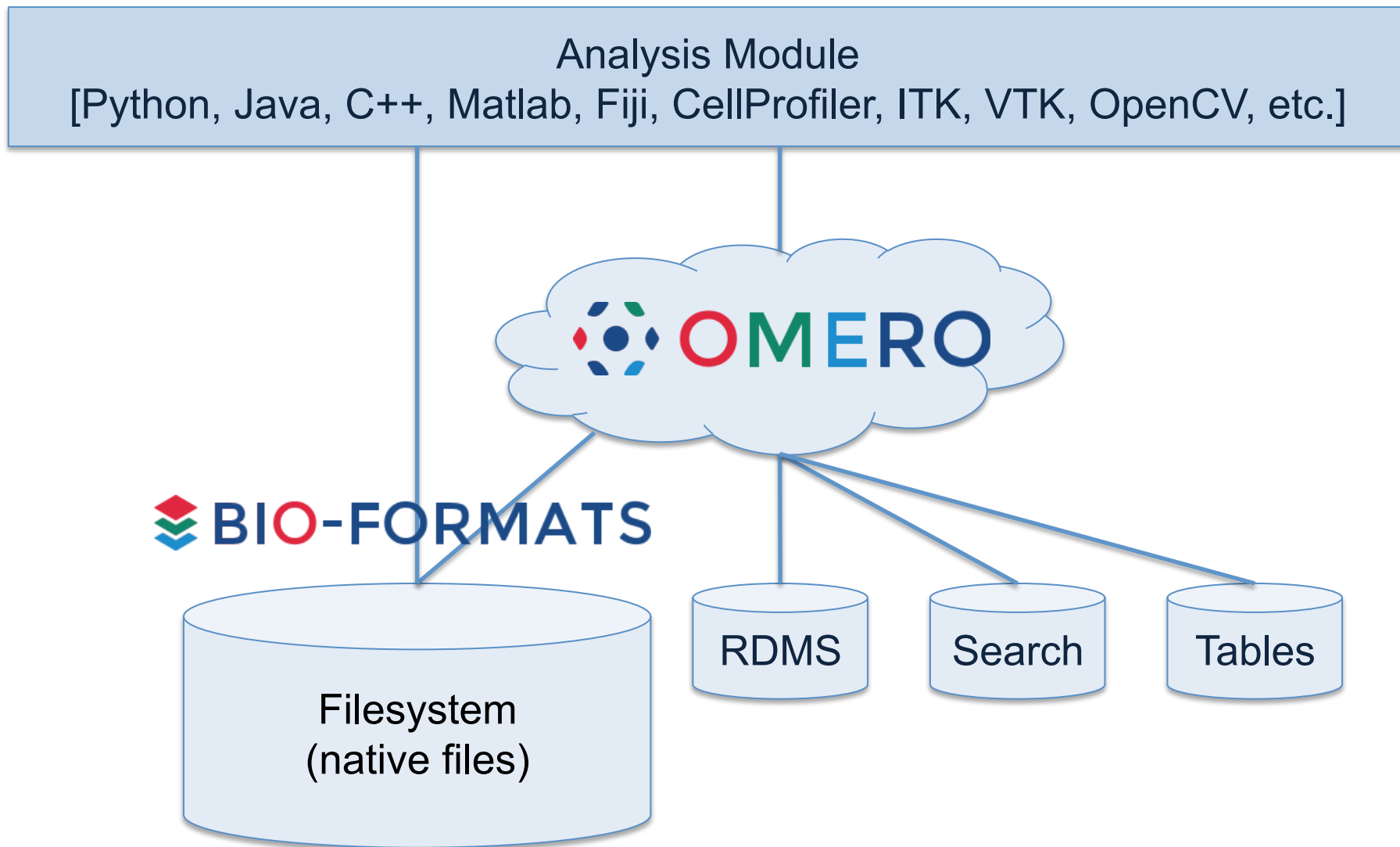
Digital Pathology



0.01 - 1.2 TB/day

OMERO-5.0 includes OMERO.fs, released Feb/2014 (Google: "OMERO 5.0")

OMERO & BIO-FORMATS 5.0: Distributed Data Access



OME 5.0 – 5.1: 2014/2015

OME 5.1.x ...

- *Performance*
- *Bio-Formats/C++*
- *Improved support for “new” imaging modalities (SRM, LSFM, OPT, ...)*
- *API Updates*
 - Units
 - Map Annotations
 - New detectors
 - Rendering Settings
- *Extended Metadata support*
 - ROIs, Features, etc.
 - Graphs: (trajectories, provenance, ...)
- *Data Sharing & Publication*
 - R-W groups
 - Lab, Institute, National/Worldwide Repositories
- *Substantial UX and UI Updates*
 - Consistent UX
 - Configurable Web UI

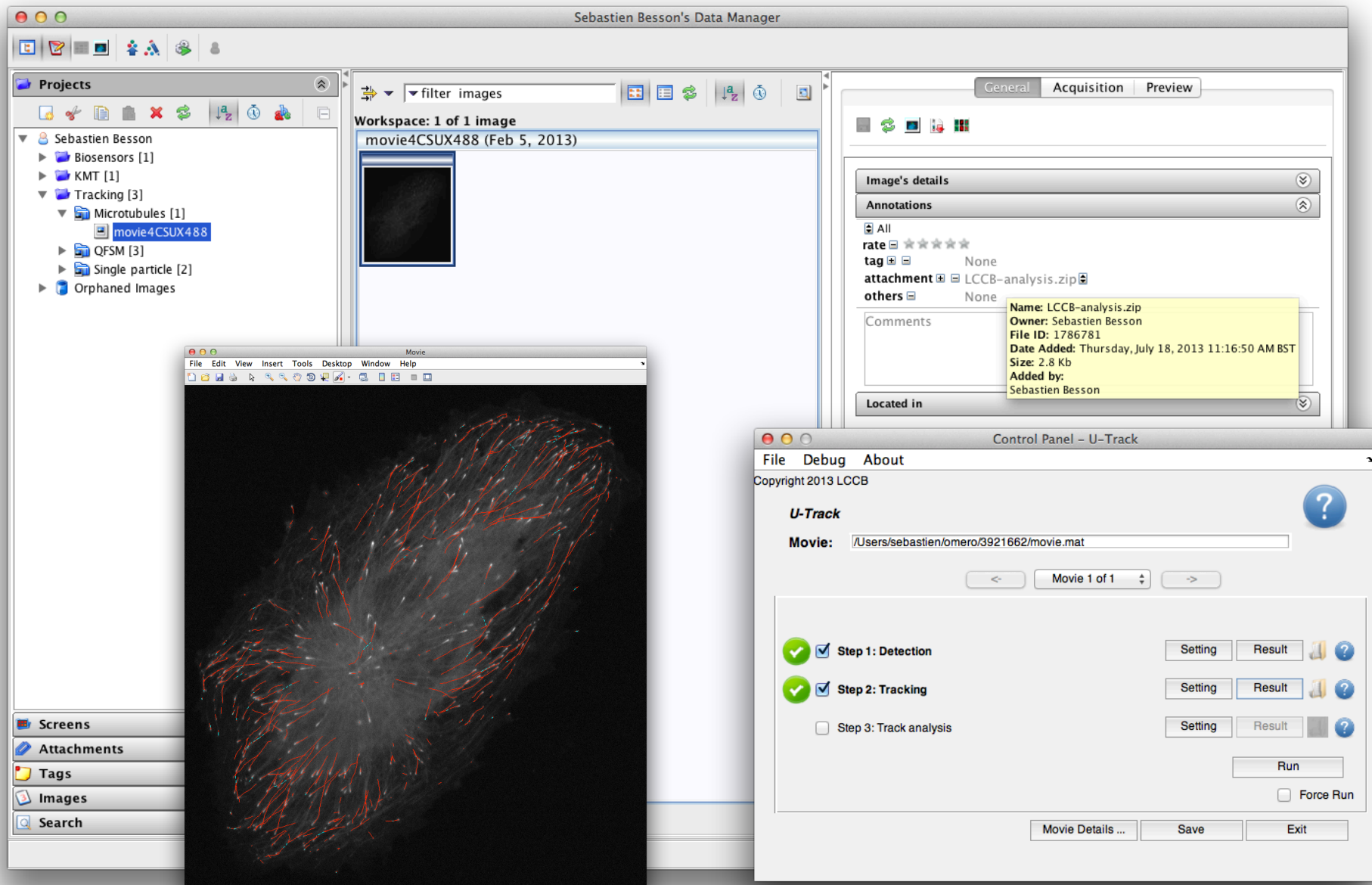
OME 5.1: Map Annotations

The screenshot displays the OME 5.1 web interface for an image. The main content area is titled "1.6M P-TRE_22_R3D_D3D_VOL.dv" and includes various metadata fields such as "Acquisition Date", "Imported Date", "Dimensions (XY)", "Pixels Type", "Pixels Size (XYZ) (µm)", "Z-sections/Timepoints", "Channels", and "ROI count". Below the metadata, there are sections for "RATINGS", "TAGS", "ATTACHMENTS", and "ANNOTATIONS". The "ANNOTATIONS" section contains a table with columns for "Key", "Value", and a delete icon. The table lists several annotations, including "Temperature", "Cell Line", "Concentration - Sodium", "Concentration - Potassium", and "Antibodies". A blue arrow points to the "Concentration - Potassium" row in the table.

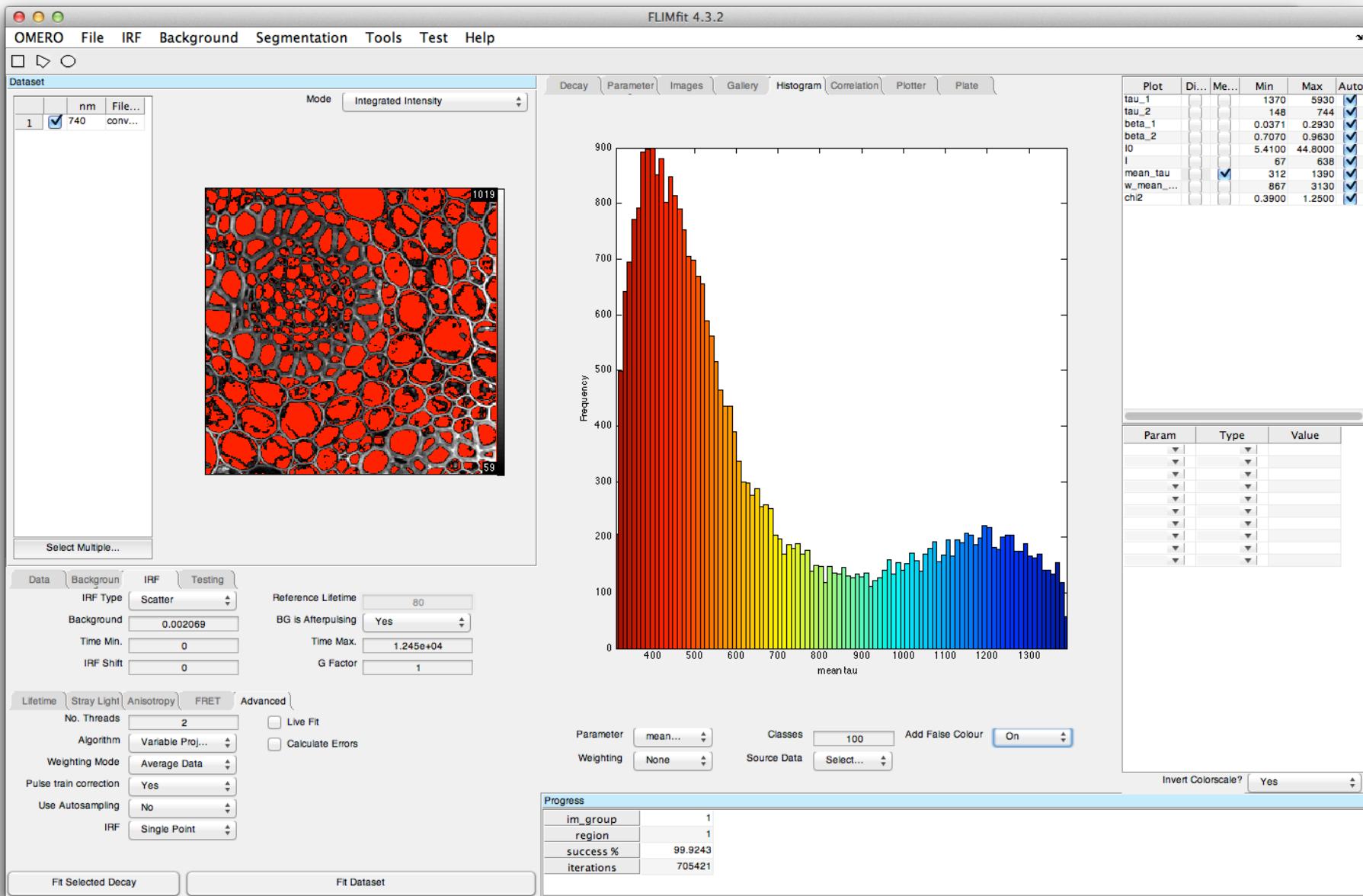
Key	Value	
Temperature	37.0	x
Cell Line	HT-29	x
Concentration - Sodium	150.0	x
Concentration - Potassium	4.3	x
Add key	Add value	
Concentration - Potassium	4.3	
Concentration - Potassium	4.8	
Antibodies	Sheep	

Ordered, non-unique, key-value pairs

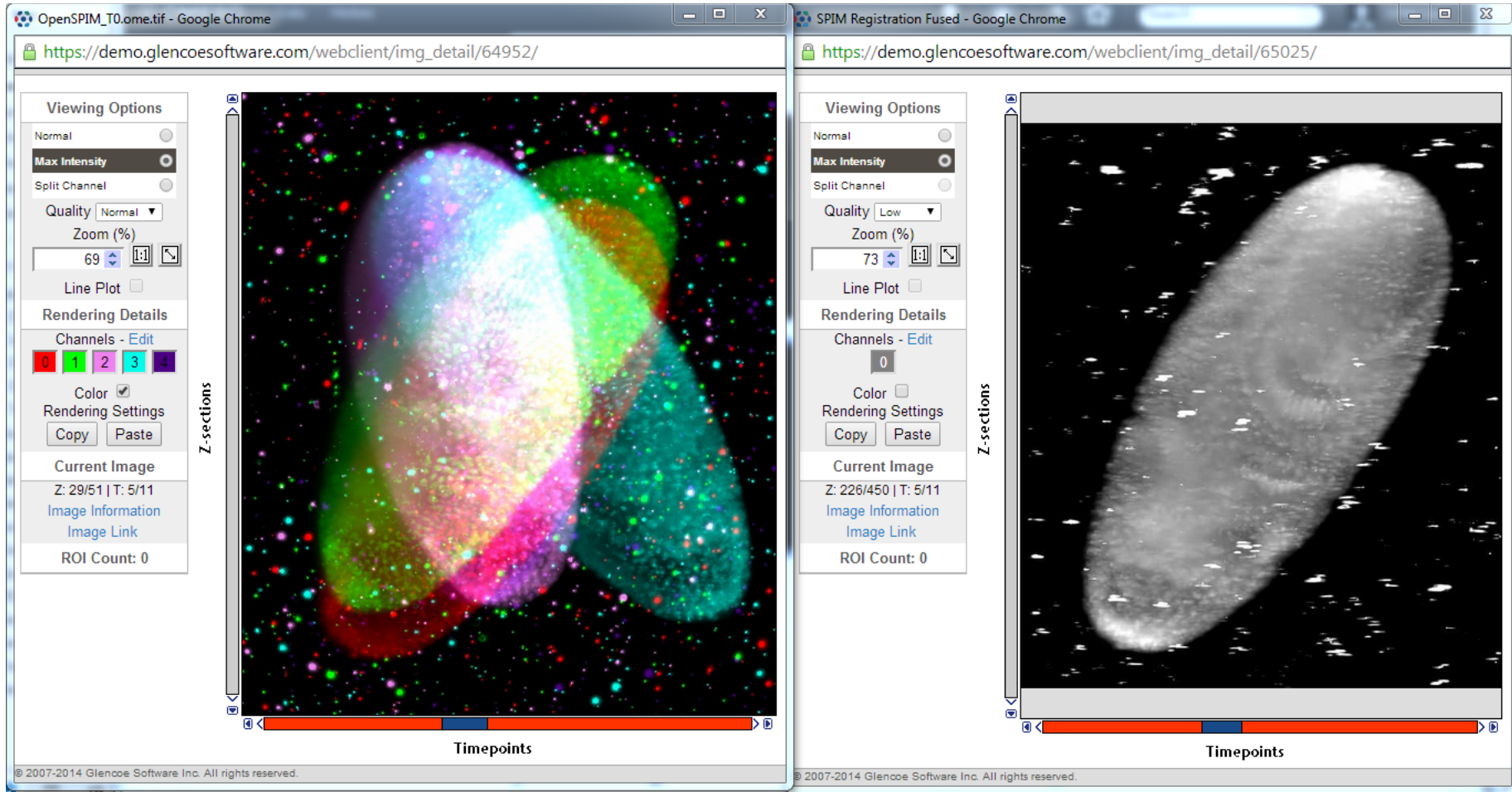
OMERO & u-track



OMERO & FLIMfit



OMERO & Bio-Formats: LSFM MV Reconstruction



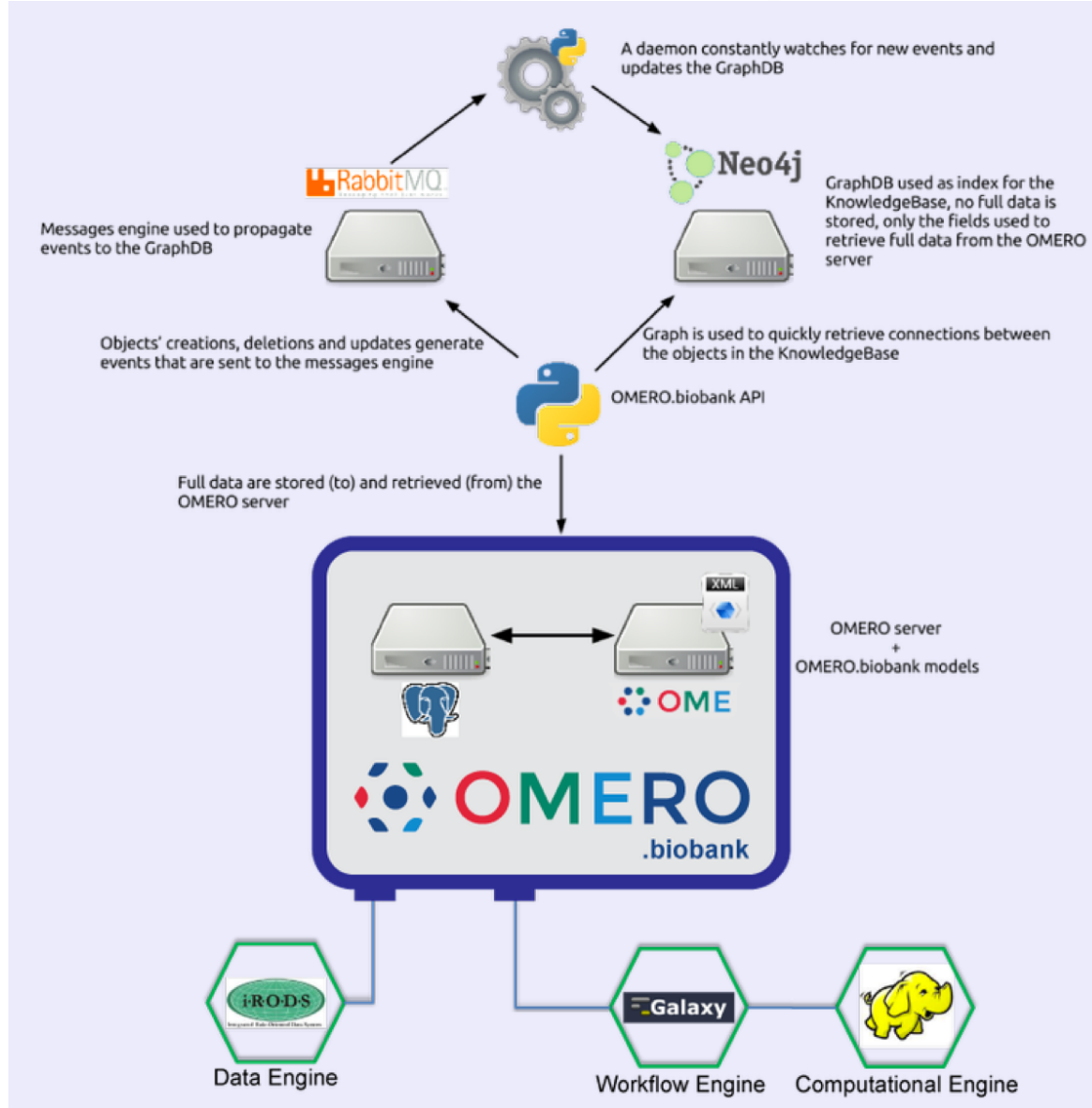
Emil Rozbicki & Chris Allan, Glencoe Software

Inspired by Preibisch et al. (2010) Nature Meth, 7: 418-419; http://fiji.sc/SPIM_Registration





OMERO.biobank: Enabling Meta-Compute



OMERO & Auto-Tagging

The screenshot shows the OMERO webclient interface. The browser address bar displays `https://omero1.bioch.ox.ac.uk/webclient/userdata/`. The interface includes a navigation menu with 'Data', 'History', 'Admin', and 'Tag Search'. A search bar is visible with the user 'Douglas Russell' logged in.

The main content area displays a file list for 'Douglas Russell' under the 'Demo 3' folder. The file list is organized into a table with columns for various tags: siRNAi, home, example, dpwrussell, data, INCEP, FromWill, Downloads, CSFV, r3d, and D3D. Each cell in the table contains a checkbox, indicating the tagging status for each file. The first 12 files under the 'CSFV' folder are highlighted in green, indicating they are tagged.

On the right side, a metadata panel for the selected 'CSFV' dataset is visible. It includes the following information:

- General** tab selected
- Dataset ID:** 4201
- Owner:** Douglas Russell
- Creation Date:** 2014-04-25 16:02:30
- RATING:** No ratings
- TAGS:** (empty)
- ATTACHMENTS:** (empty)
- OTHERS:** (empty)
- COMMENT:** (empty)
- Add Comment** button

OMERO.figure

OMERO.figure

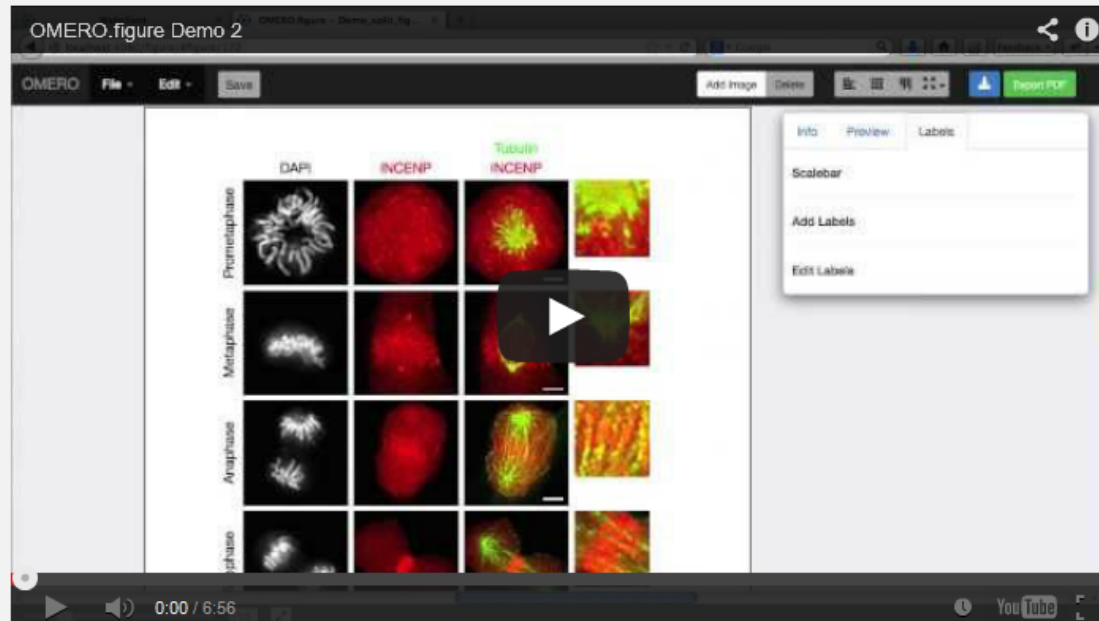
[Home](#) | [Blog](#) | [User Manual](#) |

Try the DEMO (beta!)

tar.gz

.zip

Fast figures from your OMERO images



Smart figures with metadata

OMERO is a server platform for managing biological images. See the [Open Microscopy Site](#) for more info. OMERO.figure combines OMERO's powerful image rendering and metadata to provide a tool for rapid figure creation. Each panel of the figure becomes a multi-dimensional image viewer allowing you to zoom and pan adjust rendering



OMERO & BIO-FORMATS: Pathology Instruction/Dundee VM

The screenshot displays the OMERO web client interface. At the top, there is a navigation bar with 'Data' and 'History' menus, a search bar, and a user profile for 'Jason Swedlow'. Below this is a 'Virtual Microscope Anatomy' header. The left sidebar shows a tree view of the file system under 'Anatomy', with '14_Tendon.svs' selected. The main area features a 'Filter Images' search bar and a grid of image thumbnails. The selected image, '14_Tendon.svs', is shown in a detailed view window. This window includes a 'Viewing Options' panel with 'Quality' set to 'Normal', a 'Rendering Details' panel with three channels (0, 1, 2) and 'Color' checked, and a 'Current Image' panel showing 'Z: 1/1 | T: 1/1'. The main image area has 'Z-sections' and 'Timepoints' axes, a 'Scale: 25.00%' indicator, and navigation controls. The bottom status bar shows the URL 'https://learning.openmicroscopy.org/dundee/webclient/userdata/?experimenter=5#' and copyright information '© 2007-2011 Glencoe Software Inc. All rights reserved.'

OMERO Help

Getting Started with OMERO.insight v. 5.0.2

[Download PDF](#)



User Help

[User Help Home Page](#)

▼ Quickstart User Guides

[Getting Started v. 5.0.2](#)

[Getting Started v. 4.4.11](#)

[Using ImageJ with OMERO](#)

[Try the OMERO Demo Server](#)

▼ Workflow User Guides

[Sharing Data](#)

▶ OMERO.insight

▶ OMERO.web

▼ Other OMERO Applications

[OMERO.figure](#)

[Virtual Microscope](#)

[OMERO.dropbox](#)

[OMERO.editor](#)

▼ More

[Guides for Previous Versions](#)

[Resources](#)

[Contact Us](#)

[Main OME Website](#)

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The Open Microscopy Environment

OMERO stores image data on a central server. You can use the OMERO.insight client to upload, view and download data from any personal computer.

Your institution's OMERO server administrator will provide you with the server address to use when connecting from OMERO.insight. They may have set up a user name and password for you too. Alternatively your username and password may be your standard login for the institution's networked computers.

Installing

1. Download OMERO.insight client at: <http://downloads.openmicroscopy.org/latest/omero5>



OMERO 5.0.2 Downloads

[Clients](#) | [Plugins](#) | [Additional](#) | [Servers](#) | [Virtual Appliance](#) | [API](#) | [Code](#) | [Artifacts](#) | [Legacy](#)

- Information on this release of OMERO is in the [release announcement](#)
- Full documentation is available as [web documentation](#) or [PDF documentation](#) and there are user guides for the clients on our [Help website](#)
- A standard OMERO user just needs to download the client package with the same major version as their institutional server e.g. 5.0 clients with the 5.0 server

OMERO client downloads

Clients	Size	File Name	Checksum
Windows	70.29 MB	OMERO.clients-5.0.2-icc35-b21.win.zip	3fb156 (MD5)
Mac OS X	205.68 MB	OMERO.clients-5.0.2-icc35-b21.mac.zip	55f177 (MD5)
Linux	68.44 MB	OMERO.clients-5.0.2-icc35-b21.linux.zip	a6e1a6 (MD5)

- Each client package includes [OMERO.insight](#), [OMERO.importer](#) and [OMERO.editor](#) and requires Java Version 1.6 or higher. OMERO.web is part of the server package, so individual users do not need to install it locally.



OME-based Public Data Resources

- Public Data Resource
 - Harvard LINCS
 - JCB DataViewer
 - Stowers ODR
 - SSBD, Riken
 - EMDataBank– 3D tomograms
 - SYSGRO– *S. pombe* phenotypic screens
 - Liverpool CCI
 - Imperial CISBIC FLIM
 - Dundee Virtual Microscope
 -

2015 Highlights

- Bio-Formats and OMERO 5.1
 - Model & API Updates
 - Performance
 - Extended Metadata
 - UI Improvements
 - Commercial contributions and participation
 - Specifications, suggestions from several industrial partners
 - Intelligent Imaging, Richard Myers, SlideBook Reader
- Bio-Formats/C++
 - Native OME-TIFF Reader & Writer
- Major releases of OMERO.figure and FLIMfit
- Security: SecVuln Patches and Process
- New modalities
 - LSM: Multiview reconstruction
 - OPT: “Spinny Fish”
- Learning & Teaching
- Growing, Active Community
 - Feedback on Forums
 - Social Media: 2x jump in Twitter followers

“Super OMERO”



THE FUNDING

££££££££

- Extension of Strategic Award, co-funded by Wellcome Trust & BBSRC
 - ~£600k
 - Funds Bio-Formats and OMERO through mid-2016
- BBSRC “Big Data” Award
 - £1.79M partnership between Dundee OME, Cambridge & EBI
 - Partnership with Elixir
 - Build & deploy a next generation image data repo
 - >50 TB of GW HCS datasets at start, growing to >100 TB
 - Includes virtual analysis resource
 - More info: “Euro-BioImaging Elixir Data”
- H2020
 - CORBEL, MULTIMOT, (INFRADEV-2)

2015/2016 PRIORITIES?

Some words to think about...

- New Modalities (MS, Raman, X-ray, etc.)
- Multi-modal/Correlative
- Federation:
 - SSO
 - Multiple server Auth
- Import/Export
- Ontologies
- Bio-Formats Decoupling
- OMERO Gateway
- REST API
- C++ API
- Client Architecture
- Archiving
- ...

OME Consortium

- Dundee – Jason Swedlow, Colin Blackburn, Jean-Marie Burel, Mark Carroll, Gus Ferguson, Helen Flynn, Kenny Gillen, Roger Leigh, Simon Li, Dominik Lindner, Josh Moore, Will Moore, Balaji Ramalingam, Gabriella Rustici, Aleksandra Tarkowska, Petr Walczysko, Eleanor Williams *and you?!?*
- University of Wisconsin, Madison (LOCI) - Kevin Eliceiri, Curtis Rueden, Mark Hiner
- UT Southwestern – Gaudenz Danuser, Sebastian Besson
- Oxford – Ilan Davis, Douglas Russell
- Cambridge – Rafael Carazo-Salas, Bálint Antal
- CRS4 - Gianluigi Zanetti, Gianmauro Cucurru, Simone Leo, Luca Lianas
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- Carnegie-Mellon – Robert Murphy, BK Cho, Ivan Cao-Berg
- Imperial – Paul French, Chris Dunsby, Ian Munro, Yuriy Alexandrov
- NIA, NIH – Ilya Goldberg, Chris Coletta
- Pasteur – Spencer Shorte, Sebastien Simard, Julien Jorde
- EMBL-EBI – Gerard Kleywegt, Ardan Patwardhan, Ingvar Lagerstedt, Alvis Brazma
- Glencoe Software – Chris Allan, Joshua Ballanco, Andreas Knab, Melissa Linkert, Chris MacLeod, Josh Moore, Mike Rossner, Emil Rozbicki, Liza Unson, Rebecca Walker, Wilma Woudenberg