



The Open Microscopy Environment: Image Informatics Opportunities

Jason Swedlow

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Wellcome Trust Biocentre

University of Dundee

Scotland

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Seattle, WA

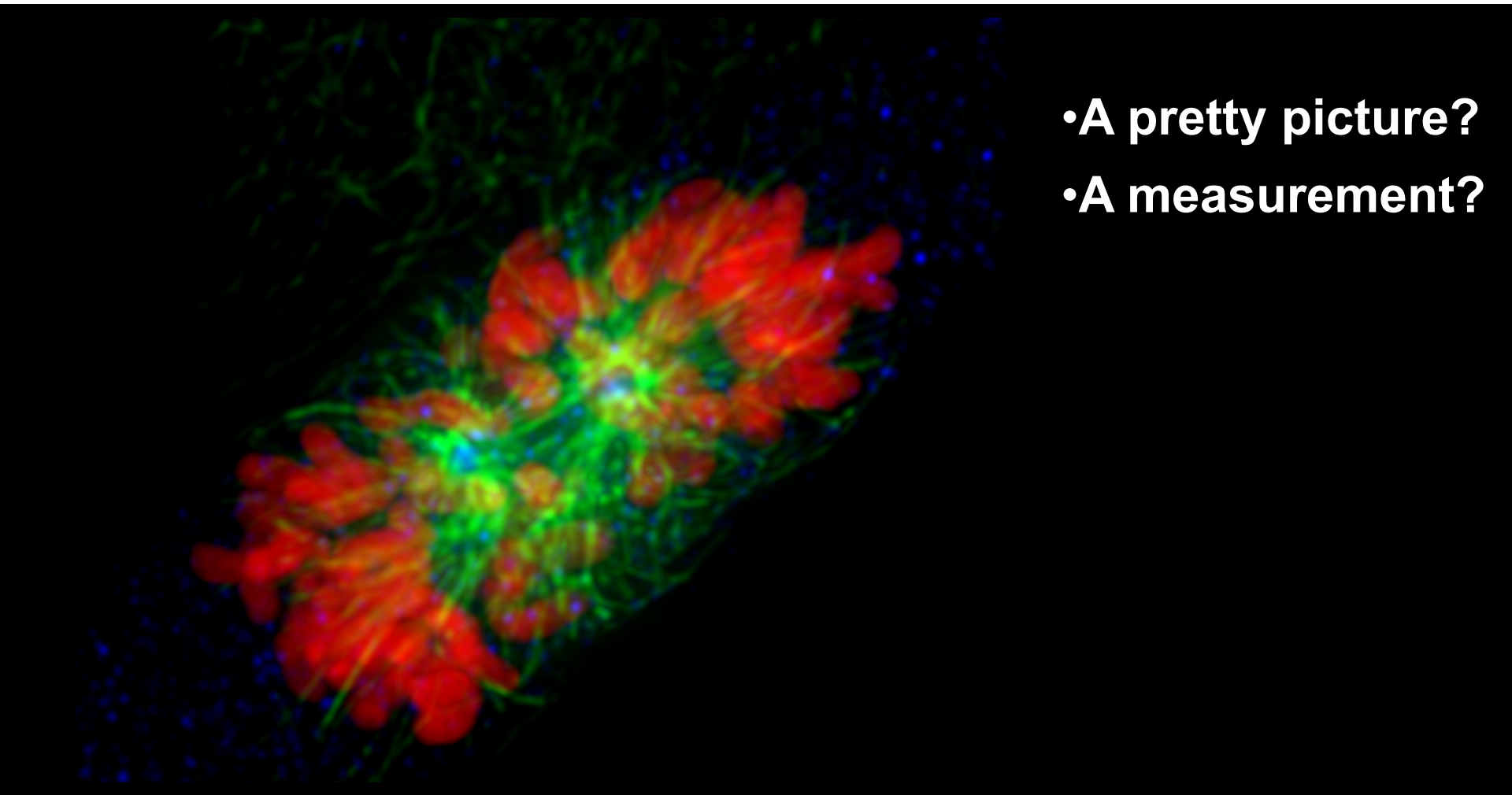
USA



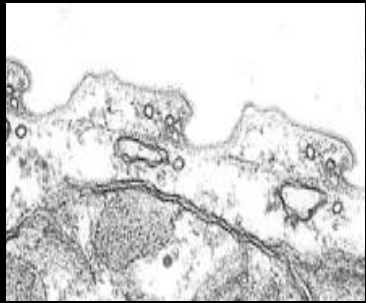
Talk Outline



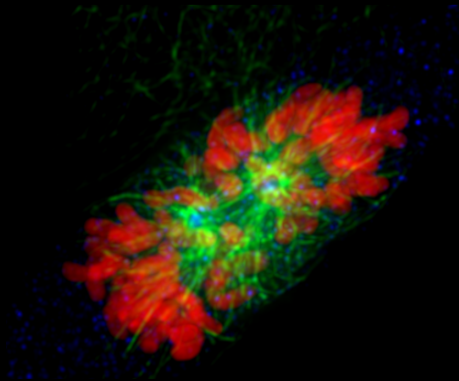
- **The Problem**
- **Bio-Formats– *accessing scientific images***
- **OMERO– *storing, viewing, analysing, sharing...***
- **Open Image Community– *moving together***
- **DataViewer– *publishing scientific images***



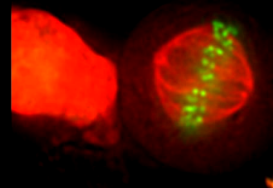
- A pretty picture?
- A measurement?



Organelles

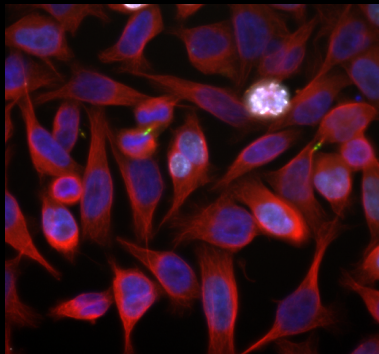


Cells



Dynamics

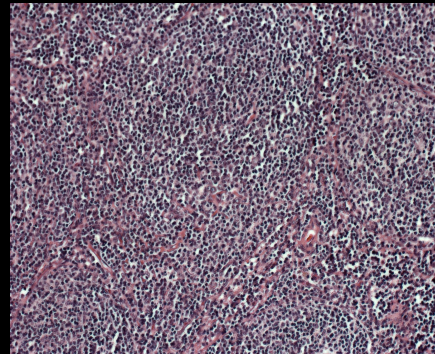
- A pretty picture?
- A measurement?



Lead Discovery
Target Validation



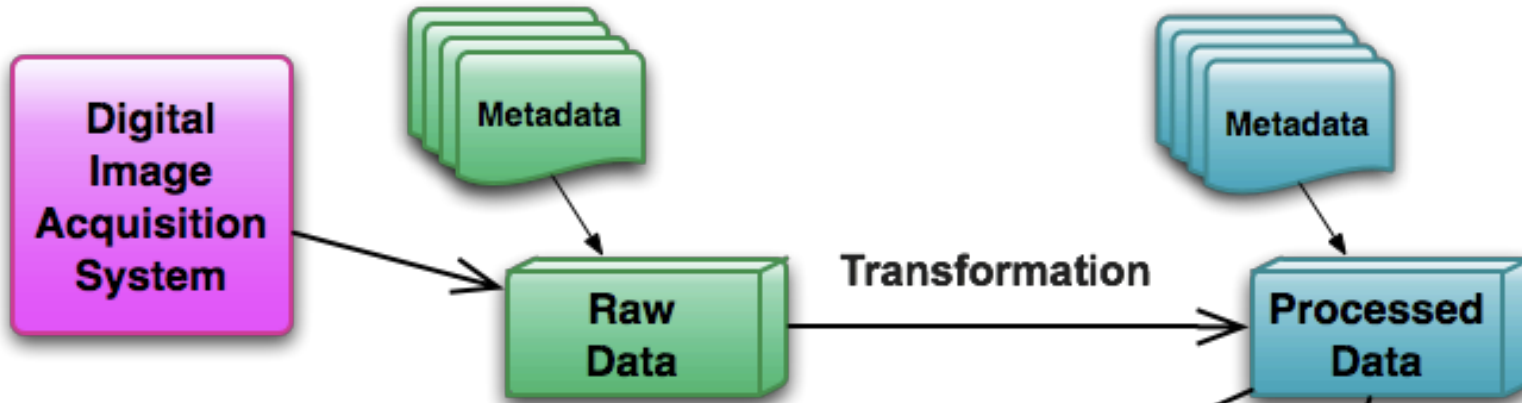
Physiology



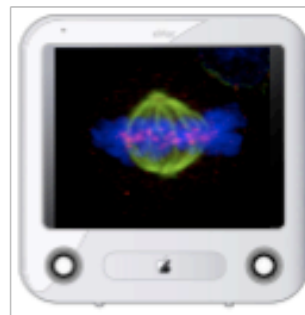
Pathology



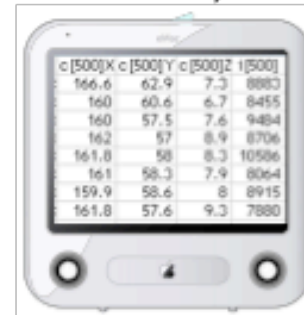
In Vivo



No Standards



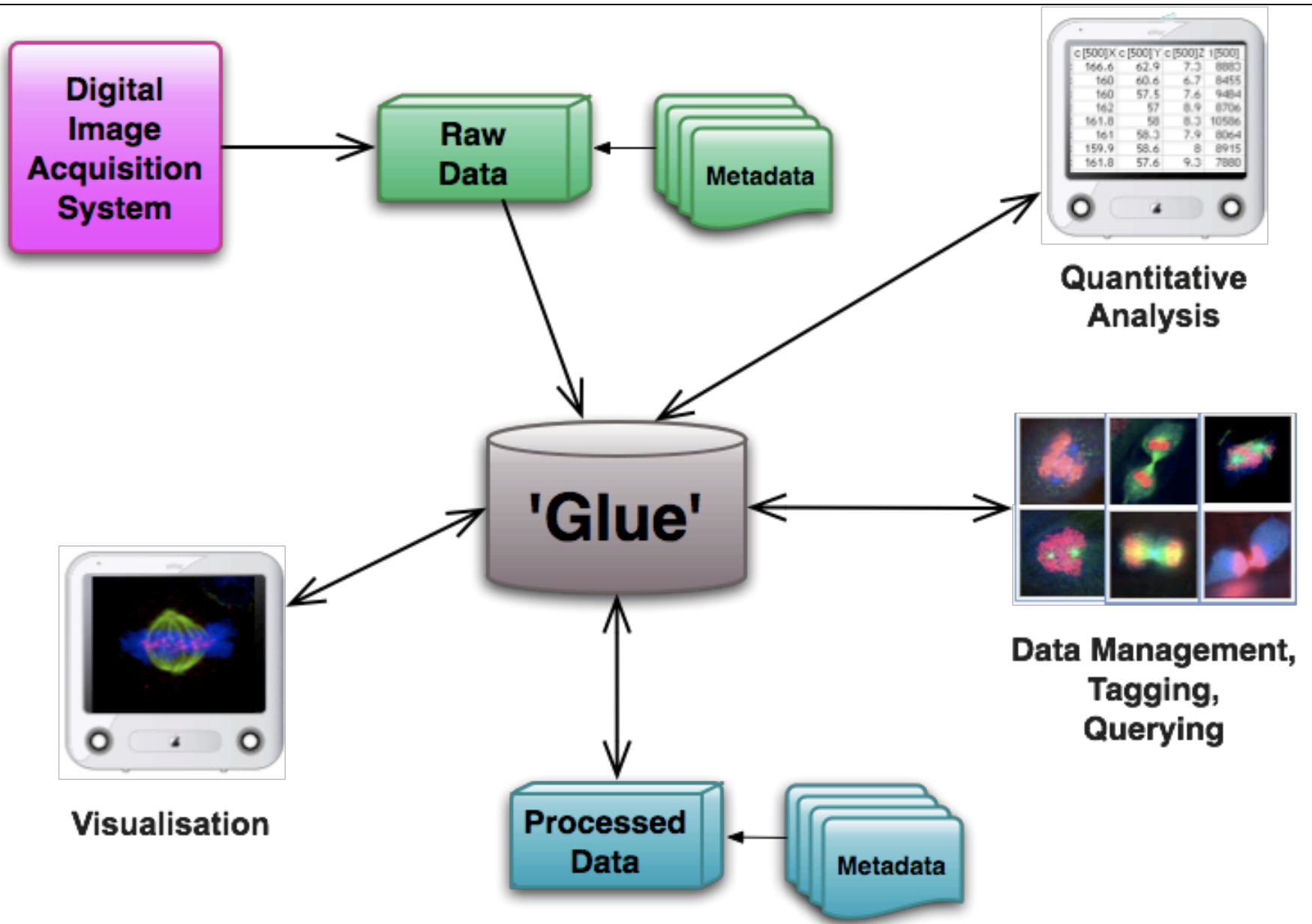
Visualisation

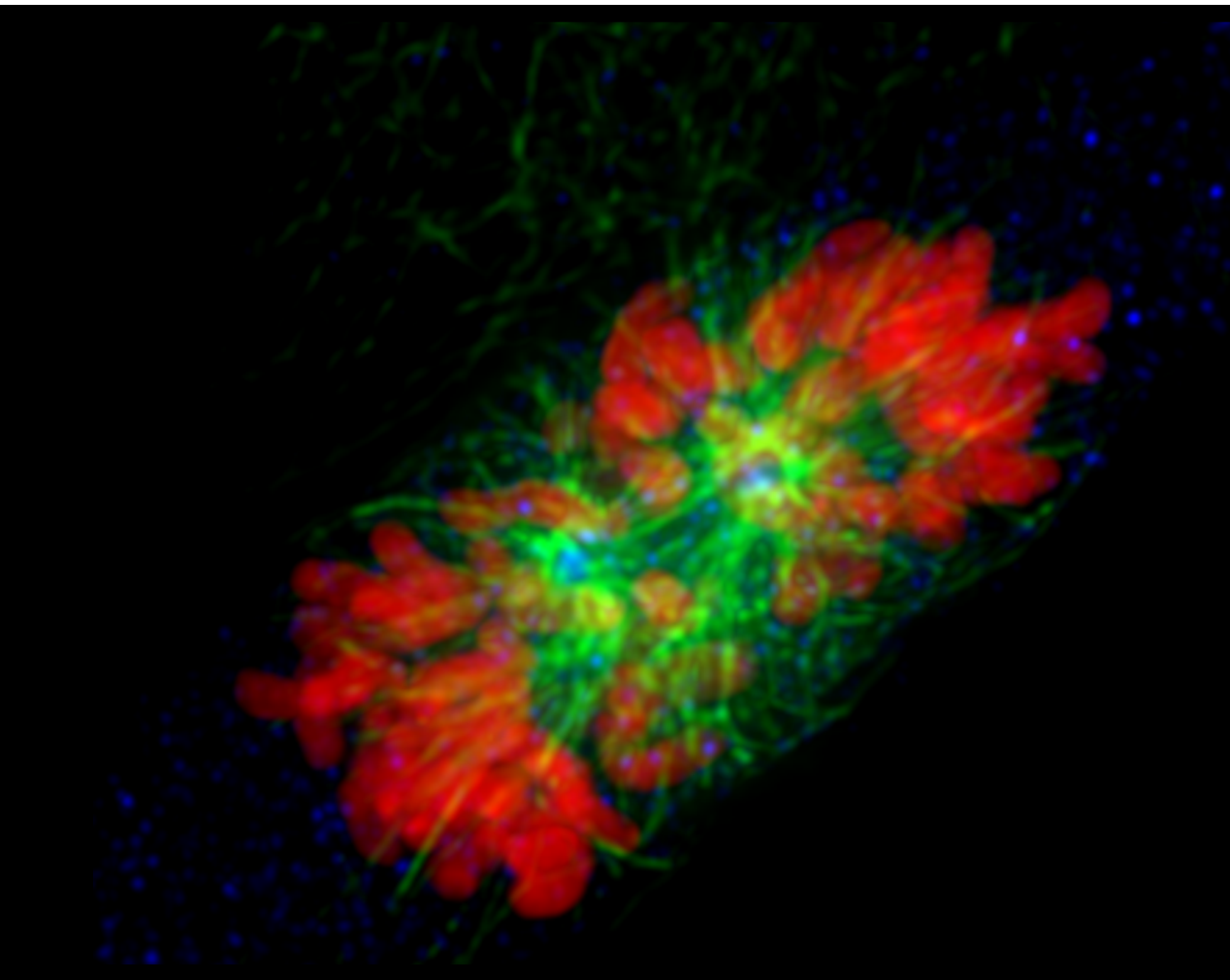


Quantitative Analysis

*Experiment?
Treatment?
Image?
Analytics?
Annotations?*







- **Accessible**
- **Secure**
- **Shareable**
- **Analysable**
- **Publishable**
- **Scaleable**



OME: Brief Overview



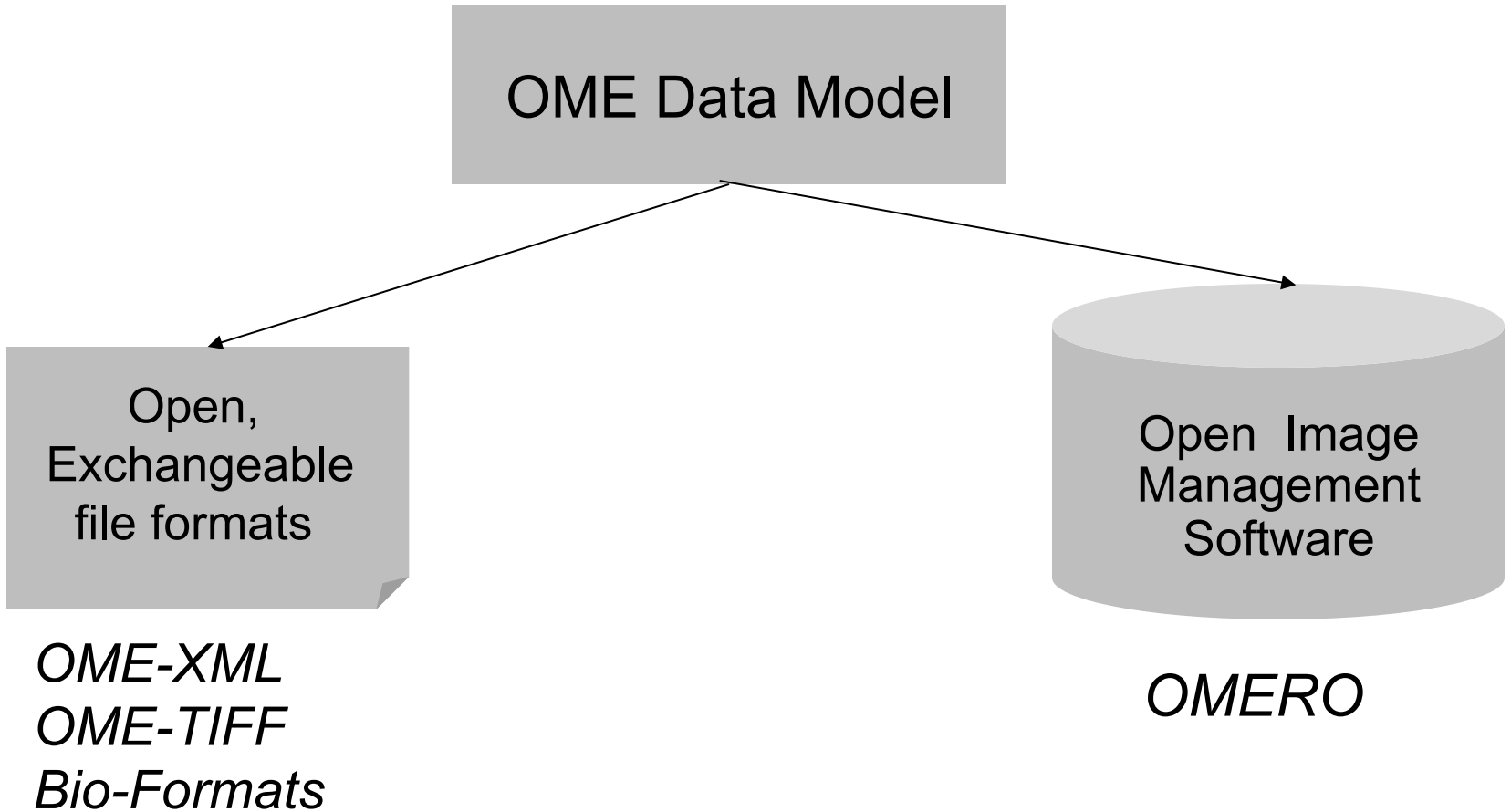
- **Founded 2000 by J. Swedlow, P. Sorger, I. Goldberg**
- **Funded by Wellcome Trust, BBSRC, EPSRC, NIH**
- **Partnered with other image informatics efforts (EPCC, EBI, UEA/JIC, LOCI, UCSB, VU, NCBO...) & many commercial imaging companies**
- **Currently, Dundee and LOCI are main development sites**
- **Open source (LGPL & GPL), nightly release, public roadmapping**
- **Current goal: *Development and integration of usable, effective tools for image data management, visualization and analysis***
- **Glencoe Software founded Nov 2005– OME's commercial arm**

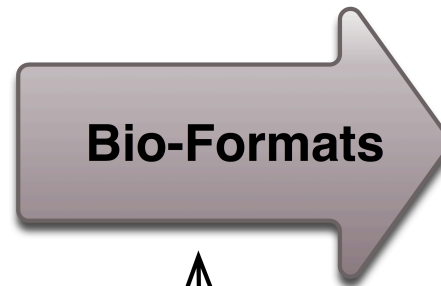
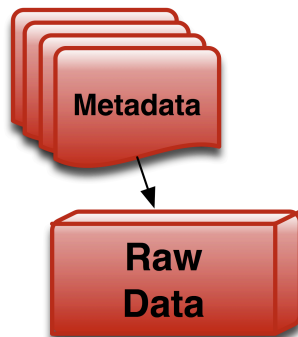
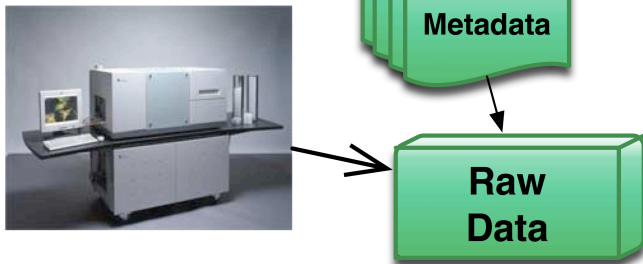
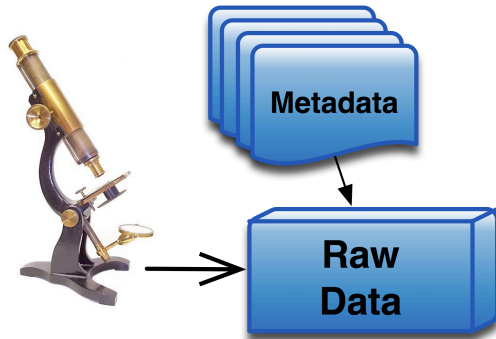
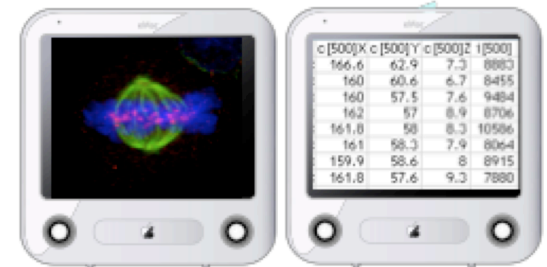


Interoperability

✓ *Metadata*

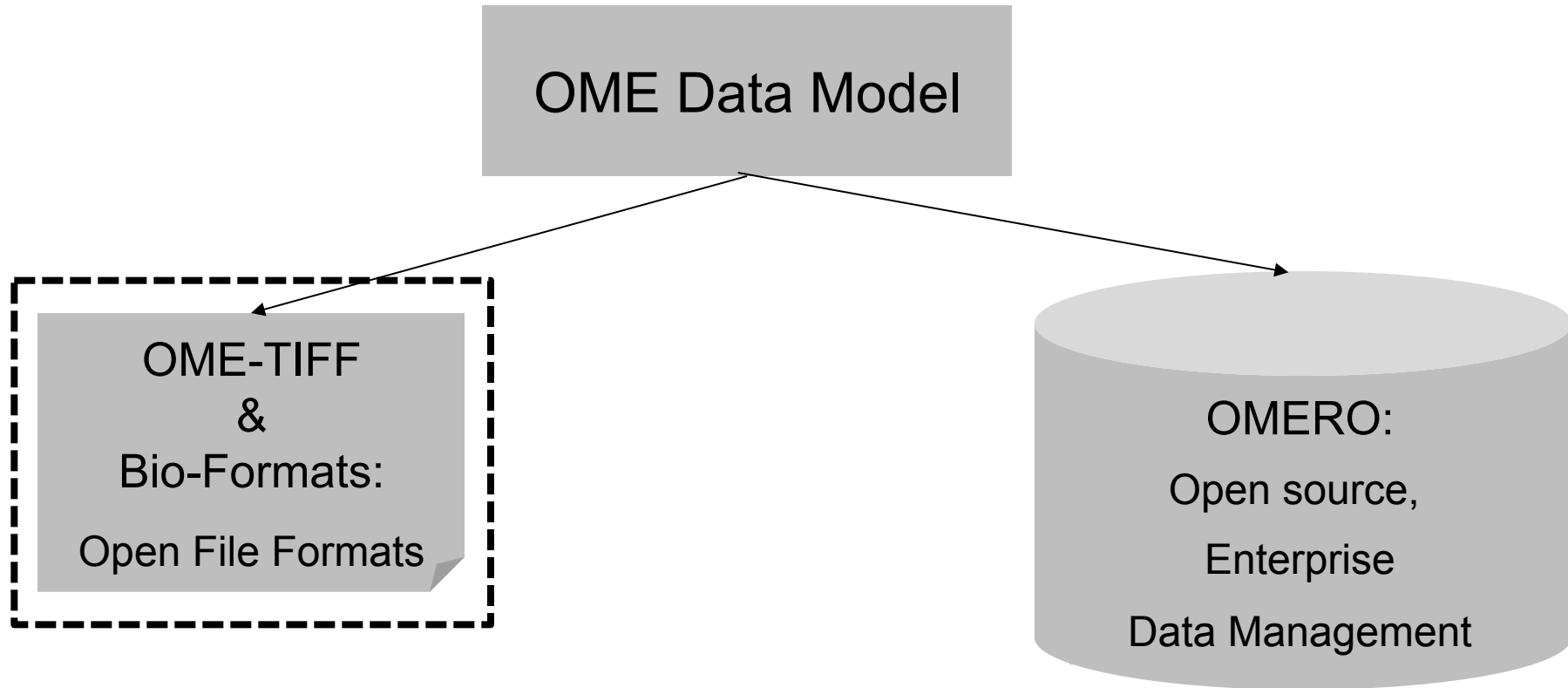
✓ *Interfaces*





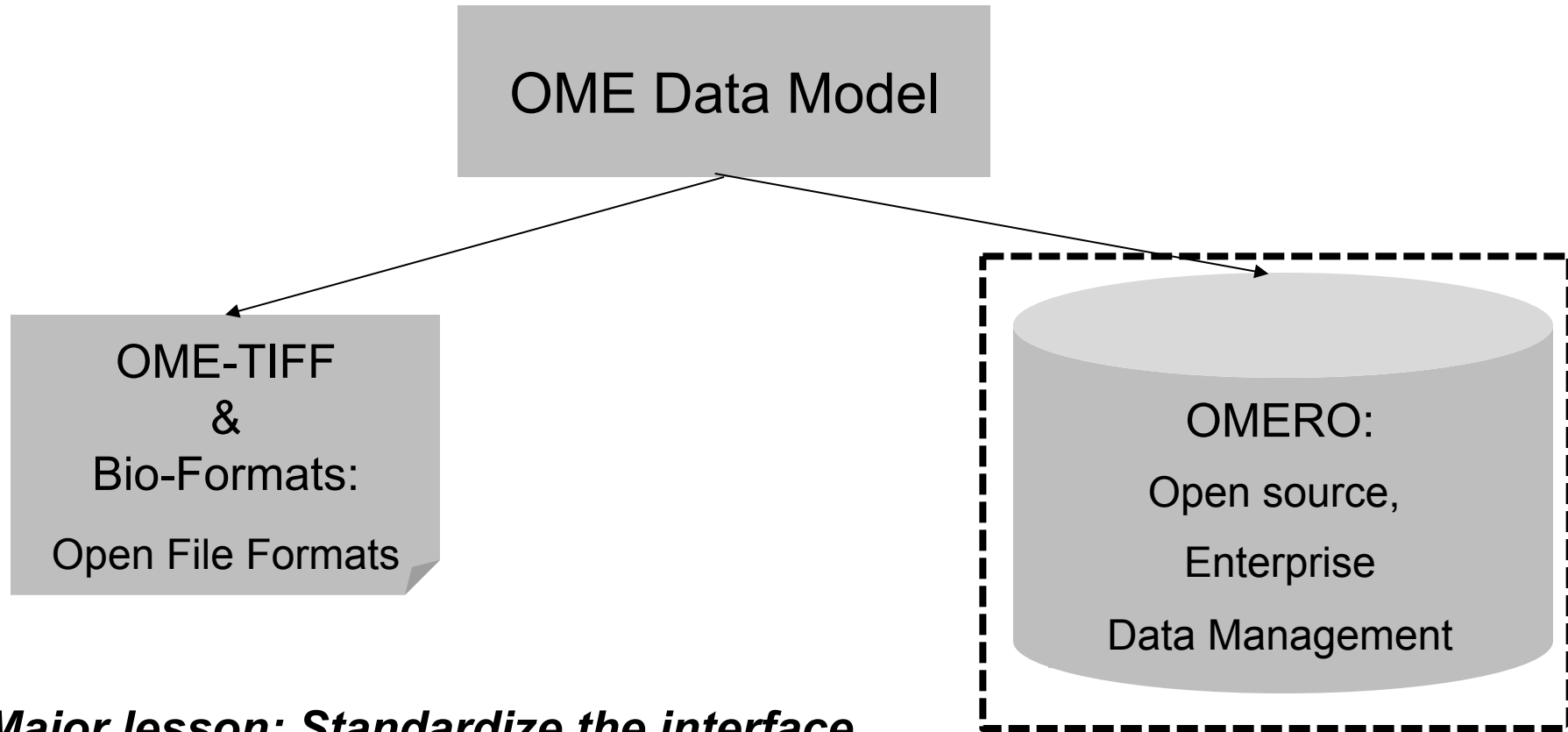
66k Datasets
600k Files
775 GB

Google:
'Bio-Formats'



Major lesson: Standardize the interface

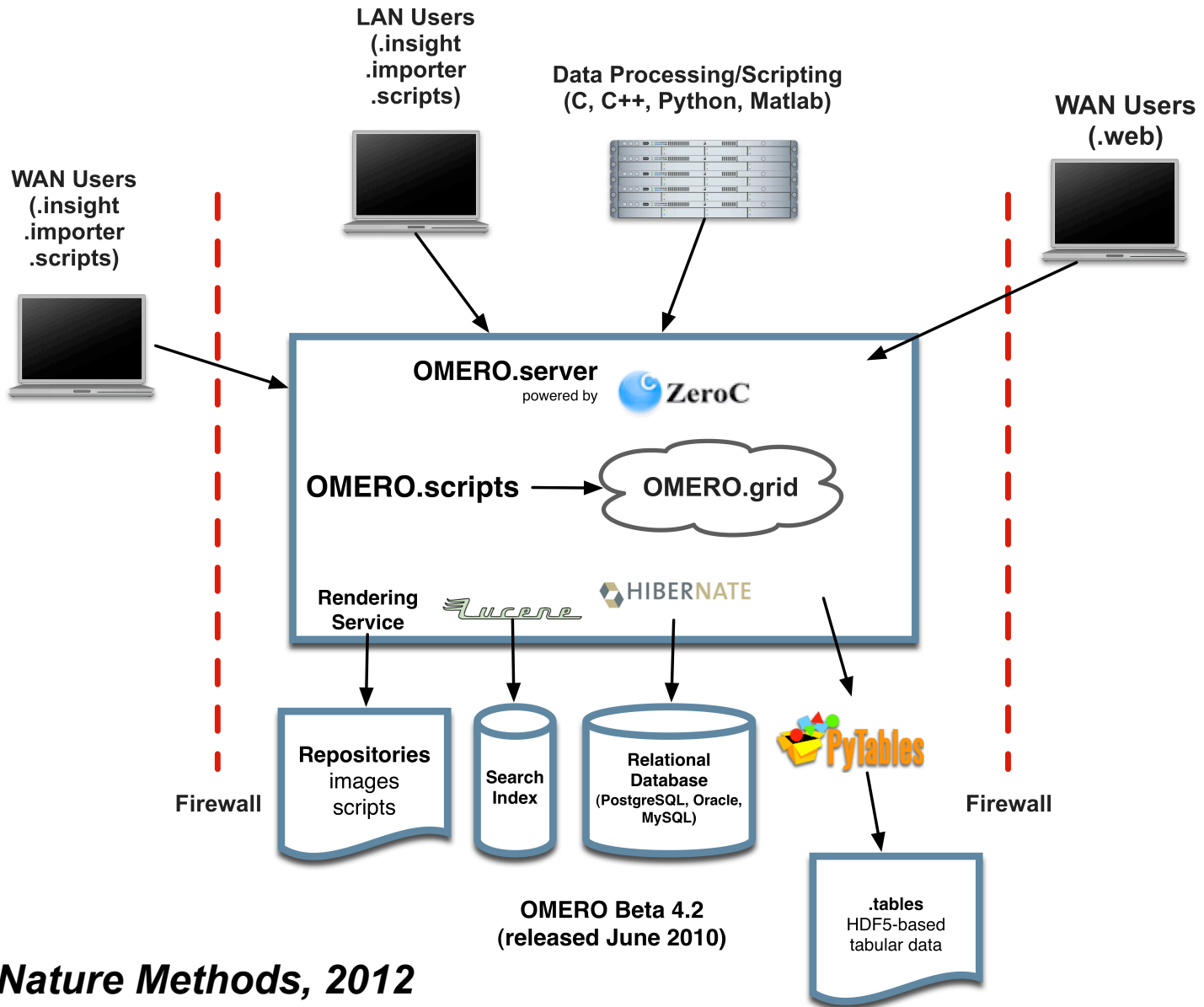
- open specification*
- great data from the community*
- open software for read/write*

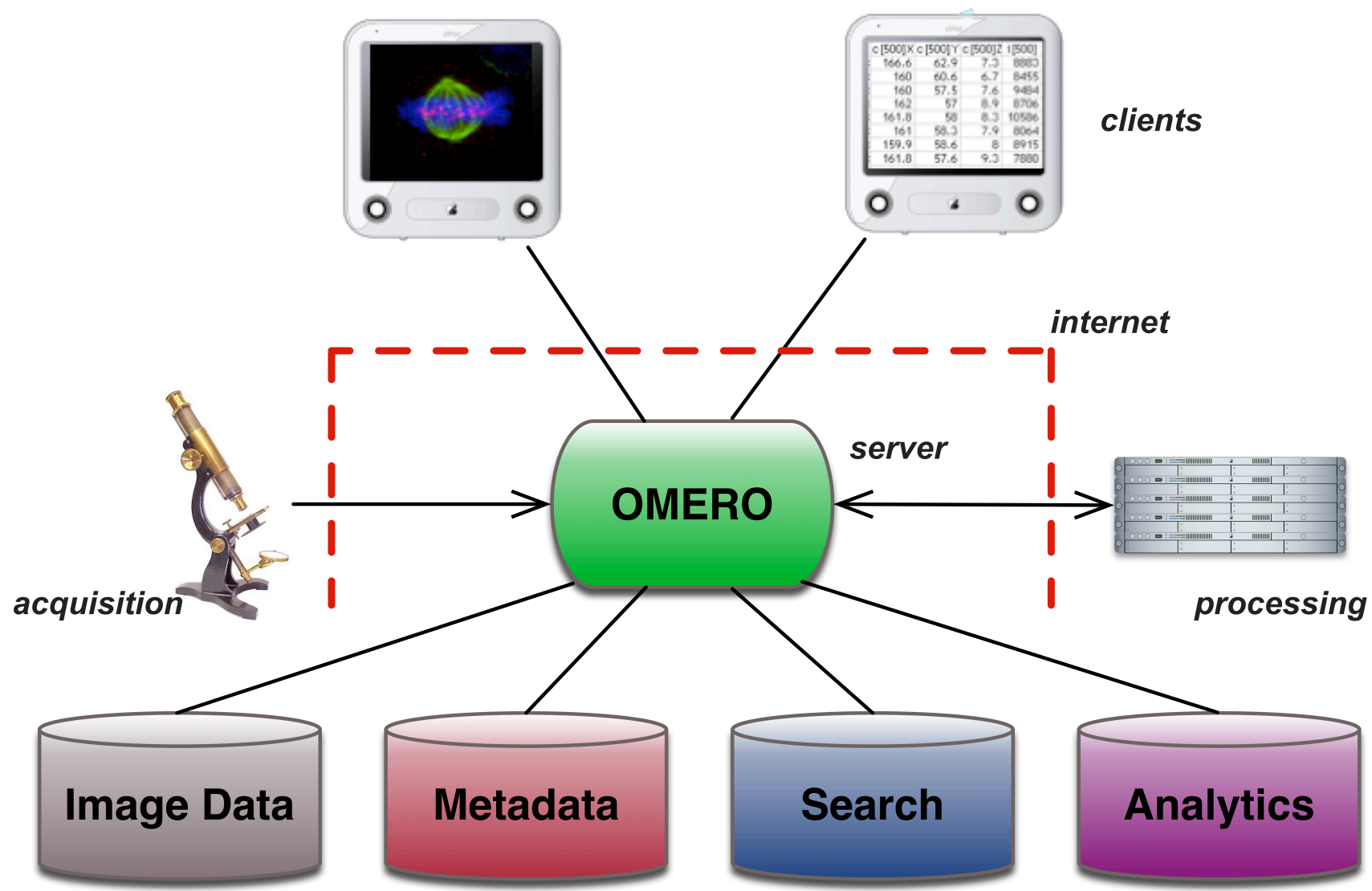


Major lesson: Standardize the interface

- open specification
- great data from the community
- open software for read/write

Google: 'OMERO features'





Jason Swedlow's Data Manager

[ID: 3840635] ...101026-siRNA/101026-siCTL-GFPMCAK_SKIP_ACA_02_0...

Swedlow Lab

Projects

- Jason Swedlow
- Iain Porter
- Michael Porter
- Alexia Ferrand
 - Analysis MCAK - GFP-MCAK cell line [8]
 - 101026-siCTL_LPM_M_total [11]
 - ...101026-siRNA/101026-siCTL-GFPMCAK_SKIP_ACA_0...
 - ...101026-siRNA/101026-siCTL-GFPMCAK_SKIP_ACA_0...
 - ...101026-siRNA/101026-siCTL-GFPMCAK_SKIP_ACA_0...
 - ...101026-siRNA/101026-siCTL-GFPMCAK_SKIP_ACA_0...
 - ...101026-siRNA/101026-siCTL-GFPMCAK_SKIP_ACA_0...
 - ...101026-siRNA/101026-siCTL-GFPMCAK_SKIP_ACA_0...
 - ...101026-siRNA/101026-siCTL-GFPMCAK_SKIP_ACA_0...
 - ...101026-siRNA/101026-siCTL-GFPMCAK_SKIP_ACA_0...
 - ...101026-siRNA/101026-siCTL-GFPMCAK_SKIP_ACA_0...
 - ...101026-siRNA/101026-siCTL-GFPMCAK_SKIP_ACA_0...
 - ...101026-siRNA/101026-siCTL-GFPMCAK_SKIP_ACA_0...
 - 101026-siHP1a_LPM_M_total [11]
 - 101026-siHP1b_LPM_M_total [11]
 - 101026-siHP1g_LPM_M_total [12]
 - 101216-siCTL_LPM_M_total [12]
 - 101216-siHP1a_LPM_M_total [12]
 - 101216-siHP1b_LPM_M_total [9]
 - 101216-siHP1g_LPM_M_total [11]
 - Analysis Sgo2 [24]
 - Analysis Sgo2 PP2A-A a/b [12]
 - Analysis siSgo2_Sgo1RD_Sgo2Cy5 [6]
 - DYRK1A-lbr [2]
 - DYRK1A_Ab test [3]
 - DYRK1A_fragments [5]
 - Embryos [1]
 - Flp-In cell lines [5]
 - HeLaSPM_MNB [1]
 - HeLaMNB [19]
 - HP1 [47]
 - ienny [6]

Screens

Attachments

Tags

Images

Search

filter images

Workspace: 11 of 11 images

...101026-siRNA/101026-siCTL-GFPMCAK_SKIP_ACA_0...

Image details

Image ID: 3840635

...GFPMCAK_SKIP_ACA_0...

Description

Acquired

Imported

Dimensions (XY)

Pixel Type

Pixels Size (XYZ) (µm)

z-sections/timepoints

Channels

Annotations

All

rate ★★★★★

tag None

attachment None

Comments

Image

Split

Projection

DAPI

FITC

RD-TR-PE

CY-5

Z=32 (6.2µm)/60 T=1/1

6s 32s 1min10s 1min54s x1.0

Alexia Ferrand 11/9/10 2:16 PM
for fig siCTL VS siMCAK

Alexia Ferrand 11/9/10 2:13 PM
gfp 6000 instead of 1000s

Contained in Datasets

Measurement Tool [ID: 3840635] ...101026-siRNA/1...

Manager Inspector Results

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"/>

Ready.



OMERO.web: Access & Collaborate



HOME

MY DATA

TEAM

SHARE

HISTORY

SEARCH

IMPORT

ME

HELP

CONTACT

BASKET contains 0 items

group: Swedlow Lab | my account | logout |

> Mydata > INCENP Staining > PTRE

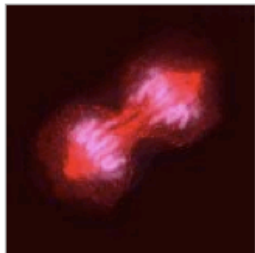
Dataset: PTRE (ID: 67)

| Copy | Paste | Edit |

Staining by IF with anti-P-TRE antibody

My data (34 items):

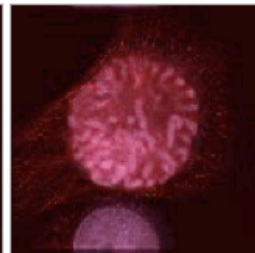
| View | Zoom: x2



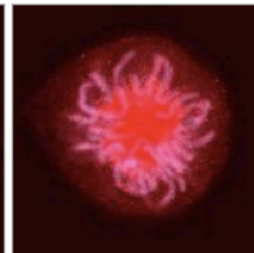
[8] jason/PTRE/P-TRE_10_R3D_D3D.dv



[3] jason/PTRE/P-TRE_11_R3D_D3D.dv



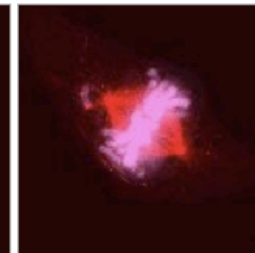
[1] jason/PTRE/P-TRE_12_R3D_D3D.dv



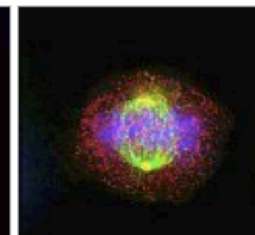
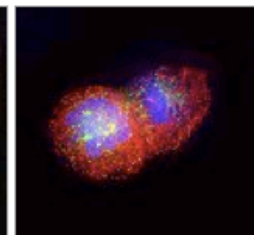
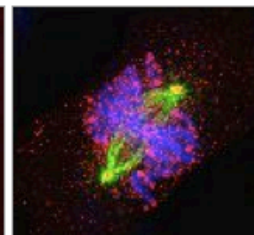
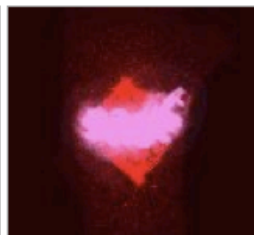
[3] jason/PTRE/P-TRE_13_R3D_D3D.dv



[1] jason/PTRE/P-TRE_14_R3D_D3D.dv



[1] jason/PTRE/P-TRE_15_R3D_D3D.dv





OMERO.web: Access & Collaborate



HOME



MY DATA



TEAM



SHARE



HISTORY



SEARCH



IMPORT



ME



HELP



CONTACT

BASKET contains 0 items

group: Swedlow Lab | my account | logout

> Mydata > OMERO images > DICOM

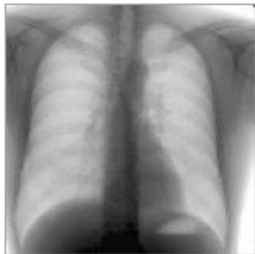
Dataset: DICOM (ID: 382)

| Copy | Paste | Edit

no description

My data (16 items):

| View | Zoom: x2



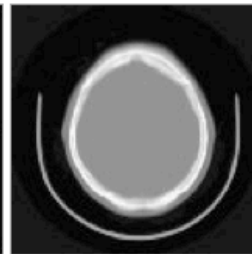
...s/DICOM/images/CR-MONO1-10-chest.dcm



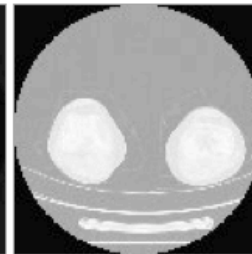
...ICOM/images/CT-MONO2-12-lomb-an2.dcm



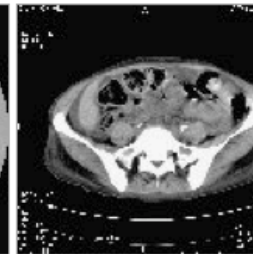
...s/DICOM/images/CT-MONO2-16-ankle.dcm



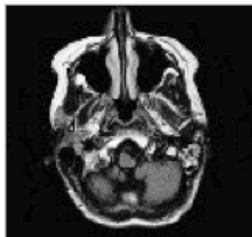
...s/DICOM/images/CT-MONO2-16-brain.dcm

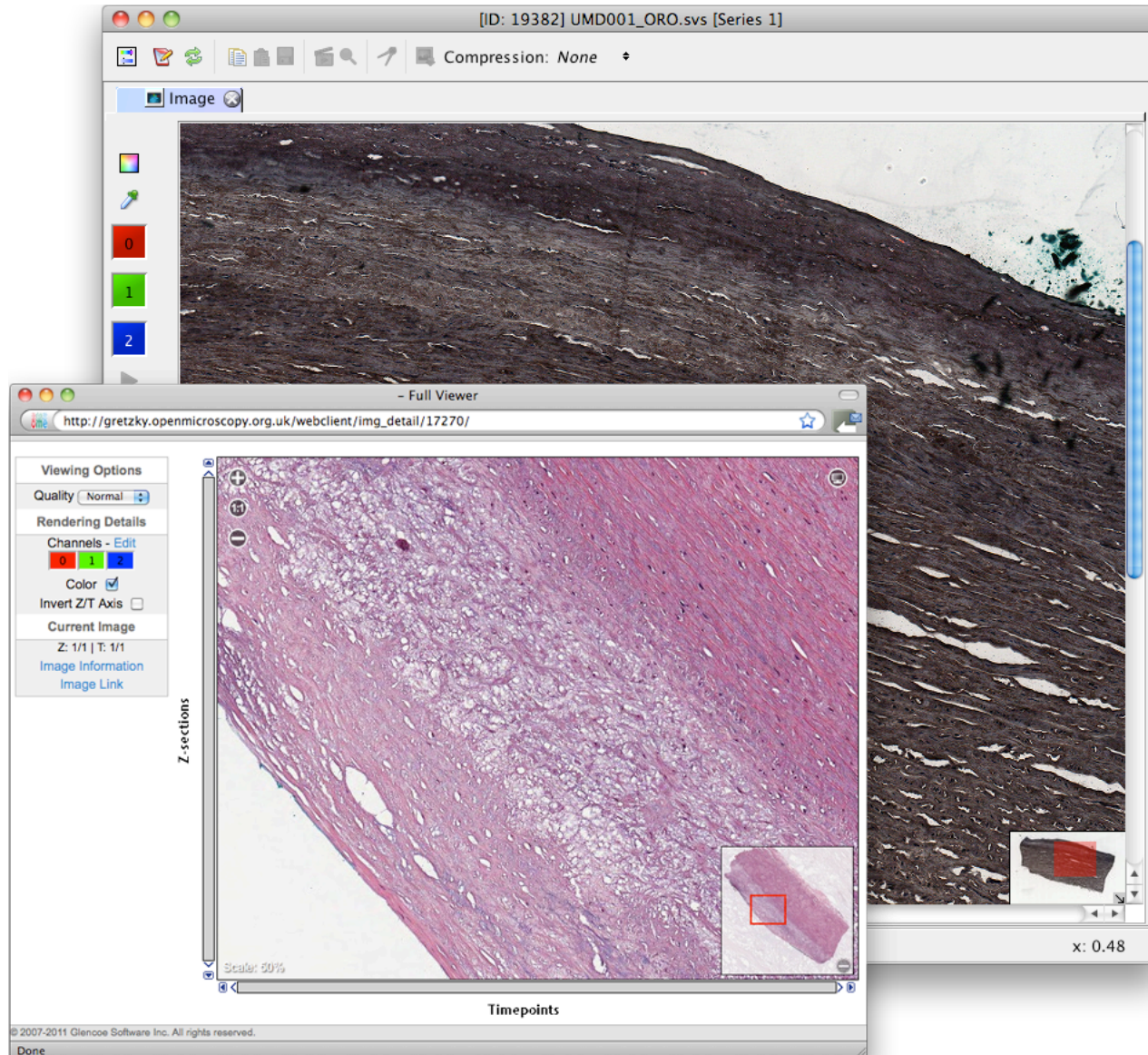


...ges/DICOM/images/CT-MONO2-16-ort.dcm



...ges/DICOM/images/CT-MONO2-8-abdo.dcm





BASKET: 0 items ACTIVITIES: 0 job(s) group: data Virtual Microscope (pfelts) logout

Virtual Microscope

- Intro to Human Anatomy FO22046 [5]
 - 13th of February [4]
 - 21_Foetal Skull.svs [Series 1]
 - 22_Foetal tibia.svs [Series 1]
 - 23_Adult Tibia.svs [Series 1]
 - 4_Trachea.svs [Series 1]
 - 20th of February [5]
 - 26_Heart.svs [Series 1]
 - 24_Prostate.svs [Series 1]
 - ...us early luteal.svs [Series 1]
 - ...Urinary Bladder.svs [Series 1]
 - 6_Tongue.svs [Series 1]
 - 27th of February [4]
 - 1_Lung.svs [Series 1]
 - 2_Kidney.svs [Series 1]
 - 3_Gall Bladder.svs [Series 1]
 - 7_Oesophagus.svs [Series 1]
 - 5th of March [30]
 - Others [6]
 - 45_Testis.svs [Series 1]
 - 46_Vas deferens.svs [Series 1]
 - 47_Ovary.svs [Series 1]
 - ...terus menstrual.svs [Series 1]
 - 49_Uterine tube.svs [Series 1]
 - ...reast lactating.svs [Series 1]
- Orphaned images

7_Oesophagus.svs [Series 1]

Image ID: 172

Launch full viewer

Aperio Image Library v10.2.23

Owner: Virtual Microscope
Acquisition Date: 2012-01-25 00:28:03
Imported Date: 2012-01-25 12:28:03
Dimensions (XY): 58583 x 59590
Pixels Type: uint8
Z-sections/Timepoints: 1 x 1
Channels: 0, 1, 2

Annotations

Rate: No ratings
Tag: No tags
Attach: No attachments.
Others:
Comment:
No comments.

Contained in Datasets

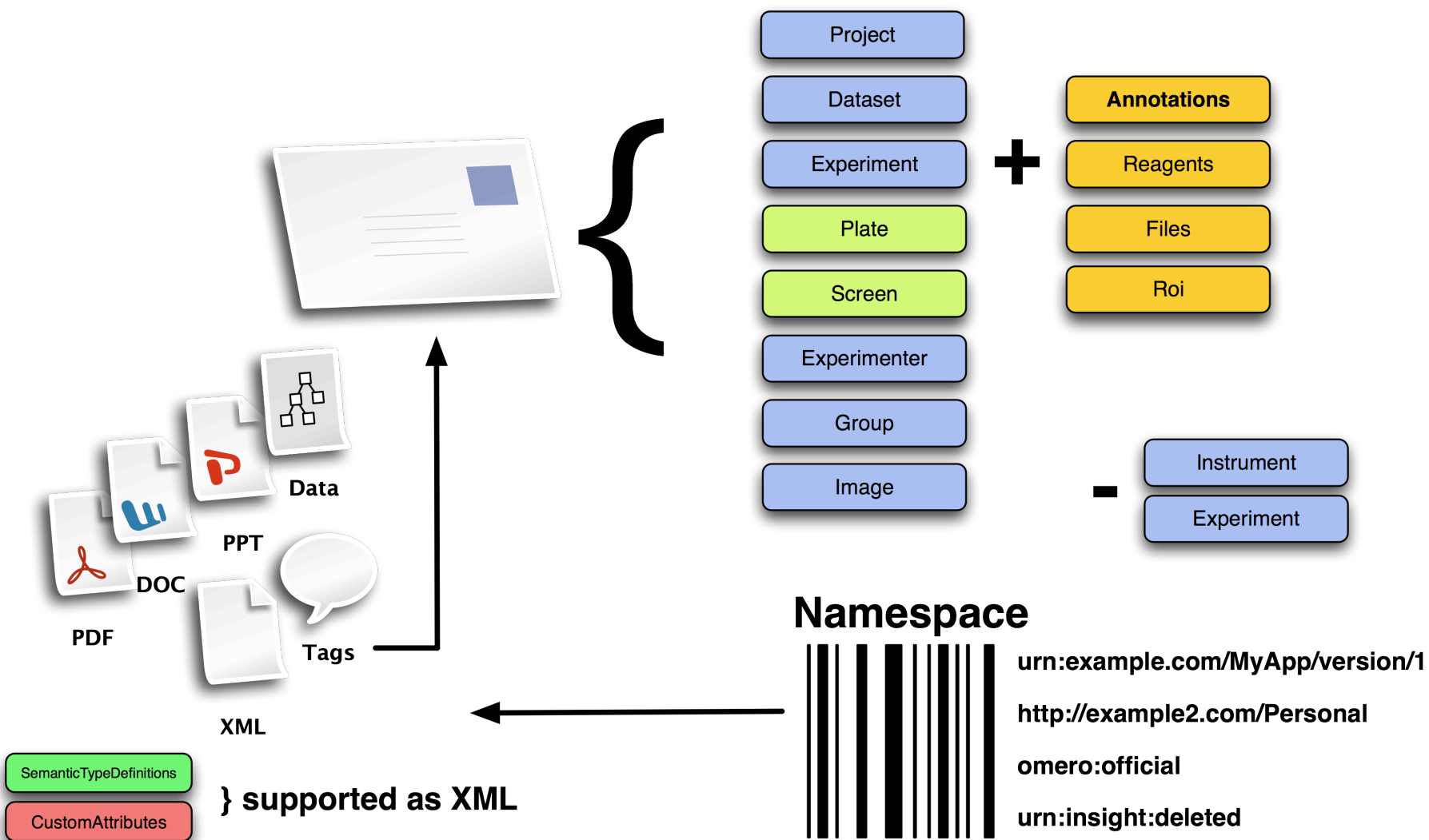
[Load hierarchy...](#)

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The screenshot displays the OMERO EMDB webclient interface. The browser window title is "Webclient" and the address bar shows "localhost:8000/webclient/userdata/". The page header includes the OMERO logo and navigation links: Home, Data, Public, Search, History, My Account, Help, Contact. Below the header, there are filters for "BASKET: 0 items" and "ACTIVITIES: 0 job(s)", along with dropdown menus for "group: EMDB" and "*EMDB Owner (emdb)".

The main content area is divided into a left sidebar and a central panel. The sidebar contains a tree view of EMDB entries, with "emd_1080.map" selected. The central panel shows a preview of the selected map, "emd_1080.map", with tabs for "General", "Acquisition", and "Preview". The "General" tab is active, displaying a 3D visualization of the map. The map is rendered as a yellow, textured surface, showing a complex, interconnected structure. The viewer controls include a "Solid" radio button (selected) and a "Wire Frame" radio button. A "Contour Level" slider is set to 0.823, with a range from -1.3412 to 2.365. The "Map Size" is 100 x 100 x 100, and the "Map Pixel Data" is set to "Compressed (int8)". There are also "Download full map" and "Reload" buttons. The "Controls" section lists: "Zoom: Shift and Drag up/down" and "Pan: Drag and hold down Ctrl".

At the bottom of the interface, there is a copyright notice: "AstexViewer™ Copyright (C) 1999-2007 Astex Therapeutics Ltd. OpenAstexViewer Copyright (C) 2007-2009 Mike Hartshorn. Modifications to the OpenAstexViewer has been made by the EMDataBank.org team, these include changes to allow map and models to be displayed with limited memory".



/OMERO/Files/1 (HDF file)

"/OME/Measurement:Plate1" (HDF group)

ImageColumn	LongColumn	DoubleColumn	DoubleColumn	DoubleColumn

*Aggregation
(e.g. mean)*



SourceColumn	RoiColumn	DoubleColumn	DoubleColumn	DoubleColumn

"/OME/Measurement:Image1" (HDF group)

Google: 'OMERO Tables'



OMERO ScreenPlateWell: High Content Assays



hcs user's Data Manager

Hierarchies
Screens

- hcs user
 - RTH-KH-yfp-pml_A-100819_1 (96-Well Plate) [1]
 - omero.model.PlateAcquisition:0:0
 - ~RTH-KH-yfp-pml_A-100819_1 (96-Well Plate) [1]

Field #1

RTH-KH-yfp-pml_A-100819_1 > Well A-4, Field #1 (Nov 13, 2009)

	1	2	3	4	5	6	7	8	9	10	11	12
A												
B												
C												
D												
E												
F												
G												
H												

Compound ID:RNA00000742
Batch Ref.:01
OBJECT ACCESSION:NM_001982
OBJECT CATALOGNUMBER:M-003127-02
OBJECT DDDPLATEID:11814
Well:155
OBJECT GENESYMBOL:ERBB3
OBJECT LIBRARYNAME:Human Protein Kinase Pools
OBJECT LIBRARYNAMECODE:RNA-HPKP
OBJECT LOCUSID:2065
OBJECT LOTNO:6126
OBJECT OBJDBATCHREF:01
OBJECT OBJID:RNA00000742
OBJECT OBJJNO:94763
OBJECT ORDERNO:HAYRC 100733
OBJECT ORIGINALPLATEID:Plate 4
OBJECT ORIGINALWELLID:A04
Test ID:RNA-CEFF-SP-YFP-PML-02
Comments:ARSENIC DRUG
Plate ID:100840
Well Ref.:A004
CELL COUNT:6817.00
ORGANELLES COUNT:1.33
ORGANELLES INTENSITY:184.05
ORGANELLES TOTALAREA:11.00
PA:52.72

Compound ID:RNA00000742
Batch Ref.:01
OBJECT ACCESSION:NM_001982
OBJECT CATALOGNUMBER:M-003127-02
OBJECT DDDPLATEID:11814
Well:155
OBJECT GENESYMBOL:ERBB3
OBJECT LIBRARYNAME:Human Protein Kinase Pools
OBJECT LIBRARYNAMECODE:RNA-HPKP
OBJECT LOCUSID:2065
OBJECT LOTNO:6126
OBJECT OBJDBATCHREF:01
OBJECT OBJID:RNA00000742
OBJECT OBJJNO:94763
OBJECT ORDERNO:HAYRC 100733
OBJECT ORIGINALPLATEID:Plate 4
OBJECT ORIGINALWELLID:A04
Test ID:RNA-CEFF-SP-YFP-PML-02
Comments:ARSENIC DRUG
Plate ID:100840
Well Ref.:A004
CELL COUNT:6817.00
ORGANELLES COUNT:1.33
ORGANELLES INTENSITY:184.05
ORGANELLES TOTALAREA:11.00
PA:52.72

Attachments
Tags
Images
Search

General Acquisition Preview

Field's details

Field ID: 617
Plate: RTH-KH-yfp-pml_A-100819_1
Well A-4
Well A-4, Field #1

Description

Acquisition Date 11/13/09 11:35 AM
Dimensions (XY) 2048 x 2048
Pixels Type Unsigned 16-bit (2 byte)
Pixels Size (XY) (µm) 0.74x0.74
z-sections/timepoints 1 x 1
Channels DAPI, YFP

Annotations

All
rate ★★★★★
tag None
attachment None
comment
Comments

Katie Hands & Ron Hay



OMERO ScreenPlateWell: High Content Assays



hcs user's Data Manager

Hierarchies
Screens

hcs user
RTH-KH-yfp-pml_A-100819_1 (96-Well Plate) [1]
omero.model.PlateAcquisition:0:0
~RTH-KH-yfp-pml_A-100819_1 (96-Well Plate) [1]

Field #1

RTH-KH-yfp-pml_A-100819_1 > Well A-4, Field #1 (Nov 13, 2009)

	1	2	3	4	5	6	7	8	9	10	11	12
A												
B												
C												

General Acquisition Preview

Field's details
Field ID: 617
Plate: RTH-KH-yfp-pml_A-100819_1
Well A-4
Well A-4, Field #1
Description

[ID: 618] Well A-4, Field #1
Compression: High

Image Split

DAPI
YFP

Z=1/1 T=1/1 x0.25

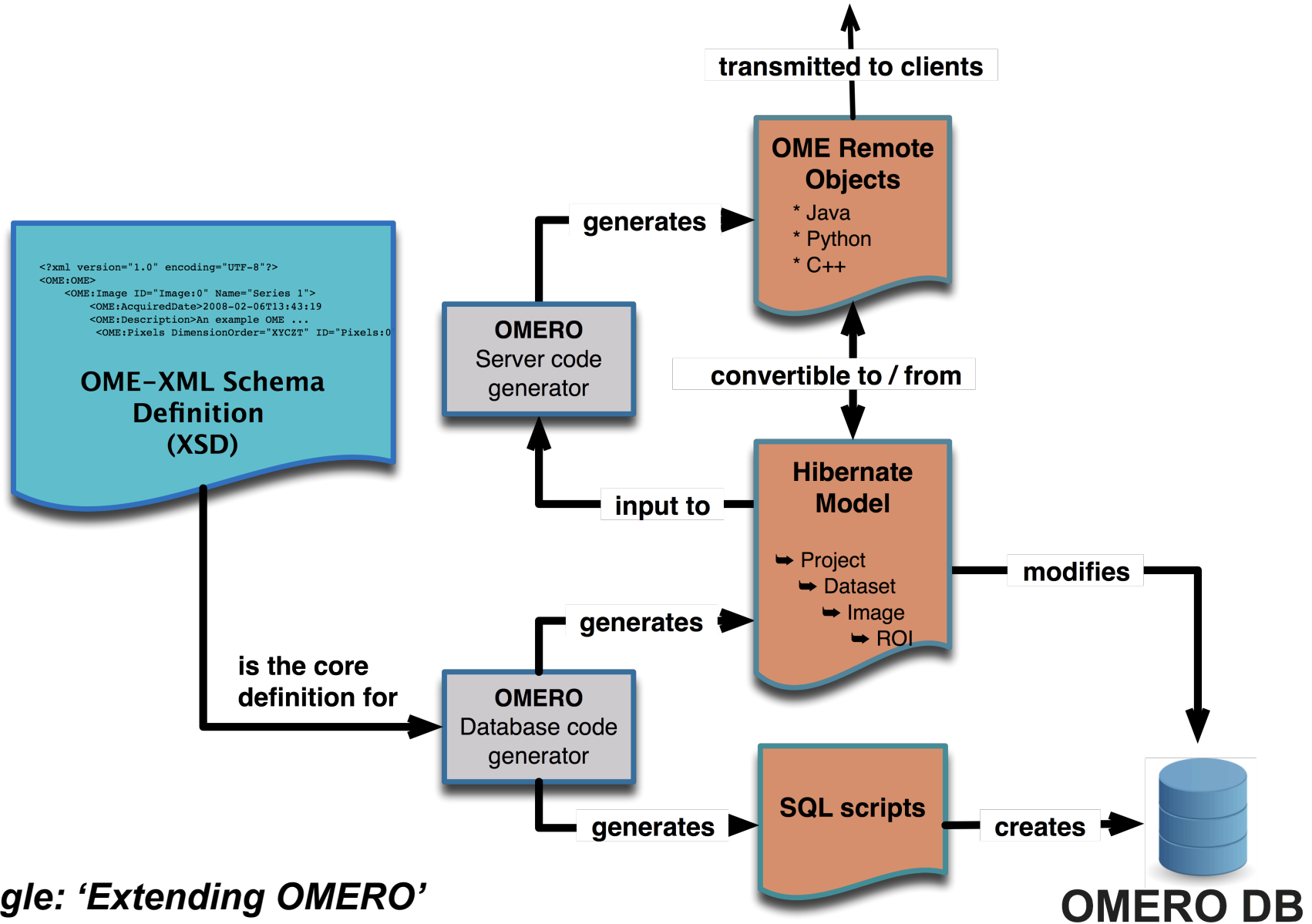
Measurement Tool [ID: 618] Well A-4, Field #1
for omero YFPpml incell 2000 Nuclei

Visible	Image	Cell	Nucleus: Size	Nucleus: cgY	Nucleus: cgX	Nucleus: NucleusIntensity	Nucleus: GreyscaleNonuniformity
<input checked="" type="checkbox"/>	618	2451	181.27	38.46	903.21	151.09	0.05
<input checked="" type="checkbox"/>	618	1	110.62	2041.23	147.71	142.81	0.03
<input checked="" type="checkbox"/>	618	2	114.46	2040.93	222.51	137.78	0.02
<input checked="" type="checkbox"/>	618	3	146.77	2038.88	444.33	145.01	0.02
<input checked="" type="checkbox"/>	618	4	179.63	2037.99	486.23	143.7	0.02
<input checked="" type="checkbox"/>	618	5	173.06	2035.18	553.83	160.23	0.06
<input checked="" type="checkbox"/>	618	6	183.46	2035.07	584.19	145.89	0.02
<input checked="" type="checkbox"/>	618	7	217.41	2036.53	690.9	147.07	0.02
<input checked="" type="checkbox"/>	618	8	87.08	2042.52	723.62	147.27	0.02
<input checked="" type="checkbox"/>	618	9	101.86	2041.28	755.0	145.6	0.02
<input checked="" type="checkbox"/>	618	10	89.81	2041.46	866.18	146.15	0.02
<input checked="" type="checkbox"/>	618	11	115.01	2039.28	888.41	146.54	0.02
<input checked="" type="checkbox"/>	618	12	225.08	2034.75	963.0	147.2	0.02
<input checked="" type="checkbox"/>	618	13	112.27	2039.3	995.24	150.56	0.03
<input checked="" type="checkbox"/>	618	14	131.43	2040.05	1083.57	153.37	0.05
<input checked="" type="checkbox"/>	618	15	361.99	2025.2	1134.28	153.04	0.04
<input checked="" type="checkbox"/>	618	16	108.98	2038.05	1175.86	146.29	0.03
<input checked="" type="checkbox"/>	618	17	105.7	2041.87	1198.6	146.73	0.03
<input checked="" type="checkbox"/>	618	18	118.29	2041.82	1328.42	144.98	0.03
<input checked="" type="checkbox"/>	618	19	139.65	2037.79	1396.17	143.46	0.03
<input checked="" type="checkbox"/>	618	20	138.01	2039.36	1887.71	133.87	0.03
<input checked="" type="checkbox"/>	618	21	110.08	2040.19	1928.19	132.46	0.02
<input checked="" type="checkbox"/>	618	22	103.5	2043.26	1972.06	135.61	0.02
<input checked="" type="checkbox"/>	618	23	140.74	2036.5	638.77	148.94	0.03
<input checked="" type="checkbox"/>	618	24	230.01	2026.5	842.73	146.54	0.02
<input checked="" type="checkbox"/>	618	25	404.71	2027.26	350.11	142.07	0.02
<input checked="" type="checkbox"/>	618	26	113.36	2033.27	775.28	145.75	0.02
<input checked="" type="checkbox"/>	618	27	140.74	2031.87	1240.05	142.4	0.02
<input checked="" type="checkbox"/>	618	28	230.56	2024.43	202.76	137.3	0.02
<input checked="" type="checkbox"/>	618	29	261.77	2026.59	1294.25	152.08	0.06

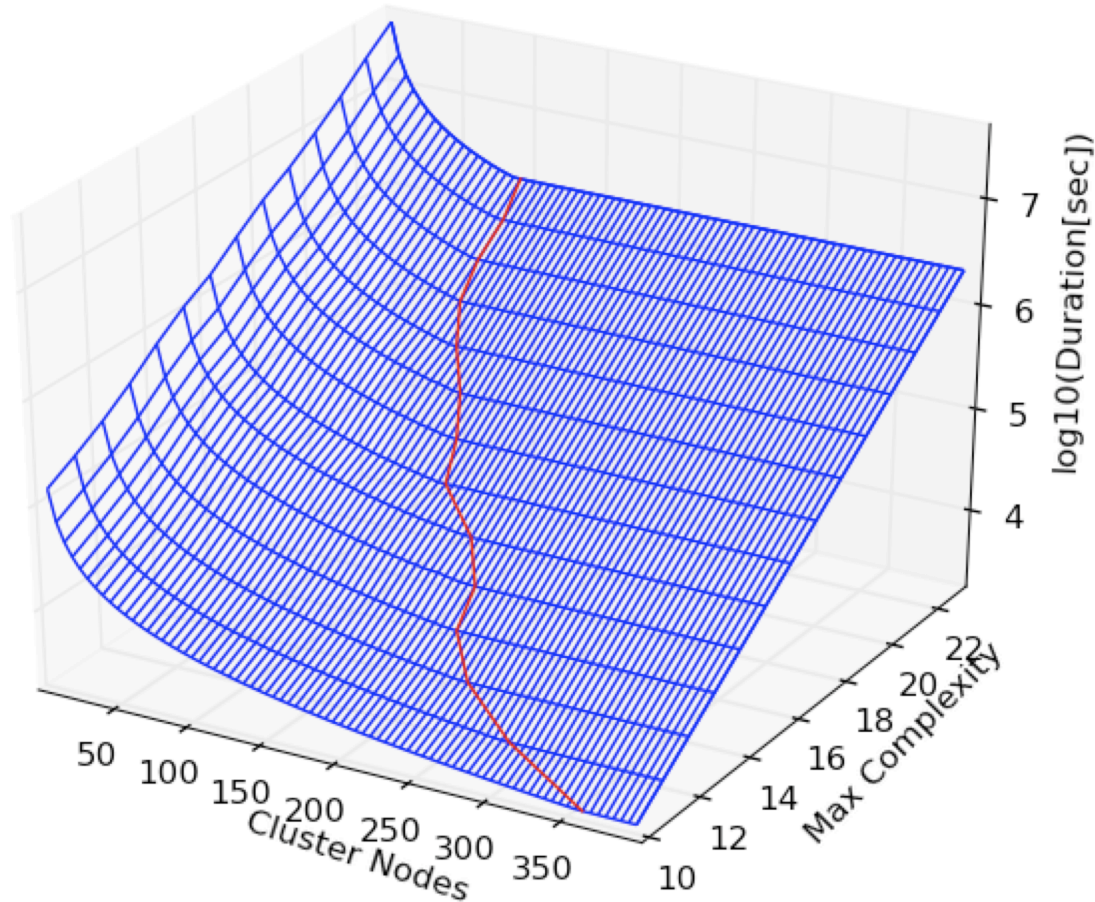
Save To Excel

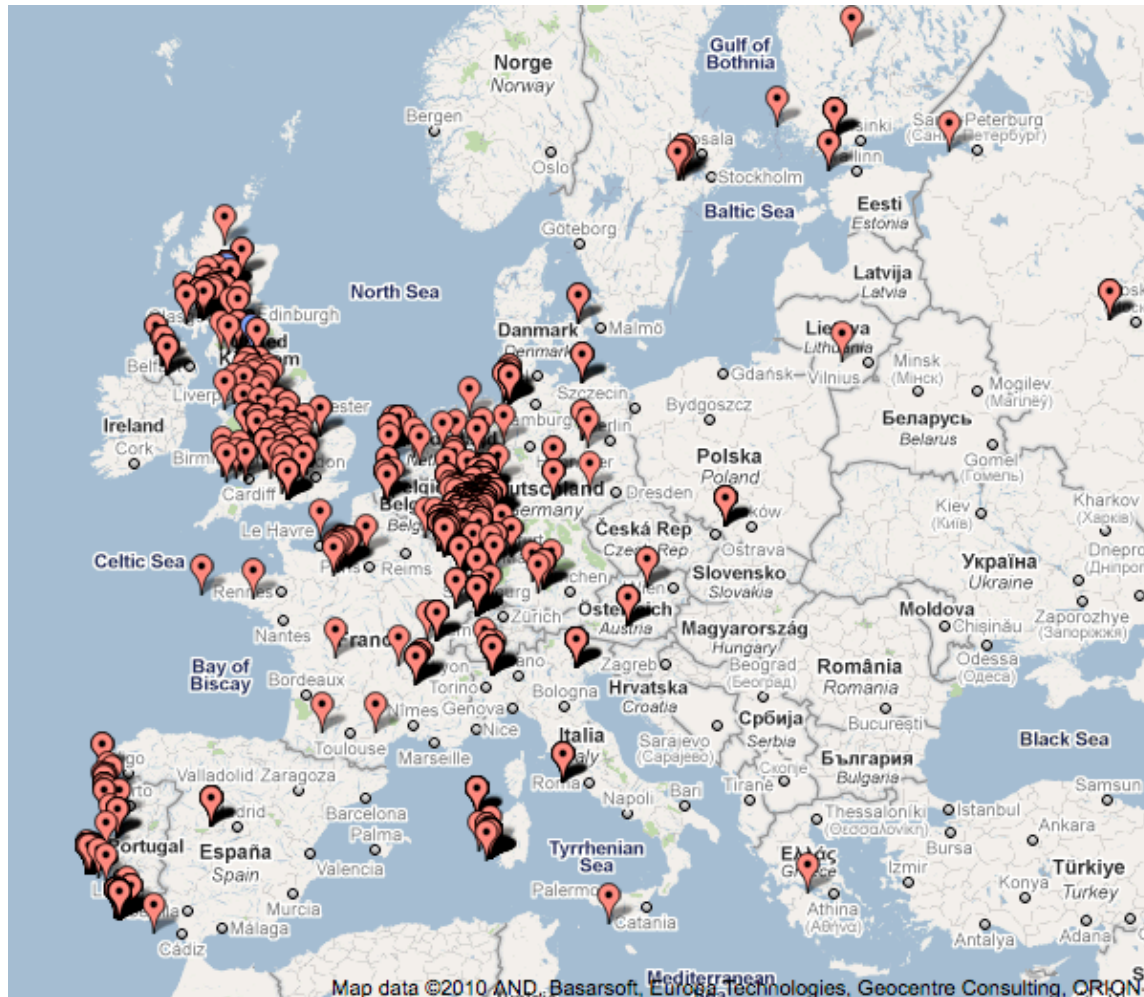
Ready.

Katie Hands & Ron Hay



Compute efficiency for SNP Imputing

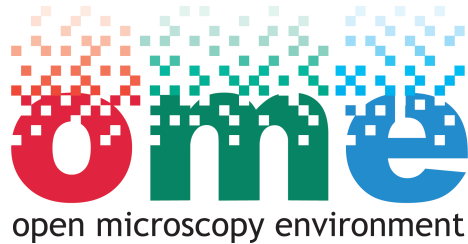




APPLICATION	BIO-FORMATS	INSIGHT	SERVER	WEB
UNIQUE IPs	41478	5510	3269	857



Open Communities



Micropilot





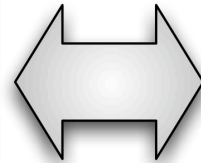
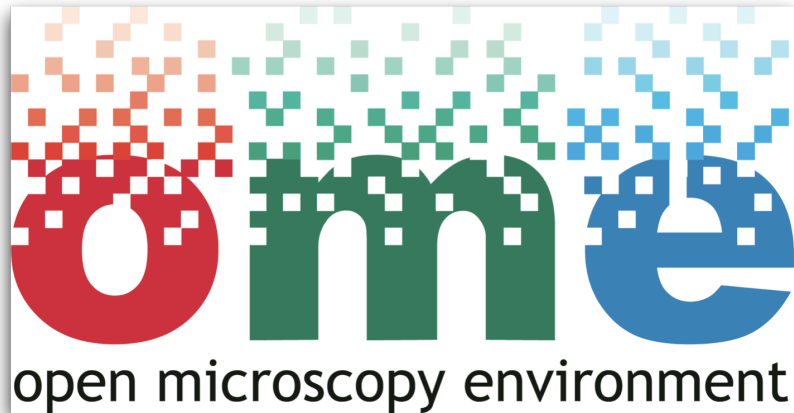
OME: Open Community



7th Annual Users Meeting



June 18/19 2012 – Paris (Pasteur)



- Open
- GPL License
- Freely available
- Supported by email lists

- Open, wholly owned
- Commercial licenses for OMERO
- Customized, supported, warrantied
- SaaS

JCB Data Viewer

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Current Issue

See the Editorial for more details about data download.

Search

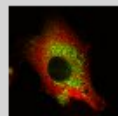
Search

Welcome to the JCB DataViewer!

The JCB DataViewer is a browser-based application designed to facilitate viewing, analysis, and sharing of multi-dimensional image data associated with articles published in **The Journal of Cell Biology**.

For more information about the JCB DataViewer click [here](#).

Featured Images

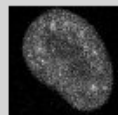


The dynamic interaction of AMBRA1 with the dynein motor complex regulates mammalian autophagy

Sabrina Di Bartolomeo, Marco Corazzari, Francesca Nazio, Serafina Oliverio, Gaia Lisi, Manuela Antonioli, Vittoria Pagliarini, Silvia Matteoni, Claudia Fuoco, Luigi Giunta, Marcello D'Amelio, Roberta Nardacci, Alessandra Romagnoli, Mauro Piacentini, Francesco Cecconi, Gian Maria Fimia

jcb. 2010. 191:155-168 DOI: 10.1083/jcb.201002100.

[Full Viewer](#) | [Article](#) | [Figure](#)

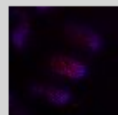


The differential interaction of snRNPs with pre-mRNA reveals splicing kinetics in living cells

Martina Huranová, Ivan Ivani, Aleš Benda, Ina Poser, Yehuda Brody, Martin Hof, Yaron Shav-Tal, Karla M. Neugebauer, David Staněk

jcb. 2010. 191:75-86 DOI: 10.1083/jcb.201004030.

[Full Viewer](#) | [Article](#) | [Figure](#)



Kinesin-1 and dynein at the nuclear envelope mediate the bidirectional migrations of nuclei

Heidi N. Fridolfsson, Daniel A. Starr

jcb. 2010. 191:115-128 DOI: 10.1083/jcb.201004118.

[Full Viewer](#) | [Article](#) | [Figure](#)



Protein turnover of the Wallenda/DLK kinase regulates a retrograde response to axonal injury

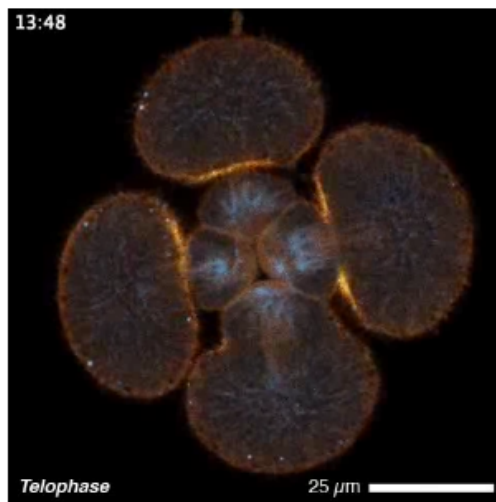
Yin-Yang, Yin-Wang, Benny Eversak, Deepak Bhat, Aaron DiAntonio, Catherine A. Collins

Cell Process	Cell Component	Cell Type	Organism	Recent
--------------	----------------	-----------	----------	--------

Watch the Neuroscience Information Framework hosted webinar on The Cell. Just click [here](#).

Looking for a new wallpaper? [Inside NIF: The Cell, An Image Library](#) - great science images formatted for your phone!

Featured Image

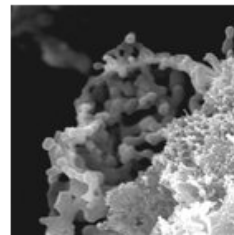


Like 22

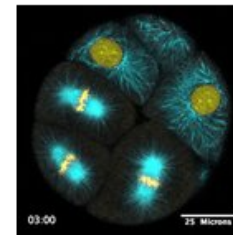
Purple sea urchin embryos undergoing mitosis. Embryos are expressing GFP-rhotekin GTPase binding domain, which is a probe for active Rho, with 3xmCherry-Enscn5in (a microtubule associated protein shown in blue). Embryos were imaged with a laser scanning confocal microscope (Radiance 2000; Bio-Rad...[more](#))

Image contributed by George Von Dassow

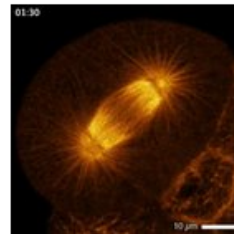
Images of Note



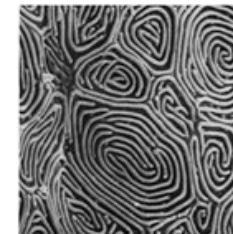
CIL:12659*
NCBI Organism
· *Danio rerio* (zebrafish)
Biological Process
· notochord formation
Cellular Component
· extracellular matrix



CIL:15792*
NCBI Organism
· *Strongylocentrotus purpuratus* (California purple urchin)
Biological Process
· cytokinesis after mitosis
Cellular Component
· microtubule

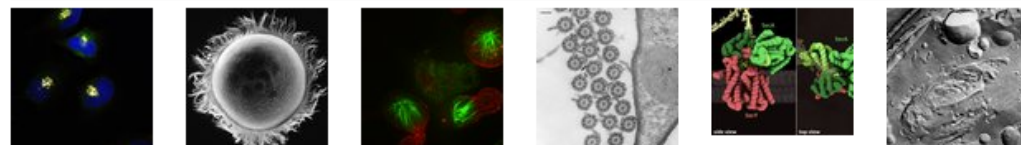


CIL:15806*
NCBI Organism
· *Dendroaster excentricus*
Biological Process
· mitotic anaphase
Cellular Component
· microtubule



CIL:11110*
NCBI Organism
· *Parophrys vetulus* (English sole)
Biological Process
· none specified
Cellular Component
· cell surface

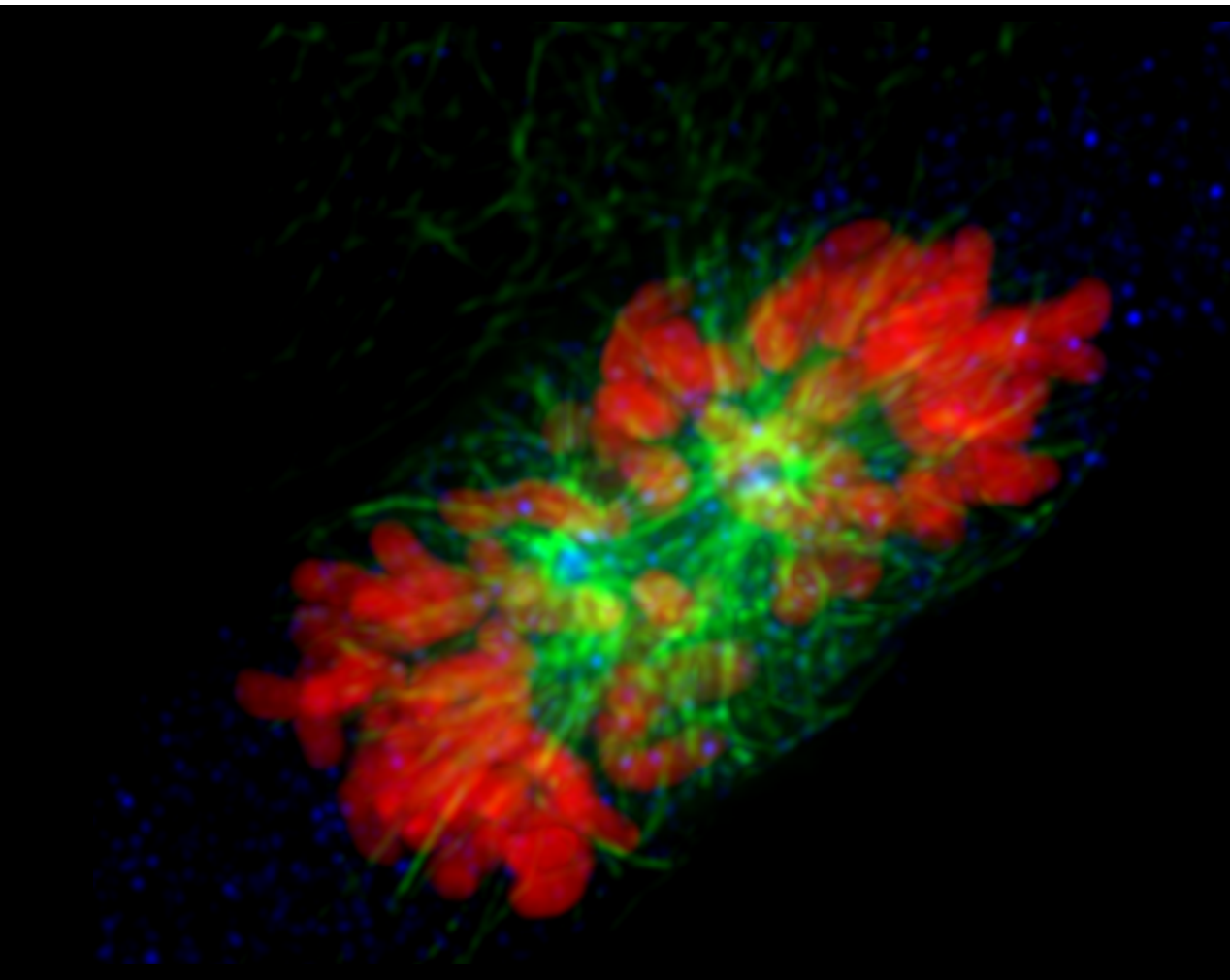
Recent Images



- **Major Expansion @ Dundee**
 - ✓ Development, Usability, Support, Management
- **Collaborations**
 - ✓ EBI: Kleywegt (EMDB)
 - ✓ Edinburgh: Atkinson (Rapid)
- **OME Satellites**
 - ✓ Edinburgh: Richard Baldock
 - ✓ Oxford: Ilan Davis
 - ✓ Imperial: Paul French
 - ✓ Pasteur: Spencer Shorte
 - ✓ CRS4: Gianluigi Zanetti
 - ✓ Harvard Med: Gaudenz Danuser
 - ✓ CMU: Robert Murphy
 - ✓ NIH: Ilya Goldberg
 - ✓ Madison: Kevin Eliceiri

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- **Accessible**
- **Secure**
- **Shareable**
- **Analysable**
- **Publishable**
- **Scaleable**



OME: Current Team



- **Dundee (Swedlow Lab) - Chris Allan, Colin Blackburn, Jean-Marie Burel, Gus Ferguson, Emma Hill, Roger Leigh, Scott Littlewood, Scott Loynton, Josh Moore, Will Moore, Andrew Patterson, Aleksandra Tarkowska**
- **Univ Wisconsin, Madison (LOCI) - Kevin Eliceiri, Curtis Rueden, Mark Hiner**
- **Glencoe Software – Melissa Linkert, Chris MacLeod, Carlos Neves, Liza Unson**



Engineering and Physical Sciences
Research Council

Potential conflict: JRS is a Co-Founder of Glencoe Software



OME: Collaborators



- **OMERO/RAPID:** Jos Koetsier, Jano van Hemert, Malcolm Atkinson (NeSC, Edinburgh)
- **OMERO FLIM:** Saskia Hutten, Ashwat Visvanathan, Angus Lamond, Pieta Schofield, Geoff Barton (Dundee)
- **OMERO/Medical:** Andy Judson, Andrew Morris (HIC, Dundee) & Gianluigi Zanetti (CRS4)
- **OMERO.searcher:** BK Cho, Jenn Bakal, Robert Murphy (CMU)
- **EMDB:** Ingvar Lagerstadt, Ardan Patwardhan, Gerard Kleywegt (EBI)
- **VolViewer:** Jerome Avondo, Steve Rawthshorne (JIC)



Engineering and Physical Sciences
Research Council

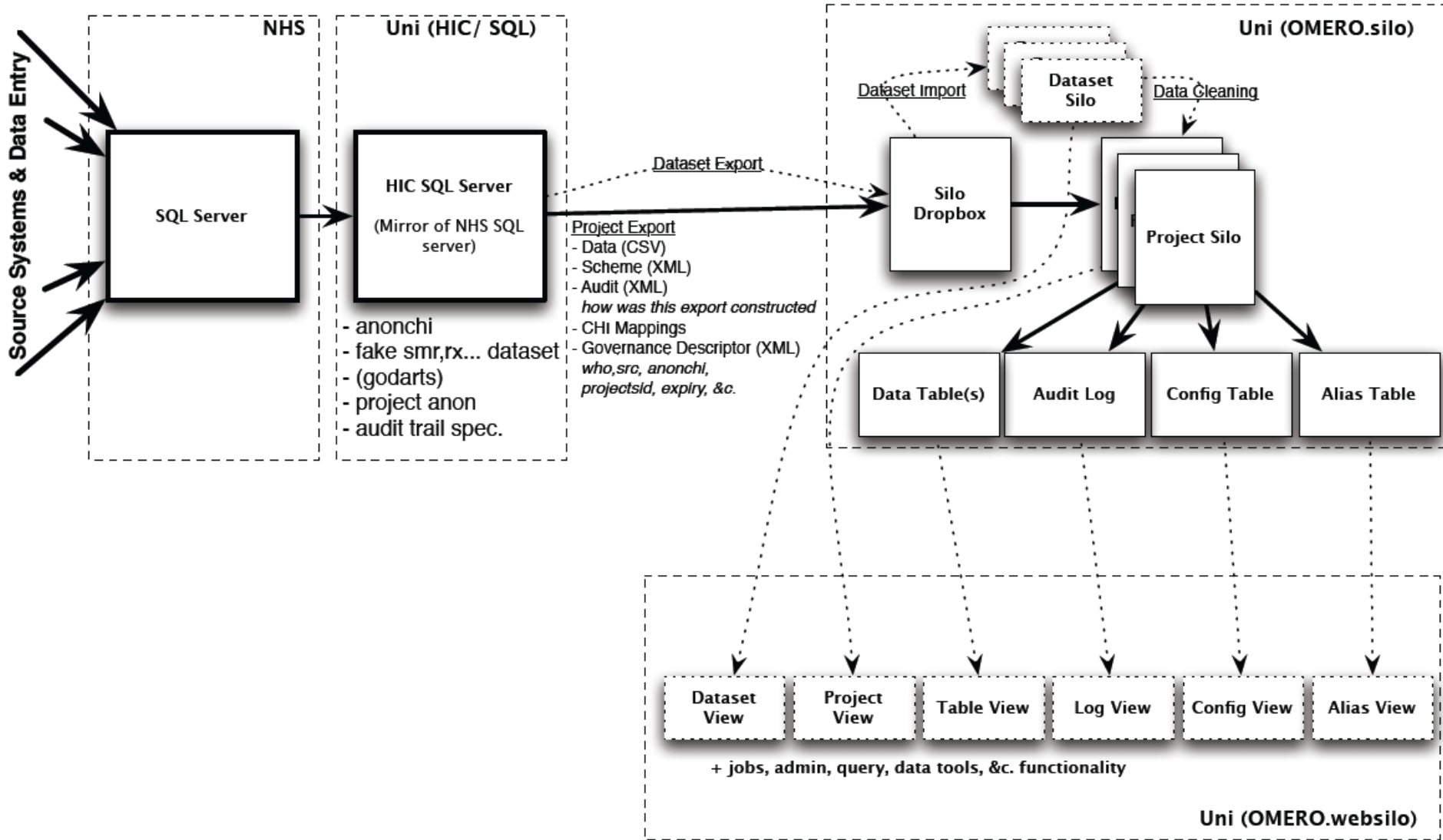
Potential conflict: JRS is a Co-Founder of Glencoe Software



Recognition!!!!



- Community of 1000's of users, with many academic biotech, and commercial installations
- 2011 BBSRC Innovator of the Year
- Wellcome Trust Strategic Award 2011-2014; £4.5M (\$7M) (Dundee leading 9 Universities from UK, Europe, and USA)
- Partnership with Arhidia Informatics





OMERO.silos: Health Informatics



Volunteers List

INDIVIDUAL	GENDER	FATHER	MOTHER
1 T1D05823	MALE		
2 T1D07695	MALE		
3 T1D07497	MALE	T1D07695	
4 T1D04355	MALE		
5 T1D00450	FEMALE		
6 T1D02844	FEMALE	T1D04355	T1D00450
7 T1D09653	MALE		
8 T1D05018	MALE	T1D09653	
9 T1D07071	MALE		
10 T1D09248	FEMALE		
11 T1D03641	FEMALE	T1D07071	T1D09248
12 T1D01823	MALE		
13 T1D03706	FEMALE		

Samples

SAMPLE LABEL	CREATION DATE	EXPERIMENTER	ITEM TYPE	STATUS
VB00001	01/01/2010	Mario Rossi	BLOOD	✓
VD12001	04/01/2010	Mario Rossi	DNA	✓
P001-A08	27/02/2010	Giulio Bianchi	WELL	
VC23541	03/03/2010	Giulio Bianchi	RAW GT RESULT	✗
P023-C03	01/04/2010	Anna Verdi	WELL	
VC24511	10/04/2010	Anna Verdi	RAW GT RESULT	✓
VD15451	05/01/2010	Mario Rossi	DNA	✓
P231-G11	12/02/2010	Giulio Bianchi	WELL	
VC24114	10/02/2010	Giulio Bianchi	RAW GT RESULT	✓
VG T2451	22/03/2010	Luca Verdi	GT CALLS	
P133-B01	23/03/2010	Tommaso Neri	WELL	
VS33110	01/10/2010	Mario Rossi	SERUM	✗

SAMPLE LABEL:

SAMPLE TYPE:

BARCODE:

CREATION DATE:

EXPERIMENTER:

INITIAL VOLUME:

CURRENT VOLUME:

SAMPLE STATUS:

- **Software Start-up**

- ✓ Wholly owned
- ✓ Self-funded



- **OEM partnerships providing software infrastructure for imaging**
- **Commercial licenses and/or customization and support of OME software**
- **Major contributors to Bio-Formats & OMERO GPL code base**

- **More Image types and domains**
- **Heterogeneous data**
- **Integration with other open source projects**
 - ✓ ImageJ, KNIME, ITK/VTK, R, Usability, Support, Management
- **Processing & Analysis**
- **Annotation**
 - ✓ Human & Machine-based
- **Search**
- **Image Data Repositories**

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