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JCB Data Viewer

A New Dimension for Publishing and Sharing Image Data

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QUALITY AND INTEGRITY

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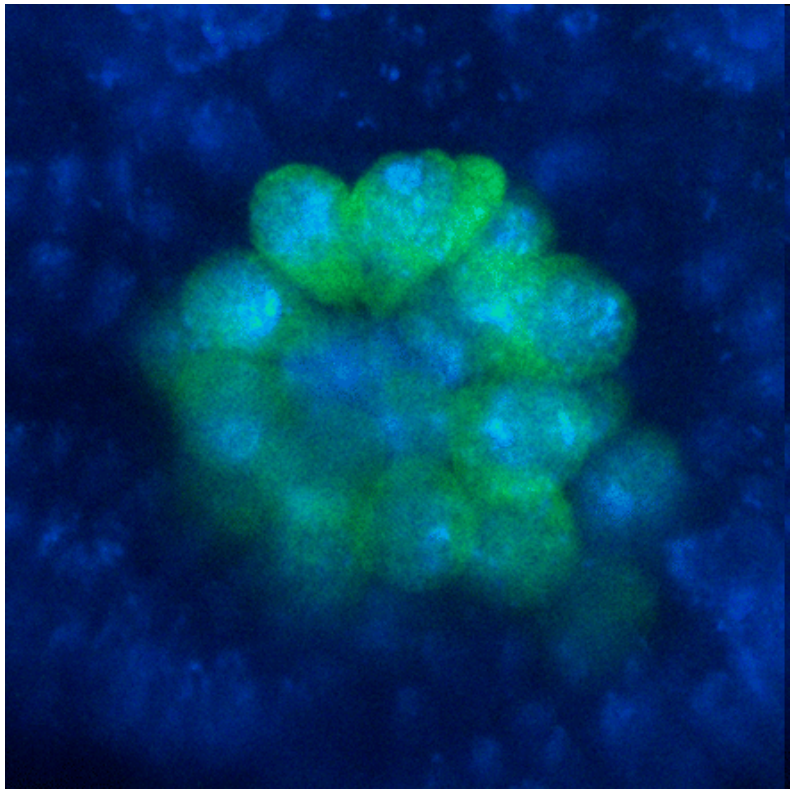
What does JCB have to do with OME?



The Journal of Cell Biology

- Launched in 1955
- Publish a LOT of microscopy images & movies
- Results derived from multi-dimensional microscopy data
- Request minimum information about data acquisition
- Focus on data integrity

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GLENCOE SOFTWARE

http://jcb-dataviewer.rupress.org

- A browser-based application for viewing original image files associated with JCB articles.
- Various light microscopes and gel-documentation systems supported.
- The first browser-based system for viewing multi-dimensional light microscope image data.

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Original Data:

- Ensures integrity.
- Authors present their original data as acquired.
- Metadata are captured.

Multi-Dimensional Publishing:

- Authors present their multi-dimensional microscope data.
- Users can interact with the data and perform simple analyses.
- Opens up a new dimension for online scientific publishing.

Data Sharing:

- Data are freely accessible after publication.
- In line with funding agency guidelines.

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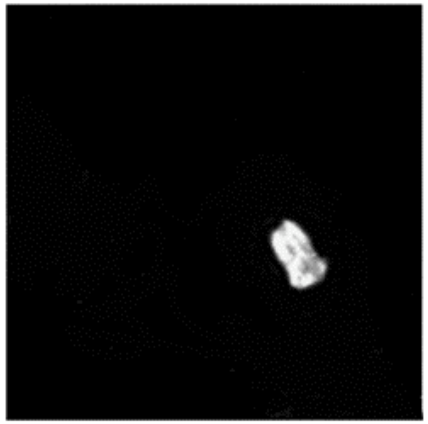
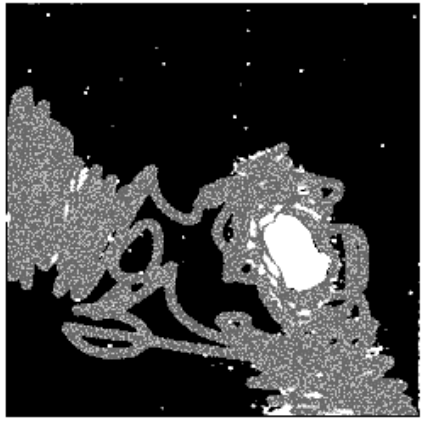
Original Data: Integrity

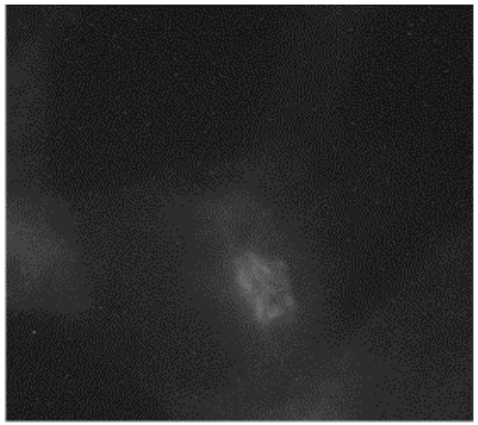
Submitted Figure



Adjusted Contrast



Original Data



"we only wanted to show the actual data presented, and therefore, some parts of the figures were erased."

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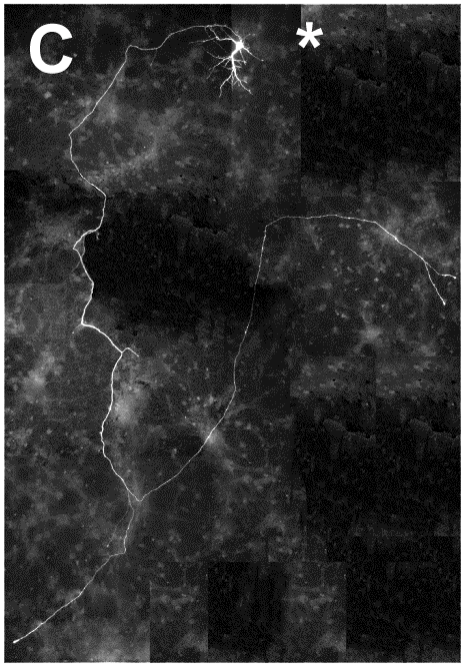
Original Data: Integrity

Submitted Figure



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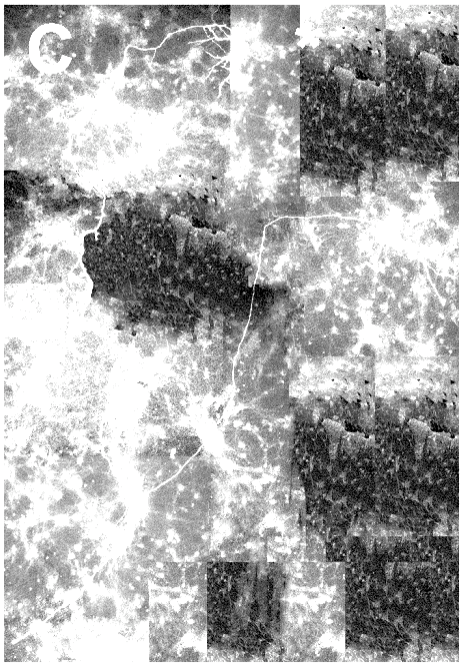

"We erased dirt (dust or dead neurites/cells) because of aesthetic reasons. In two cases near neurons have been carefully erased to provide an easier understanding of the axonal arbor."

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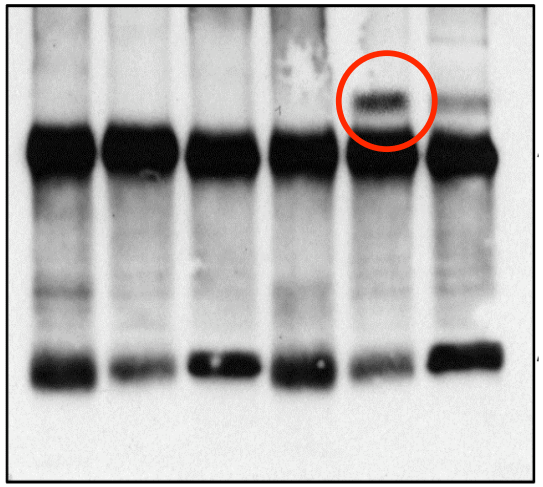
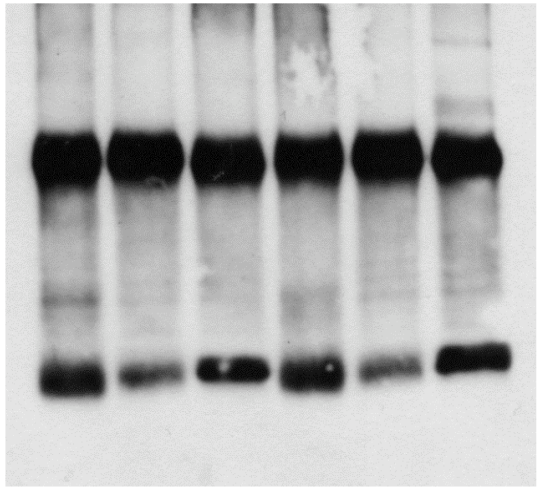
Original Data: Integrity

Submitted figure

B

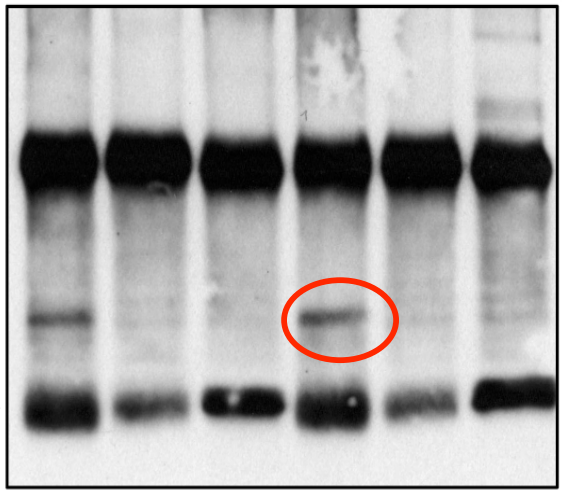


Original Data



Submitted figure

C



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Original Data: Filetypes Supported

Format	Extensions
BioRad	.pic
Bitmap	.pic
DeltaVision	.dv, *.r3d, *.r3d_d3d
Digital Imaging and Communications in Medicine	.dicom, .dic, .dcm
Amersham Biosciences GEL	.gel
Graphics Interchange Format	.gif
Image Cytometry Standard	.ics, .ids
Bitplane Imaris	.ims
Improvision Tiff	.tif
Joint Photographic Experts Group	.jpeg,.jpg
Leica "lei" Format	.lei
Leica Image Format	.lif
Li-Cor L2D	.l2d

Format	Extensions
Metamorph	.stk
Nikon NIS-Elements	.nd2
Olympus FluoView FV1000	.oib, .oif
Openlab Raw	.raw
Openlab LIFF	.liff
PerkinElmer UltraView	.tif, .2, .3, etc
PICT (Machintosh Picture)	.pict
Portable Gray Map	.pgm
Portable Network Graphic	.png
Prairie Technologies TIFF	.png
Tagged Image File Format	.tif, .tiff
Visitech XYS	.xys
Zeiss LSM	.lsm
Zeiss AxioVision	.zvi

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Multi-Dimensional Publishing

Benefits to Authors

- Showcase & discuss their data in 3D
- Data are linked to directly from the article
- Serves as an archived copy
- Conform to funding agencies requests for data sharing
- Viewers can't download data, they only have access to rendered JPEG.

Why have a fancy microscope if you can't publish the resulting data?

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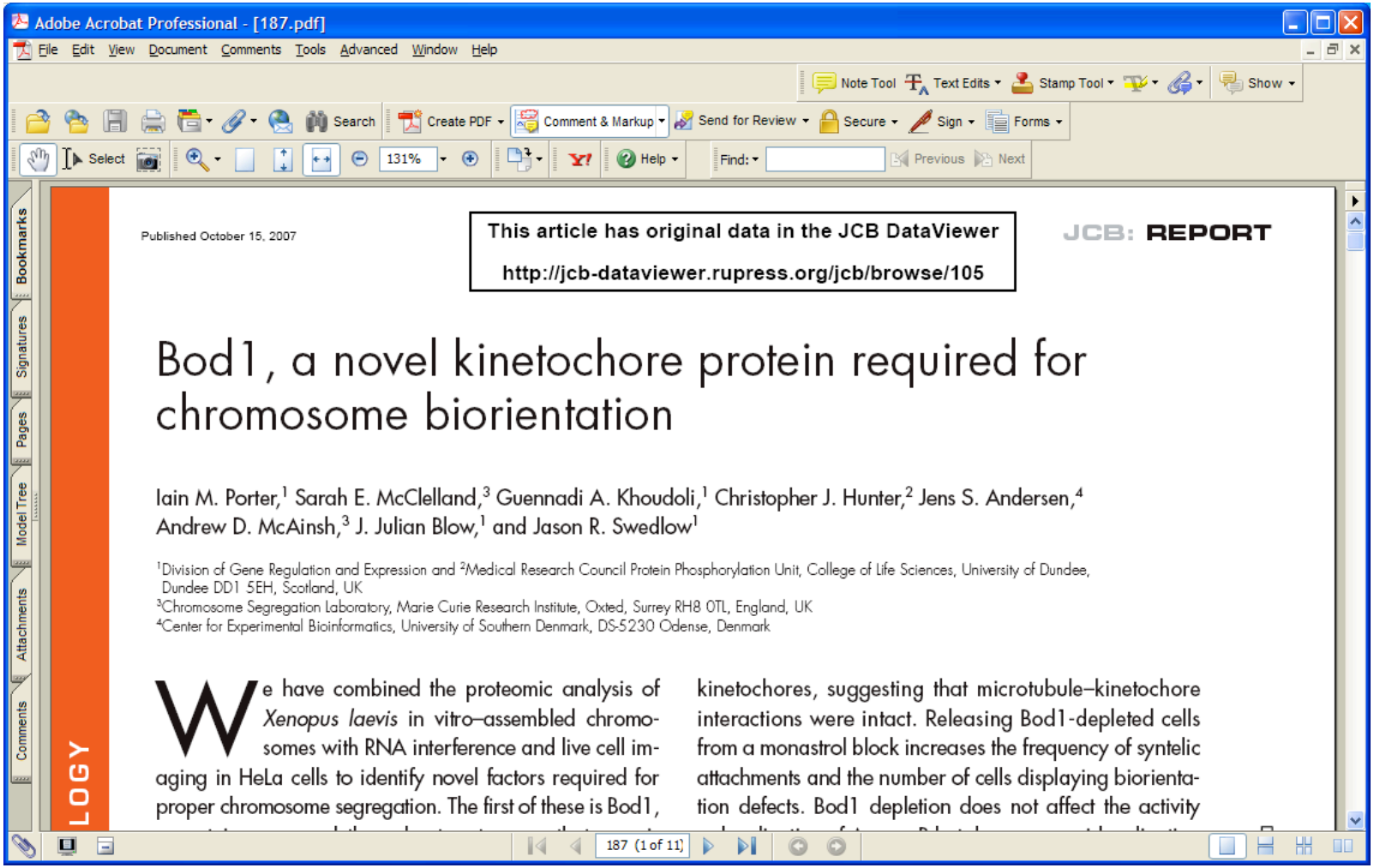
Multi-Dimensional Publishing



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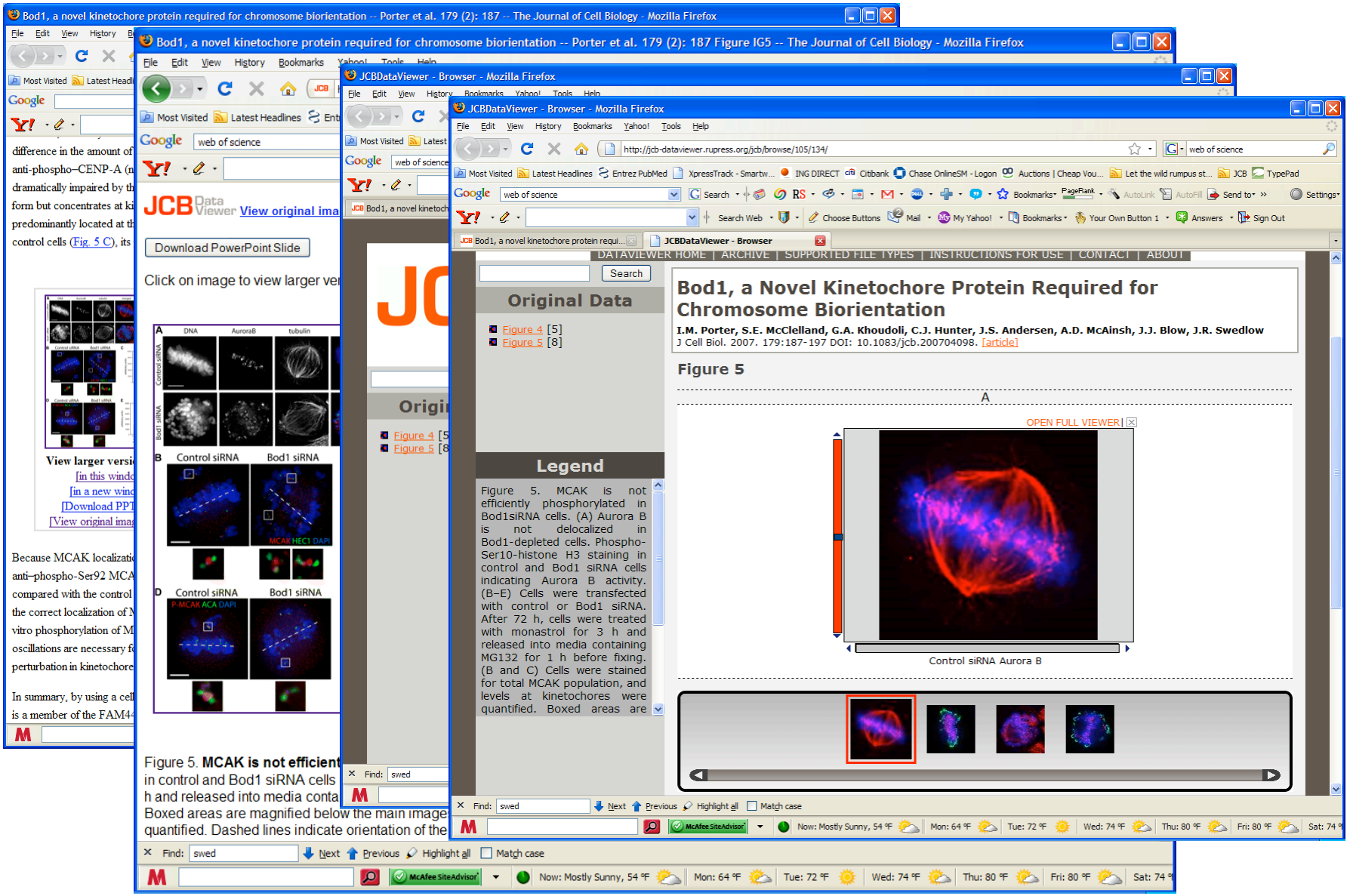

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Multi-Dimensional Publishing

Benefits to Readers

- Access to the real data being presented
- Real-time interaction with the data (through z-stack and time axes)
- Perform simple analyses (line-plots, split channels…)
- Obtain metadata

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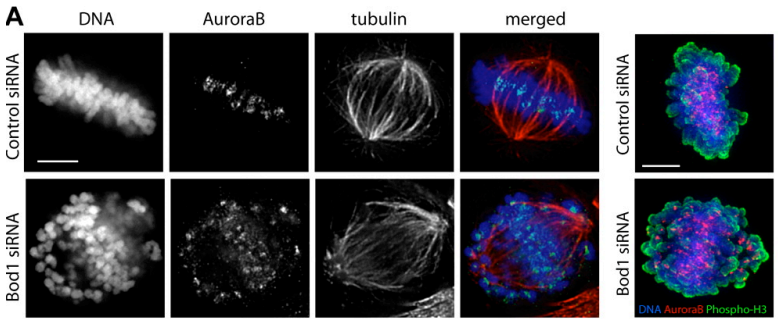
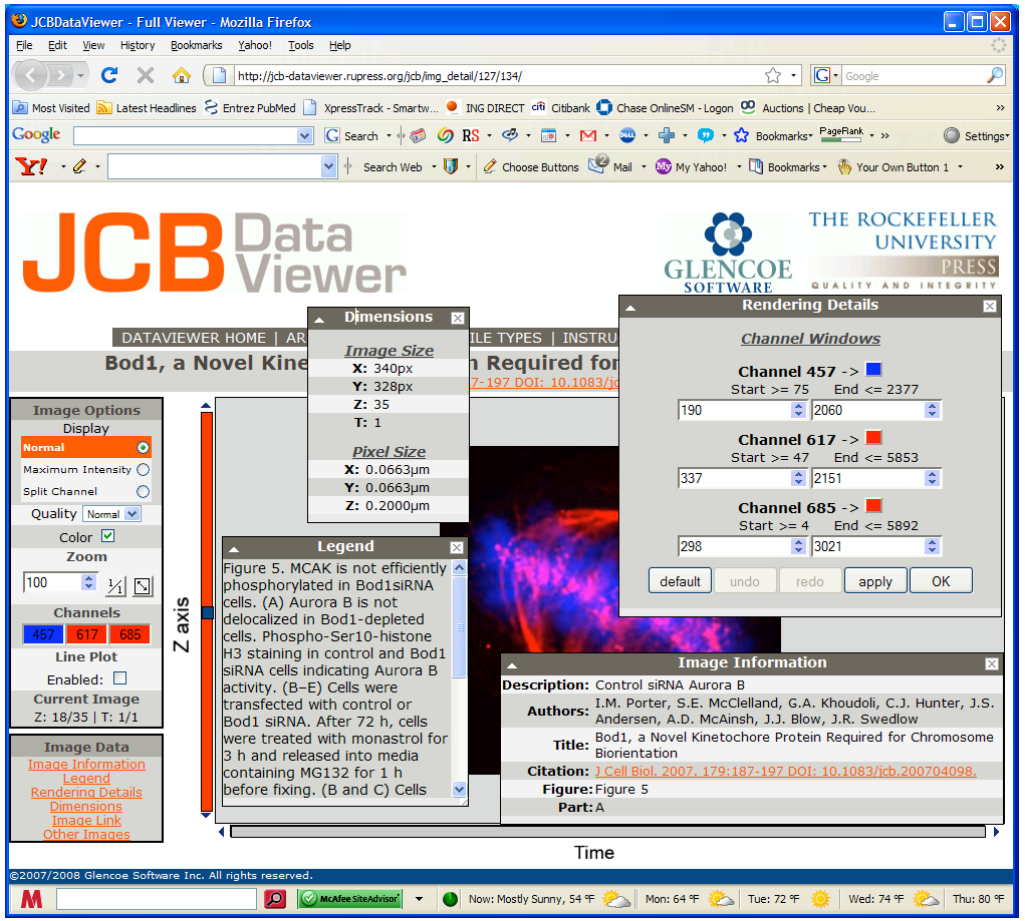
Multi-Dimensional Publishing

Figure 5



Porter et al., 2007 JCB Vol. 179, No. 2, 187-197



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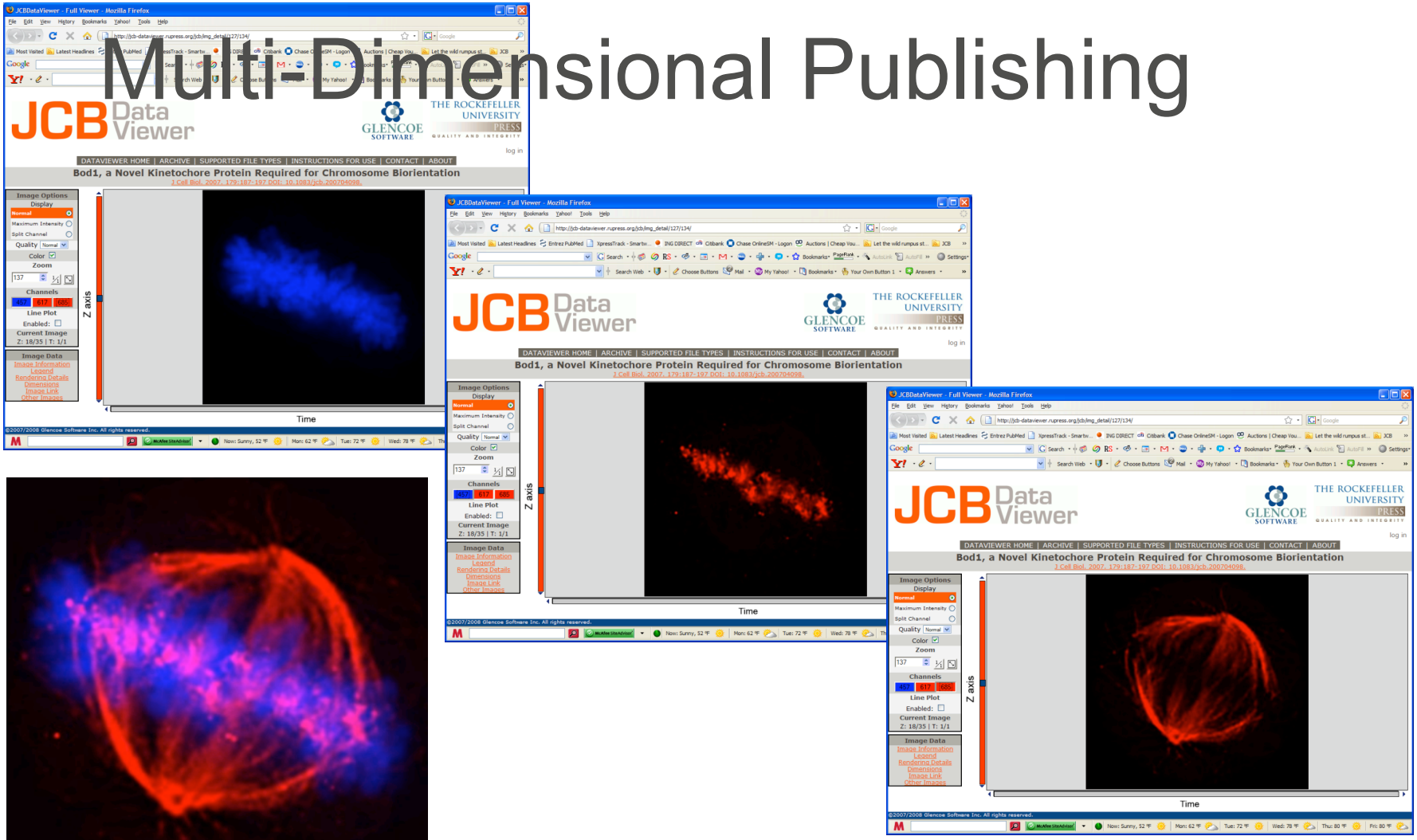
Multi-Dimensional Publishing



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Data Sharing: Funding agencies

The NIH

In NIH's view, all data should be considered for data sharing. **Data should be made as widely and freely available as possible while safeguarding the privacy of participants, and protecting confidential and proprietary data.** To facilitate data sharing, investigators submitting a research application requesting $500,000 or more of direct costs in any single year to NIH on or after October 1, 2003 are expected to include a plan for sharing final research data for research purposes, or state why data sharing is not possible.

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Data Sharing: Funding agencies

Wellcome: Policy on data management and sharing

1. … the Trust wishes to ensure that the outputs of the research it funds, including research data, are managed and used in ways that maximise public benefit. The Trust considers that the **benefits gained from research data will be maximised when they are made widely available to the research community as soon as feasible, so that they can be verified, built upon and used to advance knowledge.**

2. … the Trust **expects the researchers that it funds to maximise the availability of research data with as few restrictions as possible**…

3. … it is good research practice for all researchers to consider at the research proposal stage how they will manage and share the data they will generate.

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Data Sharing:

Funders guidelines strongly encourage data availability

Deposition of much biological data is required for publication.

Should this be standard for the publication of image data?

Precursor to an international repository of original image data?

How available should these data be. Only rendered JPEGs currently accessible. Should full access be granted?

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Future Directions

Additional functionality

Greater access for the user?

Direct download from microscopes to the JCB DataViewer

Ability to access JCB DV data directly from Insight OMERO client?

Adaptation by other journals

http://jcb-dataviewer.rupress.org

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