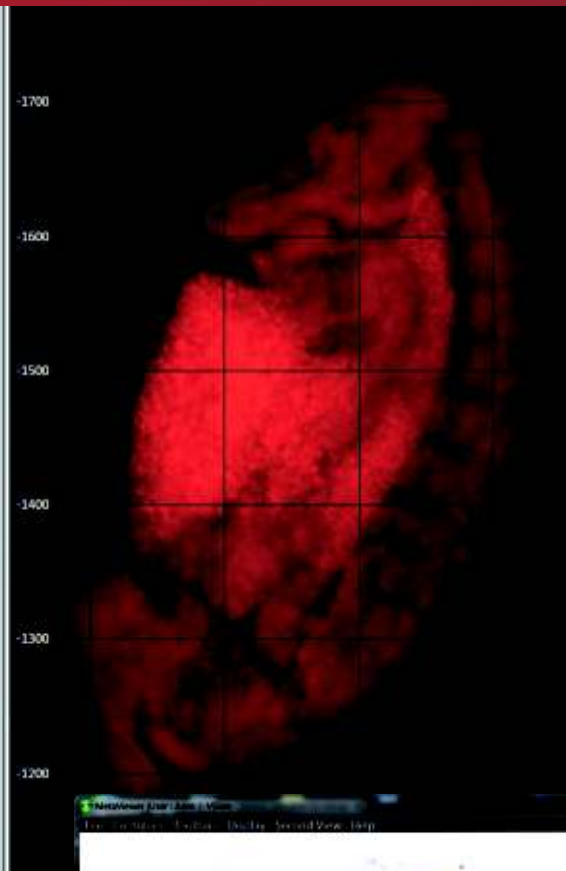
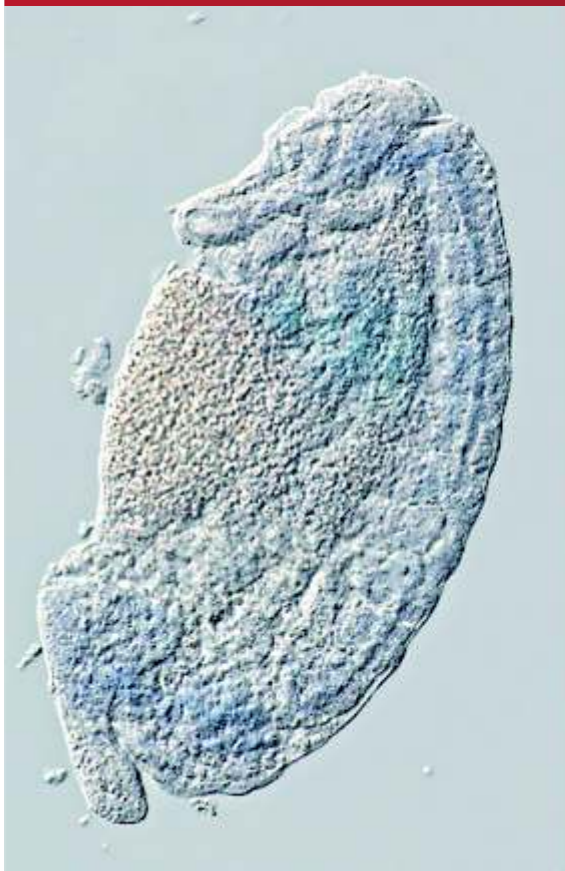


# VSlide

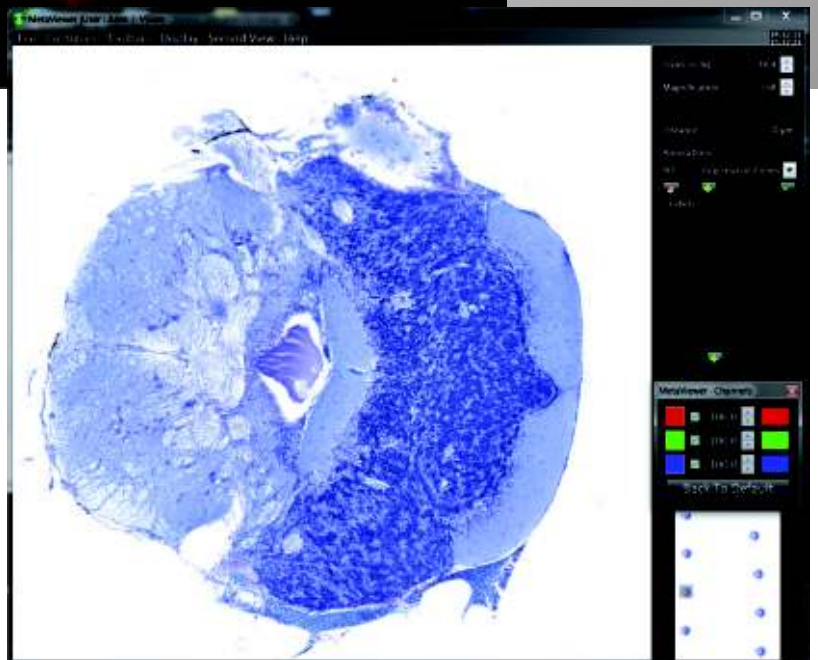
Flexible High Quality Slide Digitization

## Digitize

*Transform your slides into images of amazing quality and precision. Use the monitor as a virtual microscope, and share your data with others.*



- ▶ *Digitize*
- ▶ *Automate*
- ▶ *View/Share*
- ▶ *Store*
- ▶ *Customize*



# VSlide

## Flexible High Quality Slide Digitization

### Automate

*Use VSlide for smart sample digitization.*

*Take advantage of the many possible workflows to streamline your imaging task - fully automated and with superior quality.*

### Flexibility

*Create high-quality images with amazing detail*

VSlide is the software for slide digitization from MetaSystems. Based on the renowned scanning platform **Metafer**, it combines all the advantages of a high-end motorized microscope with state-of-the-art, high-quality imaging automation. Therefore VSlide is not restricted to predefined magnifications or contrasting modes.

VSlide files include data on image positions, color channels, magnifications, and focus planes. With the free, dedicated viewers for local viewing and for accessing the images through the internet these data can be used to selectively display exactly the information that is required for proper analysis.

Samples can be virtually 'focussed' on screen, and color channels are visualized in any selected color - with adjustable thresholds, inverted, and even side by side to the same image section displayed in another color or contrast mode.



## Automation

*Combine unlimited options to a smart slide digitization workflow*

Imaging with VSlide is easy. The system scans up to 880 slides unattended (using the extendible SlideFeeder x80), reads bar code labels, and pre-scans slides with a low power objective lens. Images of detected specimens are subsequently acquired at the selected magnification, thus avoiding time consuming scans of empty areas. Scanning parameters are stored in a *classifier* file, which can be selected on start or even be encoded in the bar code.

Digital slide images are automatically generated in the background. Parameter sets determine the color mode of the digital slide, its file format, and optional image processing operations applied to the raw images. Color channels originating from different contrasting methods can be combined in one file.

Original images can be repeatedly stitched using the offline mode - this way it is easy to create one or more additional images with different color channel settings or file formats.

*Create as many digital slides from your images as you want.*

*Select from a variety of different file formats and color modes.*



# VSlide

## File Formats and Viewers

### View/Share

*Use VSlide to digitize your samples and turn them into a digital collection of brilliant images.*

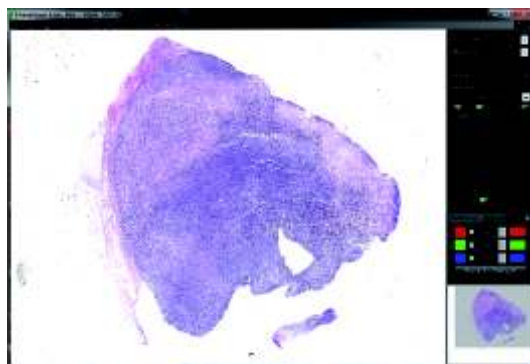
### Stitching and Viewing

*View digitized slide images online and offline*

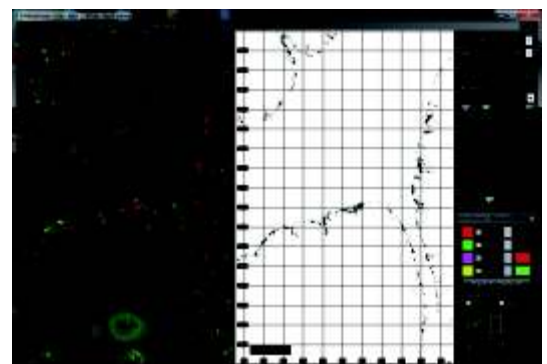
Image fields acquired by VSlide are automatically stored as color separated raw images (*Tagged Image File Format, TIFF*). Additionally the system writes all relevant data on origin and position of the image fields. The VSlide stitching software reads the raw data and processes them to a digital slide. If the software's own file format (*VSlide Image File Format, VSI*) is used for output, the final image contains information on colors, focus planes, and positions. Alternatively VSlide writes a number of other file formats (please contact [MetaSystems](#) for details). All stitching parameters are stored in a file that can be conveniently selected prior to the VSlide run.

Images are stitched either online (automatically during the scan) or offline. The latter option allows for additional stitching runs based on the same set of raw images, e.g. to generate an image with another file format or other color settings.

VSI files can either be read with our free software to display, modify, and annotate images on the local workstation, or with a browser-based viewer allowing for accessing VSlide images through the internet. In combination with the dedicated image server solution of MetaSystems any VSlide image collection can be turned into a database for sharing and collaboration - with highest security standards and user-dependent access rights.



*With the free VSlide viewing software digital slides can be evaluated on screen.*



*Different color view modes can be visualized side by side (left: original fluorescence image; right: inverted red channel).*

## Viewer Features

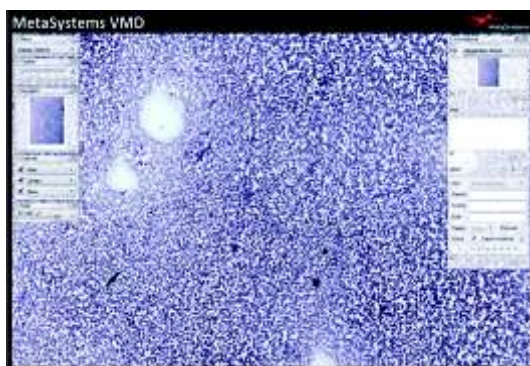
*A comprehensive concept for viewing VSlide images online and offline*

### Local Image Viewer

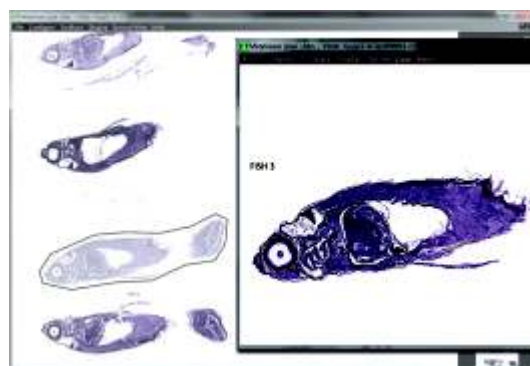
- ▶ Free local viewer software for VSI images (no installation required)
- ▶ Display of single color channels, focus planes, and extended focus image
- ▶ Zooming, panning, distance measurement, annotations
- ▶ Split display for side-by-side viewing of different color extracts
- ▶ Snapshots, sub-image extraction, and generation of focus stack video files
- ▶ Color and histogram adjustments, pseudo-colors, grayscale inversion
- ▶ Adjustable ruler, grid display, annotation of original image tiles

### Browser Based Image Viewer

- ▶ Browser based viewer for VSI images
- ▶ Display of single color channels, focus planes, and extended focus image
- ▶ Zooming, panning, distance measurement, annotations
- ▶ Navigator panel
- ▶ Online conferencing
- ▶ Ruler, zoom factor display, snapshot export, and print functionality



*VSlide images can be visualized online in the free browser-based viewer within the online image database framework.*



*Regions of interest can be extracted from a digital slide and stored as separate sub-image.*

# VSlide

## Image Data Storage and Retrieval

### Store

*Forget about all the problems associated with large image files.*

*VSlide helps you to focus on the images, not the logistics.*

### Data Access and Organization

*Convenient handling of large image files and metadata*

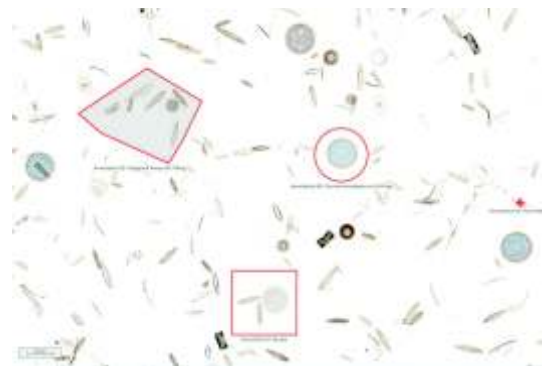
VSlide files do not only carry image information, but also metadata. These include basic information on image acquisition and stitching parameters, but also details on color channels, focus planes, sample positions on the slide, and much more.

Therefore each VSlide system comes with a convenient software package to read, filter, and organize large image databases on a local network server. It uses automated indices to manage data, and displays relevant information in representative tables, galleries, or graphs. A double-click opens any VSlide image directly in the associated viewer context.

If images have to be shared online with other users, any VSlide system can be extended with a webserver-based database for VSlide images. The software provides a platform to store, manage, and view VSlide images through the internet. Uploading VSlide data is done unattended and extremely fast with the dedicated file uploader. Images are organized in a tree of institutes, cases, and slides, and of course the database handles definite access rights and audit trails of changes. All VSlide data are displayed in a clearly-arranged gallery, and can be directly opened in the browser based viewer from there.



*Various possibilities to display and export results of metadata statistics are included.*



*Image annotations are stored with the image and can be selectively visualized.*

## Offline and Online Image Data Handling

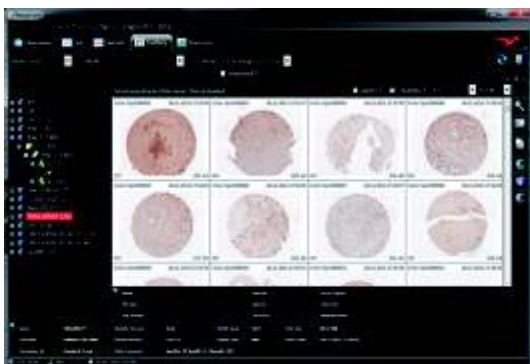
*Organizing, sharing, and retrieving VSlide results*

### Local Image Data Organization

- ▶ Software to organize and display VSlide image data and metadata on the local workstation or in local networks
- ▶ Various customizable view modes for easy data access (data dashboard, case table, detailed table, image gallery)
- ▶ Quick filter panels to select cases based on any metadata entry
- ▶ Editable statistics queries with export functionality
- ▶ Case and image management: copying, moving, and deleting cases and images, automated mirroring of databases
- ▶ User management and data access control

### Online Image Data Organization

- ▶ Online database for VSlide image and case organization
- ▶ Simultaneous multi-user web access and conferencing
- ▶ Access rights management; managed visibility; audit trail
- ▶ Uploader for images and metadata with maximized bandwidth
- ▶ Convenient multi-level case and image organization
- ▶ Gallery display of images and direct link to the browser based viewer



*Multiple subimages (e.g. tissue microarray cores) are automatically organized and can be retrieved separately.*



*Online image galleries provide comfortable access to VSlide images with the web browser.*

# VSlide

## Hardware and Performance

### Customize

*Not every imaging task is the same.*

*Take advantage of VSlide's flexibility and find the best solution for your samples.*

### Hardware Options and Performance

*Customize your VSlide system to exactly match your requirements*

Of course each VSlide system - even in its basic configuration - includes all required hardware and software features. However, special applications need special solutions, and the flexibility of the Metafer slide scanning platform provides the best foundation for adapting the system even to the most demanding tasks.

VSlide users can choose from a variety of different hardware items (e.g. the new **SlideFeeder x80**) that can be added to the basic system. The revolutionary camera portfolio allows for choosing between 2 different high-performance CCD camera models: the **CoolCube 1** cameras with a resolution of 1,360 x 1,024 pixels and an extraordinary signal-to-noise ratio, and the high-performance camera **CoolCube 2** with a resolution of 2,336 x 1,752 pixels for unrivaled scanning speed. Both models are available as color or monochrome camera.

The revolutionary electronic **MetaLED** illumination device generates highly homogenous light of different, well defined wavelengths, so that even with a monochrome camera, true color images can be acquired. The latter is of particular interest if Brightfield and fluorescence shall be combined in one image.



*With the new SlideFeeder x80 up to 880 samples are loaded from handy slide frame magazines.*



*The ultra-fast color MetaLED illumination is utilized to acquire high quality true color images with a monochrome camera.*



## Camera Types and Performance

Choose from 4 different camera models

### Standard Resolution System

- ▶ Camera Model: CoolCube 1m (monochrome) or 1c (color)
- ▶ Resolution: 1,360 x 1,024 pixels (SXGA)
- ▶ Sensor: 2/3", pixel size 6.45  $\mu\text{m}$  x 6.45  $\mu\text{m}$
- ▶ Frame Rate: 15 fps @ full resolution
- ▶ Fields of View / s: 13.5
- ▶ Pixel Rate (Mpix / s): min. 17.55 (CoolCube 1c color camera)
- ▶ Data Interface: High-Speed USB 2.0
- ▶ Scanning Time: < 140 s/15x15 mm<sup>2</sup> @ 20x; 0.32  $\mu\text{m}$ /pixel (interpolated)<sup>(1)</sup>  
< 420 s/15x15 mm<sup>2</sup> @ 20x; 0.32  $\mu\text{m}$ /pixel for each color<sup>(2)</sup>

### High Resolution System

- ▶ Camera Model: CoolCube 2m (monochrome) or 2c (color)
- ▶ Resolution: 2,336 x 1,752 pixels
- ▶ Sensor: 1", pixel size 5.5  $\mu\text{m}$  x 5.5  $\mu\text{m}$
- ▶ Frame Rate: 32 fps @ full resolution
- ▶ Fields of View / s: 13.5
- ▶ Pixel Rate (Mpix / s): min. 54.00
- ▶ Data Interface: PCI Express
- ▶ Scanning Time: < 65 s/15x15 mm<sup>2</sup> @ 20x;  
0.275  $\mu\text{m}$  per pixel (interpolated)<sup>(3)</sup>  
< 420 s/15x15 mm<sup>2</sup> @ 20x;  
0.275  $\mu\text{m}$  per pixel for each color<sup>(4)</sup>

- (1) Fast Brightfield scan with CoolCube 1c color camera  
 (2) High resolution Brightfield scan with CoolCube 1m monochrome camera and sequential RGB illumination  
 (3) Fast Brightfield scan with CoolCube 2c color camera  
 (4) High resolution Brightfield scan with CoolCube 2m monochrome camera and sequential RGB illumination



# VSlide

The most flexible slide digitizer

*Because of its special configuration VSlide offers an unrivaled degree of flexibility.*

*Are you looking for a certain functionality?*

*Please contact MetaSystems to see if VSlide is the solution.*

## VSlide Feature Overview

### General Configuration / Hardware Options

- ▶ System for slide digitization based on the scanning platform Metafer
- ▶ Comprehensive flexibility in the choice of magnifications and contrasting modes, including fluorescence, darkfield illumination, *Nomarski* interference contrast, and more.
- ▶ Fully operable high-end research microscope with free choice of magnification lenses and add-ons; support of inverted microscopes
- ▶ Choice of 4 cameras (monochrome and color) with two resolutions
- ▶ Dedicated electronic color LED illumination

### Smart Scanning

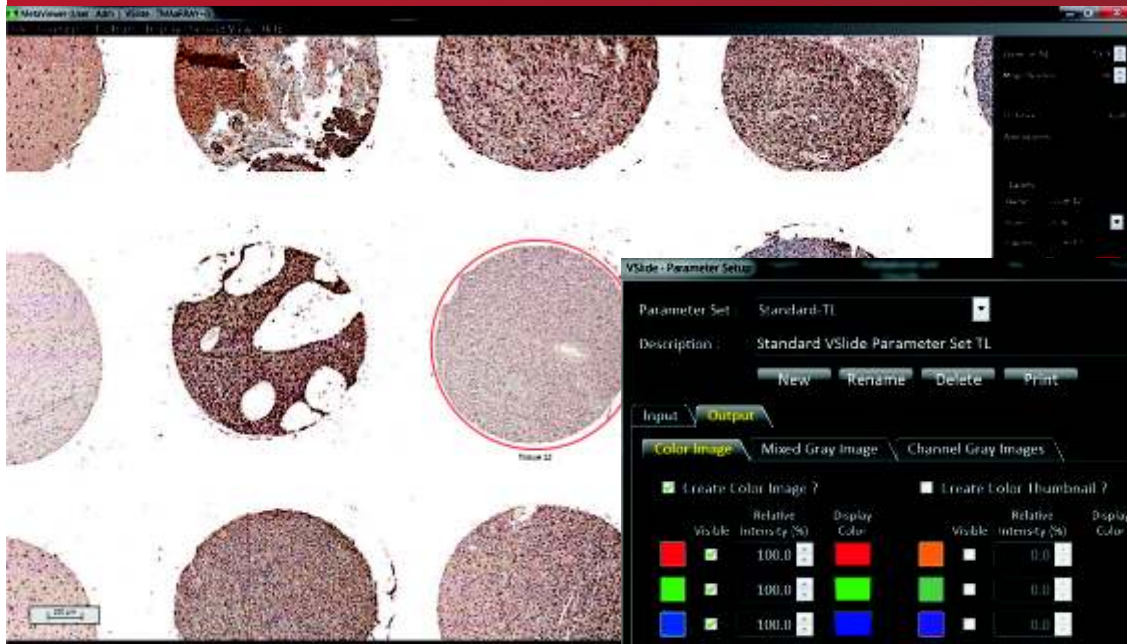
- ▶ *Smart Focus*: empty regions are automatically excluded; prediction of focus grid positions for samples with dispersed specimens
- ▶ Automated pre-scan to determine specimen dimensions
- ▶ Automated focus-stack imaging: each focus level is kept and can be displayed individually
- ▶ *Smart Scanning*: regions of interest within the sample can be selected and scanned again with different parameters and/or contrast modes
- ▶ *Tissue Matching*: serial tissue sections can be aligned to visualize the same region in both sections (e.g. for selection of ROI in H&E stained samples and subsequent analysis of fluorescent signals in corresponding regions on another tissue specimen)

### Data Access and Viewing

- ▶ Dedicated software for display, annotation, and analysis included
- ▶ Online image viewing (browser-based); conferencing
- ▶ Local data management software (image data dashboard, image gallery, convenient data filtering, statistics)
- ▶ Online database for images and metadata

### Extensions

- ▶ SlideFeeder x80: automated slide frame changer with capacities from 80 to 880 slides; bar code reader; automated immersion oil dispenser
- ▶ Seamless integration of MetaCyte: fully automated cell signal analysis based on configurable, highly flexible classifiers



Flexible parameter sets (right) determine the image stitching procedure for various output image formats (above: Brightfield TMA; below: fluorescence with pseudocolor counter stain).

VSlide - Parameter Set

Parameter Set: Standard-TL

Description: Standard VSlide Parameter Set TL

New Rename Delete Print

Input Output

Color Image Mixed Gray Image Channel Gray Images

Create Color Image? Create Color Thumbnail?

Visible	Relative Intensity (%)	Display Color	Visible	Relative Intensity (%)	Display Color
<input checked="" type="checkbox"/>	100.0	Red	<input type="checkbox"/>	0.0	Orange
<input checked="" type="checkbox"/>	100.0	Green	<input type="checkbox"/>	0.0	Yellow
<input checked="" type="checkbox"/>	100.0	Blue	<input type="checkbox"/>	0.0	Light Blue
<input type="checkbox"/>	0.0	Purple	<input type="checkbox"/>	0.0	Pink
<input type="checkbox"/>	100.0	Yellow	<input type="checkbox"/>	0.0	Light Green
<input type="checkbox"/>	0.0	Cyan	<input type="checkbox"/>	0.0	Light Cyan

Standard RGB

File Format:  \*.vsl  \*.dcm  \*.ims  \*.tif  \*.jpg

Compression: JPEG JPEG Quality: 80

Save FOVs As Annotations?

Stack Mode: Both in Separate Files  Use All Planes?

Output Files:

- Use Automatic Suffix?
- Allow Overwriting?
- Optimize Size Difference?

Thumbnail Settings:

Mode: Scale To Size

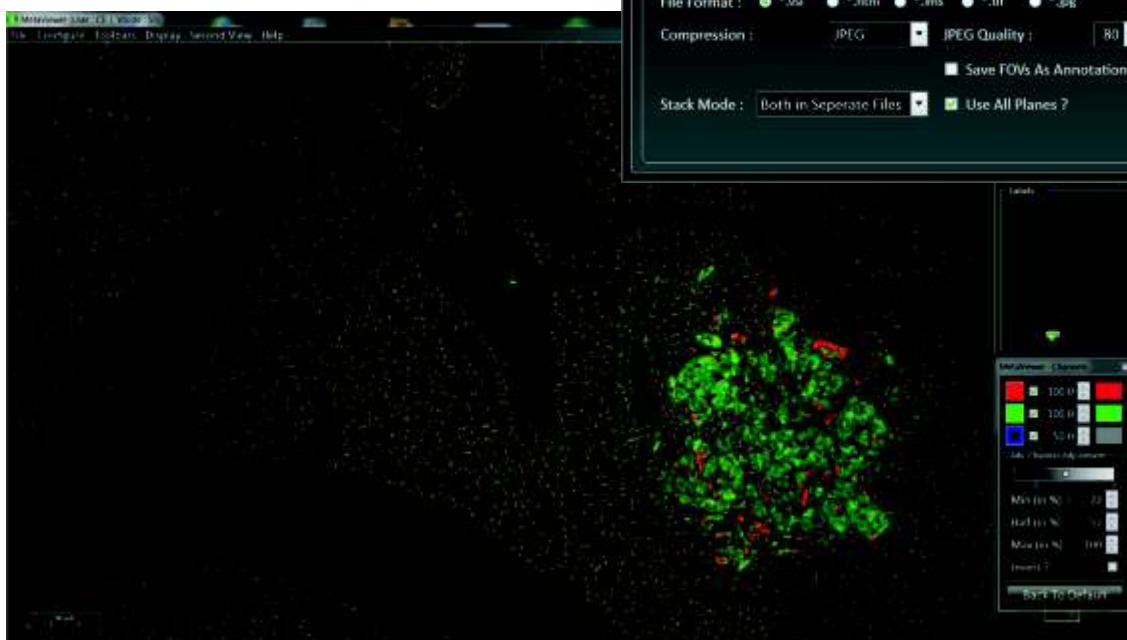
Width: 1280 Screen

Height: 1024

File Format: TIFF (.tif)

Use Compression?

Save Irreg. Position List As: Single Spot Images



# MetaSystems

## Imaging Automation



*The images on the front page and above show fruitfly embryos acquired with Nomarski interference contrast and fluorescence. Specimen are courtesy of E. Kvon and A. Stark, IMP, Vienna, Austria.*

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BRO-VSLIDE-2011-11-02

### More Products

MetaSystems is a leading manufacturer of imaging systems and DNA probe kits worldwide. Please contact MetaSystems if you would like to receive information about the following other product lines of MetaSystems:

- ▶ Clinical Cytogenetics (Pre- and Postnatal)
- ▶ Oncology, Hematology, Cancer Therapy Monitoring
- ▶ Toxicology, Mutagenicity Assays, and Radiation Bio-Dosimetry
- ▶ Pathology and Forensic Imaging Assays

### MetaSystems Worldwide

MetaSystems is proud to have a worldwide network of competent business and service partners. For inquiries please contact your local MetaSystems partner or one of the three MetaSystems offices in Germany, USA, and Hong Kong.

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